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Modernization of agricultural statistics: how to make it happen? European statistical system experience

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ABSTRACT

Today's fast changing landscape of emerging new data sources and digital technologies poses significant challenges to the capacity of national statistical offices and international organisations to modernise agricultural statistics. If we want to develop strategies for producing high quality agricultural and rural statistics that meet users' needs and the increasing demand for evidence-based policy making, we need tomobilise resources, develop new skills and introduce innovative ways to provide training and capacity building. With the more active use of administrative data and new information sources such as big data, building up partnerships outside the statistical community is becoming an increasingly important way to mobilise resources for the successful transformation of agricultural statistics.

The presentation looks at how the European Statistical System is developing its capacity to moderniseagricultural statistics in the supranational context of the EU. The presentationshares results achieved and lessons learned that might be useful for other institutions undergoing similar modernisation programmes

Keywords: agricultural statistics; capacity building; modernisation; European Statistical System

PAPER

1. Introduction

Over the last decade, the shift towards evidence-based policy making in general and output-oriented development policies in particular hasgenerated an ever increasing demand for high quality official statistics across the globe. As a result, national statistical offices (NSOs), other national authorities and regional and international organisations now more than ever need the capacity to provide data. A range of technical assistance and capacity-building initiatives have been launched in various statistical domains, including the agriculture and food sector. A major part of thisworkhas focused on enhancing NSOs' human resources capacity and on developing their technical skills. In agriculture,this related to sampling techniques, planning and conducting agriculturalcensuses and building food supply balance sheets. In addition, the Paris 21 consortium of international development institutions has been assisting countries to develop national statistical development strategies and makeagriculture an integral part of them.

Over the years, the European Commission has supported agricultural statistics byco-financing actions as part ofthe FAO's'Global Strategy to Improve Agricultural and Rural Statistics' (GSARS, 2016) and through the Paris 21 partnership. To mention one example, the EU is supporting capacity building for agricultural statistics through the 'Information for Nutrition Food Security and Resilience for Decision-Making Programme' (INFORMED) (FAO, 2016).The EU is contributing EUR 20 million, or 59 %, for the project duration until June 2019. INFORMED supports decision-making by improving the availability of regular, timely and early warning information. It also produces evidence-based analysis on food security, nutrition and resilience. Three outcomes are expected:

- better and more integrated data systems for long- and short-term trend analysis of food crisis situations;
- strengthening of the Integrated Food Security Phase Classification (IPC) process largely applied at country level;
- improved resilience programming byapplying a common methodology to measure resilience.

Eurostat has a multi-faceted role in international cooperation over statistics. Firstly, it represents the Commission in the United Nations Statistical Commission (UNSC), in bilateral relationships with international financial institutions such as the IMF, the World Bank and regional development bank and on the OECD Statistics Committee (CSTAT). Secondly, Eurostat cooperates with these international statistical agencies to:

- set up international standards for statistics;

- improve the comparability of statistical information;

- improve the coordination of international statistics-related activities;

- support financially and technically national statistical systems in building capacity to deliver data on agriculture and food.

This work involves on-the job and formal training in country-level field projects, study tours, international, regional and national training seminars and workshops, and preparing and disseminating methodological and technical guidelines.

Despite the efforts and investment in statistical capacity building, we are having to cope withnew data demands. These are triggered by the latest trends in agriculture and rural developmentand the increasingly important role of sustainable management of natural resources in response torising concerns about climate change, biodiversity loss and water and soil quality. The analysis of the available data for monitoring and evaluating the recently adopted UN Sustainable Development Goals (SDG) identified a number of data gaps linked to the availability of geo-referenced and regional data and challenged statistical capacities across countries. The increasing global interconnectedness of agricultural production structures, prices, yields and supply chains callsfor detailed data in this area. This will make it possible to carry outrapid crisis responses and have more effective policyin general. At the same time, the astonishing developments in information and communication technologies and the instantaneous availability of information are openingup new opportunities to produce statistics faster and cheaper and to improve theirquality. Accessing the emerging new data sources requires new capacities. Statisticians'classical role in designing and carrying outsurveys and turning the results into statistics isno longer sufficient. Capacitiesto adapt to rapid change, acquire knowledge and innovate are becoming the most valuable assets for any statistical office, whether in developing ordeveloped countries. As stated in the Report *A World that counts: mobilizing the data revolution for sustainabledevelopment* prepared by the Independent Advisory Expert Group (IAEG, 2014) established by the UN Secretary General on data revolution, *'...improving data is a development agenda in its own right, and can improve the targeting of existing resources and spur new economic opportunities. Existing gaps can only be overcome through new investments and the strengthening of capacities.'*.In other words, modernising statistical production now depends on one'scapacity todo so, making this latter issuea universal problem.So far, discussions about statistical capacity building at various international fora have focused largely on less developed countries. However,nowadays the challenges and opportunities triggered by the data revolution are faced byall NSOs and systems, including the most developed ones, as well as by international organisations. In the age of data deluge and digital transformation, capacity building has expandedto include thecapacity to modernisestatistical production. Changing user needs mean that statisticians need to have an open and broadapproach in order to respond to the requestsmade to them. Continuing the traditional approach by creating additional surveys or by adapting existing surveys is not a feasible option in times of resource constraints at all levels. Instead, smart ways of producing statistics are needed. This paper looks specifically at agricultural statistics and how the European Statistical System is developing its capacity to modernisestatistics in this field in the supranational context of the EU. It shares results achieved and lessons learned that might be useful for others undergoing similar modernisation programmes.

