

# Issues and Concerns for Emerging Market Countries

Irena Orešnik

Statistical Office of the Republic of Slovenia

**ABSTRACT:** The structural changes of agriculture in transition countries has an enormous impact on agricultural statistics. In this article, the main characteristics of structural transition and the necessary adaptations of agricultural statistics to the new economic situation are presented. The new requirements can only be achieved by profound methodological and organisational changes. Possible solutions are discussed and related problems are listed and described on the case of Slovenia.

## 1. Introduction

Understanding and managing the complex problems of economic and political integration (market globalisation, political and trade integration) requires reliable and timely information. Emerging market countries are not an exception; on the contrary, the need for data in their particular situation of transition from central planning to market economy are even greater. As it is true for statistics in general, the agricultural statistics in transition countries (Central and Eastern European Countries - CEECs) have to be changed substantially due to structural changes of the agricultural sector and integration into different economic and political associations such as the European Union (EU).

Before the transition, apart from Poland and Slovenia, most agricultural land was operated by collective and state farms. Slovenia and Poland retained to a large extent the traditional peasant farms; therefore, the private farm sector was dominant and consisted of a large number of small farms.

With the collapse of the political and economic system, large collective and state farms were privatised and restructured resulting in fragmentation of ownership and farms. Different countries have chosen different ways of land restructuring [Czaki 1997]. There is no single general type of land privatisation. However, the number of farms has increased in most cases.

In the countries which had a predominantly collectivised agriculture in the past, it appears that the dualistic character — very large-scale collective or state farms on the one hand and very small individual or private plots on the other — is diminishing. The average size of what is left of the state-managed farms or their successors, e.g. private cooperatives, has decreased significantly, while at the other end of the scale, the size of individual farms is slowly increasing. In Slovenia and Poland, the structural changes have been less significant [European Commission 1995].

The state of agricultural statistics before the political and economic change differed very much from country to country. The level of harmonisation with international standards is also very different. Data on individual private farms in many countries were collected only by decennial censuses or were based on expert estimates. On the other hand, state farms were surveyed in a very comprehensive manner, often beyond policy needs and with no economic justification.

The new situation, in most countries characterised by rapid structural changes and harmonisation of agricultural statistics with EU definitions and standards, requires considerable methodological changes. The methodological changes and related problems are described in the following sections. The solutions of specific problems are shown in the case of Slovenia.

## 2. Methodological Changes and Related Problems in CEECs

In order to adapt existing agricultural statistics to the structural changes and harmonisation requirements, the statisticians in CEECs have to concentrate their work:

- to prepare comprehensive lists or area frames for conducting surveys;
- to introduce data collection based on sample surveys;
- on finding reliable and cost effective methods of data collection for different types of farms and for different characteristics;
- on improvements in management and technology, including better coordination between different institutions;
- to harmonise the data with international standards without serious breaks in the time series; and
- to define the goals, design the time schedules and to stick to them when they are approved.

The tasks listed are more or less general, valid worldwide, but some of the related problems are typical for the transition countries.

The successful introduction of the new system is dependent on comprehensive knowledge of the existing situation and comprehensive knowledge of the alternatives. It requires knowledge of practices and solutions of different countries. Both require well-educated statisticians with a good knowledge of at least one western European language (English, French, German). The knowledge of foreign languages is improving, but still a problem in many CEECs where the methodological changes can be carried out only by a limited number of statisticians with the above-mentioned competence.

Besides the competence of statisticians, the political, economic and institutional situation in the countries also has a big influence on the success and speed of the introduction of the necessary changes. Institutional problems, such as the nonexistence of certain parts of state administration, are often present in newly established countries (Slovenia, Baltic states, Slovakia). Lack of coordination or less efficient coordination between statistics, public administration and policymakers is also a common situation.

Changes in the number and size of collective farms and the increase in the number and size of individual farms cause difficulties in the preparation and updating of adequate survey frames. In the case of a list frame (farm register), preparation of it in a situation of rapid structural changes is a complicated and time consuming task. As a general rule, new individual farms are not registered and a complete farm register can only be obtained by an agricultural census.

In most transition countries, an agricultural census has been carried out or is being planned. In many countries, financial and organisational problems delay the holding of censuses which influence the introduction of sample surveys.

