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**COMPARISONS BETWEEN AN INTERVIEWER CONDUCTED CENSUS OF
AGRICULTURE (1991) AND A POSTAL CENSUS OF AGRICULTURE (2000)**

Invited paper submitted by Central Statistics Office of Ireland*

Summary: The CSO conducted the 2000 Census of Agriculture (COA) by post using administrative farm registers as the basis for identifying farmers. Most of these administrative registers were held by the Department of Agriculture, Food and Rural Development (DAFRD). In addition to the DAFRD registers, another relatively complete listing of larger farms was obtained from a Government agricultural training and research institute. The previous Census in 1991 was conducted by interview immediately after the 1991 Census of Population primarily using a list of farmers compiled during the Census of Population field work. The 1991 and 2000 Censuses were conducted using very different approaches principally arising from the changing national situation with regard to the availability of a register of farmers. This Paper compares the two Censuses highlighting differences in approach and consequences arising from those.

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1991 Census of Agriculture

1. Prior to the 1991 Census, the CSO had been conducting sample surveys in a fixed set of enumeration districts. Up to 1987-1988 these surveys were conducted by personal interview. Temporary enumerators were recruited at local level before each survey. Each enumerator was required to interview every land owner within a particular geographical district. The local area districts accounted for one-quarter of the country and the same districts were annually re-surveyed each June and December. The recruitment and supervision of these interviewers was undertaken by the local Police force. The system became untenable for a variety of reasons: cost; unwillingness of the Police to continue involvement given other priorities; informality of the field supervisory and enumerator procedures and rigidity of the sampling areas.

2. As part of an EU restructuring Plan, postal surveys were introduced in the fixed enumerator sampling areas during 1987-1988. The enumeration process involved collecting the name and address of each landowner. As part of the transition process, these were computerised to represent a register of landowners in the traditional fixed enumeration districts.

3. An interviewer based Census of Agriculture (COA) was conducted in June 1991. The Census was conducted immediately after the April 1991 Census of Population (COP). The primary farm register used for the Census of Agriculture was the list of households and premises identified during the Census of Population field work as being farm households. This strategy reduced Census costs through the use of the COP field force, maps etc. The Agriculture Division was thus saved the costly and time-consuming tasks of recruitment and payment of enumerators and supervisors, training and interviewer area map preparation work.

4. The 1991 Census was used to create a complete register of all farmers in the State. This statistical farm register was maintained during the 1991-2000 period using a combination of direct farm surveys, register enquiries and analyses of changes to the DAFRD main direct payments file (principally ewes, cattle and cereals). However it proved impossible to maintain a fully up-to-date register of farmers based on two postal sample surveys of farmers in June and December and two register enquiries in March and September. The two main problems were identifying when a farm ceased operation and the creation of duplicate farms arising from small variations in a potential new farmer's name and address compared to the version already captured in the register. For example, when farming land was sold or leased then the name and address of the purchaser/leasee (supplied to the CSO by the former land owner in response to a question on the June and December farm sample surveys questionnaire) would be cross-checked with the statistical farm register.

Department of Agriculture, Food and Rural Development (DAFRD) Reference number

5. The Department have done much work during the 1990s developing one complete client file of all farmers. However at the time of the Census, they had one large file of 186,000 names. This file included persons not active in farming. DAFRD had assigned a reference number to each farmer in this main client file. The reference number consists of a geographical code and a sequential number e.g. A123 001. The A123 classifies the farm into a district of around 60 farms. This number is well-known by a farmer as it is used in all DAFRD premia applications. It is also collected directly from the farmer by the CSO in the farm sample surveys and Censuses. Thus this reference number is the main means of matching CSO and DAFRD files.

