

Farm Structure Survey 2007

National Methodological Report

Country: **ROMANIA**

FARM STRUCTURE SURVEY 2007

NATIONAL METHODOLOGICAL REPORT

A. CONTENTS

SUMMARY

This report presents the methodology of the Farm Structure Survey – 2007 (FSS-2007) carried out in Romania in accordance with the EU and national requirements.

The National Institute of Statistics was responsible for the survey and also hosted the survey committee. The latter was made up of representatives of the Academy of Agricultural and Silvicultural Sciences, the Ministry of Agriculture and Rural Development, the Ministry of Interior and Administrative Reform and NIS.

For FSS-2007, out of the statistical farm register (REXA), established for the 2002 General Agriculture Census (GAC) and updated with FSS 2005 data, a sample of about 8% of the total agricultural holdings was drawn. Thus, a sample of 354,742 holdings resulted, of which 336,299 individual holdings and 18,443 legal units. The sample was representative at national, development region and county level.

In the FSS-2007 case, the survey was conducted by direct interview between the surveyor and the head or another adult member of the individual holding and between the surveyor and the manager or another suitable person of the unit for the judicial personality holdings.

A single 8-chapter questionnaire was used for data collection both for the individual and the judicial personality holdings.

The field work was carried out in the 10 January-10 February 2008 period and 6,944 field operators were employed.

The data relative to land use, irrigations and rural development took the crop year 2006-2007 as a reference. As regards the livestock data, the reference moment was 31 December 2007, while for the agricultural labour the reference period was the year 2007 (12 months).

The FSS-2007 implementation activities were the following: sample design, establishing the statistical tools, IT application design, printing and sending out the questionnaires and methodological guides, recruitment and training of the surveyors, field work, data processing, preparation of the Eurofarm file, data dissemination and publication.

The survey results were processed at national level, development region and county and were presented both on paper in a 2-volume publication and in electronic form (CD-Rom and NIS website-selection).

For the “Eurofarm” database registrations for 339,890 holdings were sent to Eurostat in the standard format according to the Eurostat manual for data providers.

1. INTRODUCTION

1.1 Background and objective

In Romania, the first general census of agriculture (GAC-2002) took place in the period 2 December 2002 – 31 January 2003.

The main RGA-2002 objective was to get an exhaustive picture of the structural features of the national agricultural system. At the same time, the data necessary for compiling the statistical farm register were provided as sampling frame for carrying out agricultural sample surveys in the inter-census periods.

The general census of agriculture was conducted based on the FAO recommendations made within the World Agricultural Census 2000 programme, as well as the EU requirements. The information obtained allowed the setting up of a database containing data comparable at an international level on the main structural characteristics: number and size of the agricultural holdings, the livestock, the land use for the main crops, as well as information on the main production factors (agricultural labour, agricultural machines and equipment, agricultural constructions, etc.). The list of the census characteristics and their definitions were compliant with the EU requirements relative to FSS 2003.

The GAC-2002 results were processed at national/development region/county/commune level and transmitted to Eurostat in the required format for the Eurofarm database.

FSS provides an up-to-date picture of the agricultural structures being also an indispensable tool in updating the statistical farm register, the sampling frame for carrying out the other agricultural surveys.

The FSS 2005 was a sample survey based on a national/development region/county (NUTS 3) representative sample of approximately 8 % of the population existing in the statistical farm register. Thus, of the total 4,484,893 holdings a sample of 361,169 holdings was drawn with an error margin of less than 5 %.

1.2 Legislation

FSS-2007 was conducted in accordance with EU requirements (Council Regulation no. 571/88 on the organization of Community surveys amended by Council Regulation no. 2467/96, Commission Regulation no. 1444/2002, Commission Regulation no. 2139/2004, Commission Regulation no. 204/2006, adopting and implementing the Council Regulation no. 571/88 and amending the Commission Decision no. 115/2000 regarding the Community surveys on the structure of agricultural holdings in 2005 și 2007.

