

FARM STRUCTURE SURVEY 1999/2000 NATIONAL METHODOLOGICAL REPORT

Member State: SPAIN

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NATIONAL METHODOGICAL REPORT - SPAIN

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SUMMARY

The most recent agricultural census was carried out in Spain in 1999. The data were collected in a single phase, from 1 October 1999 to 31 January 2000.

The data refer to the farming year 1999, that is the period between 1 October 1998 and 30 September 1999, except for "Livestock" and "Tractors, cultivators, machinery and equipment" belonging exclusively to the holding, for which the reference date is the day of the survey.

The final data of the census yield a total of 1 790 162 holdings, of which only 1 287 418 fall within the scope of EuroFarm, according to the Community definition.

To gather the data, the information provided by the holders was entered into a single questionnaire on paper. Bilingual questionnaires were printed for the Autonomous Communities that have their own language (Basque, Catalan, Galician, Valencian and Majorcan).

A co-operation agreement was signed with the Autonomous Communities of the Basque Country and Catalonia, according to which said Communities would collect and record the information relating to their own territories.

Prior to the data collection, a directory of holders was drawn up by crossing various administrative files from the Ministries of Economy, Labour and Social Security and Agriculture, Fisheries and Food.

The data were collected through census agents' personal pre-arranged interviews with holders (or their representatives), in places prepared to the purpose (in town halls, municipal or district offices and even at the interviewees' homes).

Initial check-ups on the quality of the information were carried out in the local and district offices; those questionnaires which did not meet the specified standards of quality, were returned to be filled in correctly.

The rate of response to the census was 98.29%. The high response rate was due on the one hand to the co-operation of the Municipal Councils, the Autonomous Communities, the Ministry of Agriculture and agricultural professional associations, and on the other to the publicity campaign in support of the census. In both cases informative posters were produced and direct advertising appeared in the media.

The recording of the questionnaires, except for the Basque Country and Catalonia, was carried out by four service companies, outside the INE [National Statistical Institute], under the appropriate competitive bidding process.

Once the questionnaires had been recorded, the data (including those pertaining to the Basque Country and Catalonia) were submitted to check-ups and logical controls in order to detect errors and inconsistencies. This was done at the central departments of the INE in Madrid, and the errors were corrected, when necessary, by contacting the holder or his representative.

After these check-ups and corrections, the data were tested by an automatic imputation programme with a view to correcting any remaining errors. As a result of the earlier check-ups, this imputation was insignificant, it thus being sure that the data were of a high quality and representative.

The final results have been analysed and approved, and they are now being tabulated and published.

Besides the tabulations on the INE website and the census methodology (concepts, definitions and organisation), it is currently envisaged that the variables investigated be published in electronic and/or paper format, aggregated by municipalities, agricultural districts, provinces, autonomous regions as well as the country's total.

Additionally, a municipal database will be created and the requests for tailor-made information will be complied with.

1. INTRODUCTION

1.1. History and Objectives

An agricultural census was carried out in Spain in 1999; it was the fifth in the country's recent history. The 1957 General Censuses Act stipulated that the National Statistical Institute would be tasked with the nation's general censuses, including both population censuses and those referred to economic and related factors. A general regulation established that censuses should be conducted every ten years. The first agricultural census was executed out on the basis of this Act in 1962, and they were followed by those of 1972 and 1982.

After Spain's accession to the European Union, it also joined the Community surveys programme on the structure of agricultural holdings. In line with this Community programme, the INE carried out sampling surveys in 1987, 1993, 1995 and 1997, as well as the latest agricultural census in 1989.

Having to choose between 1999 or 2000 for the following census, Spain settled on 1999, the data being collected in the final quarter of 1999 and January 2000. The selection of this period was determined by the date of the latest agricultural census, budgetary reasons and a wish not to coincide with other exhaustive projects.

With the aim of planning the census preparatory work well in advance, on 12 December 1997 the National Commission for the Design and Planning of the 1999 Agricultural Census [Comisión Nacional de Estudio y Programación del Censo Agrario 1999] was set up as part of the INE. It was made up of representatives of all the INE units involved in the different census stages. (Field Work, Data-Processing, Management and Budget, Personnel, Dissemination and Agricultural Statistics). The Ministry of Agriculture, Fisheries and Food also joined the working groups.