Next to lack of experience, outdated sample frames are the main obstacles in the introduction of sample surveys, which have to be introduced due to the enormous increase in the number of observation units. Use of inadequate sample frames results in unreliable estimates or at least lead to additional costs due to oversampling to overcome the frame deficiencies.

Annual or more frequent surveys of individual farms are for many countries a new issue. Farmers are not used to statistical surveys. In general, they are not well-educated and are elderly. These are the reasons that for most surveys face-to-face interviews have to be used, to avoid large non-response and to assure adequate reliability. Face-to-face interview is one of the most costly data collection methods and necessity of its use in CEECs makes agricultural statistical surveys very costly.

Harmonisation with EU standards does not only mean copying EU definitions. It presents many problems such as:

- the structure of the agriculture sector in CEECs differs very much from the EU structure, so big ex-state farms are not well covered in the EU definitions;
- classification of agricultural products and land use are not harmonised within the EU;
- the priorities in harmonisation are not clear; and
- harmonisation with EU standards means, in many cases, lack of comparability with the previous data and sometimes even abandoning more precise methods used in transition countries in the past.

Besides changes of the definitions due to harmonisation, changes of the survey frames and data collection methods have an influence on the comparability of data over time. To a certain extent, comparability can be retained by carrying out parallel surveys by old and new methods. In addition, expanded questionnaires can be used to avoid serious breaks in the time series.

Due to lack of finances and of competent staff and due to high demands for timely data in many cases, the necessary measures cannot be applied. The result will often be insufficient comparability of the new data with the old. As a consequence, many serious breaks in the time series in emerging market countries can be found. Such a discontinuity is statistically serious and limits the use of statistical data in policy analysis and forecasts.

### **3. Introduction of a New System of Agricultural Statistics in Slovenia**

In Slovenia, 93 percent of all agricultural land was privately owned or leased and was cultivated by a large number of small farms. Although state farms cultivated only 7 percent of agricultural land, they have been favoured by agricultural policy. After the independence of Slovenia in 1991, the position of family farms in agricultural policy has changed; their importance has increased.

Anyway, the structural changes in Slovenia were only minor and consisted mainly of a decrease in the number of very small farms up to two hectares. So the need for changes in agricultural statistics in Slovenia derived mainly from changes in agricultural policy, the EU accession process and unreliable methods used in the past.

The old system of agricultural statistics was designed and its implementation coordinated by the Federal Statistical Office of Yugoslavia. The Slovene Statistical Office had the position of a regional office with mainly data collection and processing responsibilities. With independence, the Slovene Statistical Office became a national office and took over the responsibilities of methods. Lack of experience in methodological work had an inhibiting influence on the introduction of the changes necessary in statistics.

In Slovenia, all data on state farms were surveyed annually or more frequently by means of a census. The structure of private individual farms was surveyed only every ten years as a supplement to the census of population. The latest such census was carried out in 1991. Data on livestock numbers were collected annually by personal interview on a sample of farms selected from the census list. The sample remained unchanged for ten years (panel). The data on crop areas and production were not reliable. Data on crop areas were never collected from the farmers, even during a census. They were estimated by employees of the Agricultural Extension Service. The estimates were based on land cadastre data on land use. The land cadastre information was not regularly updated and overestimated agricultural area, resulting in overestimated areas and production of important arable crops.

The situation was analysed in light of national needs and EU standards, and necessary changes to agricultural statistics were defined. Priority areas were as follows.

- Due to structural changes after 1991, the data on actual farm structure had to be obtained in line with EU standards.
- The reliability of data on areas of arable and permanent crops had to be improved by the introduction of more objective methods.
- The Annual Survey on Livestock Numbers had to be replaced by a cattle number survey twice a year and a pig number survey three times a year. The reasons were national policy needs and EU standards.

The introduction of a new program of agricultural statistics was based on data needs and on a set of pilot surveys, by which the optimum methods were selected and the necessary budget was estimated. The aim of the pilot surveys was to define the appropriate method for preparation of a list frame (farm register) and to find the most objective and cost effective methods of data collection.

### *3.1 Preparation of a Farm Register*

Construction of a farm register was one of the priority tasks in order to obtain a frame for agricultural sample surveys and for the agricultural census.

