Theme 1 – Conceptual Framework

Session 1.1 – Determining the scope and coverage

Basic entities: the discussion on households versus the agricultural holding, versus the holder or versus the land parcel

Summary

An important element in the conceptual framework to be applied for the Global Strategy to Improve Agricultural Statistics is the choice of the basic entity for collecting and analysing the information on agriculture, forestry and fisheries. In this paper the important choice is discussed from the perspective of data availability in the European Union Member States. For this choice there is no one-size-fits-all solution as shown for 27 Member States. The lesson learned from this is that input harmonisation in agricultural statistics is very difficult to achieve, and would most likely neither bring very many benefits, at least not considering the costs it would bring. It is argued that trying to force input harmonisation would perhaps be possible, but it would have to be very complex and would most likely not be transparent enough to bring the expected results.

1. Introduction

As can be expected from a document on and about statistics, the Global Strategy to Improve Agricultural Statistics contains several references to scope and coverage of the agricultural statistics systems. In addition to the basic definition of agriculture that is based on the System of National Accounts and the International Standard Industrial Classification of Economic Activities it has been decided to broaden the scope to include also agroforestry and aquaculture production, and aspects of forestry, fishery, land and water use. In addition, it is seen as necessary to take a wider socio-economic scope into account, meaning the rural economy, with specific stress on the rural households.

This has an impact on the coverage, leading to the conclusion that agriculture should be covered as exhaustive and comprehensive as possible, any omissions for any criteria should be avoided. It means, in principle, that any enterprise, either itself active in any agricultural activity (ISIC 01), or up- or downstream of it, should be covered by this statistical domain, even if often only partly. In addition, fishery/ aquaculture activities should be widely covered, whereas forestry would be covered in detail only to the part it is integrated in the activity of an agricultural holding. Considering the important relations between agriculture and rural households, increasing the coverage to these households has also been seen as inevitable.

After identifying the starting point, the Strategy also takes note of the statistical units, identifying the agricultural holding as the basic unit for economic statistics, for social statistics the household and for environmental statistics the land parcel, stating that the challenge is linking these statistical units. There will often be a one-to-one relationship between the agricultural holding, the household, and the land parcel, making it, in principle, feasible to collect economic, social, and environmental information from one basic unit.

However, ever so often there will not be a one-to-one correspondence between these three aspects (holding, household, parcel). A choice must then be taken on how to proceed, as it is not possible to use all as the basic entity in statistical surveys. There is, in fact, also one additional entity that can be used: the holder or the manager, i.e. the person who takes the decisions. Eurostat will try to discuss the different aspects of these choices, with the aim of identifying the challenges involved.

Even if information on rural households are in the Strategy considered as falling within the scope of agricultural statistics, Eurostat considers that collecting data on these units must be considered separately from "pure" agricultural statistics, as the data needed cover not agricultural production but social features in a greater extent. The necessary data underlying many of the indicators needed to monitor rural development, and economic growth leading to poverty and hunger reduction are based on the rural household as a statistical unit. Neither will the other statistical units required by the Global Strategy: enterprises that service agriculture such as input suppliers, processors, and transporters of agricultural goods be covered.

This paper tries to summarise some of the discussion on these important issues, albeit from a European point of view.

2. Reducing burden and costs

The Strategy states that the coverage of agricultural statistics should be as exhaustive and as comprehensive as possible, and any omission of units based on their size, importance, location, or other criteria should be avoided. However, many countries must apply certain criteria to reduce both the burden on respondents and the costs of collecting data. It would be futile to reject the notion that such choices must be made; it is the question on how the choices affect the results that is important. The options will be different depending on the overall situation a country, but also depending of the aim of the data collection.

In Europe it is often considered that it is the overall agricultural production volume that should be the basis for the discussion on the choice of scope, coverage and entities to be surveyed. The argument is not only the fact that in most European countries the bulk of the agricultural production comes from quite large farms, but also that it is the marketed production that is the most important item to follow, not the consumption.

Admittedly, the Strategy is correct in stating that introducing thresholds or concentrating data collection to major producing areas leaves smaller plots and remote parts of a country unrepresented in agricultural statistics, although these areas may account for a majority of the country's food insecurity and poverty and that omitting small holders and household plots deprives decision makers of important information about subsistence, households income from produce from gardens and small plots, as well as the gender issues. However, one must ask whether these needs really necessitate collecting the full set of agricultural statistics from all households producing food, or whether it is better to first analyse user needs in detail before deciding on the population to be surveyed. This decision will be different for every country, and most likely even for different crops and animals.