The outcome of this Commission's meetings was a preliminary project that was sent to the Autonomous Communities, the Ministries and agricultural professional associations, for them to comment on it.

After receiving their suggestions and duly analysing them, the final project was laid down and approved by the Plenary Session of the Higher Statistical Council.[Consejo Superior de Estadística] on 24 November 1998.

From the start, the fundamental objective was to meet national statistical needs, maintaining as far as possible the trend of previous censuses. While strictly complying with Community norms, this allowed the comparability of the series and the study of Member States' results.

1.2. Legislation

According to the provisions of Article 26 (j), of Law 12/1989 of 9 May 1989, on the Public Statistical Function, it is the responsibility of the National Statistical Institute to carry out general censuses, both population censuses and those of a more economic nature.

The 1999 Agricultural Census is one of the objectives of the 1997-2000 National Statistical Plan, approved by Royal Decree 2220/1998 of 16 October 1998. It is also included in Royal Decree 278/1999 of 22 February 1999, which approves the annual 1999 programme of the above mentioned National Plan. The census therefore is a statistical operation for State purposes. As compliance with it is compulsory, no specific legislation was necessary.

However, given the great complexity of censuses and in order to regulate and co-ordinate co-operation among local, autonomous and central Administrations, Royal Decree 922/1999 of 28 May was enacted for the execution of the 1999 Agricultural Census. Its final provision empowered the Ministry of Economy and Finance to stipulate the complementary procedures needed to comply with the Royal Decree. To this end the INE, through the National Commission for the Design and Planning of the 1999 Agricultural Census, drew up the regulations for the organisation and implementation of the 1999 Agricultural Census, which were laid down in the Ministry of Economy's Order of 15 October 1999.

This Order regulates the following aspects of the census:

- Objectives
- Scope of the Census
- Basic Definitions
- Organisation of the Census
- Publicity
- Questionnaires
- Obligation of the holders to provide the data and possible penalties for failure to do so
- Statistical Confidentiality
- Collection Mechanisms
- Collection Period
- Timetable of Operations

1.3. Principal Changes in the Nineties

The latest agricultural census has been carried out in 1989, using the Community methodology. Since then, the most striking change is the disappearance of almost 500 000 holdings, resulting in the 1 790 162 holdings surveyed in 1999.

As compared to the previous census, the methodology remained more or less the same. The main modification is the introduction of new variables derived either from the latest Community regulations or from the request by the Ministry of Agriculture, Fisheries and Food and other agencies and users. The methodological novelties, which did not stem from Community regulations included:

- Expansion of the section on irrigation with new headings relating to the management of water, in order to know whether water is granted individually or is part of an irrigators community. Similarly, the heading "origin of the water" was extended to determine which areas are irrigated with treated waste water and which use desalinated water.
- Investigation on ostrich farms.
- Incorporation of a new section on "Marketing of the production" in order to know the relationships between the producer sector and the agri-food industry.

However, the most important changes refer to the organisation of field work and data collection. In 1989, a co-operation agreement was reached with the Institute for Agricultural Relations [Instituto de Relaciones Agrarias], under the Ministry of Agriculture, Fisheries and Food, for the collection of data by its offices in every municipality of Spain, with the participation of its officials. In 1999, as the above Institute no longer existed, the data were collected at the municipal and district offices, on premises provided by the local and Autonomous administration, after the signature of co-operation agreements between the INE and the administrations involved.

2. CONTENTS

2.1. The target population

As in the previous census, in order to meet national statistical needs the number of the census target holdings was increased.

The population investigated includes the agricultural holdings existing in Spain on 30 September 1999, managed by whatever natural or legal person and whatever the final use of the agricultural production.