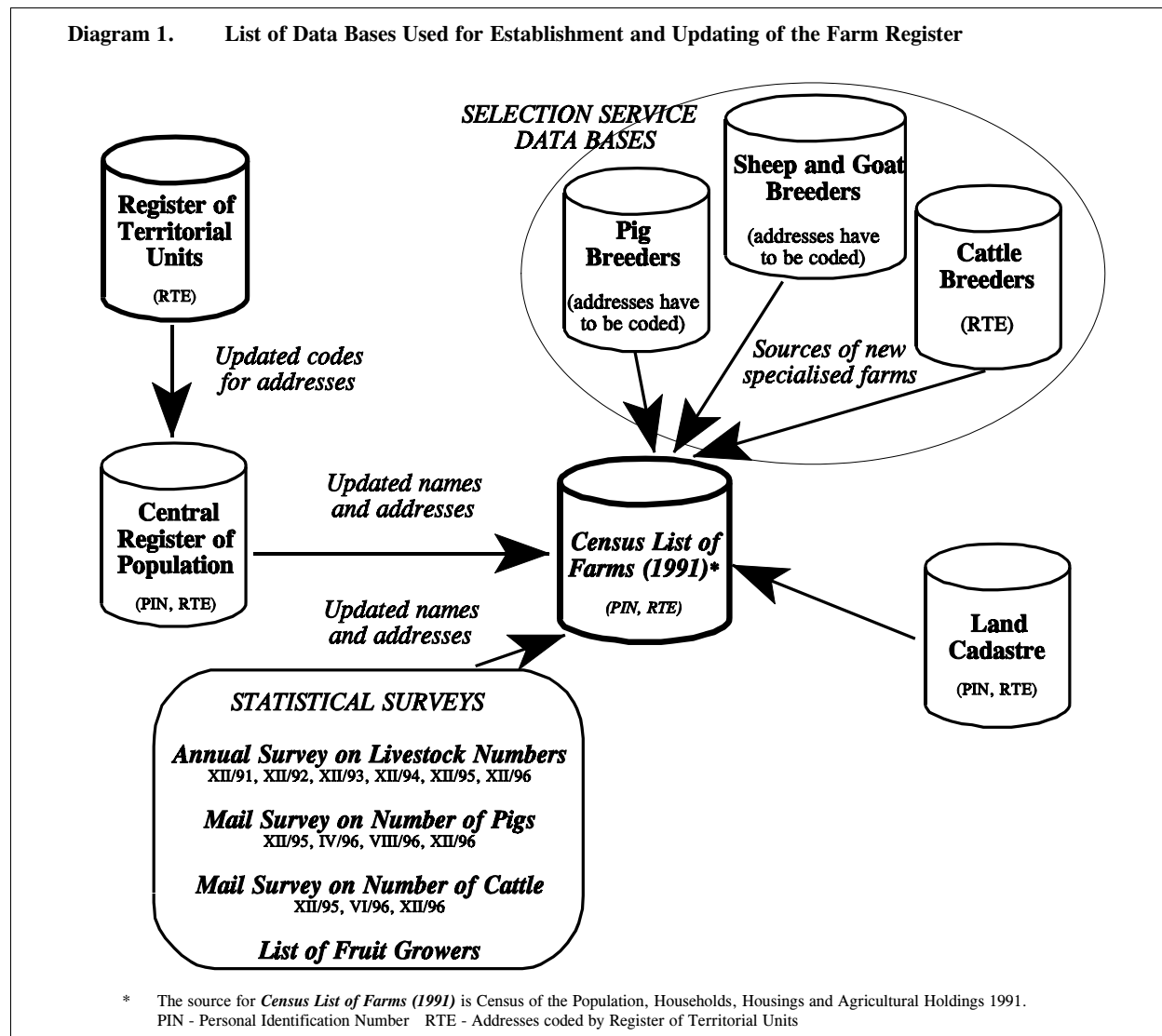
In Slovenia, an administrative farm register does not exist. The existing Census 1991 list of farms was without data on areas of crops and had not been updated. Since some structural changes happened and the list was not updated, it was clear that these changes were not covered in the census list. The introduction of sample surveys based on the Census 1991 list of farms would not provide reliable results. There were two possibilities: either to carry out the census as soon as possible, or to update the census list with the existing statistical and administrative data bases. It was decided to first try the compilation of a farm register from existing data bases.