2. New capacity for high quality agricultural and rural statistics in the EU:results achieved and lessons learned

Thispaper is based on the idea that building capacity to provide high quality statistics goes beyond technical skills. Building capacity involves establishing a robust and sustainable institutional set-up and a legal framework that requires interaction with many other national authorities. Building sustainable statistical capacity is a long process that requires more than just money. Even in the area of mobilising financial resources, new business models of partnership and financial instruments could be explored. The current context of digital transformation and data deluge even demands this.To build and provide the technical assistance needed to boost skills, we needto beinnovative and to embracethe opportunities offered by information technology. Finally,we also need leadership and high-level political support and national ownership ofthe capacity-building processif we want to modernise agricultural statistics and strengthen our capacity to stay relevant to evolving user needs.

The EU context: a common agricultural policy

Since the early 1950s statistics on agriculture in the European Union has developed with the aim of supporting the policy design, implementation, monitoring and evaluation of the common agricultural policy (CAP) and ofenvironmental and rural development policies. In response to the evolving policy needs and increasing role of evidence-based policy making in the EU, agriculture statistics has developed in a rather consistent manner among the EU Member States over the past 60 years. Over 77 % of the EU's territory is classified as rural (47 % is farm land and 30 % forest) and is home to around

half its population (farming communities and other residents). Agriculture accounts for almost 40 % of the EU budget and is supported almost exclusively at the European level, unlike most other sectors, which are governed by national policies. With an annual budget of around EUR 59 billion,the CAP aims to providea stable, sustainably produced supply of safe food at affordable prices for consumers, while also ensuring a decent standard of living for 22 million farmers and agricultural workers in the EU. Agriculture also plays an increasingly important role in the sustainable management of natural resources against the backdrop ofrising concerns about climate change, biodiversity loss andwater and soil quality.

The CAP's focus has moved away from structural measures to modernise farmsand guaranteed prices to encouragefood production towards environmental protection, the development of rural areas and responding to consumers' concerns. This has led to new data needs and new phenomena that need to be measured and described. For example, cereals have started to be used for energy production and not for food and feed only. Greenhouse gas emissions from agriculture also are a telling example of the clear link between agriculture and climate-related policies.

The value proposition of agricultural statistics — Link betweenstatistics andthe systems for monitoring and evaluation of policies

The active use of official statistics in the design, monitoring and evaluation of the CAP and rural development policy over the years has been a strong driving force inthe evolution of statistics and the strengtheningof the capacity of both Eurostat and NSOs. Here comes the first useful lesson from EU experience. A stronger link between country capacity-building programmes and systems for monitoring and evaluating agricultural and rural development policies could help to break the vicious circle betweenunder-resourced NSOs, low-quality statisticsofno use and demand for official statistics that exists in a number of developing countries. This could also facilitate the involvementof potential resource partners interested in investing in agricultural statistics.

Communicating the value proposition of agricultural statistics to users, in particular to national governments and international donors, has played an essential role in mobilising resources for building sustainable statistical capacity. The starting point in theprocess is the mechanism for permanent review of data needs and user engagement in settingpriorities. In the EU context, a crucial role has been played by the European Statistical Advisory Committee and regular hearings with the European Commission departmentsthat implement agricultural, environmental and rural development policies. On many occasions, these stakeholders have served as promoters and supporters ofthe need for investment toextend capacity building for measuring new phenomena and modernising statistical production.

A holistic approach and integrated framework for agricultural statistics

Starting from user needs, it has been crucial to follow a holistic approach and plan an integrated framework for agricultural statistics that canserve multiple policy purposes.In 2014, Eurostat initiated a review of the current state of the European agricultural statistical system and a discussion with Member States on the system's future.