The definitions were the following:

- Agricultural holding: This is the technical and economic unit from which agricultural products are obtained under the responsibility of a holder. This technical and economic unit is characterised by the use of the same means of production: manpower, machinery, etc. It is in turn devided into:
- Agricultural holding with land: an agricultural holding with land is one whose total surface, made up of one or several parcels, whether contiguous or not, is equal to or bigger than 0.1 ha. For census purposes, these agricultural holdings are included in the municipality with the greater part of the land or, in case of doubt, where the single or main building of the holding is located.
- Agricultural holding without land: An agricultural holding without land
 is one that measures less than 0,1 ha. and owns in total one or more
 head of bovine livestock; two or more head of horses, mules or
 donkeys; six or more head of sheep or goats; two or more head of

porcine livestock; fifty or more fowl comprising chickens, turkeys, ducks, geese, guinea fowl, doves or pigeons, quails, pheasants and partridges bred in captivity; thirty or more breeding rabbits; ten or more beehives. This livestock may belong to rural or urban areas. The agricultural holdings are considered as part of the municipality where the holder has declared his or her livestock.

2.2. Features Investigated

For national purposes, and following the usual process for surveys on agricultural structures, the number of variables to be investigated was greater than those on the Community list:

- Dry and irrigated areas where investigated separately for every crop as well as combined and successive crops.
- A more detailed breakdown was made for crops such as leguminous plants, industrial plants, fodder plants, citrus fruits, fruit trees and nurseries for wood crops.
- The categories of livestock were extended.
- The principal types of legal personality of the holder were investigated.
- A section on irrigation was included, to ascertain the areas irrigated, covering the methods of irrigation, the origin of the water, the system for managing the irrigation and the adequacy of the water supply.

For the first time, this census included ostriches under livestock and at the request of the Ministry of Agriculture, Fisheries and Food a new table was introduced dealing with the marketing of the production.

2.3. Questionnaires

The data were collected by entering into a single type of questionnaire the information provided by the holders. All of the questionnaires were in paper form.

For an easier understanding of the questionnaire, bilingual versions were printed in the communities having their own language (Basque, Catalan, Galician, Valencian and Majorcan).

For the specific information needs of the Autonomous Communities of the Basque Country and Catalonia, the latters' questionnaire included additional questions on their regions.

3. COLLECTION OF INFORMATION AND DATA PROCESSING

3.1. Directory of Agricultural Holdings

The Agricultural Census was carried out by complete enumeration of all the agricultural holdings in Spain.

For a smoother data collection and coverage control, an initial frame register was set up, with the title *Directory of Holders of Agricultural Holdings*.

It was made up of administrative information from the Ministries of Economy, Labour and Social Security and Agriculture, Fisheries and Food.

Most of the administrative records were checked automatically against the Taxation Identification Number (*NIF*) or the National Identity Document (*DNI*) of the holders, in order to eliminate duplicates.

The file resulting from the above steps, was then submitted, at each of the INE's 52 provincial offices, to a new process to eliminate duplication and erroroneous records.

Thus the final *Directory of Holders of Agricultural Holdings* was achieved for the 1999 Agricultural Census, after which they were subdivided into the 52 provincial files of the geographical areas used for data collection. Additionally, a Large Holdings Indicator was worked out according to the known scale of the holdings, the areas devoted to vineyards or olive-groves, etc. This led to a higher interest and greater willingness to obtain information during the fieldwork.

The Directory included, for each register, the following information:

- NIF/DNI of the holder of the agricultural holding
- Corporate name or names and surname of that holder
- Complete postal address of the holder's residence
- Area under olives (both dry and irrigated) within the holding, and the municipality and province where this crop is located
- Area under vines
- Municipality and province where the holding's livestock or dairy quota are declared

Another important feature of the final *Directory of Holders of Agricultural Holdings* is that the postal addresses included are those of the holders' residences, which are not necessarily the geographical location or actual assignment of the agricultural holdings.

This feature, stemming from the information in the files used to create the Directory, was maintained after a survey with a sample of holders showing that 80% of them wished to supply census information at their place of residence, irrespective of the geographical location of the holding.

3.2. Data Collection

3.2.1. Co-operation Agreements

A co-operation agreement was signed with the Statistical Institutes of the Autonomous Communities of the Basque Country and Catalonia, for the collection and recording of information in said Communities.

The fieldwork in these regions was similar to that of the INE in the rest of the country.

The INE tracked and monitored the operation through the national and provincial census organisation, described below.

3.2.2. Organisational Structure

An organisational structure was created at national, provincial and district levels.

The **national** Organisation included the following functionally autonomous administrative bodies.