Besides the above-mentioned EU legislation on the agricultural structural surveys the national legal basis was created.

- Statistical Survey Programme 2008 (SCP 2008) approved through the Government Decision no. 685/2008.
- Order of NIS President no. 575/2007

According to the provisions of the Official Statistics Law all the individual data and information registered on the questionnaires and subsequently processed are confidential and used only for statistical purposes.

2. CONTENTS

2.1 Characteristics

The list of the characteristics included in this survey and their definitions observe the Eurostat requirements relative to FSS-2007. Moreover, characteristics requested by national users were also included. The survey did not include certain characteristics unspecific to Romania or carrying little economic significance.

In such context, the characteristics not included in the Romanian FSS-2007 are listed in the table hereunder:

FSS characteristic symbol	Characteristic denomination
A03	Environmentally-restricted agricultural areas
A04D	Locality code zones under the Nature 2000 programme
D25	Cotton
D33	Other textile crops
G01B	Fruits and fruit trees – sub-tropical climate
G02	Citrus plantations
G03	Olive groves
G03A	Olive groves – table olives
G03B	Olive groves – oil olives
G04D	Land under vines – raisins
G07	Permanent greenhouse crops
I08C	Areas converted into permanent pastures under payment scheme
I08D	Areas converted into wooded areas under payment scheme
I08E	Other areas under payment scheme

For the fields D22, F03, I08A and I08B the registration of the areas applied for was accepted based on the interviewee's declaration because until the field work started no financial aid was received for these areas.

In Romania, there are three categories of less-favoured zones:

- zones unfavoured by specific natural conditions
- significantly-unfavoured zones
- mountainous less-favoured zones

The list of the FSS-2007 characteristics only for national requirements is the following:

- primary accountancy of the activity carried out on the holding (Y/N);

- number of sparse trees;
- environmentally-restricted holdings;
- organic farming.

The date and periods of reference for FSS-2007 were the following:

- the crop year 2006-2007 for: land use, irrigations and rural development;
- 31 December 2007 for the livestock;
- the year 2007 (12 months) for the agricultural labour.

As for the FSS-2005 compared with GAC-2002, the date of reference was changed for the livestock from 1 December to 31 December and consequently the livestock data are not comparable, especially for pigs. The change of the reference date took into account the pig slaughterings during Christmas time.

Concerning the methodology of collecting data for the cocks, there was a difference between FSS-2005 and FSS-2007. For FSS-2005 they were included in J16D ("other poultry" category), but for FSS-2007, according to the definitions of the regulation they were included in the fields J14 (domestic animals of the species "*Gallus domesticus*", which are kept for the production of meat) or J15 (domestic animals of the species "*Gallus domesticus*", which are kept for the production of eggs).

2.2 Questionnaire

A single questionnaire was used both for the individual holdings and the legal units and it was designed to be scanned. Its structure was jointly established with the users.

The questionnaire was printed on paper, structured into 8 chapters and consisted of 10 pages.

The chapters dedicated to the characteristics to be observed were the following:

- I. General information on the holding;
- II. Land use;
- III. Irrigations;
- IV. Livestock;
- V. Rural development;
- VI. Organic farming;
- VII. Agricultural labour;
- VIII. Other information.

A copy of the FSS-2007 questionnaire is attached to this report.

3. SURVEY METHODOLOGY

3.1 Survey organisation

NIS was responsible for the whole survey organization and conduct. The departments involved were the following:

- at NIS central level: General Department for Agriculture and Environment Statistics, General Department of IT and Statistical Infrastructure, the Budget and Accountancy Department, Department of Human Resources Policies and Human Resources;

- at territorial level: 42 county statistical offices.

Within the General Department for Agriculture and Environment Statistics the following activities were carried out: drafting of legislative acts, questionnaire and field operator manual design, establishment of data processing requirements at territorial and central level, data checking and validation, control table compilation, IT application use, data integrity analysis, non-response treatment, data grossing-up, final table design and compilation, publication preparation and issuing. The IT application was sub-contracted to a specialised company.