3. Households

The household can be said to be the centre for all human activities, as we all interact with those close to us (except if we live in singles households), and everyone is aware that any decision taken will have an impact on those relying on us. Still, economic statistics is normally not collected in a way allowing analysing the links to households, it would be too complex to carry out such surveys. The same thinking should also be used in agricultural statistics: only those data that are really referring to the household should be collected with the household as the basic entity.

It might be better to make a clear distinction between the household as a producer and as a consumer of food products. With this is meant that a household that produces only food only/mainly for own consumption is not considered to be an agricultural producer, and would not be a basic entity for statistics concerning agricultural production, but merely for the socio-economic impact of agriculture. This is of course often a line drawn in water, as the role will be fluctuating depending on the year but would still help the statisticians to understand the dual role the households play in statistics. In any case it would allow statisticians to create the necessary thresholds they need.

If the structure of food production is clearly such that households make out a very important part of a country's food security, then household must be part of the agricultural statistics. In such cases an agricultural census will become very expensive, and will most likely also be unnecessary. Households will not be as heterogeneous as farms, and thus sample surveys will give the needed reliability with fewer costs. The Strategy describes the possibility of asking specific questions on agricultural production in the Population Censuses, but one can also ask whether this is necessary in these countries. It might be easier just to carry out normal surveys on households, not trying to target only those producing agricultural products, if the aim is to get a good picture of the role of the household in food security.

In countries where the role of households is smaller, but still significant, it is more important to identify the households taking a bigger part of food production. In these cases key questions in the Population Census would be appropriate, lowering the costs of data collection. Still, it is unlikely that a full census is necessary of these units, and in addition it is probably not worthwhile collecting the full set of agricultural data from these units, a limited set will allow making appropriate estimates.

4. Agricultural holdings

If we get the information on the amounts of food needed and actually consumed from surveys on the households, the next question is how to satisfy these demands for food, and can they be satisfied locally or have food to be imported to the region or the country.

If an agricultural holding is defined as a unit that produces agricultural products with the outspoken intent of selling at least a part of it, regardless of the size, the work of the statistician is much easier. Then he can start analysing a possible threshold for measuring the part of the agricultural production that is needed to satisfy the user needs. In the European Union it has been considered that for production statistics it is enough to cover 95% of the area/ animal population and for the agricultural censuses/ structure surveys 98%. The reasoning behind these differences is that the production statistics are meant to act both as early warning systems by following the trends at slaughtered animals, milk delivered and sowed areas, and the actual production/ livestock inventory, whereas the census/structure surveys give the details on who and how. Many EU Member States consider that this coverage is already too high, and demand constant careful consideration on the real use of the data is needed so that the user needs are not blown up from "necessary data" to "nice to know data". However tempting it might be to add data requirements, it has to be kept in mind that they all come with a cost.

It is visible in Europe that the threshold must be adapted to the actual production patterns, even within some of the countries there are so big differences in agricultural production systems that threshold that would cover 99% of the holdings in one region would be way too high in other parts, even for the same crops.

The danger of this approach is that the smaller farm units and households are completely left out of the picture. From a purely agricultural point of view this can be logical, as their impact on food production is not very significant, but certainly not from a rural policy standpoint. As the Strategy correctly points out, the social aspects of agricultural production must not be forgotten, and this is where the small units make a big difference even in countries where

agriculture on the face of it is mainly based on highly efficient big farming enterprises. Ideally, specific surveys on the smaller units should be carried out with regular intervals; less frequency is needed the smaller their significance for agricultural production is.

5. Holder (farmer)

The decisions in agriculture are taken by persons, based on the personal situation and values of that person, and it is often necessary to understand not what the decision is, as this is seen from the actions, but what it is based on.

Therefore it is important to link the holding with a holder or manager, the one making the actual decisions. Often this is the same person, but increasingly one person owns the farm and thus makes long-terms plans, while another one takes the daily decisions, making things more complicated. This is also the case for legal persons.

Information on holders is linked both to economic and structural characteristics and to production. Thus in an ideal world, certain information on the holder would be collected in all surveys, but this would be too costly. This is why a data warehouse type of data storage would be of high importance, as it would allow combining different sources.