- National Commission for the Agricultural Census, made up of 11 members of the directive staff at the Central Services of the National Statistical Institute (INE).
 Its primary functions were to manage all the Census implementation stages, to perform the administration of the budget, to set the timetables for the work and to analyse and approve the census results.
- Central Census Office, made up of 9 officials of the higher and medium INE statistical staff. Their main tasks were to issue additional instructions during the data collection phase, to handle administrative needs and give methodological and organisational guidance, to monitor a continuous following up of the work, to draw up periodic reports, and to act as a receiving and transmission agency of information among the provincial offices, etc.
- Central Inspectorate, made up of 12 officials from the higher and medium INE statistical staff. Their main tasks were to advise, to supervise on-the-spot following given routes, to plan and organise provincial structures and to mark the pace and quality of data collection.

The **provincial** Organisation consisted of two bodies:

- Provincial Inspectorate, to which, in turn, the Provincial Census Office was subordinate, and the District Inspectorate, made up by senior, medium and administrative statistical personnel assigned to the INE provincial offices. Also from 5 to 10 people for each of Spain's 52 provinces (including the cities of Ceuta and Melilla). These inspectorates' functions were similar to those of the three national bodies, covering their own provinces.

The **district** organisation was the result of subdividing the whole country (except Catalonia and the Basque Country) into 241 districts, all of them being included in a single province. Each district was tasked with collecting data for an average of 10 000 holders of agricultural holdings.

The *District Office* evolved into the on-the-spot centre for the technical direction, management and supervision of the fieldwork

4.500 municipal offices were under the authority of the district offices, equipped with an infrastructure of telephone nets and computer techniques.

For the management of district office work, 260 graduates were hired with the rank of District Officers responsible to the District Inspectors. Likewise, 360 office clerks were taken on.

The district offices also employed 1 350 group leaders and 5 500 census agents who worked at the *municipal offices*.

3.2.3. Training of Census Staff

The training of the civil servants, namely Central, Provincial and District Inspectors, was performed in three phases, according to their ranks, during the two months preceding the beginning of the work.

The training of contracted staff, depending on their categories, was achieved at the provincial and district offices in September 1999.

To the purpose of a consistent training of the census staff, didactic manuals were worked out in accordance with each agent's specific commitment. At the same time, standards were established for the order and the duration of the explanations; the material supports for each of the topics were laid down, including pictures and sound of an audio-visual teaching unit.

3.2.4. Institutional Support and Census Advertising

Prior to the data collection, support was requested from and granted by the most representative national and regional Agricultural Professional Organisations which would help disseminating the aims of the census and encouraging co-operation by the holders of agricultural holdings.

Support was also received from town councils in the majority of municipalities; besides fostering census activities in their municipality, they provided premises for census offices, pre-selected the staff later to be contracted and gave advice for revising the Directory of holders in their municipality.

Assistance for the census was also obtained from other institutions: Autonomous Communities Agricultural Councils, provincial and local chambers of agriculture, etc.

An institutional publicity campaign was undertaken throughout Spain: it involved stimulating the awareness of the census operation, the publication of specialised articles and interviews in the press, radio and television on the national, regional as well as local scale. It also edited and exhibited informative posters and other advertisement items.

3.2.5. Field Work Achievements

Field work was mainly carried out from October to December 1999, missing questionnaires and supplementary information being collected in January 2000.

Data were collected through personal interviews with the holders or the authorised people responsible for the everyday running of the holdings.

Personal interviews with the holders or with their representatives were conducted by census agents, on appointment and prior notification of the data

that would be requested, either at the municipal offices or at the interviewees' homes.

The supervision, following up and refinement of the census agents' work, as well as a second manual and exhaustive revision of the information obtained, were the responsibility of another of local employees, that is the group leaders, one for every four agents.

After a first data quality and consistency control by inspection assistants, the group leaders took the questionnaires to the district office. There, a further automatic checkup of the censitized municipal areas was carried out and the documentation was stored, prior to the complete recording of the data.

The census agents, under the supervision of the group leaders and district inspectors, and with assistance from the town councils, were also responsible for updating the *Directory of Holders of Agricultural Holdings*, by locating and surveying those holders who had initially been omitted.