In line with the Global Strategy to improve agricultural and rural statistics, the plannedEuropean2020 integrated framework of agricultural statistics involves a combination of the Agricultural Census and intercenialcore, module and adhoc sample data collections (surveys).Following the approach recommended by the FAO's World Programme for the Census of Agriculture 2010 (FAO 2005), the Agricultural Census will continue to be a core data collection instrument that provides statistics on farms at the lowest geographical level. An essential novelty in the framework are the flexible adhoc surveys that will focus on special topics not traditionally part of the EASS, i.e. surveys which aim to cover variables that fulfil new and emerging data needs. Their exact content will be determined later, prior to their implementation.They are not planned to be carried out at fixed intervals, but may be repeated when needed[1].

The integrated framework of agricultural statistics has made it easier to present them to users and to wintheir support, including financial support.It has also helpedwithbetter planning of diminishing budget resources available to carry outthe planneddata collections. Similar approaches could be useful for developing countries because they help to ensureinterest by national and international resource partners in investing in statistical capacity building. A targeted integrated framework that at the same time includes opportunities to add some ad hoc data modules could attract and guide potential donors and investors who would like to receive statistical outputs and services after initial investment in building statistical infrastructure and capacity.

Embrace opportunities provided by new technologies and multiple data sources

[1] A seguito della istituzione del nuovo comune di Valsamoggia (legge regionale 7 febbraio 2013, n. 1, in vigore dal 1° gennaio 2014), in provincia di Bologna, avvenuta mediante fusione di cinque comuni, appartenenti a zone altimetriche diverse, per il criterio della prevalenza della superficie, la percentuale di territorio collinare complessivo passa dal 41,64 al 41,65 per cento, mentre il territorio di pianura dal 23,17 al 23,16 per cento.

While agricultural statistics in the EU havebeen evolving, a set of administrative registers have been set up in individual countries and at EU level with the primary objective of enablingimplementation and monitoring of the CAP. Technological advances lead to ever more data: aerial images are nowadays available without cost, whilesmart farming creates another data source. These new sources have created a treasure trove of information that is worth exploiting for the benefit of official statistics, topotentiallyreduce the burden on respondents andto reducethe costs of statistical production.In order to cope with the challenges, a number of steps have been taken in the European Statistical System (ESS).Some useful lessons could be derived from that experience as well. In 2014, the headsofthe national statistical institutes and Eurostat adopted the ESS Vision 2020 (ESS, 2014). The ESS Vision 2020 aims to increase efficiency, reduce response burden, cut the cost of compiling statistics and respond better to user needs byexploiting new and emerging data sources, innovative data collection methods and digital technologies. The basic elements of the ESS Vision 2020 were implemented in concrete modernisation programmes in the core statistical domains.

Wider use of administrative sources has occupied a central place in the modernising of agricultural and rural statistics in the EU. In the past, administrative data weremostlyused for sampling frame construction or as auxiliary information in estimation processes and in analysing and validating the data from surveys. However, recently administrative data have been more and more used as a direct data source. The motivation is two-fold: to reduce costs and to decrease theresponse burden. The results indicate that integrating administrative registers with censuses and sample surveys is a cost-effective way of producing statistics while reducing the burden on respondents. The quality dimension 'accuracy' is a key issue for further development to improve quality when integrating registers and surveys in farm structure statistics.

Sharing and promoting best practices

Pilot projects to setup and improve the use of administrative data in producing agricultural statistics were launched in 14 countries between 2013 and 2015, with financial support fromEurostat.Results were presented at a thematic seminar with directors of agricultural statistics in 2016 in Belgrade. Poland shared itsexperience on creating an agricultural holdings register using administrative data sources, whileGreece shared its experience on upgrading the quality and timeliness of agricultural statistical survey with the farm register. Serbia explained the integration of administrative data for crop production data collection and Slovenia focused on using administrative data in the context of the preparation/provision of annual crop statistics. Sweden showed how information from control bodies is incorporated in statistics on organic farming. During the animal statistics working group meeting in February 2016, Hungary shared itsexperience of using administrative data in animal production statistics and Poland presented the first insights fromits investigation ofdata validation in animal production statistics.

Strong legal basis that ensures the use of administrative data sources

While exchange of best practices and methodological solutions in using administrative data for statistical purposes has proven to be a driving force for innovation and strengthening statistical capacity in the EU, it is equally important to have a strong legal basis that ensures access to these sources by NSOs. At EU level, the access to administrative data for statistical purposes in general is provided for by the Statistical Law[2].

Article 17a of the Statistical Law lays down the right of the national statistical institutes and Eurostat to access and use, promptly and free of charge, all administrative records and to integrate them with statistics, to the extent necessary for the development, production and dissemination of European statistics. More specifically, the current EU Regulation for the Farm Structure Surveys[3] in the EU Member States includes an article explicitly ensuring access to three administrative data sources available in EU Member States: the Integrated Administration and Control System (IACS), the System for the Identification and Registration of Bovine Animals and the Organic Farming Register.

