Farm Structure Survey 2009/2010

Survey on agricultural production methods 2009/2010

National Methodological Report (NMR)

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FARM STRUCTURE SURVEY 2009/2010 SURVEY ON AGRICULTURAL PRODUCTION METHODS 2009/2010
NATIONAL METHODOLOGICAL REPORT

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SUMMARY

The Farm Structure Survey (FSS) is a survey of national interest, which is carried out both as a sample survey and as a census, in order to collect objective quantitative information relating to the structure of the farming sector.

The Hellenic Statistical Authority (ELSTAT) carried out the first sample survey of the Structure of Agricultural and Livestock holdings in 1966/67, when Greece was still an associated member of the EU. The next sample survey took place in 1977/78. After the accession of the country to the EU further surveys were carried, out every two years from 1983 till today.

Every ten years an exhaustive survey (Basic FSS or Agricultural Census) is carried out. The first Agricultural Census was conducted in 1950, after the Second World War. Since 1950 five censuses of agriculture and livestock farming have been held, in 1961,1971,1981,1991 and 1999/2000. From 1961 to 1991 censuses were conducted simultaneously with the General Population and Housing Census. The Agricultural Census of 1991 was the last census carried out at the same time with the General Censuses for Population, Households etc. The Agricultural Censuses of 1999/2000 and 2009/2010 were carried out before the General Population Censuses of 2001 and 2011, respectively.

The purpose of FSS is to determine the basic structural features of the agricultural and livestock holdings, which encapsulate the agricultural picture of Greece at the specific time.

The developments of the agricultural holdings' structure constitute the main element for the National and Community policy drawing up in the Agricultural Sector.

Therefore, the collection of objective and reliable data is absolutely necessary in order to draw up time series tables concerning the holdings' characteristics.

During the last decade FSS took place as a sample survey in years 2003, 2005 and 2007 and as an exhaustive survey (census) in year 2009. The FSS 2009 was conducted simultaneously with the sample Survey on Agricultural Production Methods 2009 (SAPM 2009), which was carried out for the first time.

Whereas the aim of FSS is to determine the basic structural features of the agricultural and livestock holdings, the aim of SAPM is to explore more technical aspects of the agricultural activity in Greece.

The Hellenic Statistical Authority (ELSTAT.) is the responsible body for the surveys implementation. Some of the Central Office responsibilities are the surveys organization and preparation, the tabulation and presentation of the results and finally the information dissemination. The data collection and process are carried out by the Regional Statistical Offices of the 51 districts. The data collection is carried out by interviewers, selected by the Regional Statistical Offices and recommended to ELSTAT. for appointment. On average, 100 agricultural units correspond to each interviewer. The Regional Statistical Offices, in charge of the surveys, supervise the activities of the interviewers.

The FSS 2009 and SAPM 2009 were planned for the end of year 2009 (October – December 2009) but were finally carried out during the period July to October 2010 due to decisions made by the competent Minister.

The processing of the data was carried out the period from 1st November 2010 to 31st March 2011.

The reference period for the FSS data in respect of crops, labour force and other items, as well as for the SAPM 2009, was the cultivation period from 1 October 2008 to 30 September 2009. The reference date for the FSS data, in respect of livestock, was 1 November 2009, and for Rural development was the last three (3) years of the reference year

The public announcements for the agricultural census made through the media and press (newspapers, radio, TV broadcasts), as well as the announcements released by the Municipalities underlined that the reference period of the census was October 2008 to September 2009. Furthermore, the data collection has been made via personal interview with the farm holder. During the interview the interviewer made clear that the data he had to record concerned the reference period and not the period when the interview was taking place.

FSS 2009 was an exhaustive survey so every agricultural, livestock or mixed holding of the Statistical Farm Register was surveyed.

The Farm Register includes holdings, the holder of which made use of: at least 0.1 ha of utilized land or at least 0.05 ha of greenhouses, the holding's own animals, namely: one (1) or more cows or two (2) or more other "large animals" of any type and age (oxen, horses, donkeys, mules), or five (5) or more "small animals" (sheep, goats, pigs) of any age and type, or fifty (50) or more poultry birds, or twenty (20) or more hives of "domestic" or "European" bees or five (5) or more ostriches.

SAPM 2009 was a sample survey with the same threshold as for the agricultural census. The sampling frame used was the Statistical Farm Register.

The bodies involved in the FSS 2009 and SAPM 2009 were:

1 Working Group at ELSTAT,
2 senior supervisors (two senior officials of the Central Office of ELSTAT),
52 supervisors at the 51 Regional Statistical Offices (Heads of the Regional Statistical Offices),
235 assistant supervisors at the 51 Regional Statistical Offices (officials in the Regional Statistical Offices),
8.345 interviewers and 105 accompanying (interpreters) interviewers (in order to assist the main interviewers in areas where language problems existed). (ANNEX IV Decisions designating private interviewers)
550 local statistical correspondents for the common land questionnaires (without charge)
1 expert to contribute to the survey design, processing, tabulation design and publication.

Data was collected by a personal interview with the holder of the farm. The filled in questionnaires were collected and checked by the assistant supervisors. The assistant supervisors checked the questionnaires and deliver them to the supervisors who coordinated the whole work at the district of their responsibility.

ELSTAT's personnel carried out the scanning of the questionnaires for the OCR (Optical Character Recognition), as well as the processing and correction phase.

The responsible department, at central level, carried out the quality controls. The FSS and SAPM results were compared with data coming from previous FSS surveys as well as data coming from other sources (e.g. special annual agricultural surveys, administrative data etc).

1.   CONTACTS

Contact organisation	Hellenic Statistical Authority – ELSTAT.
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2.   SURVEY METHODOLOGY

2.1   National legislation

ELSTAT is an independent authority acting under the supervision of the Greek Parliament. The main statute concerning the ELSTAT is Law 3832/09-03-10.

In addition, a joint decision including matters relating to the proclamation as well as the approval of the surveys implementation and the duty delegation of the surveys to the responsible unit together with details of implementation and processing is issued by the Ministers of Economic Affairs and Finance and the co-responsible Ministers. Furthermore, the joint decision sets out the time schedule, the organization and the cost of the surveys.

The above-mentioned national legislation deals with the scope and the coverage of FSS and SAPM, assigns ELSTAT the responsibility for the surveys, determines the obligations of the respondents with respect to the census and identification, as well as the protection and the obligations of enumerators. In addition, it includes administrative and financial provisions and provisions relevant to the right of access to administrative data.

As far as the methodology for both FSS and SAPM is concerned, ELSTAT fully complies with the EU legislation.

2.2   Characteristics and reference period

The characteristics of the FSS 2009 and SAPM 2009 fully comply with the EU Regulation and more specifically ver.7 of the Handbook on implementing the FSS and SAPM. There are no

characteristics that are surveyed only for national purposes, or characteristics that deviate from EU list or characteristics not collected.

In addition, there are no changes of definitions of characteristics and/or reference time and/or measurement affecting the comparability with previous survey data.

The reference period for the FSS data in respect of crops, labour force and other items, as well as for the SAPM, was the cultivation period from 1 October 2008 to 30 September 2009. The reference date for the FSS data in respect of livestock was 1 November 2009. For RD was the last three (3) years of the reference year.

A copy, in Greek and in English, of both questionnaires (FSS & SAPM) is provided in the Annex.

2.3 Survey organisation

The Hellenic Statistical Authority (ELSTAT) is responsible for the FSS and SAPM, and more precisely the Structure of Agricultural and Livestock Holdings Statistics Section of the Primary Sector Statistics Division.

In particular, this Section is responsible for the overall planning, organization, supervision and conduct of the surveys, as well as the processing and publication of the survey results, in collaboration with other co-responsible sections of ELSTAT, such as the Divisions of Organization and Methodology, Informatics, Statistical Information and Publications, Administrative Support and Financial Administration.

The conduction and processing of the survey was decentralized and was in the hands of the Regional Statistical Offices of ELSTAT at 51 prefectures (nomi).

The bodies involved in the FSS 2009 and SAPM 2009 were:

- 1 Working Group at the ELSTAT,
- 2 senior supervisors,
- 52 supervisors at the 51 Regional Statistical Offices,
- 235 assistant supervisors at the 51 Regional Statistical Offices,
- 8345 interviewers and 105 accompanying (interpreters) interviewers (in order to assist the main interviewers in areas where language problems existed) (ANNEX IV Decisions designating private interviewers)

  550 local statistical correspondents for the common land questionnaires
- 1 expert to contribute to the survey design, processing, tabulation design and publication.

The composition, the responsibilities and the functions of the bodies involved in the survey were defined as follows:

1.   Working Group at ELSTAT:
In connection with the organization, conduction and processing of the FSS and SAPM, a working group was set up and operated in the Central Office of ELSTAT.

The task of the Working Group was the effective planning and coordination of all the work relating to the organisation and conduction of the survey and the processing of the results.

2.   Senior supervisors:

The senior supervisors were two senior officials of the Central Office of the ELSTAT, Division of Primary Sector Statistics. More precisely, they were the head of the Division and the Head of the Structure of Agricultural and Livestock Holdings Statistics Section.

Their task was to organize and monitor all kinds of operations of the surveys, train the supervisors, supervise and coordinate their work, monitor the organization, conduct the surveys in the prefectures, and deal with any potential problems.

3.   Supervisors:

The supervisors were mainly the heads of the Regional Statistical Offices, who have long experience in coordinating and implementing the structural surveys and the agricultural census, as well as other statistical surveys.

Their task was to organize and complete, within the prescribed time limits, the necessary work for preparing and conducting the surveys, in the area of their responsibility (prefecture). More particularly, they were responsible for:

- Informing all local-government bodies, public services, organizations and the public about the survey,
- Allocating all municipalities and rural districts in the prefecture to assistant supervisors,
- Selecting, on the basis of merit, the interviewers and recommending their appointment by the ELSTAT,
- Training assistant supervisors and interviewers,
- Assigning work to the interviewers,
- Monitoring and coordinating the work of the assistant supervisors and interviewers throughout the conduct of the surveys and providing them with instructions and every possible assistance, and
- Supervising and taking responsibility for the successful conduct of the surveys, together with the collection, checking and processing of the questionnaires for their district.

4.   Assistant supervisors:

The assistant supervisors were mainly officials in the Regional Statistical Offices who have long experience to implement structural surveys, agricultural census and other agricultural surveys as well as other statistical surveys. They were responsible for assisting the supervisors in the work of organizing, conducting and processing the surveys, as described above.

5.   Interviewers:

The interviewers were private collaborators, mainly unemployed, students and agriculturalists.

Interviewers were selected by the Regional Statistical Offices, which recommended their appointment to ELSTAT.

The interviewers were selected on the basis of their experience on statistical surveys in the agricultural sector, their knowledge of the territory and the local situation in agriculture as well as their agronomic background.

The task of the interviewers was to complete the questionnaires and to check their quality.

6.   Accompanying interpreters:

The accompanying interpreters were also private collaborators.

Their task was to assist the interviewers in completing the questionnaires in areas where language problems existed.

7.   Experts:

Furthermore, other ELSTAT's staff and experts outside ELSTAT were appointed for specific tasks of the survey and contributed to particular stages of the survey as:

- Survey design
- Survey processing
- IT application for OCR and data entry, automatic controls and programming development.

In addition, a pilot study, funded by Eurostat (Grant Agreement No. 40701.2008.001-2008.142), was carried out in collaboration with the Agricultural University of Athens, as well as with the National Institute of Agricultural Economics of Italy (INEA). Its scope was to provide a model for the estimation of the volume of water used for irrigation in agriculture and a pilot survey was conducted, in three different prefectures, to support it. For more information, see the Final Report of the pilot study.

2.4 Calendar (overview of work progress)

The Farm Structure Survey 2009 and the SAPM 2009 were conducted in the period from July 2010 to October 2010.