At this stage of the data collection, the group leaders assigned the agricultural holdings surveyed to the municipality where the greatest part of their areas were located (holdings with land) or where their livestock was declared (holdings without land), thus giving rise to a new final product, the *Updated Directory of Agricultural Holdings*.

3.2.6. Quality Controls during Data Collection

The checks on quality carried out during this phase were intended to detect and correct any flaws in the quality of the work carried out by the census agents and the group leaders.

This was the mission of 230 inspection assistants. Checking the last table of the questionnaire and a random sample of 20% of those which had already been revised twice by the census agent and the group leader, they studied the internal consistency of the total area of the holding, the Utilised Agricultural Area (UAA), the land tilled, the exclusively livestock holding (holding without land), family workers and ownership of the holding by others than the natural persons. They also verified whether or not the areas under vines and under olives, recorded in the initial Directory, tallied with the census information provided by the respondent.

The district and provincial offices also performed an automatic comparison between the census areas and the municipally recorded rural land, in order to detect any non-censed holdings.

3.2.7. Events detected in the Data Collection, including nonresponse

The quality of the Directory used, accounts for the events occurring in the data collection for agricultural holdings.

WITHDRAWALS: Holdings that, according to the holder's information, subsequently checked at the municipality to which they were assigned, had been abandoned or broken up into other separate holdings, which were treated as Incorporations.

ERRONEOUSLY INCLUDED: Holdings not included in the census, either because they were engaged in another activity or were smaller than the minimum area of 0.1 ha, or because they did not have a high enough number of livestock.

NOT FOUND: A holding whose holder or a suitable respondent could not be found, despite all the efforts.

DUPLICATIONS: A holding whose holder appeared more than once in the Directory.

INCORPORATIONS: A holding whose holder was not included in the Directory and was detected in the data collection. Incorporated census holdings amounted to 10.1% of the total investigated.

REFUSALS: A holding whose holder and his representative refused to provide the required data, despite the efforts of all those working for the census. The holders who refused to co-operate were only 1.71% of those researched upon.

3.2.8. Units resolved

98,96% of the investigated units were resolved, either by means of an agricultural holding census or the above described events, except refusals.

3.3. Processing of the Data, Estimates and Analysis of Results

3.3.1. Data Entry

Since it was impossible for the INE teams to cope with the bulky census information, several services firms were hired so that the records would be available reasonably soon. The recording took two months and each company involved collected the questionnaires from the appropriate district offices. The questionnaires were collected and subsequently recorded by the companies by complete provinces (52 files), using a tailor made programme for the technical specifications drawn up by the INE.

The recording was submitted to a coverage and quality control before its approval.

3.3.2. Computerised Processing

After the data entry, the entire information control and checkup was centralized at a single office, whose specially appointed staff appropriately sorted and stored the questionnaires.

For the work at the central office, besides the permanent personnel of the Agricultural Statistics Unit (six officials), a team of 38 people was hired for the correction and treatment of the information, as well as three external consultants, experts in both data-processing and agriculture, to help with the supervision and analysis of results and the maintenance of the office's computer network and equipment.

The subsequent computerised data processing was carried out entirely at the INE, by the staff of the Subdirectorate for Computer Processing (one analyst,

one PL1 programmer and one TPL programmer) in co-ordination with the Agricultural Statistics Unit.

Once the files resulting from recording had been accepted and before detecting and correcting any variable, the records (within each provincial file) were given a correlating number so as to maintain the order in which they had been entered, in the event of any structural problem in the course of this process.

For each province or file the computerised processing was structured into several consecutive phases:

Phase 1: Detection and listing of coverage errors (duplicates, incorrect identifications, etc.).

Phase 2: Correction of errors in phase 1.

Phase 3: Detection and listing of internal consistency errors in the questionnaires (partially missing data in a questionnaire, inconsistent data and check on the rank and availability of quantitative variables). In total, 104 logic or preventive checks were set up for this stage.

Phase 4: Correction of errors in Phase 3.

Phase 5: Automatic imputation programme of residual errors.

Phase 6: Analysis of the imputations performed

Phase 7: Calculation of aggregated variables and evaluation of results.