To construct a farm register with the necessary characteristics, the available statistical and administrative sources were studied in detail. The technical characteristics, as well as the content and reliability of the data, were examined and an appropriate strategy for the farm register construction and updating was chosen.

The most important database on farms in Slovenia is the list of farms obtained in the 1991 Census of Population, Households, Dwellings and Agricultural Holdings. Data on livestock numbers could be obtained from different administrative and statistical data sources. Data on size of farms and their land use could be obtained from the Census list or from land cadastre. Technically, it was possible to match those data bases by personal identification numbers (PIN) or by codes of addresses (RTE) which

existed in the data bases (see Diagram 1). If more data existed on the same characteristic, the most reliable data were used for construction of the register.

The updated frame was very complete with respect to coverage of farms. The weak point of the frame was the lack of data on areas of crops by the farmers and inclusion of farms no longer in operation, the so-called “dead” farms. These two deficiencies caused problems in the accurate estimation of the size of the sample by which reliable data on areas of crops at the national level could be obtained. Nevertheless, these deficiencies did not affect the estimates based on the samples selected from the new register.



### 3.2 Selection of Data Collection Methods

In order to obtain the appropriate data collection method for data on farm structure and for data on areas of arable crops, the pilot postal survey on farm structure was carried out. In parallel, the quality of data bases for updating the farm register was evaluated.

Slovene farms are small and difficult to access. Due to fragmentation of the land in different parcels and low specialisation of the farms, it is possible to obtain reliable estimates only with large samples. Therefore, data collection by face-to-face interview is very demanding, time consuming and expensive. A cheaper data collection method is the postal survey.

Postal surveys of farmers had not yet been undertaken in Slovenia. To obtain information on the suitability of this method, a pilot postal survey on farm structure was carried out in June 1995.

A sample of about 500 farms was prepared. A questionnaire with questions on farm structure, including areas of crops, was prepared and designed to suit postal data collection. The survey was carried out according to the rules of "Dillman's Total Survey Design" [Dillman 1978].

The response rate was less than 40 percent. A part of non-response was due to frame errors, but it seems that the main problem was that the questionnaire was too long and too complicated to be answered without any help from interviewers.

For all sampled farms, census data (1991) and cadastre data on land owned by their members were obtained as well.

Since data on land use by farms were different in those three data sets, the quality of the pilot survey data on land use as well as the quality of the data in the census and cadastre was tested by re-interviewing the respondents in August 1995. All of the respondents' fields were visited, their area was measured and land use was defined. Pilot, census and cadastre data were compared with the data obtained by field measurements. Comparisons were done on an aggregate level for the comparable land use categories.

The conclusions of the June pilot survey can be summarised as follows.

- In Slovene circumstances, the farm structure survey has to be carried out by face-to-face interview. The response rate in postal surveys is too low and the quality of the responses insufficient.
- Data on size of farms and on land use were most reliable in the Census 1991 data base. This data base could be complemented by data from cadastre, from which only addresses of potential farms and their size could be taken.
- Cadastre data on land use were out-of-date. Since data on crop areas and production were based on cadastre data, they were not reliable. The methodology had to be changed.

Due to budget limitations, the introduction of more frequent surveys on livestock numbers was possible only if data could be collected by post. The postal method was tested. The response rate was in all tests above 70 percent and the quality of the responses, measured by consistency in time, was sufficient. The results of the pilot surveys were judged as acceptable and the method became operational in 1997.

The census of orchards has not been carried out in Slovenia yet. A pilot census was carried out in 1996. The updates of the list of fruit producers as well as interviewing were carried out by the Agricultural Extension Service, i.e. agriculture specialists. Based on the results of the pilot census, the methodology was finalised and the census was carried out in 1997. The use of interviewers from the Agricultural Extension Service proved to be very successful, so the same method of updating the lists and interviewing is planned for the horticultural census in 1998 and the vineyard census in 1999.

### 3.3 A New Program of Agricultural Statistical Surveys and Related Problems

Based on the pilot surveys, it is possible to compile an adequate farm register from existing data bases, by which data collection from farmers by means of sample or census surveys is possible. The most appropriate methods of data collection were also determined.