The processing of the data was carried out in the period from November 2010 to March 2012.

The multiple operations for the FSS and SAPM, more particularly the preparatory work, the actual surveys taking and the post-survey work, were carried out in four phases, as detailed below:

Phase 1: Organization and preparation of the survey.

The first phase comprised the organization activities and preparatory work for the surveys, more precisely the following actions were carried out:

- Farm registers' update from "Organic Farming" and "New Farmers" register of Ministry of Rural Development and Food,
- Survey design,
- SAPM sample design,
- Design of questionnaires, manual of instructions and other auxiliary documents,

- Analysis, design and implementation of the IT application for OCR, data entry and automatic controls,

- Development of the database applications,

- Development of Eurofarm file and control tables,

- Appointment of senior supervisors, supervisors and assistant supervisors,

- Training of the above staff, in training centers assigned for the supervisors by the relevant Section of the Central Office of the ELSTAT and for the assistant supervisors by the supervisors,

- Delivery to the supervisors of the questionnaire instructions and other auxiliary documents,

- Situating of the supervisors and assistant supervisors in their posts,

- Contacts between supervisors and respective prefects and familiarization of the Regional Statistical Offices and all public services in the prefectures with the purpose of the survey and the manner of conducting it,

- Division of each supervision area into zones of responsibility for the supervisors and their assistants,

- Selection and appointment of the interviewers for the conduct of the surveys,

- Selection and appointment of accompanying interpreters to assist interviewers in completing the questionnaires in areas where language problems existed.

Updating in phase 1, during the preparation of the census.

The basic farm register that was used for the 2009 census was the register from the 1999 census as this had been updated from the FSS surveys of 2003, 2005 and 2007, to a certain degree, and the special annual agricultural surveys (orchard survey, survey on areas under vine, survey on cereals production, survey on crop production other than cereals, survey on pigs livestock, survey on cattle livestock, survey on sheep livestock, survey on goats livestock).
Also for the update of the register in 2007, ELSTAT collaborated with the Ministry of Rural Development and Food. In this framework, ELSTAT made use of the specific registers of the Ministry of Rural Development and Food pertaining only to "New Farmers" (measure 1.1.2. of the Programme for the Rural Development of Greece, which is co-financed by the European Union by virtue of Council Regulation (EC) No 1698/2005 and Commission Regulation (EC) No 1274/2006) and "Organic Farming", that is it compared those registers with ELSTAT's basic register. No other Registers either from the Ministry of Rural Development and Food were used, such as registers for **olive trees** and the **vineyards**, because there was no consistency with the definition of the agricultural holding, or from any other Administrative source.
The data from the basic Register and the two other registers of the Ministry of Rural Development and Food (that of the New Farmers and Organic Farmig), were compared and crosschecked on the basis of the identification data of the holder.

There were cases where the registers of the Ministry of Rural Development and Food were not fully complete, as some data were missing, such as the date of birth date, the tax registration number, etc., and so these could not be matched. Those not matched cases with the basic ELSTAT's register, were kept separately in two "temporary file registers" i.e., one for the new farmers and one for organic farming.
That was the procedure to update the basic Farm Register at the preparatory phase.

Phase 2: Data collection

The second phase comprised the main work for conducting the surveys. In the course of this phase the following operations were carried out:

- Training of interviewers,
- Allocation of the interviewers in their sectors, distribution to them of the questionnaires and the lists from the Farm Register with the units and the sample units (for SAPM) and other necessary documents,
- Conduct of the surveys (collection of statistical data), and monitoring and supervision of the operation from beginning to end by the assistant supervisors and supervisors,
- Check of the questionnaires,
- Delivery of the questionnaires by the interviewers to their assistant supervisor,
- Collection of the questionnaires that had been checked by the assistant supervisors by the supervisors of the questionnaires.

Updating during the Census

a) In the cases where some of the necessary characteristics for the identification of the holding was still missing, making the identification impossible, the supervisors collaborated with the departments of Agriculture located in the Prefectures for:
  a. obtaining the necessary missing information for the holdings. On that basis, ELSTAT's basic register was updated with the new information
  b. clarifying whether the holdings were in operation or not.

b) During the census, the interviewers used apart from the basic register, the two "temporary file registers" (regarding the "new farmers" and "the organic farming"). If they found out a holding that was in the basic register as well as in one of the "temporary file register" then they filled in the questionnaire for the holding of the basic register making a noteon the "temporary file register" indicating that these holdings had been merged.

*Phase 3: Data processing (**After the census)**

The following operations were carried out:

- Scanning of the questionnaires, OCR, online processing (logical controls, consistency controls and automatic controls) by the ELSTAT personnel and creation of a database containing the survey data,
- Quality controls of the data by the Regional Statistical Offices, at NUTS III level, (the quality controls can be found in ANNEX IX Validation rules: error 403-406)
- Validation in the Central Office of the data from the prefectures,
- Automatic controls of the data in the database at central level, (the quality controls can be found in ANNEX IX Validation rules: error 01)
- ANNEX VII
- Quality controls on the survey data (the quality controls can be found in ANNEX IX Validation rules: error 01- 406)

-
- Processing of the data in accordance with the Eurofarm programme-typology of holdings and creation of the Eurofarm file of individual data.
- Continuous checking with Farm Register and correcting according

Updating after the Census (during phase 3)

a) The holdings of the "temporary file registers" that were not included in the basic register and found to be in operation were added to the basic register. As it is said before a questionnaire had been filled in during the census.

b) The quality checks identified cases of duplication. (the quality controls can be found in ANNEX IX Validation rules : error 403-406)

c) The quality checks identified holdings that did not fulfill the classification criteria of a "holding", thus they were deleted from the basic register. (the quality controls can be found in ANNEX IX Validation rules : error 01)

Other potential sources for updating the Basic Register

In 1996 a "micro-census" took place before the 1999 census. For the 2009 census such a "micro-census" was not conducted, something that could have been used as an updating tool.

However,

a) Beside the effort undertaken to update the census register, some holdings were identified which should be in the register as operating holdings and they were not or holdings which were in the register at the time of the census while they should not be included because they were closed for a number of reasons such as, the holder was too old or he had changed occupation not economic efficiency of the holding, merging, change of land use (land to be developed) , cultivations which were burnt, etc.

b) Other critical issues are the sources which are used for the update: for example the structural surveys, even though they take place every two years, they are sample surveys (10% sample size). Therefore the updating that takes place refers only to the sample size as no imputations are made pertaining to updating issues and consequently the register cannot be fully updated.

c) ELSTAT has not yet developed a system for automatic and continuous update of the register, for instance, by linking its register with the register of other public services or government ministries such as the register of the Ministry of Agricultural Development and Food and the register of OPEKEPE, etc. It should be mentioned that developing a system for automatic and continuous update is amongst ELSTAT's priorities and a relevant project has already been envisaged.

d) The discrepancies and differences identified before and after the census in the registers of ELSTAT, i.e. the register from the 2007 survey and the register from the 2009 census pinpoint issues pertaining to the quality of the applied methods for updating the register

Phase 4: Evaluation of the results-Publication and Dissemination

At the final phase the following operations were/will be carried out:

- Qualitative analysis and documentation of the results,
- Production of national tables with the final results,
- Preparation of press releases and a publication with the final results.

CALENDAR

Survey phases	Unit in charge	Period
Draft design and other preliminary work	Central Office / Agricultural Unit	
• Survey design	And Methodology/IT /Information and Publication Unit	April 2009 – June 2009
• Questionnaire		September 2008 – May 2009
• Manuals of instructions for survey conduct and processing.		September 2008 – May 2009
Sample design, sample selection	Central Office / Methodology Unit	
• Sample design		April 2009 – July 2009
• Sample selection		August 2009 – September 2009
Production of Survey materials	Central Office / Agricultural Unit	
• Production of questionnaires		June 2009 – September 2009
• Field work materials		June 2009 – September 2009
• Advertising posters		June 2009 – September 2009
General computer programming	IT Unit	
• IT application for data entry and automatic controls		September 2009 –December 2010
• Development of the database applications		November 2010 – March 2011
• Development of Eurofarm file and control tables		May 2011 – July 2011
Coordination, support, control and monitoring by Agricultural Unit	Central Office / Agricultural Unit	
• Training session for survey Supervisors and assistant supervisors		October 2009
• Training courses for Interviewers		July 2010 – August 2010
• Distribution of materials to the regional statistical offices		June 2010 - October 2010
• Guidance during data collection		July 2010 – October 2010
Survey collection	Regional Offices	
• Field work		July 2010 – October 2010
Survey processing	Central Office / Agricultural Unit and IT Unit	
• Logical checks and checks on the completeness of the questionnaires		October 2010 – June 2011
• Questionnaire Optical Reading Data entry and automatic controls		April 2011- September 2011
• Corrections on Optical Reading Data (data validation, verification)		May 2011- February 2012
• Data input in Oracle database		October 2011- February 2012
• Quality controls at NUTS III level		January 2012-March 2012
Evaluation of the results-Publication and Dissemination	Central Office / Agricultural Unit and Methodology Unit	
• Validation in the Central Service of the data from the prefectures		February 2012-March 2012
• Automatic controls of the data in data base at Central level		February 2012-March 2012
• Quality controls on the survey data		February 2012-March 2012
• Processing of the data in accordance with the Eurofarm programme-typology of holdings and creation of the Eurofarm file of individual data		January 2012 - March 2012
• Qualitative analysis and documentation of the results	And IT unit	March 2012
• Production of national tables with the final results		March 2012 - September 2012
• Preparation of press releases and a publication with the final results	And Methodology/Information and Publication Unit	June 2012 -September 2012

2.5 Population and frame

The definition of agricultural holding in the Farm Register is consistent with the definition stated in Regulation 1166/2008 article 2.a. 571/88 article 5 a. It should be noted that the definition of agricultural holding is exactly the same with the definition stipulated in Regulation 571/88 (ANNEX VII page 12-13).

The survey was conducted in all districts of Greece and the target population is all the **agricultural, livestock or mixed holdings,** the holders of which made use of:

a) at least one (1) *stremma* (0.1 ha) of utilized agricultural area or at least half a *stremma* (0.05 ha) of greenhouses, regardless of the type of crop, the ownership of the land or the location, **or**

b) the holding's own animals, namely:

one (1) or more cows or two (2) or more other "large animals" of any type and age (oxen, horses, donkeys, mules), **or**

five (5) or more "small animals" (sheep, goats, pigs) of any age and type, **or**

fifty (50) or more poultry birds, **or**

twenty (20) or more hives of "domestic" or "European" bees **or**

five (5) or more ostriches.

The Sampling Frame, which was used in this survey, was the updated Register of Agricultural Holdings of ELSTAT (*Updating in phase 1-During the preparation of the census and phase 2-During the census* of the Item 2.4. Calendar)

The total number of the sampling frame accounts to 843.007 holdings (816.357 holdings from the basic Register of ELSTAT and 26.650 holdings from the Registers of the Greek Ministry of Rural Development and Food) for the agricultural census and 59.967 for the SAMP survey.

ELSTAT made use of the registers of the Ministry of Rural Development and Food only concerning the New Farmers and Organic Farming and it compared those registers with the register of ELSTAT. Afterwards, the data of the registers were compared and crosschecked on the basis of the identification data of holder.

However, there were some cases where the registers of the Ministry were not complete and some of the data were missing, such as the date of birth, the tax registration number, etc.

Cases that could not be matched with ELSTAT's farm register were kept separately in two temporary file-registers. During the conduct of the agricultural-livestock census, these temporary file-registers were made available to the interviewers together with the basic register.