Phase 8: Creation of final files and tables of results

Data Control

The manual correction of errors in Phases 1 and 3 was done on screen, using either general already available programs (EDICAM) or custom-made ones, with tests being applied at specific phases of execution to verify that the corrections made were consistent and correct.

For the correction of these errors, a comparison was made between the records and the data available in the questionnaire and other sources. Where necessary, a telephone call was made to the respondent for correction or confirmation of the data. In most cases, both phases involved correcting or confirming data from 30% of the questionnaires.

Subsequent to this manual correction of errors and before working out the final data files, all the questionnaires underwent automatic data imputation (PIA)

This process consists of 18 units known as blocks, each of them in charge of a more or less complex function. These blocks are applied sequentially, following their numbering from 1 to 18, to all the holdings; in essence, they are tasked with three types of operations:

- Asking questions to detect inconsistencies
- Asking questions to get information from the questionnaire itself when inconsistencies were detected

- Carrying out imputations when necessary

If there are no inconsistencies, the block makes no imputations for the target holding, which then proceeds to the following block. When a block does apportion data to a holding, the modified data then become final. Therefore, questions asked in the successive blocks always refer to the current state of the data, not to the initial one. Within a block, the logic is similar. Questions asked after imputations always refer to the current state of the data, even when they have been modified within the block.

The imputations are of two general types: those deduced from the information in the questionnaire itself by application of the criteria adopted, and those for which the lack of necessary data in the questionnaire requires outside information. The former, when they relate to numerical inconsistencies, for example in tallying totals, are generally performed by attributing new data in proportion to those in the questionnaire and whose total satisfies the consistency sought. Imputations of the second type are achieved by using the information in a specifically designed set of Hot Deck (HD) matrices. This information is classified according to the total area of the holdings before being stored. When this method is resorted to in cases of numerical inconsistencies, new data are imputed on the same proportional distribution principle. Obviously, the HD matrices have to be initialised at the start of the process and for each province, on the basis of greater probability criteria according to data from earlier surveys and from the agricultural statistical yearbook.

In view of the exhaustive checks-ups prior to imputation, it was applied in only 2.42% of the total records.

Obtaining the Final Files

After the automatic imputation and the analysis of its effect on the data, a calculation was made of aggregated variables, such as Agricultural Work Units (AWU), Livestock Units (LSU), Gross Margin (GM) and Type of Farming (TF). The latter two were obtained by cross-referencing our file with the Standard Gross Margins (SGM) file, provided by the Ministry of Agriculture, Fisheries and Food.

The results obtained before their final approval, were compared with other data sources (1989 Agricultural Census, Structural Surveys of Agricultural Holdings, Yearbook of the Ministry of Agriculture and the Register of Rural Areas).

The resulting final file and compliance with EUROSTAT specifications, gave rise to EUROFARM, a file containing the data of 1 287 418 holdings.

4. PUBLICATION AND DISSEMINATION

Before the 1999 field work, the Project for the 1999 Agricultural Census was published, showing the methodology to be used in the entire census as well as the definitions and concepts that make it possible for users to avail themselves correctly of the bulky census information.

The first results were published on the INE's web page in January 2002. These were general data on land use, tenure status, size of the holdings, legal personality, labour force, livestock and machinery, with breakdowns for provinces, Autonomous Communities and the overall country.

In addition to these tabulations, the idea also is to publish the following results in electronic format:

- National results: classifications by total area, UAA and type of farming.
- Results by Autonomous Communities: classifications by total area, UAA and type of farming.
- Provincial, district and municipal results: classifications by total area and UAA.
- National summary by Autonomous Communities and provinces. This publication will also be provided on paper supports.

A municipal database is also being elaborated.

Finally, requests for tailor made information will be met.

5. CONCLUSIONS

Despite the bulk and complexity of the census from the methodological, organisational and managerial viewpoint, Spain may be satisfied with the work achieved.

This does not mean there is no need to review some of the aspects towards the improvement of the execution times. In particular, it should bring about a more flexible data collection, entry and computerised processing, provided the necessary resources are available.

Since in the structural surveys the sample size was smaller, the data collection and entry were directly carried out by the INE provincial offices, thus enabling a more exhaustive quality control on the spot as well as shorter implementation terms.