Obviously, the way decisions are taken depend greatly on for example the training of the manager, but the social situation has most likely the greatest impact. Where the manager of a large agricultural enterprise has the pure economic result in mind when pondering different options, the young farmer on a family farm who wants to stay independent for his whole career and hopefully leave it to one of his children one day will plan in a very different way. On the other hand, the manager that knows he/she has to produce enough food for the family to survive one more season can certainly afford to think too far into the future, and the decisions will therefore need to be taken based on a completely different set of premises.

6. Land parcel

The Strategy has identified the need to have information on the land cover that can be used as a layer for different kinds of analyses linked to georeferenced data. It is likely that land cover can be efficiently mapped by using remote sensing, but it is questionable if remote sensing is also the best tool for collecting information on the actual use of the land. In any case the remote sensing data need to be calibrated through on the spot verification.

Several data needs are so closely linked to the land use that one possible basic entity is the land parcel. Farmers usually make the crop production decisions specifically for each individual parcel, which means that also the data collection should refer to this same parcel. It is therefore, in principle, possible to bypass the farm level completely for many of the data needs that are linked to the use of the land. This is for example the case for crop production statistics, where it is possible to collect data on sown and harvested areas, yields, input use, meteorological conditions, soil, etc. directly at parcel level. It is not even necessary to ask the farmer for data for some of these items, the surveyor can use different tools for collecting the

information, both based on remote sensing (for example by comparing radiation emitted from the crops) or by going to the spot.
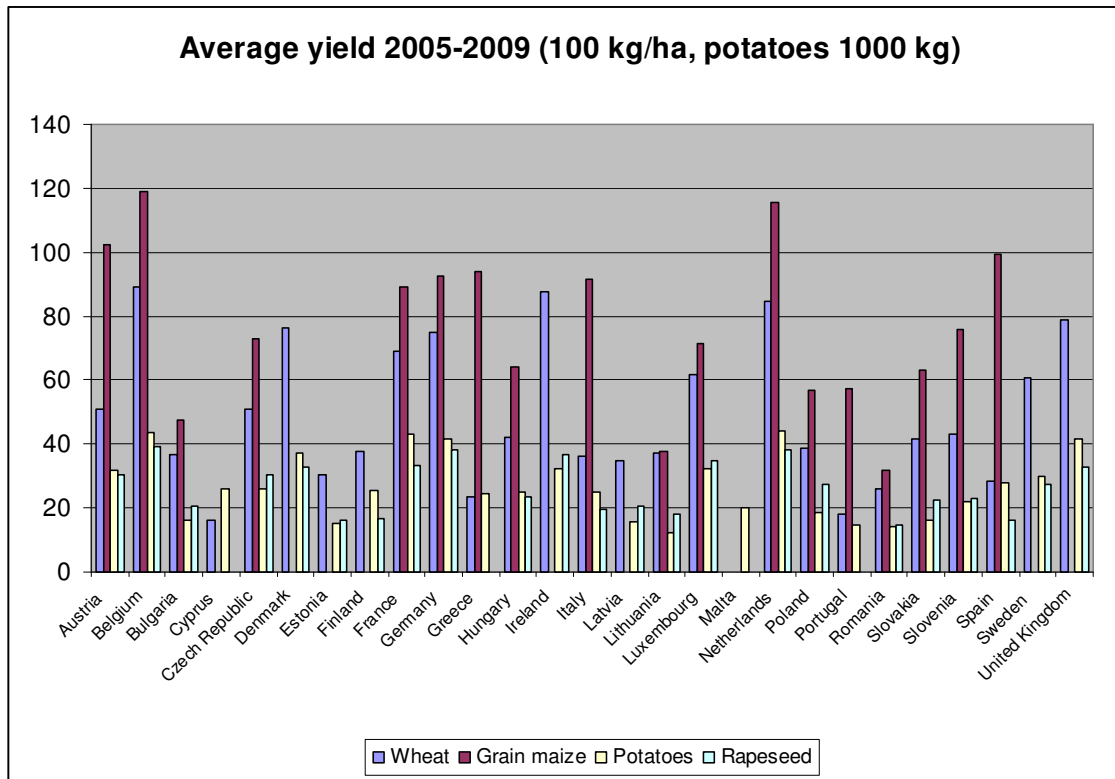
This option can be especially useful when setting up early warning systems for crop failures (or bumper crops) or similar structures, as it is enough to identify deviations from the average situation, the small details are of less important. This is the case in the EU where the MARS project of the Joint Research Centre makes use of a complex set of agro-meteorological data and other remote sensing information to identify deviations from the average yields, and combines them with early information on sown areas from Eurostat to make forecasts on crop production.