2.6 Survey design

The Sampling Frame is the updated basic Register of ELSTAT as mentioned above. (*Updating in phase 1-During the preparation of the census and phase 2 During the census*)

The Farm Structure Survey 2009 was carried out as a census in accordance with the EU legislation (EC) No 1166/2008, and the SAMP survey as a sample survey. The total number of the sampling frame accounts to 843.007 holdings (816.357 units from the Register of the

ELSTAT and 26.650 units from the Register of the Greek Ministry of Rural Development and Food) for the agricultural census and 59.967 for the SAMP survey.

The holdings of the Ministry of Rural Development and Food, which entered in the sampling frame of the FSS year 2007, were 33,783. From these, only 5,538 holdings were selected in the sample of the FSS, year 2007. As a result, the register of ELSTAT was only updated, with regard to the 5,538 holdings, after the completion of the specific survey. For the rest of the holdings of the Ministry, there has been an examination for duplicated or closed holdings. After the completion of the Agricultural Census, the remaining (not duplicated and open holdings) have been verified to be 12956. These holdings did not have the necessary auxiliary variable for the determination of their size. As a result, the design of the study SAMP was based on the register of ELSTAT that included all the necessary variables.

To sum up, we did not select sample from the 12956 holdings of the Ministry, for the survey SAMP. However, during the production of the results, these holdings were used for the calculation of the extrapolation factors, since the necessary information became available from the Agricultural Census.

In addition, the register, between 2007 and 2008, was updated only by the sample data of the annual surveys on livestock and crop capital statistics.

It is to our belief that the fact of no sample selection from the 12956 holdings for the SAMP creates bias. However, this bias is almost negligible, because in the weighting process for estimating the results of SAMP, we took under consideration all the holdings that they were finally collected from the Agricultural Census (both ELSTAT and Ministry of Rural Development and Food registers).

There were 37186 holdings that were discovered and recorded during the field work. These new holdings were not included in any register (ELSTAT or Ministry), because they were unknown. That is the reason for not being included in the sample of SAMP.

Data was collected by personal interview with the holder of the farm.

2.7 Sampling, data collection and data entry

2.7.1 Drawing the sample –for SAPM

The sampling method that ELSTAT applied for the conduct of SAPM 2009 was the *one-stage stratified random sampling* with *sampling unit* the agricultural, livestock or mixed holding belonging to the target population.

The initial sample size amounts to 59.967 holdings (sampling fraction=7,3%). The decision for determining the sample size was based on financial criteria and on several precision criteria as follows:

a. At regional level (NUTS 2), the relative standard error of the size of the arable land of a certain crop characteristic should be less than 10%, when the size of the land of this certain characteristic is greater than 10% of the Region's utilized agricultural area.

b. At regional level (NUTS 2), the relative standard error of the capital livestock units of a certain kind of livestock should be less than 10% (annex IV – Precision requirements), when the capital livestock units of this certain kind of livestock exceed 10% of the total capital livestock units in the region, *under the condition* that the capital livestock units in the Region exceeds 5% of the total capital livestock units (country level).

The sample of holdings was selected from the Register of Agricultural Holdings of ELSTAT, with reference year 2008.

According to this sampling scheme (one-stage stratified random sampling) and for holdings included in the above Register of ELSTAT, the strata were created by the combination of the following stratification criteria:

1. NUTS 3 (54 areas in Greece - 50 Departments and Department of Attiki, which is divided into 4 areas).

2. The economic size of holdings (6 classes). The Economic Size has been defined by the Standard Gross Margin (SGM) calculated in ESU (1 ESU=1.200 Euro).

Table 1: Classes of Economic Size

Class	*Boundaries*
1	*Less than 2 ESU*
2	*From 2 to less than 5 ESU*
3	*From 5 to less than 10 ESU*
4	*From 10 to less than 19 ESU*
5	*From 19 to less than 38 ESU*
6	*Greater than or equal to 38 ESU*
7	*Economic size is not specified*

3. The following categorization of the general type of farming, according to the technical and economic orientation of holdings:

Table 2: General Type of Farming

Serial number	*Code of type*	*Type of Farming*

1	*T10*	*T1*
2	*T21*	*T201*
3	*T22*	*T202+T203*
4	*T30*	*T3*
5	*T41*	*T41*
6	*T44*	*T42*
7	*T51*	*T51*
8	*T52*	*T52*
9	*T53*	*T53*
10	*T60*	*T6+T7+T8+T0*
11	*T90*	*BIO[1]*
12	*T00*	*Not specified type*
13	*10*	*Not specified either the type or the economic size*

The above codes stand for the following general types of farming:

a) Holdings belonging to the Register of Agricultural Holdings of ELSTAT (Codes of types T10-T90)

- Specialist field crops (T10)

- Specialist market garden vegetables (T21)

- Specialist flowers and ornamentals (T22)

- Specialist permanent crops (T30)
  (Specialist vineyards, specialist fruit and citrus fruit, specialist olives).

- Specialist bovine animals (T41)

- Specialist sheep and goats (T44)

- Specialist pigs (T51)

- Specialist poultry (T52)

- Specialist pigs and poultry (T53)

- Mixed cropping (T60)

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[1] *BIO: Holdings that follow organic farming. Although this group is not a specific class of organic farming on the typology, however it is considered a specific design domain with homogeneous population and there no overlapping with the rest of the domains.*

(Mixed crops- livestock)

- Specialist organic farming (T90)

- New crop holdings that neither the type of farming nor the economic size are specified (10)

- New holdings that the type of farming is not specified (T00)

4. The crop holdings belonging to the types T00 (new holdings that are included in the Register of Agricultural Holdings of ELSTAT), were stratified as follows:

• By Region (NUTS 3)

• By size class of holdings: In each Region (NUTS 3), the crop holdings were stratified into 9 size classes, according to their size, determined by their area with crops, as follows:

Table 3: Classes of holdings' size determined by their area with known type of crops

Class	Code of class	Area with crops in hectares
1	11	Less than 1 hectare
2	12	From 1 to less than 2 hectares
3	13	From 2 to less than 3 hectares
4	14	From 3 to less than 5 hectares
5	15	From 5 to less than 10 hectares
6	16	From 10 to less than 20 hectares
7	17	From 20 to less than 30 hectares
8	18	From 30 to less than 50 hectares
9	19	Greater than or equal to 50 hectares

The following categories of holdings have been surveyed exhaustively:

❑ Holdings with economic size more than 38 ESU (9.061 holdings) – class 6 from table 1.

❑ Crop holdings (code type T00) included in the Register of Agricultural Holdings of ELSTAT, for which their classes of economic size and types of farming are not specified and their size class is greater than or equal to 50 hectares (30 holdings) – class 9 from table3 .

❑ Livestock holdings (size class 07 from table 1) that included in the Register of Agricultural Holdings of ELSTAT (164 holdings), for which either their classes of economic size or types of farming were not specified.

The variable used for the construction of size classes, the size class boundaries and the number of classes were determined as follows:

- The ideal variable used for the creation of size classes of holdings belonging to the Register of Agricultural Holdings of ELSTAT is the standard gross margin (SGM) y of the holdings, as the value of y in combination with the type of farming is highly correlated with all the survey characteristics. If we could stratify the holdings by the value of y in Regions and type of farming, there would be no overlap between strata, and the variance within strata would be much smaller than the overall variance, particularly if there are many strata.

- Given the number of strata, in order to determine the best size class boundaries under Neyman allocation, the CUM $\sqrt{f(y)}$ rule was applied. Taking into consideration the frequency distribution of y, it was found that the CUM $\sqrt{f(y)}$ rule creates the same stratum boundaries with the Dalenious-Hodges rule, which is roughly equivalent to making $W_h \cdot S_h$ constant (W_h is the weight of the size class h, S_h is the standard deviation of y in the size class h, $h = 1,2,...,6$).

- The question relevant to a decision about the number of size classes is at what rate does the variance of $\widehat{Y}_{st}$ decrease as L (number of size classes) increases? ($\widehat{Y}_{st}$ is the estimated value of y in stratified sampling, given the sampling size). So, applying the CUM $\sqrt{f(y)}$ rule, the holdings were stratified into L=4 to 8 strata, and subsequently, given the sample size in each separate case, the variance $V(\widehat{Y}_{st})$ of $\widehat{Y}_{st}$ was calculated. As L increased, the values of $V(\widehat{Y}_{st})$ were decreased. As very little reduction in variance appeared beyond L=6, we decided that the ideal number of the size classes should be equal to 6.

In each separate Region (NUTS 2), the sample belonging to sampling strata was allocated to the strata following the Neyman allocation. More specifically, the following formula was used for the allocation of the sample units in each separate stratum:

$$n_h = n \frac{N_h^{08} S_h}{\sum_h N_h^{08} S_h},$$

where n is the overall sample size in each Region (NUTS 2), n_h is the sample size at stratum h, N_h^{08} is the population (number of holdings of the year 2008) of the stratum h and S_h is the standard deviation of the standard gross margin (SGM) of the holdings in the stratum h.

For the new crop holdings belonging to the Register of Agricultural Holdings of ELSTAT (Type T00), where the type of farming and the economic size are not specified (T00), in the above formula, the value of S_h is the standard deviation of the arable land of the holdings belonging to the stratum h.

The following table 4 depicts the distribution of the sample of holdings, whose their types are available (Types T10 – T90).

Table 4: Distribution of the sample of holdings

Type of farming	Total	Classes of economic size of the holdings							
		0*	1	2	3	4	5	6	7**
T10	16130		1386	1960	2837	3514	3157	3263	13
T21	2270		119	140	216	389	495	911	
T22	375		3	17	32	44	75	204	
T30	21110		5076	5046	4803	3777	1671	728	9
T41	1677		86	105	124	179	324	850	9
T44	4358		292	405	760	1238	1106	484	73
T51	466		15	25	33	40	52	301	
T52	405		37	12	16	36	65	239	
T53	90		28	23	15	10	7	7	
T60	10070		1214	1345	1729	2239	1880	1656	7
T90	1714	54	118	152	201	325	424	418	22
Total	58665	54	8374	9230	10766	11791	9256	9061	133

* Holdings that follow organic farming and whose economic size is not specified
** Holdings that the economic size is not specified

The following table 5 depicts the distribution of the sample of holdings, whosetypes and economic sizes are not available (Types T00 and 10).

Table 5: Distribution of the sample of holdings by size classes

Code of class	Area with crops in hectares	Sample size
11	Less than 1 hectare	151
12	From 1 to less than 2 hectares	145
13	From 2 to less than 3 hectares	129
14	From 3 to less than 5 hectares	134
15	From 5 to less than 10 hectares	192
16	From 10 to less than 20 hectares	187
17	From 20 to less than 30 hectares	73
18	From 30 to less than 50 hectares	62
19	Equal to or greater than 50 hectares	35
7	Not specified area	31
10	Not specified area	163
	Total	1302

The number of respondent sampling units is 43110 holdings (response rate = 71,9%), which is the 6,3% of the total number of the agricultural and livestock holdings all over the Country, according to Census data. From the non respondents (6857 holdings), the 43,0% is out of scope units (closed holdings, merged holdings etc) and the rest are refusals. Corrective measures for non-response of the SAMP were taken during the process of compiling the extrapolation factors for the estimation of the survey characteristics.

Drawing the Sample

a) The sample of holdings was selected from the Register of the basic register of ELSTAT, with reference year 2008. This Register was compiled using the data of the 1999/2000 census and it was updated with the data of the sample units of the Farm Structure Surveys of the years 2003, 2005 and 2007, as well as the Livestock and Crop Capital Surveys conducted by ELSTAT till the year 2008. Concerning the new holdings, the Register was updated using the Register of the Greek Ministry of Rural Development and Food. *More specifically, the Register of ELSTAT was updated with regard to the sample holdings of FSS 2007 using the Register of the Ministry.* Regarding the economic size of the holdings, this was specified by data of the base year 1999/2000, and it was updated with the data of sampling units from the Farm Structure Surveys of the years 2003, 2005 and 2007.

b) Regarding the specialist organic farming, all holdings of this type were surveyed on a census basis in the Farm Structure Survey of the year 2007, aiming at the identification of the economic size of these holdings. Consequently, ELSTAT had the necessary information to create the strata of specialist organic farming using the criterion of the economic size of the holdings. *Most of the organic holdings, coming from the Ministry, were surveyed on a census basis in the FSS 2007 and as a result they were included in the Register of ELSTAT.*

c) The holdings of the Ministry of Rural Development and Food entered the surveyed population in FSS of year 2007 and reached 33,783. From these, 5,538 holdings were selected in the sample of the FSS, year 2007. As a result, the register of ELSTAT was updated after the completion of the specific survey.