Partnership with owners of the administrative registers

While the legal base foraccessing administrative data is laid down by law, the practical implementation is not immediately given. In order to be useful for statistics production, data from other sources need to be available in a usable form and in a timely manner. Experience in several EU Member States has shown that building a trusting and process-oriented relationship with the owner of the administrative register is essential to success. Even if the holder of the register is legally obliged to give statisticians access to the information, the statisticians need to invest in explaining the 'user needs of the statistics' and to influence the content of the register so that it isas useful as possible for statistics production. This cooperation needs well-defined governance and can by no means be left to the technical level or individualgoodwill.

Increasing use of administrative data sources

[2] Article 17a of Regulation (EC) No 223/2009 as amended by Regulation (EU) 2015/759.
[3] Regulation (EC) No 1166/2008 of the European Parliament and of the Council of 19 November 2008.

The EU Member States are more and more consideringthe use of administrative sources to reduce expenditure ondata collection and significantly decrease the response burden. Several lessons could be derived from the experience so far that might be useful in building statistical capacity in the rest of the world:

- The first step in the process should be the mapping of the existing information (data sources) followed by the elimination of sources which could not provide the level of information requested.

- Statistical data (unit of observation, coverage, definition of characteristics, classifications, periodicity for data collection, reference period etc.) are mainly regulated by statistical legislation or clearly defined in methodologies for data collection. Therefore, the difference for any variable will imply a reduction in data quality.

- The use of administrative data for statistical purposes depends very much on cooperation and communication between the statistical office (or the responsible body for the agricultural data collection and dissemination) and the owner of the administrative data. It is important that the authorities responsible for agricultural statistical data collection are formally and regularly involved in preparingadministrative data.

- All the available options should be taken into consideration, including the possibility to adapt statistical collection methods or slightly adapt administrative data collection channels.

- The use of a common identifier that would make it possible tolink observed units in the various statistical data collections with the administrative register(s) is one of the key points of the whole process, together with the management of metadata (storage, maintenance, transmission procedures, etc.).

- Generally, the transition from statistical survey data collection to the use of administrative data takes time, needs resources and usually cannot be completelyimplemented from one year to another.

Institutional and financial capacity to deal with new data sources

Private data sources need to be identified, while their suitability and potential for sustainability need to be evaluated. It would also be worthwhileto analyse whether any obligation exists to report such data to an administrative body in the Member State, as this could provide for access without additional cost to the statistical office.

In view of the scarce resources available, EU Member States and Eurostat combine resources through cooperation in modernisation programmes via networks and ESSnet projects[4] to exploit the potential of new data sources. Building partnerships,firstly with other countries inside the ESS and secondly with actors outside the statistical community, with private data owners and with the owners of administrative data, is becoming an increasingly important way tomobilise resources for thesuccessful transformation of agricultural statistics. Statisticians will no longer be self-sufficient in designing and carrying out data collection and in producing statistics. The traditional role of statisticians will need to be supplemented by the capacity to work with others in a partnership.

New quality framework for the use of new data sources and for the combination of data sources

Although the advantages of administrative data use are quite evident, it is also necessary to consider the possible disadvantages and shortcomings of such a practice. Although it is often believed that administrative data are free of errors, this is not always the reality. Administrative authorities also use some kind of collection processes, which inevitably produce different kinds of errors in the collected data. Besides these measurement errors, which are due to the 'hidden' collection processes, some other quality issues mayalso exist. Theseare specific to the administrative data and should be studied in as a detailed manner as possible before deciding to includesuchdata in the production process of official statistics. Data matching and data linking is usually easily feasible if unique identifies are used for the observation units. In the agricultural sector, this might for example be farms, people or land parcels. Using a unique identifier in different data sources will generally lead to higher quality data than if no such identifier is available. This is just one example that illustrates the need for a new quality framework.

3. Conclusion and way forward

Capacity building goes beyond the traditional approach of training and resource allocation. The lessons drawn from the experiences gathered in the EU and summarised in this paper couldbe of relevance for any statistical institute that is modernising agricultural statistics in today's fast changing landscape of emerging new data sources and digital technologies. While we have long known a lot about the pros and cons of some of these technologies in agricultural statistics, promoting the better use and improving the quality of administrative data for statistical purposes appears to be the most significant innovation for improving the existing statistical systems.

[4] 'ESSnet project'means'A network of several ESS organisations, aimed at providing results that will be beneficial to the whole ESS'.

Building partnerships together in the ESS with actors outside the statistical community, including with private data owners, is becoming an increasingly important way to mobilise resources for the successful transformation of agricultural statistics. In the age of data deluge and digital transformation, capacity building is expandingto include the capacity tomodernise statistical production. If we want to develop strategies for producing high quality agricultural and rural statistics that meet users' needs and the increasing demand for evidence-based policy making, we need tomobilise resources, develop new skills and introduce innovative ways to provide training and capacity building.

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