The county statistical offices took care of the recruitment and training of the field operators, the monitoring of their work during the survey, the reception and analysis of the filled-in questionnaires.

Survey co-ordinators (one by county) were designated to ensure a good survey conduct. They were trained at NIS central level by the staff of the General Department for Agriculture and Environment Statistics and the trainees became in their turn trainers of the field operators on a local level.

The data collection for all the holdings was done by direct interview of the field operator with the holding head or another adult member in case of the individual holdings or with the holding manager or another competent person in case of the legal units. 6 944 field operators were hired for the FSS-2007 and each had to complete 54 questionnaires on an average. As a rule, the field operators were agricultural or economic experts and most of them also took part in the GAC 2002 and FSS 2005.

The filled-in questionnaires were returned to the county statistical offices and the data entry was made by scanning. A first data validation was done at the county statistical offices level. The data files at county level were sent to the centre where the other survey stages were implemented until obtaining the final results.

The data processing was achieved as follows:

- at county level:

- data entry by questionnaire scanning, data validation, error solving, comparison with other sources, data integrity control, control tables, transmission of files with correct data to the centre;

- at central level:

- reception of data files from the county offices, data validation at central level, error solving, control tables, non-response treatment, data grossing-up, estimations of the main characteristics at county level and their sending to the county offices for validation purposes, final estimations for all the observed characteristics, compilation of the final tables, making the publications and the "Eurofarm" file in order to send it in the Eurostat-required format.

The FSS-2007 activity at the county statistical offices level was monitored by the central technical secretariate, to whom a weekly report on survey progress used to be sent.

3.2 Survey programme

The FSS-2007 activities were carried out based on a programme, which included the following stages: sample drawing, elaboration of the statistical tools, scheduling of the activities, sending out the statistical tools at territorial level, recruitment and training of the field operators, data processing, obtaining the final results to be sent to Eurostat and their dissemination.

Calendar of the main FSS-2007 activities:

No.	Activity	Deadline
1.	Survey plan drafting	28.02.2007
2.	Drafting the government decisions for survey implementation	30.05.2007
3.	Sample drawing (about 8% of the total number of individual holdings, as well as all the legal units) and establishing the list of observation variables	29.06.2007
4.	Drafting the data collection questionnaire, the field operator's manual, the survey guide, the locality codes	01.06.2007
5.	Finalising the statistical tools – data collection questionnaire, manual, guide, locality codes	16.07.2007
6.	Approval by NIS management of the number of copies to be printed of the FSS-2007 statistical tools	01.08.2007
7.	Delivery of the statistical tools for printing	15.08.2007
8.	Establishing the IT processing requirements at county level and drafting the specification book for sub-contracting in co-operation with the General Department for IT and statistical infrastructure	15.08.2007
9.	Printing and distribution of the statistical tools according to the approved number of printed copies	15.10.2007
10.	Training of county offices staff (survey co-ordinators)	01.11.2007
11.	Transmission of the sample of holdings to the county offices	15.10.2007
12.	Design and development of the IT application for data processing at central and county level	30.11.2007
13.	Selection and training of the field operators	30.11.2007
14.	Finalising and sending of the IT application and of the documentation for data processing at territorial level	22.01.2008
15.	Finalising the IT application and the documentation for data processing at central level	22.01.2008
16.	Training of the staff working with the IT application at territorial level	15.02. – 29.02.2008
17.	Field work	10.01 – 10.02.2008