NUTS2 regions with more than 10000 holdings
Crop characteristics:

Precision requirements	Field codes	NUTS2 regions			
		11	12	13	14
Number of holdings in the NUTS2 region		53.160	101.200	24.230	63.511
UAA, ha of the NUTS2 region	A_3_1	346.763,1	641.668,4	222.759,6	392.203,3
Area of cereals in ha in the NUTS2 region	B_1_1	161.150,5	337.622,7	131.028,1	180.867,1
% Cereals in the UAA of the NUTS2 region		46,5	52,6	58,8	46,1
Area of potatoes and sugar beet in ha in the NUTS2 region	B_1_3 + B_1_4	8.389,7	12.125,1	3.168,7	2.131,1
% potatoes and sugar beet in the UAA of the NUTS2 region		2,4	1,9	1,4	0,5
Area of oilseed crops in ha in the NUTS2 region	B_1_6_4 + B_1_6_5 + B_1_6_6 + B_1_6_7 + B_1_6_8	23.381,1	8.962,8	689,3	198,8
% oilseed crops in the UAA of the NUTS2 region		6,7	1,4	0,3	0,1

Area of permanent outdoor crops in ha in the NUTS2 region	B_4 -B_4_7	20.210,5	92.198,2	8.291,0	47.529,4
% permanent outdoor crops in the UAA of the NUTS2 region		5,8	14,4	3,7	12,1
Area of fresh vegetables, melons, strawberries, flowers in ha in the NUTS2 region	B_1_7 +B_1_8	7.011,3	10.878,5	937,6	7.210,7
% fresh vegetables, melons, strawberries, flowers in the UAA of the NUTS2 region		2,0	1,7	0,4	1,8
Area of temporary grass and permanent grassland in ha in the NUTS2 region	B_1_9_1 +B_3	29.687,2	71.927,2	43.640,6	49.326,8
% temporary grass and permanent grassland in the UAA of the NUTS2 region		8,6	11,2	19,6	12,6

NUTS2 regions with more than 10000 holdings
Crop characteristics:

Precision requirements	Field codes	NUTS2 regions			
		21	**22**	**23**	**24**
Number of holdings in the NUTS2 region		33.524	29.041	88.391	70.457
UAA, ha of the NUTS2 region	A_3_1	104.141,4	76.998,9	298.448,4	334.579,0
Area of cereals in ha in the NUTS2 region	B_1_1	9489,1	2.497,9	60.730,3	88.525,7
% Cereals in the UAA of the NUTS2 region		9,1	3,2	20,3	26,5
Area of potatoes and sugar beet in ha in the NUTS2 region	B_1_3 +B_1_4	551,8	544,0	5.004,8	2.478,9
% potatoes and sugar beet in the UAA of the NUTS2 region		0,5	0,7	1,7	0,7
Area of oilseed crops in ha in the NUTS2 region	B_1_6_4 +B_1_6_5 +B_1_6_6 +B_1_6_7 +B_1_6_8	46,9	0	139,8	104,0
% oilseed crops in the UAA of the NUTS2 region		0,1	0	0,1	0,0
Area of permanent outdoor crops in ha in the NUTS2 region	B_4 -B_4_7	28.855,3	38.115,3	111.797,3	88.264,7
% permanent outdoor crops in the UAA of the NUTS2 region		27,7	49,5	37,5	26,4
Area of fresh vegetables, melons, strawberries, flowers in ha in the NUTS2 region	B_1_7 +B_1_8	638,6	392,6	9.516,5	8.060,2
% fresh vegetables, melons, strawberries, flowers in the UAA of the NUTS2 region		0,6	0,5	3,2	2,4
Area of temporary grass and permanent grassland in ha in the NUTS2 region	B_1_9_1 +B_3	55.131,4	30788,0	81.134,2	84.472,8

% temporary grass and permanent grassland in the UAA of the NUTS2 region		52,9	40,0	27,2	25,2

NUTS2 regions with more than 10000 holdings
Crop characteristics:

Precision requirements	Field codes	NUTS2 regions				
		25	31	41	42	43
Number of holdings in the NUTS2 region		94.149	23.375	30.265	21.486	90.218
UAA, ha of the NUTS2 region	A_3_1	338.208,9	46.968,2	164.874,6	99.180,3	411.134,7
Area of cereals in ha in the NUTS2 region	B_1_1	184.616,0	5.545,7	12.085,0	6.051,8	4.029,5
% Cereals in the UAA of the NUTS2 region		5,5	11,8	7,3	6,1	1,0
Area of potatoes and sugar beet in ha in the NUTS2 region	B_1_3 + B_1_4	1.908,0	148,3	284,8	1.142,7	1.448,2
% potatoes and sugar beet in the UAA of the NUTS2 region		0,6	0,3	0,2	1,1	0,4
Area of oilseed crops in ha in the NUTS2 region	B_1_6_4 + B_1_6_5 + B_1_6_6 + B_1_6_7 + B_1_6_8	124,8	20,1	427,4	0,9	0,4
% oilseed crops in the UAA of the NUTS2 region		0,04	0,04	0,3	0,0	0,0
Area of permanent outdoor crops in ha in the NUTS2 region	B_4 - B_4_7	235.546,8	29912,6	60.718,2	20.328,4	168.500,4
% permanent outdoor crops in the UAA of the NUTS2 region		69,6	63,7	36,8	20,5	41,0
Area of fresh vegetables, melons, strawberries, flowers in ha in the NUTS2 region	B_1_7 + B_1_8	4.006,1	2.330,9	434,0	1.147,4	3.611,6
% fresh vegetables, melons, strawberries, flowers in the UAA of the NUTS2 region		1,2	5,0	0,3	1,2	0,9
Area of temporary grass and permanent grassland in ha in the NUTS2 region	B_1_9_1 + B_3	57707,3	4.689,0	86.902,3	49.264,8	223.914,7
% temporary grass and permanent grassland in the UAA of the NUTS2 region		17,1	10,0	52,7	49,7	54,5

Livestock characteristics:

Precision requirements	Field codes	NUTS2 regions			
		11	12	13	14
LSU in the NUTS2 region		217.109,5	406.997,6	98.022,8	305.484,2

Bovine animals (all ages)	Number of Bovine animals in the NUTS2 region, in LSU	C_2_1*0.4 + C_2_2*0.7 + C_2_3*0.7 + C_2_4 +C_2_5*0.8 + C_2_6 + C_2_99*0.8	80177,3	144307	31114,6	79852,3
	% of the LSU in the NUTS2 region		36,9	35,5	31,7	26,1
	% of national share of bovine animals in LSU		16,4	29,5	6,3	16,3
Sheep and goats (all ages)	Number of Sheep and goats in the NUTS2 region, in LSU	C_3_1*0.1 + C_3_2*0.1	105257	141389	56504,9	161055
	% of the LSU in the NUTS2 region		48,5	34,7	57,6	52,7
	% of national share of sheep and goats in LSU		7,9	10,6	4,2	12,0
Pigs	Number of Pigs in the NUTS2 region, in LSU	C_4_1*0.027 + C_4_2*0.5 + C_4_99*0.3	20351,1	37204,3	5940,2	50056,3
	% of the LSU in the NUTS2 region		9,4	9,1	6,1	16,4
	% of national share of pigs in LSU		8,3	15,3	2,4	20,5
Poultry	Number of Poultry in the NUTS2 region, in LSU	C_5_1*0.007 + C_5_2*0.014 + C_5_3*0.030	11250,6	83841,9	4417,9	14340,7
	% of the LSU in the NUTS2 region		5,2	20,6	4,5	4,7
	% of national share of poultry in LSU		3,4	25,2	1,3	4,3

Livestock characteristics:

			NUTS2 regions			
Precision requirements		Field codes	**21**	**22**	**23**	**24**
LSU in the NUTS2 region			257.182,4	33.569,5	289.419,4	165.973,8
Bovine animals (all ages)	Number of Bovine animals in the NUTS2 region, in LSU	C_2_1*0.4 + C_2_2*0.7 + C_2_3*0.7 + C_2_4 +C_2_5*0.8 + C_2_6 + C_2_99*0.8	45060,7	4195,4	42839,6	20028
	% of the LSU in the NUTS2 region		17,5	12,5	14,8	12,1
	% of national share of bovine animals in LSU		9,2	0,9	8,7	4,1
Sheep and goats (all ages)	Number of Sheep and goats in the NUTS2 region, in LSU	C_3_1*0.1 + C_3_2*0.1	100328	24416,9	195518	91997,6
	% of the LSU in the NUTS2 region		39,0	72,7	67,5	55,4
	% of national share of sheep and goats in LSU		7,5	1,8	14,6	6,9
Pigs	Number of Pigs in the NUTS2 region, in LSU	C_4_1*0.027 + C_4_2*0.5 + C_4_99*0.3	29802,6	1092,6	33203	26741,2
	% of the LSU in the NUTS2 region		11,6	3,2	11,5	16,1

	% of national share of pigs in LSU		12,2	0,4	13,6	11,0
Poultry	Number of Poultry in the NUTS2 region, in LSU	C_5_1*0.007 + C_5_2*0.014 + C_5_3*0.030	81902,4	3648,5	17396,2	26967,5
	% of the LSU in the NUTS2 region		31,8	10,9	6,0	16,2
	% of national share of poultry in LSU		24,6	1,1	5,2	8,1

Livestock characteristics:

Precision requirements		Field codes	**25**	**31**	**41**	**42**	**43**
LSU in the NUTS2 region			150.529,7	68.207,7	67.345,2	65.393,5	281.283,7
Bovine animals (all ages)	Number of Bovine animals in the NUTS2 region, in LSU	C_2_1*0.4 + C_2_2*0.7 + C_2_3*0.7 + C_2_4 +C_2_5*0.8 + C_2_6 + C_2_99*0.8	13347,6	3562,8	8535,6	14572,2	2110
	% of the LSU in the NUTS2 region		8,9	5,2	12,7	22,3	0,7
	% of national share of bovine animals in LSU		2,7	0,7	1,7	3,0	0,4
Sheep and goats (all ages)	Number of Sheep and goats in the NUTS2 region, in LSU	C_3_1*0.1 + C_3_2*0.1	102518	11967,3	53379,4	41645,1	251030
	% of the LSU in the NUTS2 region		68,1	17,5	79,3	63,7	89,2
	% of national share of sheep and goats in LSU		7,7	0,9	4,0	3,1	18,8
Pigs	Number of Pigs in the NUTS2 region, in LSU	C_4_1*0.027 + C_4_2*0.5 + C_4_99*0.3	20187,8	1477,3	2020,5	4167,1	11452,7
	% of the LSU in the NUTS2 region		13,4	2,2	3,0	6,4	4,1
	% of national share of pigs in LSU		8,3	0,6	0,8	1,7	4,7
Poultry	Number of Poultry in the NUTS2 region, in LSU	C_5_1*0.007 + C_5_2*0.014 + C_5_3*0.030	14176,1	50927,8	3347,4	4857,6	15726,8
	% of the LSU in the NUTS2 region		9,4	74,7	5,0	7,4	5,6
	% of national share of poultry in LSU		4,2	15,3	1,0	1,5	4,7

2.7.2. Data collection and data entry

Data collection

The data collection of the FSS and SAPM was carried out through personal interviews with the farm holders.