2000 Census of Agriculture

6. The pattern of change in the conduct of the statistical farm surveys during the 1990s was to make increased use of existing administrative information, to reduce the response burden on farmers, to have access to an up-to-date register of farmers and to reduce data collection costs. The 1990s were a period when an increasing amount of farm level information was being captured in a format suitable for use by statistical offices. Computer developments also facilitated access to the new administrative data files making what had been complex programming into more routine work and also facilitating the computerisation of previously manually maintained registers. As the decade progressed it was possible to obtain access to both administrative farm registers and to the associated data files on ewe numbers, various categories of cattle, cereal areas etc. A decision was made to base the 2000 Census on these administrative registers and to conduct it so as to facilitate continuing the methodology for subsequent sample farm surveys after June 2000. Thus a key objective of the 2000 Census was to identify a reliable method of using administrative farm registers for the 2001-2009 farm sample surveys. Two important advantages of using administrative farm registers are that they are being updated on a weekly basis at a local area level by DAFRD staff and that they are becoming more comprehensive in coverage as new agricultural, food control and environmental policies are developed.

7. Another key objective of the 2000 Census was to develop practices that facilitated the ongoing CSO usage of the administrative registers and data files. An example was to encourage DAFRD to add a phone number variable to the DAFRD client file to assist identifying potential duplicates. The CSO independently collects phone numbers from farmers as part of the farm surveys. It is a useful item of information in register matching for births, deaths and duplicate checking. The CSO also had a role in encouraging the Department to complete the remaining work to develop one complete client file of all active farmers.

8. During the Spring of 2000, the CSO obtained electronic copies of the relevant administrative farm registers and wrote SAS programs to integrate the various registers so as to remove multiple occurrences of the same farmer. Census questionnaires were issued by the CSO in late May and six reminders were issued during the June-November period. A pilot telephone follow-up of some non-respondents was undertaken in August (after the third written reminder) but it proved to be slow and very resource consuming. Questionnaires were initially receipted to allow reminders to be issued and were then scrutinised, keyed and edited in stages.

9. The final step data collection step was to resort all the active farm returns into geographical order using the DAFRD reference number used when issuing the forms. In some cases the Census form was issued from a non-DAFRD register. Any of these forms that have been returned with farm activity have generally also been returned with a DAFRD number supplied by the farmer in response to a question on the form. Some farmers made duplicate returns because they received more than one questionnaire. This generally arose if the farmer had two DAFRD numbers or was left in the Census register twice (once from a DAFRD register and once from a non-DAFRD register) due to a small variation in the name and address.

Differences between postal and interviewer methods

Census register compilation

10. Both the 1991 and 2000 Censuses required a very substantial amount of farm register preparation. In 1991 in addition to the list of farmers compiled during the Census of Population,

supplementary lists from administrative registers and from previous CSO surveys were compiled and classified into interviewer enumeration areas. Thus the interviewer had three separate listings of farmers to work from to ensure that all farmers were included. These were all classified by geographical location to assist with cross-referencing.

11. In 2000 the CSO obtained copies of fifteen administrative farm registers. These combined to around 539,000 names. They were matched within CSO and reduced to a Census register of 192,000 names. From the 1992-1999 farm sample surveys, it was estimated that there were around 141,000 farmers in Ireland at the time of the Census. Thus after all the internal register matching work had been completed, there were over 50,000 names included in the 2000 Census who were not expected to be active farmers. Many of these were included in the administrative registers for non-farming reasons and it was also expected that the extra 50,000 names included a significant number of duplicates.

12. The task of using the 1991 Census of Population as a filter to identify active farms was considerably more reliable than the matching of multiple over-lapping administrative registers. However the 2000 Census enabled the CSO to make ongoing use of administrative registers in the sample farm surveys and to use a methodology that could be repeated in non-Census years.

More timely Census results

13. The 1991 detailed results were published in May 1994 whereas the 2000 results are due in December 2001. The time-saving was due to two reasons. There was minimal register work in 2000 whereas in 1991 a new register of over 170,000 names and addresses had to be keyed from the Census returns. It was possible to run a first edit on returned 2000 forms by the middle of June i.e. within two weeks of the Census reference date. In 1991 forms were only returned in late July after an interviewer had completed all of his/her work. This time saving meant that the extra staff recruited for the COA could be released to other CSO sections at an earlier stage.

Response rates

14. There were no refusals in the 1991 interviewer Census whereas after six postal reminders and a small-scale telephone reminder a gross response rate of 92% was achieved in the 2000 Census. If allowance is made for the inclusion of some non-farmers and for duplicates then the effective response rate in 2000 was around 97%. The issuing of so many reminders greatly increased the data collection workload of the CSO staff working on the Census and delayed the data entry and editing of the returned questionnaires.