18.	Collecting the questionnaires filled-in at county level and their manual validation	29.02.2008
19.	Data entry finalisation and data validation at county level	02.06.2008
20.	Sending the data files to the central level	10.06.2008
21.	Data control at NIS level; compiling the control tables for analysis and comparison with other sources; error solving at central level	04.08.2008
22.	Analysis of centralised data by automatic procedures and making the automatic corrections	29.08.2008
23.	Data grossing-up; application of redressing and re-calibration procedures to the grossing up coefficients	30.09.2008
24.	Transmission of the main grossed-up indicators to the county offices for validation purposes	06.10.2008
25.	Validation of the obtained results	31.10.2008
26.	Drafting the paper "Farm structure survey 2007 – structural characteristics of the Romanian agriculture"	02.12.2008

3.3 Survey preparation

3.3.1 Population and sampling frame

The agricultural holdings regardless of their size and agricultural production represent the FSS-2007 coverage.

The agricultural holding as a statistical observation unit is the economic agricultural production unit performing its activity under a *single current management* and includes all the utilised land area and the livestock under full or partial property to achieve an agricultural production irrespective of the ownership or judicial form and size.

The economic units exclusively engaged in the following economic activities were not considered to be agricultural holdings:

- hunting, horse racing activities;
- forestry and logging;
- fisheries;
- raising of fur animals;
- provision of agricultural services (mechanisation, fertilisation and plant health protection, land improvements and irrigations, etc.).

The total population was of 4,480,664 holdings, of which 4,462,221 individual holdings.

The statistical farm register was used as a sampling frame updated with the data derived from the FSS-2007 and from the current annual agricultural surveys and other administrative sources.

No sampling thresholds were applied.

3.3.2 Survey design

The FSS-2007 was a sample survey, based on a representative sample at national/development region/county level (NUTS3), of roughly 8 % of the population registered in the statistical farm register. Thus out of the total 4,480,664 agricultural holdings a sample of 354,742 holdings was drawn, with an error margin of less than 5 %.

The survey sample consisted of 336,299 individual holdings and 18,443 legal units, the latter being exhaustively surveyed and updated based on the FSS-2005 information.

The sampling scheme provided the drawing of a representative sample, using the Neymann stratified random method by applying certain SAS procedures to the individual holdings and exhaustively including the judicial personality holdings.

The stratification characteristics were: the county, the economic size of the holding, the typology and the utilised agricultural area.

The strata were calculated by 42 counties, 11 ESU classes, 9 typological classes and 7 size classes of the utilised agricultural area.

The grossing up coefficients provided by the method were rounded-off to integers for a correct estimation both of the number of agricultural holdings and of other variables under different calculation combinations.

The sample probability was of 95%.

The sample size was dependent on the error margin (about 5 %) and the ensurance of the representativity for the little frequency coefficients as the methodology did not allow the existence of several grossing up coefficients for one holding (by sub-sampling).

3.3.3 Pilot survey

No pilot survey was conducted as the survey questionnaire underwent little changes versus the FSS-2005 one and most of the field operators were the same as for the previous survey (FSS-2005).

3.3.4 Briefing and training of the survey staff and of the respondents

In order to get good quality information, the field operators were largely selected among the agricultural experts and the economists at commune level having already participated in the FSS-2005 conduct and having constantly collaborated with the county statistical offices.

The training was done in several phases.

The first phase was dedicated to the training of the survey co-ordinators at county offices level by the staff of NIS General Department for Agriculture and Environment Statistics. They were instructed in the survey methodology, the questionnaire indicators and the necessity to observe the survey timetable. In the second phase, the field operators were trained by the county co-ordinators. The field operators were instructed in the survey methodology and how to fill in the questionnaire. The knowledge acquired and the questions made during the training period were applied at the interview, which explains the small number of errors due to the questionnaire filling-in. Throughout the training the necessity to meet the deadlines, to lower the non-response rate, to maintain the reliability and to duly fill in the questionnaire were also highlighted.

The field operators received the list of the units included in the sample within their activity sector, the related questionnaires and the field operator's manual.

The third phase was meant for training the users of the IT application in data questionnaire scanning and validation.