National needs, EU standards and the results of pilot surveys were the background for the preparation of a new program of statistical surveys on agricultural structure and production until the year 2003. The budget was also calculated and had to be increased by more than 100 percent compared to the situation before 1997. The main reasons for such high costs were:

- the large number of small, non-specialised farms have to be surveyed by large samples; and
- due to unfavourable age and education level of holders, most of the data have to be collected by face-to-face interviews.

In the year 1997, part of the new, EU-harmonised program had already been realised. Livestock was surveyed in EU reference periods by post. The orchard census was carried out. The farm structure and areas of arable crops were surveyed by the Sample Farm Structure Survey. In order to be able to recalculate the time series for data on areas of arable crops, the areas were estimated also by experts, as in the past.

Use of expert estimates based on outdated land cadastre data resulted in serious errors in estimates of areas and consequently of the production of most widespread arable crops. Data on potatoes, wheat, grain maize and silage maize were seriously overestimated, area of potatoes by more than 100 percent.

The approach of carrying out the estimation of arable crop areas by experts in parallel to data collection from farmers in the Farm Structure Survey enable recalculation of time series without losing the data on changes in the last year. The Farm Structure Survey data on crop areas were taken as the correct ones for 1997. The annual changes estimated by experts were taken to recalculate the data for the previous years. (See Tables 1 and 2.)

**Table 1. Areas Sown with Wheat, Potatoes and Maize by Agricultural Holdings on the basis of Expert Estimates and Sample Farm Structure Survey 1997 (hectares)**

	Expert estimates						Sample Farm Structure Survey 1997
	1992	1993	1994	1995	1996	1997	
Wheat	33826	34542	32676	32856	31744	31137	25381
Potatoes	30114	29065	23606	23497	21735	20299	8566
Maize	54183	53941	44149	41425	41496	41156	38959
Silage maize	31324	32446	40462	40742	42248	40612	27302

**Table 2. Adjusted Areas Sown with Wheat, Potatoes and Maize by Agricultural Holdings, 1992-1996 and Sample Farm Structure Survey 1997 data (hectares)**

	Adjusted data					Sample Farm Structure Survey 1997
	1992	1993	1994	1995	1996	
Wheat	27573	28157	26636	26783	25876	25381
Potatoes	12707	12265	9961	9915	9172	8566
Maize	51290	51061	41792	39213	39281	38959
Silage maize	21058	21812	27201	27389	28402	27302

Through the introduction of the new surveys, most of the urgent needs were met. Except for the orchard survey, the estimates were provided at the national level only. To cover the needs for data at the local level, an agricultural census is to be carried out in the year 2000. By means of the census, the farm register will be updated. The elimination of “dead” farms from the register and improvement of the data on farm characteristics will reduce the size of samples, and consequently, the costs of sample surveys after the census will be reduced. As already mentioned, the new program is very costly. It is also a heavy burden for the farmers and an increase in non-response is expected.

New surveys meant also an enormous increase in the number of questionnaires, which had to be sent out in time and properly registered when coming in to avoid complications with reminders. Advanced mailing and register systems were needed. There was also much more work with data entry and data editing, which was handled by changes in work process and by hiring additional part-time staff. We have experienced that handling the internal and external organisational problems were most demanding and had major impact on the introduction of the new system of agricultural statistics.

#### **4. Conclusions**

At the moment, there is a serious gap in transition countries between the agricultural policy and administration needs and the ability of agricultural statisticians to satisfy these needs. Both the high requirements and the inability to meet them are mainly due to ongoing structural changes of the agricultural sector, and also to deficiencies of the old agricultural statistics system. New requirements can be satisfied by real and thorough reorganisation of the work process and with a substantial investment in staff education, computer technology and surveys.

The Slovene case shows us that an efficient restructuring of agricultural statistics can be based on systematic preparation and pilot surveys. This approach seems the longest way but it proved to be the most efficient way towards a new internationally harmonised system.

The new agricultural statistics have to cover the national needs as well as the international, and have to take into account the costs. Quality standards as well as comparability of the data have to be respected. Duplication of work among institutions has to be reduced to a minimum. Priorities at national (also political) and internal statistical levels have to be agreed.

From our experiences, we have learned that expert knowledge offered and given from international bodies does not always cover the specific transitional problems in individual countries. It is mostly limited to the presentation of goals that have to be reached. The bridging is left to the countries in transition.

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