Response type	Response profile
<i>Number of forms issued</i>	<i>191,953</i>
Active farm returns	72%
Duplicate returns	4%
Deceased	4%
All land let	3%
Retired	3%
Other non-farm responses	6%
No response	8%

15. Processing of the 2000 Census returns is still underway. A preliminary comparison of the 1999 administrative payments file against active farm Census returns indicated that around 5,000 to 6,000 active farms did not respond to the Census. This number will be reduced as further editing work eliminates duplicates and farms with multiple herd numbers.

Return flow

16. An interviewer Census tends to have a 6-8 week period between the census date and the first receipt of forms from the field. This enables all the returns from an enumeration area to be checked for completeness in the field before being returned as one batch of forms. In contrast the postal survey allows for immediate processing of Census returns resulting in a more even work-flow for staff. It also allowed us to target particular returns for fast processing so as to produce provisional estimates by mid-October.

17. As part of the EU Farm Structures Survey, the CSO is required to classify each active farm return by whether the farm is located in a disadvantaged area. Data users also have a strong need for small area statistics. To meet both of these needs, the CSO assigns a townland to each farm return based on the location of the farm residence and the farmyard. This effectively requires that the returned Census forms are resorted into geographical order rather than left in the random order that returns are received in. This has turned out to be quite a time-consuming task whereas in 1991 the interviewers undertook this work.

Cost

18. The CSO estimated that savings of over £2m could be made by not holding an interviewer based Census. A Census of Agriculture conducted as a postal survey using administrative registers was expected to cost around £1.3m. The savings thus achieved were a key element in obtaining support from the National Statistics Board for the holding of a Census.

19. The principal financial savings were no costs associated with recruitment, supervision or payment of a field force and no field-force travel, mapping or co-ordination costs.

20. The move to using an administrative farm register meant that the CSO did not have to continue a post-Census methodology that required maintaining a statistical farm register. This is expected to result in fewer staff being required to run the surveys on an ongoing basis.

21. A reliable administrative farm register should allow for smaller sample survey sizes. One purpose of the previous sample surveys was to maintain a farm register. This resulted in a sample design that resulted in all farmers being sampled over a 5-6 years period. A consequence of this was larger samples than would otherwise have been necessary. Timely access to associated administrative data should also allow more focused sample selection particularly in less important crop and livestock categories.

Quality of completed Census returns

22. An interviewer based survey has distinct advantages particularly in relation to filtering out non-relevant returns and in dealing with any difficulties the farmers had in answering the questions. An interviewer is also in a better position to capture the exact geographical location of the farm. There has been considerably more editing work required in processing the 2000 Census returns. This ranges from

copied with bad handwriting to farmer error in completing the form to identifying partial non-response by the farmer in completing the form.

Consistency with ongoing sample surveys

23. After the 1991 Census, the CSO conducted postal surveys between 1992-1999. During the processing of the June 1992 sample survey, it was obvious that answers received by post from some farmers were not always consistent with answers obtained by interview during the Census.

Conclusions

24. From a CSO agricultural statistician's point of view, the 1991 Census was more manageable in that problems arising during it were easier to solve. However it was a one-off operation that, principally because of cost reasons, could not be continued for the subsequent postal surveys. The objective in 1991 was to establish a reliable farm register and reliable benchmark farm activity figures.

25. In contrast, the 2000 Census has resulted in many problems for the agriculture statisticians particularly in determining a unique register of farms and in identifying partial non-response. However the solution to these problems will be of immediate benefit for the ongoing sample surveys. The 2000 Census presented an opportunity to evaluate the differences between the various administrative registers and to significantly move towards a single client file of all farmers.

26. The increasing availability of farm registers and farm activity data during the 1990s and the increasing pressure on agriculture statistics to work within a tight financial budget made it inevitable that the CSO would be required to maximise the use being made of administrative information. The 2000 Census has made a large step in this direction. By the next Census of Agriculture in 2010 there should be very close correlation between the number of Census forms issued and the number of active farm returns thus eliminating many of the processing problems encountered during the 2000 Census.