The survey was popularised on NIS website, through the media at county level and through the Interior Ministry's staff at townhall level across the country.

3.4 Sampling, data collection and data processing

3.4.1 Sample design

The sample was designed using the SAS procedures.

3.4.2 Data collection

The information from the individual holdings was collected by field operators on face-to-face interview basis with the holding head or another adult member, and between the surveyor and the holding head or another competent person for the legal units. When the data collection was over, the county co-ordinators received the filled-in questionnaires from the field operators and checked for the data integrity, the filling-in correctness, etc.

After the questionnaire data were scanned, validated and corrected at county level, the resulting data files were sent to the centre by tele-transmission.

3.4.3 Administrative data use

No administrative data were used.

3.4.4 Data control

FSS-2007 data control was made in several phases, as follows:

- Control made by the co-ordinators designated at statistical county offices level. This control was made immediately after the filled-in questionnaires were collected from the field operators. The following were checked:
 - observance of the work methodology
 - correctness of data registration (correlations among the indicators, comparisons with other sources, compliance with the sample, etc.)
 - observance of questionnaire filling in rules for scanning purposes
- Automatic control through the IT application at county offices level: The IT application was designed according to the processing requirements relative to the validation rules and correlations established for questionnaire entry into the database. The use of this application determines the scanning and logical validation of the data registered on the questionnaire and, if necessary, the drawing up of an error list. Such lists were analysed by authorised staff and eventual corrections were made.
- Automatic control made by the IT application at central level.

The data centralised at NIS level were submitted to an automatic control using the same procedures as at the county offices level. The errors found were solved locally and the correct files were re-sent to NIS central level.

- Automatic control of data integrity and completeness, as well as of other aspects originally not included in the processing requirements. Automatic compliance analysis procedures between database data and the sample taking into account the non-response were developed, as well as data completeness analysis procedures in relation to the completeness code and other analysis procedures of correlations and limits. As a result of these analyses, automatic corrections were made within the database.

- Data control at central level in comparison with other sources. At NIS central level an expert team was set up to make the control of the centralised grossed-up data compared to other sources: FSS-2005, other current own surveys and administrative sources. This phase highlighted the situations where the estimator produced biases of certain variables and adjustment and re-calibration methods and procedures of the grossing-up coefficients were used.

3.4.5 Non-response treatment

The non-response information was registered at ch. VIII pt. 45 of the questionnaire.

The holdings were stratified on cells, based on the following elements:

C0—Legal status of the holding (Ch. I pt. 2)

C1—ESU classes (established for sample design)

C2—UAA classes (established for sample design)

C3—Classes of number of individuals on the holding for agricultural labour (subsequently established by sampling frame processing).

No operation was done for the closed-down holdings (code=2) and temporarily inactive holdings (code=3) (These were not processed).

An imputation method by a specific procedural algorithm was applied to the holdings who refused the interview (code=4), unidentified (code=5), uncontacted (code=6) and other situations (code=7).

The imputation supposes that for a holding mentioned at the previous paragraph, the indicators (data) of another holding (with full interview) in the same stratification cell be used.

For the indicators relative to areas and animals the cells created by C0, C1 and C2 were taken into account.

For the indicators relative to the agricultural labour the cells created by C0, C1 and C3 were used.

Treatment of the exceptions:

When within the cell there was no other holding (with full interview), the procedure was the following:

- In case of the indicators concerned with areas and livestock, an extended C1, C2 stratification was chosen (C0 was given up). If in this case too there was no similar holding, a choice was made in the adjacent cell (C1,C2±1). A careful analysis was made for exceptional cases.
- In case of the indicators concerned with the agricultural labour another stratification according to C4 and C0=1 (individual holdings) or C0≠1 (legal units) was made. A careful analysis was made for exceptional cases.