The Regional Statistical Offices were responsible for the data collection. The head of each Office was in charge of organizing and coordinating the whole work of the survey in the particular prefecture. A team of officials of the regional statistical offices (assistant supervisors) assisted the supervisor. The supervisor and the assistant supervisors trained the interviewers, assigned the units to them (approximately 100 units per interviewer) and supervised their work.

Prior to the interview date, whenever possible, the interviewers had a first contact with the farmers in order to arrange the interview date. The interviews generally took place at the holder's residence, although some interviews were conducted at municipality offices. The interviewer conducted the interviews and completed the questionnaires with data supplied by the holder. The completion time per questionnaire was approximately 30 minutes.

In the case of the holder's absence, the interviewer had to make a second visit or to obtain the required information from another person, able to give accurate information about the holding i.e. a member of holder's family, or an employee of the holding (e.g. foreman).

If a sample unit was found split in two or more holdings the interviewer should fill in a questionnaire for each new holding, other than the one included in the original sample unit, reporting the new status of the previous holding.

The interviewer had to report to his/her assistant supervisor every week about the process of his/hers work and to deliver the completed questionnaires.

The assistant supervisors gathered the completed questionnaire in order to check the quality of the data collected.

If the completed questionnaires did not fulfill the requirements of the survey they should be returned to the interviewer to correct them.

Data entry

The data entry was done almost exclusively by OCR and only in some special cases, where it was impossible to scan the questionnaires, by entering the data manually.

2.7.3. Use of administrative data sources

Administrative sources were used

a) for quality controls of the results of FSS and SAPM survey (compare their results with special annual agricultural surveys, data from the Ministry of Rural Development and Food etc), and

b) for the updating of the basic register.
Thus, all the necessary data, included in the census questionnaires, were collected through the census interviews and not taken from administrative files. For instance, data such as "equipment used for renewable energy production" are collected from the census and not from administrative sources.

2.8   Specific topics

2.8.1 Common Land

Common Lands in Greece are usually rough grazing of permanent grassland used as pasture for cattle, sheep and goat. Arable land and permanent crops are not part of Common Lands.

Common land is the area that used jointly by several holdings and it is not possible to assign a specific section to each farmer.

In line with the decision of the 21-23September 2009 FSS WG meeting, common land should be recorded using one of the three recommended propositions.

ELSTAT adopted the 3rd method (Handbook on implementing the FSSS and SAMP definitions FSS WG held in September 2011) that indicates the most relevant geographic level (e.g. NUTS III), of the total area of common permanent grassland.

The data for the common land collected through the census survey using a special questionnaire (ANNEX VII). Using a dedicated questionnaire collected census survey data for the common land. The unit was the local district t(LAU 2).

The questionnaires were filled in at the level of Communal Department (LAU 2) by the statistical correspondents in the Municipalities in cooperation with the staff of ELSTAT's Regional Statistical Offices.

Regarding only the item "Common Land", the questionnaires were filled in by the local statistical correspondents (ELSTAT collaborates with them for the Annual Agricultural Survey) with the collaboration of the staff of the Regional Statistical Office.

The unit was the local district (LAU 2). At the end, the results of the common land survey (regarding the permanent grassland area) were compared with the data from the Annual Statistical Survey.

On the basis of the Annual Agricultural Statistical Survey we have aggregated data on the total areas of grassland. Nevertheless, these data are not broken down by type of grassland (permanent meadows-rough meadows), they do not specify whether these are used for grazing or not and finally these data are not broken down by their tenure status. That is why the results of the common land survey together with the results of the agricultural census were compared with the results of the Annual Agricultural Survey.

Although the results that were transmitted are compliant with the Regulation requirements and they are accepted, Eurostat suggested that the results should be transformed according to the second method and be transmitted as "special records". This suggestion was made in order for the results to be able to be published.

Following Eurostat's suggestions, we are going to modify the transmission mode of the data- as some other countries, which had adopted the same method, did- and we are going to send these records in the next days.

Results: Common land area 1.698.948,53 ha.

2.8.2 Geographical reference of the holding

The current situation in Greece is the following:

o   The National Cadastral Register is not yet finalized so it is impossible to use it for the geo-reference of the holding.

o   The Ministry of Rural Development and Food and its supervised organizations keep various registers that are not yet completed, as far as the location of the holding is concerned. Nevertheless, even when they will be completed, they will not have the appropriate format for ELSTAT to use, as there is a difference in the definition of agricultural holdings between the Ministry of Rural Development and Food and ELSTAT.

So, both the National Cadastral Register and the various agricultural registers of Ministry of Rural Development and Food and its supervised organizations are valuable administrative sources that could be used in the future, for example for the FSS of 2013, but it is impossible to be used for the Census of 2009.

Facing these issues, ELSTAT (NSSG at that time) asked the Commission to supply more information, technical assistance and any other support on the relevant subject. For this reason, a Eurostat expert, Mrs Marjo Kasanko, visited ELSTAT in 19/2/2008 and the above-mentioned problems were discussed. After the visit there was a written consultation between Eurostat and ELSTAT referring to alternative methods of providing data on the location of the holding.

Eurostat, after studying our data of the minimum, maximum and average size of the local departments, the total number of local department for each NUTS 3 area in Greece and the number of localities with area more that 7.000 ha in each local department, suggested the following intermediate solution: ELSTAT will have to provide Eurostat with the geographic co-ordinates of the central points of the locality, where the farm is located.

This suggestion was accepted by ELSTAT and for the Census of 2009 Greece provided the coordinates of the locality where each holding is located instead of the coordinates of the holding itself.
For these reason we used the National Geodetic Reference System (Greece 87) EPSG 4121. With this system identify the head quarter in the case of legal person or holder's residence in the case of natural person.

Locality is a subdivision of LAU2. Each LAU2 consists of one or more settlements or localities. There are data concerning latitude and longitude for each locality code. There are 13.272 different localities and there are holdings in 11.121 of them (ANNEX VI).

2.8.3 Volume of water used for irrigation

ELSTAT received a Grant Agreement titled "Development of a geographic information system for the estimation of irrigation demands at farm level" in order to produce a model by which the volume of water used for irrigation could be estimated. ELSTAT collaborated with the Agricultural University of Athens, as well as with the National Institute of Agricultural Economics of Italy (INEA).
The project analyzed the different approaches found in international literature on this issue and then, after conducting a pilot survey, finalized and proposed a model – based methodology. Special attention was given in the Greek particular features of the agricultural sector such as the large number of smallholdings, the fragmentation of the holdings, the polymorphism of the holdings from the standpoint of production branch.

The starting point of the project was an in depth analysis of the existing literature and methodologies from national, European (JRC, EEA) and international agencies.

Enormous amount of knowledge was extracted from the above sources regarding the estimation of irrigation water at farm level for various crops. The agricultural research community has focused much on the agronomic side of water use, which is reflected in the very large body of Evapotranspiration (ET). Most of this research concentrates on finding the water requirements for different crops under certain field conditions related to soil, climate, and the groundwater table. Additionally data on water distribution infrastructures and management practices were included in many similar researches.

A second point was the determination of the availability and the nature (scale, spatial reference, analogue or in digital form) of the necessary data (specific climatic and soil variables) in the Greek territory. Furthermore, the availability of the necessary data related to land uses and irrigation methods – systems.

The main outputs of the above work were the selection and adjustment of a proper model(s) and the detailed description of the needed computational and spatial statistical and mathematical analysis of the necessary data.

The above-mentioned model combines data regarding land uses, crop water needs, irrigation methods, meteorological and soil data. The sources of these data are FSS and SAPM, meteorological data from the Hellenic National Meteorological Service (HNMS) and data from soil analyses of the relevant institute, NAGREF.

Due to the spatial feature and the spatial complexities of the aforementioned basic data (soil, clime, land use) Geographic Information System was the most efficient tool – platform to develop and handle an irrigation water estimation model. A GIS-based approach allowed considering local variations in cropping, soil and climate and to spatial analyzing and interpolating the initial data.

The selected model was tested in a sample of agricultural holdings through a pilot survey.

A cost/benefit analysis was also implemented.

According to the definition by this model we estimated the volume of water, which used for irrigation in agricultural for all cultivate except the kitchen gardens and greenhouses.

2.8.4 Other issues

No other issues were confronted.

2.9   Response-burden policy

In order to increase the response rates the following measures were taken:
   a. In larger cities, where there is an increased difficulty in arranging a meeting between the interviewer and the holder, the interviewer made a prior phone-call to the holder, in order to arrange an appointment.
   b. If the interviewer couldn't find the holder at his residency, he would leave a note, including his name and phone number, in order to arrange an appointment for a different day.
   c. Priority was given to important holding, for example large farms.
   d. Extra care was given in training interviewers in handling difficult respondents and in cases that it was considered necessary the ELSTAT personnel contacted directly the respondents in order to persuade them to cooperate.

ACCURACY AND RELIABILITY OF THE DATA COLLECTED

3.1 Data processing, analysis and estimation

3.1.1 Estimation and sampling errors – for SAPM

ACCURACY AND RELIABILITY OF THE DATA COLLECTED

3.1 Data processing, analysis and estimation

3.1.1 Estimation and sampling errors – for SAPM

The sampling technique that was applied in this survey was the One-Stage Stratified Random Sampling. Regarding the extrapolation factor the procedure that was followed is the following:

a) In the design phase of the survey an initial weight (design weight) was given to each sampling unit (holding). This initial weight was estimated as the inverse of the probability of selection. More precisely, for the holding i that belongs to stratum h the initial weight is w_{hi} =1/Prob (selected unit i in the stratum h). As in each separate stratum h, the n_h sampling units were selected with equal probabilities, the initial weights for all sampling units belonging to the stratum h are equal to: $w_h = \dfrac{N_h^{08}}{n_h}$ (N_h^{08} : population size according to the data of the Register of Agricultural Holdings with reference year 2008)

b) The population size N_h in each stratum h was estimated from the sample's information and farm structure survey data, as follows:

$$N_h = (N_h^{08} - N_{ch} + N_{nh}) \cdot t_h \,(1)$$

where:

N_{ch} : The number of out of scope population (closed holdings, non- target population units)

N_{nh} : The number of new units

t_h : Factor, which adjusts the population sizes in strata to make the totals in the NUTS 3 areas to conform to the population totals which are based on data from the farm structure survey 2009/2010 that was conducted on a census basis.

c) The estimation of out of scope holdings N_{ch} is based on the sample's information by applying the formula:

$$\widehat{N}_{ch} = \dfrac{N_h^{08}}{n_h} \cdot n_h^c \,(2)$$

where:

n_h^c : The number of sample units being non-population units (closed holdings, non-   target population units)

The fraction $\dfrac{N_h^{08}}{n_h}$ represents the inverse of the initial inclusion probabilities of the initial sample n_h in stratum h.

d) Concerning the estimation of the new holdings N_{nh}, in each NUTS 3 area, the total number of new holdings based on farm structure survey data was allocated to strata proportionally to the population size ($N_h^{08} - \widehat{N}_{ch}$).

e) The extrapolation factor w'_h in stratum h is calculated as follows:

$$w'_h = \frac{N_h}{m_h} \cdot (3)$$

where:

m_h : The final sample size in stratum h

The variance estimation and the calculation of the coefficient of variation was carried out as follows:

Symbolisms:

In each stratum (let h):

y_{hi} : The value of the characteristic y of the holding of order i belonging to the stratum h

Y_h : The total of the variable y for all holdings in the stratum h

Y :   The total of the variable y for all holdings in all strata. That is: $Y = \sum\limits_h Y_h$

Estimation process

The estimation of Y_h and Y is given by the following formulae:

$$\widehat{Y}_h = \frac{N_h}{m_h} \sum_{i=1}^{m_h} y_{hi} \qquad (4)$$

$$\widehat{Y} = \sum_h \widehat{Y}_h \qquad (5)$$

The variance estimation of $\widehat{Y}_h$ and $\widehat{Y}$ is given by:

$$V(\widehat{Y}_h) = \frac{N_h(N_h - m_h)}{m_h} S_h^2, \quad (6)$$

where:

$$S_h^2 = \frac{1}{m_h - 1}\left[\sum_{i=1}^{m_h} y_{hi}^2 - \frac{\left(\sum_{i=1}^{m_h} y_{hi}\right)^2}{m_h}\right], \quad (7)$$

$$V(\widehat{Y}) = \sum_h V(\widehat{Y}_h) \qquad (8)$$

The coefficient of variation of total estimation $\widehat{Y}$ is given by:

$$CV(\widehat{Y}) = \frac{\sqrt{V(\widehat{Y})}}{\widehat{Y}} \qquad (9)$$

The following tables 3.1-3.3 depict the estimation of the basic crop characteristics (in ha) and their Relative Standard Errors (RSE) by Region (NUTS 2).