It is also possible to use the land parcel as the basic entity for collecting information from the farmers. The assumption is that as the farer takes crop production decisions on the parcel level, it will also be easier for him to remember the information at that level. If he is asked information for example on fertiliser use on the whole farm, he must make complex calculations, but he would often be able to directly provide the information on the parcel. If this approach is chosen, and only a few parcels are chosen on each farm in the survey, the response burden will be greatly reduced.

The negative aspect of this approach is that farmers seldom take the decisions on the parcel without considering the whole farm at the same time. Animals will be grazed at specific intervals on the different lands, fertilisers will be spread with a certain strategy reaching over a number of years, especially manure, machines will be bought for the whole farm, not the individual parcel which will influence the crop choices and rotation, etc. Thus it would be quite difficult to imagine an agricultural statistics system that would be purely based on the land parcel approach.

7. Conclusions

The agricultural statistics system must be tailored to the actual situation in a country, or even a region. As has been said so many times before, there is no one-size-fits-all solution that can be implemented everywhere. This is also very visible in Europe, where it has been joked that the 27 Member States in the European Union probably use almost the double different agricultural statistics systems. Certain is, that there are not two identical systems in the EU, both due to historical reasons and the very diverse agricultural realities. The lesson learned from this is that input harmonisation in agricultural statistics is very difficult to achieve, and would most likely neither bring very many benefits, at least not considering the costs it would bring. European agriculture stretches from the above the Arctic Circle in the north to semi-desert conditions in the south, from rain-drenched permanent pasturelands on the westernmost Irish Atlantic coasts, through the common pastures in the high Alpine regions to the Hungarian great plains. This has also formed the agricultural societies through thousands of years, leading to the present situation with very large farms in the UK and some countries in Eastern Europe to the still very small farm holdings in Greece and Portugal, all successful in their own ways. Trying to force input harmonisation would perhaps be possible, but it would have to be very complex and would most likely not be transparent enough to bring the expected results.

Average yield 2005-2009 (100 kg/ha, potatoes 1000 kg)

Legend: ■ Wheat ■ Grain maize □ Potatoes □ Rapeseed

	Average size	Percentage of farms with no land area	Percentage of area on farms < 2 ha	Percentage farms >5 < 10 ha	Percentage of farms with 100 ha or more
Belgium	28.63	1.87%	0.42%	4.51%	21.14%
Bulgaria	6.19	2.27%	6.26%	5.97%	77.30%
Czech Republic	89.29	2.31%	0.29%	1.44%	88.08%
Denmark	59.67	0.94%	0.02%	2.48%	61.14%
Germany	45.70	0.35%	0.12%	3.36%	52.28%
Estonia	38.85	0.34%	0.43%	6.00%	69.14%
Ireland	32.28	0.16%	0.04%	3.56%	16.47%
Greece	4.74	0.70%	8.87%	36.55%	4.74%
Spain	23.85	1.33%	1.25%	7.80%	56.14%
France	52.10	1.02%	0.23%	1.99%	54.82%
Italy	7.59	0.10%	6.07%	20.84%	24.93%
Cyprus	3.64	0.65%	13.49%	28.40%	16.51%
Latvia	16.46	0.24%	0.98%	15.68%	37.95%
Lithuania	11.50	0.03%	1.74%	24.80%	35.78%
Luxembourg	56.90	0.43%	0.11%	1.64%	46.78%
Hungary	6.75	9.64%	3.44%	7.30%	65.48%
Malta	0.94	2.18%	56.05%	39.59%	
Netherlands	24.95	2.35%	0.46%	6.08%	15.71%
Austria	19.28	0.53%	0.70%	10.52%	23.96%
Poland	6.47	0.45%	5.45%	30.01%	17.50%

Portugal	12.63	0.32%	3.64%	13.10%	55.94%
Romania	3.50	2.02%	13.14%	36.64%	37.61%
Slovenia	6.49	0.05%	4.25%	45.03%	6.96%
Slovakia	28.07	3.58%	1.43%	2.27%	90.24%
Finland	33.60	0.54%	0.05%	3.53%	20.12%
Sweden	42.94	0.62%	0.02%	4.17%	49.34%
United Kingdom	53.80	16.96%	0.20%	2.03%	70.03%
Norway	20.66	3.00%	0.09%	7.69%	5.39%