3.5 Data processing, estimations and analysis

3.5.1 Methods for handling missing or incorrect data

The presentation refers to the phase when the data were already centralised, i.e. after being validated at county offices level. Specialised analysis procedures for data integrity and completeness were developed to solve errors unspotted by the logical validation control (set-up based on the processing requirements). Some of these aspects were also treated at item 3.4.4.

One of the procedures consisted in the analysis of the compliance between the sample and the centralised questionnaires to track blank questionnaires. There were no such cases.

Another procedure analysed the data registration according to the completeness code (Ch. VIII pt. 45), in order to treat non-responses.

Another procedure analysed both the data on the work volume and the correlation holding head-holding manager (a holding must have a single head and an individual holding must have a single manager).

The imputation method for non-response was discussed at item 3.4.5.

As already mentioned, where necessary, automatic corrections were made for example by removing some questionnaires, whose filling-in indicated them to be unsuitable for an agricultural holding (very few cases).

3.5.2 Estimations and sampling errors

As already shown at item 3.4.4., in the case of variables independent from sampling criteria, the estimator produced some biases, which determined the application of adjustment and re-calibration methods to keep the structural integrity of the holdings intact.

To this purpose, the method of the proportional redressing was used by applying a redressing coefficient resulted from the ratio: other source value/registered value.

It should be underlined that since the economic size was considered for sample drawing, most of the variables after grossing up had no major biases.

We present hereunder a table with the medium standard biases and the variation coefficients of several more important characteristics:

3.5.3 Non-sampling errors

This topic was basically treated at the above-mentioned items. We should emphasise that some of the errors were due to methodological unclarities. Thus, certain exceptional cases in the field operator's manual were not treated clearly enough or certain explanations were not concrete, suggestive or detailed enough.

The non-response errors were insignificant because the imputation method was applied.

3.5.4 Assessment of estimations

The FSS-2007 results were compared with the results of other statistical surveys on: land use, cultivated areas and crop production, livestock and animal production, as well as with the FSS-2005 and GAC-2002.

In the tables below, we present the comparison between the FSS-2007 and FSS-2005 results, and GAC-2002, respectively, for the following main characteristics:

- For areas:

Characteristic	GAC-2002 - ha -	FSS-2005 - ha -	FSS-2007 - ha -	col3/col2 %	col3/col1 %
0	1	2	3	4	5
Arable land	8773748,70	8866591,66	8691343,47	98,02	99,06
Natural pastures and meadows	4644004,74	4530298,46	4540135,09	100,22	97,76
Permanent crops	344091,92	339199,04	343623,35	101,30	99,86
UAA	13930710,10	13906701,28	13753046,49	98,90	98,72

- For livestock:

Characteristic	GAC-2002 (1 December) - heads -	FSS-2005 (31 December) - heads -	FSS-2007 (31 December) - heads -	col3/col2 %	col3/col1 %
0	1	2	3	4	5
Bovines	2870782	2766097	2733557	98,82	96,35
Sheep	7238404	7604425	8531851	112,20	105,06
Goats	744272	780981	874033	111,91	104,93
Pigs	8259680	4935657	4708809	95,40	59,76
Poultry	82407052	81701400	75858464	92,85	99,14
Bee families (number)	776869	949358	985205	103,78	122,20

The estimations of the final results are shown in the following table, for the main characteristics:

Variable	Number of farms	Mean	Std. Error of Mean	Coefficient of Variation %
UAA	339890	3.498301	0.011395	0.33
PIGS	339890	1.102352	0.006021	0.55
BOVINES	339890	0.695323	0.004959	0.71
SHEEP	339890	2.170209	0.050045	2.31
POULTRY	339890	19.29578	0.050413	0.26
HORSES	339890	0.230244	0.002978	1.29

4. PUBLICATION AND DISSEMINATION

The survey results were published on paper both as a 2-volume publication and in electronic form (CD-Rom and NIS website - selection).

BIBLIOGRAPHY

ANNEXES (questionnaire, applied formulas etc.):

- „*Annex-Questionnaire_FSS2007.xls*”