Table 3.1

Regions (NUTS 2)	Cereals for the production of grain, wheat and spelt, durum wheat, rye, barley, oats, grain maize, rice and other cereals		Potatoes and sugar beet	
	Estimation	RSE (%)	Estimation	RSE (%)
Whole Country / Greece Total	1.022.506	0,9%	127.187	2,6%
Eastern Macedonia &Thrace	158.913	2,3%	13.363	6,5%
Central Macedonia	338.063	1,6%	22.249	6,6%
Western Macedonia	129.482	2,8%	32.851	5,5%
Thessaly	179.554	2,1%	21.423	5,1%
Epirus	10.296	6,8%	702	22,0%
Ionian Islands	3.028	24,7%	157	18,0%
Western Greece	66.946	3,7%	7.445	7,9%
Central Greece	85.090	3,0%	9.179	6,7%
Peloponnesus	22.075	6,3%	4.838	11,2%
Attica	6.055	13,6%	1.758	27,4%
Northern Aegean	13.150	11,6%	9.287	13,2%
Southern Aegean	5.587	13,9%	2.230	19,3%
Crete	4.267	24,0%	1.706	23,4%

Table 3.2

Regions (NUTS 2)	Oilseed crops	Permanent outdoor crops

	Estimation	RSE (%)	Estimation	RSE (%)
Whole Country	34.437	4,9%	946.686	0,6%
Eastern Macedonia &Thrace	21.069	4,9%	20.432	3,7%
Central Macedonia	11.051	10,6%	89.254	1,7%
Western Macedonia	886	34,5%	8.714	7,4%
Thessaly	219	36,1%	44.815	2,7%
Epirus	104	54,8%	27.119	2,6%
Ionian Islands	0		40.168	2,5%
Western Greece	124	32,1%	116.962	2,1%
Central Greece	233	68,1%	87.821	2,0%
Peloponnesus	738	69,0%	232.347	1,2%
Attica	14	0,0%	28.398	3,3%
Islands of Northern Aegean	0		60.039	2,8%
Islands of Southern Aegean	0		21.147	3,6%
Crete	0		169.468	1,5%

Table 3.3

Regions (NUTS 2)	Fresh vegetables, melons, strawberries, flowers and ornamental plants		Temporary grass and permanent grassland	
	Estimation	RSE (%)	Estimation	RSE (%)
Whole Country	53.661	3,7%	774.107	2,6%
Eastern Macedonia &Thrace	6.225	5,7%	9.451	14,4%
Central Macedonia	9.830	6,0%	52.685	12,1%
Western Macedonia	996	13,7%	30.010	11,4%
Thessaly	6.764	5,9%	45.307	15,6%
Epirus	594	13,4%	42.356	10,8%
Ionian Islands	620	16,1%	32.578	10,0%
Western Greece	8.811	9,1%	72.152	7,2%
Central Greece	7.844	17,2%	76.874	7,4%
Peloponnesus	4.741	14,9%	63.109	8,8%
Attica	2.572	16,9%	4.958	14,2%
Islands of Northern Aegean	420	12,5%	99.215	7,1%
Islands of Southern Aegean	1.352	13,5%	38.920	11,8%
Crete	2.892	6,2%	206.493	4,8%

The following tables 3.4 and 3.5 depict the estimation of the livestock characteristics (number of heads) and their Relative Standard Errors (RSE) by Region (NUTS 2).

Table 3.4

Regions (NUTS 2)	Bovine animals		Sheep and goats	
	Estimation	RSE (%)	Estimation	RSE (%)
Whole Country	633.529	2,6%	13.109.070	1,2%
Eastern Macedonia &Thrace	97.399	6,1%	1.049.629	4,5%
Central Macedonia	174.860	5,4%	1.416.667	3,6%
Western Macedonia	44.249	8,6%	549.549	4,2%
Thessaly	106.184	6,0%	1.604.675	3,5%
Epirus	55.217	6,6%	1.032.087	5,1%
Ionian Islands	5.372	20,3%	241.283	6,3%
Western Greece	68.542	8,5%	1.957.471	2,6%
Central Greece	24.520	15,1%	855.915	3,8%
Peloponnesus	17.308	13,0%	1.075.251	4,2%
Attica	3.328	5,0%	117.026	7,7%
Islands of Northern Aegean	9.350	11,7%	611.468	6,2%
Islands of Southern Aegean	23.445	23,8%	391.883	6,5%
Crete	3.755	36,5%	2.206.165	2,9%

Table 3.5

Regions (NUTS 2)	Pigs		Poultry	
	Estimation	RSE (%)	Estimation	RSE (%)
Whole Country	894.572	6,7%	29.371.304	6,6%
Eastern Macedonia &Thrace	76.654	2,1%	734.166	3,2%
Central Macedonia	91.643	6,1%	5.889.323	10,6%
Western Macedonia	24.485	18,0%	282.448	5,7%
Thessaly	161.909	6,6%	1.080.088	2,8%
Epirus	136.801	23,7%	11.220.995	15,7%
Ionian Islands	3.100	19,7%	362.392	7,3%
Western Greece	168.672	26,0%	1.836.503	2,7%
Central Greece	93.123	20,8%	1.995.928	12,6%
Peloponnesus	69.470	1,6%	944.190	4,3%
Attica	6.134	12,1%	2.249.819	9,4%
Northern Aegean	8.292	15,9%	274.733	4,6%
Southern Aegean	13.488	15,5%	317.569	6,4%
Crete	40.801	11,4%	2.183.150	16,5%

In addition, we present the following tables in order to evaluate the precision of the estimates of the above characteristics. Particularly, according to Regulation (EC) No 1166/2008 the RSE for the crop characteristics in Regions should be less than 10%, in the case where the percentages (%) of UAA of the crops' areas in the Regions are equal or more than 10%. Concerning the livestock characteristics, the RSE in the Regions should be less than 10%, in the case where the percentages (%) of the livestock units of animal categories in the Regions are equal or more than 10% and the percentage (%) of national share of livestock units for animal categories is

less than 5%. The data of the following tables derive from the Agricultural and Livestock Census of 2009/2010.

Table 3.6: *Percentage (%) of UAA of the crops' areas by Region*

Regions (NUTS 2)	Area of:					
	Cereals	*Potatoes and sugar beet*	*Oilseed crops*	*Permanent outdoor crops*	*Fresh vegetables, melons, strawberries, flowers and ornamental plants*	*Temporary grass and permanent grassland*
Whole Country	29,3%	3,5%	1,0%	27,3%	1,6%	21,6%
Eastern Macedonia &Thrace	46,5%	3,7%	6,7%	5,8%	2,0%	3,1%
Central Macedonia	52,6%	3,4%	1,4%	14,4%	1,7%	7,7%
Western Macedonia	58,8%	12,9%	0,3%	3,7%	0,4%	13,2%
Thessaly	46,1%	5,4%	0,1%	12,1%	1,8%	8,7%
Epirus	9,1%	0,7%	0,0%	27,7%	0,6%	40,8%
Ionian Islands	3,2%	0,3%	0,0%	49,5%	0,5%	39,7%
Western Greece	20,3%	2,4%	0,0%	37,5%	3,2%	20,7%
Central Greece	26,5%	3,0%	0,0%	26,4%	2,4%	21,6%
Peloponnesus	5,5%	1,1%	0,0%	69,6%	1,2%	16,6%
Attica	11,8%	2,0%	0,0%	63,7%	5,0%	9,9%
Northern Aegean	7,3%	5,3%	0,0%	36,8%	0,3%	52,3%
Southern Aegean	6,1%	3,1%	0,0%	20,5%	1,2%	49,4%
Crete	1,0%	0,5%	0,0%	41,0%	0,9%	54,4%

Table 3.7: *Percentage (%) of the livestock units of animal categories by Region*

Regions (NUTS 2)	Livestock of:			
	Bovine animals	*Sheep and goats*	*Pigs*	*Poultry*
Whole Country	*19,4%*	*55,6%*	*10,1%*	*13,8%*
Eastern Macedonia &Thrace	*35,7%*	*48,5%*	*9,4%*	*5,2%*
Central Macedonia	*34,7%*	*34,8%*	*9,2%*	*20,4%*
Western Macedonia	*30,5%*	*57,6%*	*6,1%*	*4,5%*

Thessaly	25,2%	52,7%	16,4%	4,7%
Epirus	17,1%	39,1%	11,5%	31,8%
Ionian Islands	10,7%	72,7%	3,3%	10,9%
Western Greece	14,1%	67,6%	11,5%	6,0%
Central Greece	11,4%	55,4%	16,1%	16,2%
Peloponnesus	7,4%	68,1%	13,4%	9,4%
Attica	4,7%	17,6%	2,2%	74,6%
Northern Aegean	8,5%	79,3%	3,0%	5,0%
Southern Aegean	18,4%	63,7%	6,4%	7,4%
Crete	0,5%	89,2%	4,1%	5,6%

Table 3.8: *Percentage (%) of national share of livestock units for animal categories by Region*

Regions (NUTS 2)	Livestock of:			
	Bovine animals	Sheep and goats	Pigs	Poultry
Whole Country	100,0%	100,0%	100,0%	100,0%
Eastern Macedonia &Thrace	16,6%	7,9%	8,4%	3,4%
Central Macedonia	30,3%	10,6%	15,3%	25,0%
Western Macedonia	6,4%	4,2%	2,4%	1,3%
Thessaly	16,5%	12,0%	20,6%	4,3%
Epirus	9,4%	7,5%	12,2%	24,6%
Ionian Islands	0,8%	1,8%	0,4%	1,1%
Western Greece	8,7%	14,6%	13,6%	5,3%
Central Greece	4,0%	6,9%	11,0%	8,1%
Peloponnesus	2,4%	7,7%	8,3%	4,3%
Attica	0,7%	0,9%	0,6%	15,3%
Northern Aegean	1,2%	4,0%	0,8%	1,0%
Southern Aegean	2,6%	3,1%	1,7%	1,5%
Crete	0,3%	18,8%	4,7%	4,7%

In the Survey on Agricultural Production Methods (SAPM), the high values of the RSE of the estimated number of pigs and especially of poultry are due to the fact that certain holdings have an unusually high number of pigs or poultry.

In the sample design of SAMP the above-mentioned holdings were considered of small economical size and as a result they belong to sample strata (not in 'take-all' strata. However, after the data collection, in strata that contain these holdings, the element variance of pigs and poultry appears to be high. Therefore, these variances inflate the RSE of the estimated number of pigs and poultry.

Notes:

a) Regarding the standard errors presented in this document, ELSTAT has double-checked the holdings that included pigs and poultry in strata, which presented extreme variance. Extreme variance was noted when we recorded high values for the number of pigs and poultry. This review check revealed erroneous data in four holdings: three in poultry and one in pigs. After the corrections, the RSE of the estimated number of poultry at whole country changed from 12.5% to 6.6%, while the RSE of the estimated number of pigs remained almost unchanged. In addition, a similar check was performed for temporary grass and permanent grassland in Regions with high proportion of grass land (≥10 of UAA) and with high relative standard errors. These checks did not result in any changes.

b) Regarding the high Relative Standards Errors that are outside the precision requirements of the R1166/2008, we would like to inform you the following:

- *Concerning the cereals in Attica the cultivated land with cereals is more than 10% (11.8%) of the total Utilized Agricultural Area (UAA).This is a rather high percentage for the specific area (highly urban), but for the whole Country it covers only 0.59% of the cultivated land with cereals.*

- *Concerning the temporary grass and permanent grassland, the RSE is outside the precision requirements of the R1166/2008 in two Regions mainly due to the fact that this land appears heterogeneity in the design strata. We notice the economic size of livestock holdings (which is used as stratification variable) does not have high correlation with temporary grass and permanent grass in many cases.*

- *Concerning pigs and poultry, the RSE is outside the precision requirements of the R1166/2008 in some Regions mainly due to the fact that the number of animals presents high heterogeneity in the design strata. According to the Register of ELSTAT, these livestock holdings appeared small size and they belong to sampling strata. However, at field work it was revealed that they were large scaled holdings and therefore they should have been at take-all strata.*

3.1.2 Non sampling errors

Non-sampling errors arise mainly due to misleading definitions and concepts, inadequate frames, unsatisfactory questionnaires, defective methods of data collection, tabulation, coding, incomplete coverage of sample units etc. These errors are unpredictable and not easily controlled, and they arise from the initial stage when the survey is being planned and designed to the final

stage when data are processed and analysed. Unlike in the control of *sampling error,* this error may increase when sample size is increased. If not properly controlled, *non-sampling* error can be more damaging than sampling error for large-scale business surveys.

The non-sampling errors that appear in all statistical processes can be categorised as:
- Coverage errors
- Measurement errors
- Processing errors
- Non-response errors

In practice, the non-sampling error can be decomposed into variable error (or variable component) and systematic error (or bias). *Variable error* arises from random factors affecting different samples and repetitions of the survey, whereas *bias* refers to systematic errors that affect any sample taken under a specified survey design with the same constant error. All variable errors (sampling and no sampling) are incorporated into the variance of the estimates.

Coverage errors

Coverage errors (or *frame errors)* arise due to existing divergences between the target population and the frame population. We can distinguish the following types of coverage error:

Over-coverage stems from the fact that there are units accessible via the frame but they do not belong to the target population. In agricultural surveys, the *over-coverage* mainly has to do with holdings that were included in the farm register, they were selected in the sample, but they did not actually exist at the time of the survey (e.g. holdings that do not operate permanently or temporarily, holdings fully turned over and merged with another holding etc). These holdings actually reduce the initial sample size. The decrease of the number of sampling units from the initial to the actual size inflates the variance of the survey characteristics.

Survey on Agricultural Production Methods

By using the sample data, the over-coverage rate (%) of closed and merged holdings has been estimated and it amounts to 12,4%

By using the sample data, the over-coverage rates (%) of closed and merged holdings have been estimated and they are depicted in the tables 6 and 7.

Table 6:Over-coverage rates(%) by type of farming and economic size of holdings

Type of farming	Total	Classes of economic size of the holdings							
		0[*]	1	2	3	4	5	6	7[**]
Total	**12,1**	**20,4**	**28,6**	**17,3**	**12,3**	**8,0**	**4,9**	**2,2**	**8,5**
T10	12,4	0,0	42,8	23,5	14,2	9,0	5,4	2,0	7,7
T21	9,4	0,0	44,5	30,0	17,1	11,6	3,2	2,2	0,0
T22	5,6	0,0	66,7	17,6	9,4	6,8	4,0	3,4	0,0
T30	13,1	0,0	21,7	14,2	11,0	8,0	5,9	3,0	0,0
T41	8,9	0,0	48,8	27,6	19,4	8,9	5,6	2,4	0,0

T44	12,1	0,0	43,5	26,9	17,4	8,3	3,7	1,7	12,3
T51	9,0	0,0	13,3	36,0	24,2	12,5	11,5	4,0	0,0
T52	10,9	0,0	40,5	16,7	12,5	25,0	10,8	3,8	0,0
T53	20,0	0,0	21,4	30,4	13,3	20,0	14,3	0,0	0,0
T60	10,3	0,0	35,3	15,2	10,4	5,6	4,3	1,4	0,0
T90	5,3	20,4	16,1	10,5	4,5	4,9	2,4	2,4	0,0

[*] Holdings that follow organic farming and whose economic size is not specified

[**] Holdings that the economic size is not specified

Table 7: Over-coverage rates (%) by size classes

Code of class	Area with crops in hectares	%
Total		**25,5**
11	Less than 1 hectare	38,4
12	From 1 to less than 2 hectares	29,0
13	From 2 to less than 3 hectares	27,1
14	From 3 to less than 5 hectares	22,4
15	From 5 to less than 10 hectares	19,8
16	From 10 to less than 20 hectares	18,2
17	From 20 to less than 30 hectares	17,8
18	From 30 to less than 50 hectares	11,3
19	Equal to or greater than 50 hectares	11,4
7	Not specified area	12,9
10	Not specified area	41,1

Census

According to census data, the over coverage rate (%) amounts to 18,4%, as follows:

$$Over\,\mathrm{cov}\,erage\,rate\,(\%) = \frac{Closed\,holdings + Merged\,holdings + Duplicates}{Initial\,size} \cdot 100 =$$

$$= \frac{165.203}{900.128} \cdot 100 = 18,4\%$$

where:

a) Initial size= Holdings in Register + New holdings + Holdings arisen from the division of holdings= 843.007 holdings +37.186 holdings +19.935 holdings =900.128 holdings

b) Closed holdings=Holdings that do not operate permanently + Holdings that do not operate temporarily= 51.444 holdings + 6.502 holdings= 57.946 holdings

c) Merged holdings=102.064 holdings – in the table these are recorded as "holdings with change of the manager". Those merged holdings have at the same time and change in manager. This is now depicted in the table page 43.

d) Duplicates in the Register=5.193 holdings

The above information concerns the census over-coverage.

- *Misclassification* stems from the fact that the auxiliary information provided by the frame may be inaccurate for some population units (e.g. wrong economic size or holding's type of production). Due to problems of *misclassification*, the coefficient of variation of the produced statistics of SAMP is *higher* than the coefficient of variation based on the initial sample design.

- *Under-coverage* refers to units missing from the sampling frame. As a result, the under-coverage problem underestimates the produced statistics. Corrections and weighting for *under-coverage* is difficult, because it cannot be obtained from the sample itself, but only from external sources. According to census data, 6.451 holdings were not covered by field enumeration, because their holders refused to answer (refusal rate=0,9). In addition, according to census data, 40.392 holdings were not covered, because their holders were either unknown or temporary absent, in hospital etc. Due to refusals and the rest not surveyed holdings, about 6,4% of holdings were not covered by field enumeration and the appeared under-coverage of the total utilized agricultural area is about 3,5%, according to the historical data from the Register of ELSTAT. The above under coverage rate has been calculated as follows:

$$Under\,coverage\,rate(\%) = \frac{Re\,fusals + Re\,st\,not\,surveyed\,holdings}{Re\,spondents + Re\,fusals + Re\,st\,not\,surveyed\,holdings} \cdot 100 =$$

$$= \frac{46\,753}{734\,913} \cdot 100 = 6,4\%$$

where:

a) Respondents=688.160 holdings

b) Refusals = 6.361 holdings

c) Rest not surveyed holdings (holders were unknown, temporary absent etc)=40.392 holdings

A suitable imputation technique was applied to help maintain coverage and compensate for missing data from the 47.489 not surveyed holdings (refusals and rest not surveyed units). A 'hot deck' approach was used for 34.835 holdings since they are known to be under operation, because most of these holdings participated in the sample of FSS of the previous years. Here, a not surveyed holding was matched with a similar responding holding and all the relevant variables of the responding holding were ascribed to the not surveyed holdings. Areas and capital livestock units for not surveyed units were estimated on that basis. More specifically, '*Random imputation within classes'* was applied. In this 'hot-deck' method, a respondent (donor) is chosen at random within an imputation class and the selected respondent's values are assigned to the not surveyed unit (recipient). The respondents are as homogeneous as possible within each class. For each missing value, a reported value is imputed which is in the same class. Thus, the assumption is made that within each class the non-surveyed units follow the same distribution as the respondents. The auxiliary variables, used to define the imputation classes for holdings, were: a) 'Municipality/Commune', b) Type of farming and c) Economic size. For both the 'donors'' and

the 'recipients' the values used to determine the imputation classes, in which they belong, were taken by the historical data of ELSTAT Register. After the implementation of the imputation technique, the under-coverage rate is 1,6% at national level, in terms of number of farms. The under-coverage rate is 1.6% for both the Census and the SAPM. This was achieved due to the fact that the extrapolation factors where calculated so as the estimated number of holdings of the Census to coincide with that of the SAPM, at NUTS 3 level (Perfecture)

Measurement errors

Measurement errors occur during data collection and make the recorded values of variables to be different than the true ones. Generally, they can be regarded as random errors, which increase the variance with contributions, which enter automatically in the calculations of the variance.

Processing errors

Once data have been collected, a range of processes is performed before the production of final estimates (e.g. coding, editing, weighting and tabulating etc.). Errors that arise at these stages are called processing errors. Processing errors can be regarded as random errors, which increase the variance

Non-response errors

Non-response refers to the failure of collecting data from some or all variables of the population units designated to obtain information in a sample or complete enumeration. The difference between the statistics computed from the collected data and those that would be computed if there were no missing values is the *non-response error.* There are two types of non-response a) u*nit non-response,* which occurs when data can not be collected from all the designated population units and b) i*tem non-response,* which occurs when the information is not gathered on all survey variables from the designated population units.

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The response rate of the SAMP was defined as the fraction of actual sample size divided by the initial sample size. The initial sample size of the SAMP contains respondents, refusals, closed, merged or out of scope holdings, as well as holdings with holders unknown, temporary absent, in hospital, etc. The response rate of the SAMP amounts to 71,9%. A basic problem is that the response rate is not directly related to bias, that is, the main problem caused by non-response. In principal, it is possible non-response rates to be low and bias to be high and vice-versa.

 In SAMP, re-weighting was applied to amend suitably the extrapolation factors, by taking into account the response rates in all final strata. It compensates for non-responses, and reduces the absolute bias of the estimation of the survey characteristics. The aim is to remove non response bias but, in practice, this is unlikely to be fully achieved. The effect of non-response on the produced statistics is that it increases their variability and introduces bias. Bias is introduced by the fact that non-respondents may be different than respondents in their values of some survey characteristics. Variability increases due to decreased sample size and weighting adjustments that are used to compensate for unit non-response.

The tables 8 and 9 depict the unit response rates (%), total and broken down by type and sizes of holdings.

Table 8:Unit response rates (%) by type of farming and economic size of holdings

Type of farming	Total	Classes of economic size of the holdings							
		0[*]	1	2	3	4	5	6	7[**]
Total	**71,9**	**33,3**	**54,4**	**64,9**	**71,4**	**77,0**	**80,9**	**82,5**	**72,0**
T10	77,0		48,1	65,3	75,6	80,3	84,9	86,4	76,9
T21	67,9		37,0	50,0	61,6	69,4	72,9	72,8	0,0
T22	73,1		33,3	52,9	68,8	72,7	82,7	72,5	0,0
T30	65,8		57,4	63,4	67,8	71,5	74,3	77,9	88,9
T41	77,5		39,5	61,9	71,8	77,1	81,2	82,5	100,0
T44	75,3		45,2	62,2	69,2	80,5	82,9	84,3	65,8
T51	80,5		80,0	60,0	69,7	80,0	80,8	83,4	0,0
T52	76,5		48,6	66,7	81,3	69,4	73,8	82,8	0,0
T53	61,1		57,1	56,5	60,0	70,0	57,1	85,7	0,0
T60	75,9		52,6	72,1	75,9	80,7	81,6	83,2	85,7
T90	76,1	33,3	68,6	73,0	78,1	78,5	78,5	79,7	72,7

[*] Holdings that follow organic farming and whose economic size is not specified

[**] Holdings that the economic size is not specified

Table 9: Response rates (%) by size classes

Code of classes	Area with crops in hectares	(%)
	Total	**55,2**
11	Less than 1 hectare	39,1
12	From 1 to less than 2 hectares	46,2
13	From 2 to less than 3 hectares	54,3
14	From 3 to less than 5 hectares	61,9
15	From 5 to less than 10 hectares	60,9
16	From 10 to less than 20 hectares	64,7
17	From 20 to less than 30 hectares	65,8
18	From 30 to less than 50 hectares	69,4
19	Equal to or greater than 50 hectares	62,9
7	Not specified area	67,7
10	Not specified area	41,7

Census

The response rate of the census is the fraction of respondents divided by the initial population size (respondents, closed, merged, refusals etc). The response rate of census amounts to 76,5%, taking into account also the non-active holdings. The non response of the census creates under coverage that amounts to 6,4%. However, the under-coverage rate has been reduced to 1,6% at national level, after the implementation of imputation technique..

Item non-response

Item non-response was not appeared in the holdings included in the survey, and as a result no imputation was applied.

3.1.3 Methods for handling missing or incorrect data items. Control of the data

Follow up interviews were conducted in cases were missing or incorrect data were detected. In most cases telephone was used.

Item imputation was also conducted. The imputation procedure was based on the usage of relevant questions in the questionnaire.

The processing and checking of the data was carried out in five phases as follows:

Phase 1

The first phase encompassed the processing of the questionnaires by officials of the Regional Statistical Offices (supervisor and assistant supervisors). The assistant supervisors checked manually all the questionnaires in order to define their completeness and consistency and correct them accordingly. It is noted that the interviewers, before delivering the questionnaires to their assistant supervisor, had to check if they were complete and consistent.

Phase 2

The questionnaires were scanned and the second phase of controls followed. These controls included data verification (meaning the verification of characters not written very clearly by the interviewer), verification (meaning the verification of specific values, sums, etc), batch integrity (meaning correction of holdings surveyed twice) etc. The data had to pass through these different types of corrections in order to be transmitted to the main database.

Phase 3

A new set of controls was conducted to the imported data to the database. There were two types of errors:

The first type of errors was spotted by warnings, for example a very big (unusual) value for the number of animals. This type of error did not necessarily need correction.

The second type concerned errors that had to be corrected either immediately or later, depending on the availability of the correct answer. The control of the questionnaire could be continued. Later the user should print all the incorrect cases in order to solve the problems after consultation with the interviewer or even the holder.

Phase 4

Questionnaires were checked again in order to detect errors of the integrated data, for example double or multiple entry holdings etc.

Phase 5

Quality controls related to the aggregates at NUTS III level were made. The quality controls were carried out in order to ensure the quality of the final file and the aggregates at regional level.

3.2   Evaluation of results

	Survey		
	FSS (excl. OGA in case of sample survey)	OGA (if sample survey)	SAPM (if sample survey)
Initial list of units	843.007		843.007
Initial sample	843.007		59.967
Number of holdings with completed questionnaires (incl. Eventual imputed questionnaires):	723.007[2]		44.351[3]
Number of units under the threshold applied *	NA		NA
Duplicated holdings	5.193		
Holdings with ceased activities:	160.010		7.255
- (If information is available) of which definitely ceased, i.e. the land is abandoned, of which:	57.946		2.349
no more operated (due to abandon, changes of use, etc	51.444		
temporary no operated	6.502		
- (If information is available) of which holdings with change of the manager due to merge with others holdings, of which:	102.064		4.906
fully transfer and merged with other holding	64.181		
rented or it was turned over under another legal status and merged with another holding	37.883		
Unit Non-response :	46.753		9.602
- Refusals – not corrected of which:	11.918		9.602
unknown holder	3.541		
the holder refuse to answer	1.040		
other (temporary absence, in hospital, impossible to contact the holder e.t.c)	7.337		
- Refusals – corrected (imputed)	34.835		0

[2] 723.007 holdings, which are: 665.886 old holdings (from the Farm Register) plus 57.121 new holdings that ELSTAT identified as operating during the census. From the latter, 19.935 are new holdings coming from the splitting of old holdings that were registered in the Farm Register, and 37.186 are new holdings.

[3] 44.351 holdings, which are: 43.110 old holdings (from the Farm Register) plus 1.241 new holdings coming from the splitting of old holdings that existed in the Farm Register.

Number of records transferred to Eurostat *	*723.007[4]*		*44.351*
Common land units (A_2_1)[5]	*51*		*0*

* Units that do not meet the national threshold criteria (in some countries there could be completed questionnaires for them, in others – not). In case where it's impossible to provide this information, a short explanation about the reasons is to be provided.

Comments on major trends from FSS 2007 to FSS 2010.

Comments must be given in case there is a change of more than 10% at national level between FSS 2007 and FSS 2010 for any of the groups below:

	From FSS 2007	*From FSS 2010*	*Difference in*
Number of holdings;	*860.153*	*723.007*	*-15,9%*
UAA (A_3_1), ha;	*4.076.225,8*	*3.477.929,0*	*-14.7%*
Arable land, ha;	*2.118.620,0*	*1.767.896,5*	*-16,6%*
Permanent grassland (B_3), ha;	*819.606,2*	*750.657,1*	*-8,4%*
Permanent crops (B_4), ha;	*1.125.937.4*	*950.268,3*	*-15,6%*
Wooded area (B_5_2), ha;	*60.543,3*	*50.468,3*	*-16,6%*
Unutilised Agricultural area (B_5_1), ha;	*237.964,5*	*210.660,2*	*-11,5%*
Fallow land (B_1_12_1 + B_1_12_2), ha;	*210.207,4*	*151.009,9*	*-28,2%*
LSU in LSU;	*2.626.563*	*2.404.821,9*	*-8,4%*
Cattle (C_2), head;	*733.948*	*651.783*	*-11,2%*
Family Labour force - in persons;	*1.484.825*	*1.191.008*	*-19,8%*
Family Labour force - in AWU;	*468.105*	*354.462*	*-24,3%*
Non family labour force - in persons;	*29.582*	*26.207*	*-11,4%*
Non family labour force - in AWU	*107.500*	*79.535*	*-26,0%*

Concluding Remarks

According to the results of the 2009 Agricultural and Livestock Census (FSS 2010) and after comparison with the results of the 2007 Survey on Agricultural-Livestock Holdings (FSS 2007), as these are shown above, there appears to be a significant decrease during the period 2007-2009 in the number of agricultural holdings (-15,9%) and in the utilized agricultural areas (-14,7%) as well as in all variables that appear in the above table. These findings were thoroughly studied and checked by ELSTAT. The views of the Ministry of Agricultural Development and Food and of

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[4] 843.007 holdings - 5.193 duplicates - 160.010 with ceased activities - 11.918 refusals +57.121 = 723.007

[5] *51 special records for common land in NUTS 3 level.*

the Payment and Control Agency for Guidance and Guarantee of Community Aid (OPEKEPE) were also sought. The potential factors for the above noted decrease include the following:

1. Up to now, the Farm Register is being updated basically by the agricultural census and to a certain extent by sample agricultural surveys and administrative sources. It has not been possible to record and depict all the changes in the structure of the agricultural holdings for a number of reasons. For example, a number of holdings that were not operational any more were shown in the Farm Register as active. Thus the number of holdings included in the Farm Register, which is the sampling Frame for the conduct of the FSS 2007 is, in that particular case, potentially greater that the real one. We consider that this led to an overestimation of the FSS 2007 variables, explaining to a significant degree the **apparent** large decreases in holdings (and utilized land) between the 2007 FSS and the 2009 Census.

ELSTAT will consider the possibility of revising the 2007 FSS data and previous FSS data, taking into account inter alia the results of the 2009 and 1999 Censuses.

The issues raised regarding the quality of the farm register with regard to the sources used for its updating are presented analytically above. As it has been also mentioned above, ELSTAT has already taken actions to improve the methods and the techniques of the update of the register. In the Framework of the Joint Overall Statistical Greek Action Plan (JOSGAP) an external consultancy has already taken place and ways for improving the register have been indicated. ELSTAT envisages implementing a project with the aim of linking its farm register with the registers kept by other Greek Authorities, which will enable ELSTAT to update the farm register continuously and more fully.

2. It should also be noted that the 2009 Census took place at a significantly later date than originally planned and would have been optimal. The reason for this change of the date of the conduct of the census had to do with the crisis in which the then National Statistical Service of Greece found itself in (triggered by the problems in the area of government finance statistics) in the Fall of 2009. In this context, the time that the 2009 Census could finally be conducted was the Summer-early Fall of 2010, and this may have *conceivably* contributed to some under-enumeration of holdings and their owners beyond what would have taken place under other circumstances, although there is no direct evidence of an under enumeration and the latter cannot can be estimated.

3. Finally, it is quite possible that changes in economic incentives and other objective conditions may have had an actual effect on developments in the agricultural sector, which the Census results properly captured.

Quality Controls

In variables where big variations were detected, (the percentage of variation depends on the kind of variable), then an in depth analysis was carried out in close cooperation with the regional offices and Ministry of Rural Development and Food.

4. PUBLICATION AND PUNCTUALITY

4.1   Publication

- From the database of the Agricultural Census 2009, the Eurofarm file was compiled, with individual data for each holding. This file was sent to Eurostat in March 2012.

- Preliminary Results will be published on the web site of NSSG in the second semester of 2012 (free of charge).

- The final results of agricultural Census 2009 at national level will be presented in the second half of 2012 in the form of:

    – Detailed tables (national series of tables),

    – An electronic and a hard copy publication containing statistics and related analyses, together with maps showing the geographical distribution of the various survey characteristics (not free of charge).

All publications contain meta-data.

Access to individual data for users is not possible at all.

4.2   Timeliness and Punctuality

No interim results have been published.
The time lag for the final results is 24 months from the end of collected period.

5. CONFIDENTIALITY AND SECURITY

The issues concerning the observance of statistical confidentiality by the Hellenic Statistical Authority (ELSTAT) are arranged by articles 6, 7 and 8 of the Law 3832/2010, as amended by article 90 paragraph 8 of Law 3842/2010 and by article 10 of Law 3899/2010, as well as by article 8 of Law 2392/1996, which was brought back into force, in accordance with article 90 paragraph 8 of Law 3842/2010.

Furthermore, ELSTAT disseminates the statistics in compliance with the statistical principles of the European Statistics Code of Practice and in particular with the principle of statistical confidentiality.

Micro data can be given out to external users for research purposes only after ensuring that all identification information on the holding has been hidden.

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ANNEXES

ANNEX I. Questionnaires in Greek and English.

ANNEX II. Other supplementary documents of the survey (in Greek).

ANNEX III: National regulation: 3 Joint Ministerial decision

ANNEX IV: Decisions designating private interviewers

ANNEX V: Interviewers' payment list by Prefecture (NUTS 3)

ANNEX VI: Geographical reference

ANNEX VII: Questionnaire of Common Land

ANNEX VIII. Guidance notes

ANNEX IX Validation Rules