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REVIEW OF AGRICULTURAL STATISTICS

Note prepared by Eurostat, IBGE Brazil and USDA United States

I. INTRODUCTION

1. In its third meeting of 2007/2008, the Bureau decided to review in depth Agricultural Statistics. This review is strongly needed to take into account recent developments such as the increase in food prices and the impact of climate change, and to incorporate the final conclusions and recommendations reached at the International Conference of Agricultural Statistics (ICAS IV, Beijing, November 2007) on the situation of agricultural statistics. Furthermore, the development in the governance of agricultural statistics with reduced international organisational involvement and the unclear situation on the future role of the United Nations Food and Agriculture Organization (FAO) statistics are concerns which the Conference of European Statisticians (CES) Bureau consider justify such a review. The in-depth review has been discussed in the October 2008 Bureau meeting in Washington. The Bureau recognised the timeliness of this review because of the food crisis, increase in the food prices, climate change, etc and stressed that the current crisis might help to gain more visibility and emphasize the importance of agricultural statistics.

2. The current new version of the in-depth review paper is up-dated based on the input from the Bureau discussion. The review was also updated following the written January 2009 consultation, in general the countries were very positive of the review and comments that referred to issues not yet covered have been included in the actual document. The review also takes into account the results of the Expert Meeting on Agricultural Statistics held in Washington 22 and 23 October 2008. Furthermore, in its discussions the Bureau recognised the role of the FAO and the strong collaboration in the United Nations Economic Commission for Europe (UNECE) region in the domain of Agricultural Statistics between FAO and Eurostat. The review and the initiative for the Expert Meeting mentioned above also take into consideration the recent evaluation of FAO statistical work.

3. To facilitate a quick overview the main general recommendations resulting from this review are given in chapter 5, paragraphs 99 to 109.

A. The justification for this review of agricultural statistics

4. The raising of awareness of the effects of globalisation and the impact of climate change have led in the UNECE region to a greater understanding of the need to analyse different societal developments more in relation to each other than in isolation. The interrelatedness of agriculture,

with, for example, land use and rural development, and also with environmental sustainability and overall well-being is considered to be not yet fully reflected in available statistical information.

5. Agriculture in the UNECE region is characterised by the use of advanced technologies. Machinery, new production methods, fertilisers and pesticides and also all types of supporting instruments have created a sector that is more business-like than some old traditional primary industries. At the same time, emphasis on sustainability, environmental protection and ownership has created more attention for the important role of rural areas. The increased use of modern technologies and the increase of scale has created a farming sector with strong relations to other sectors of society, both on the level of the sector as a whole as well as on the level of individual farmers and farmers households, for example, on employment and time use. The paradox of increased efficiency on one side and more emphasis on sustainability and environmental protection on the other is also considered a challenge for current agricultural statistics that justifies a reflection on their future.

6. The burden on farmers and decreasing response rates have forced the statistical institutes to enhance their efforts in deploying new data collection techniques and to make more use of other types of information, for example, from administrative sources. Growth in the availability of advanced information technology (IT) tools for data collection, analysis and dissemination techniques also forces the statistical institutes to review the methodologies applied in agricultural statistics. Furthermore, the pressure to lower administrative burden by simplifying regulations in agricultural statistics has created an emphasis on changes in the fundamental legal and methodological bases for agricultural statistics.

7. Enlargement of the European Union (EU) in 2004 and 2007 and enhanced cooperation with future acceding countries and other neighbouring countries has visibly increased the impact of decisions on the organisation and content of agricultural statistics in the EU. The greater variety in crops and methods demands a review of the existing statistics, specifically in the EU context.

B. The relation between this review and the initiative for an expert meeting on future challenges for agricultural statistics

8. The conclusions of the ICAS IV (Beijing, November 2007) meeting on the relatively low priority given to agricultural statistics by the global statistical community in combination with the worrying situation especially in developing countries in this domain, and the weakened position of the FAO to guide a process of improving these statistics, led to an initiative to start a global dialogue on the future challenges of agricultural statistics. It was concluded that existing data suffers from inconsistent investment, institutional and sectoral isolation, and weaknesses in methods. This, combined with a lack of analytic capacity in this field of statistics, has led to serious gaps in knowledge and has hampered ability to identify and promote effective innovation in agricultural statistics especially in developing countries and even more so in the agricultural statistics of sub-Saharan countries.

9. According to the recently released World Development Report 'Agriculture for Development' (World Bank 2008), agriculture is critical if countries are to achieve the poverty targets set forth by the Millennium Development Goals within the agreed time frame. The food

crisis has sharply highlighted both the importance of sound agricultural information policies as well as the weaknesses in the agricultural information systems that hinder knowledge generation in a sector where innovation and change need to be fostered. In most sub-Saharan countries, the vast majority of people suffering from poverty and food insecurity are rural dwellers who rely on farm activities. Agriculture does not, however, exist in a vacuum. Agriculture forms part of complex household income generating strategies, involving multiple individuals and activities. Diversification into non-farm activities among smallholders is the norm. Increased income and risk attenuation can be achieved by enhancing the linkages between different income sources among the rural poor.

10. Part of the initiative mentioned above is a global expert meeting on the issue of future challenges for agricultural statistics, held in Washington on 22-23 October 2008. About 60 experts from all regions of the world and a great variety of international organisations participated at this meeting. The major outcome of the expert meeting was a general consensus on the current unsatisfactory situation of agricultural statistics and the need for a strategic plan to improve them. The participants agreed that the long-term goal of such a strategic planning exercise will be to establish a globally agreed upon core set of indicators for agriculture and rural development under a UN mandate. The strategic plan will have to reflect the agreement among national and international statistical organisations, donors and other stakeholders. The development of the strategic plan to meet this goal will:

(a) Identify a minimum set of statistics that each country will pledge to provide; that combine current core agricultural statistical needs and emerging requirements such as land use statistics for analysis of global warming, greenhouse gas emission policies and incentives for production of biofuels;

(b) Provide a blue print for agriculture to ensure its integration with the national statistical system when National Strategies for the Development of Statistics are developed and implemented;

(c) Provide advocacy for national statistical organisations and ministries of agriculture to obtain funding to meet the agreed upon international requirements;

(d) Establish the basis for statistical capacity building by identifying a suite of methodological tools based on the premise that these will be integrated into the national system;

(e) Establish agreement among donors to coordinate efforts to improve agricultural and rural statistics;

(f) Enable integration of overlapping data requirements across other sectors such as health, education, and the environment, etc.

11. In summary, the strategic plan as it will be proposed to the United Nations Statistics Committee in February 2009, will provide the framework to integrate a core set of agricultural and rural statistics into the national and international statistical systems, identify a suite of methodologies for the data collection, provide a framework for integrating agricultural and rural statistics with the overlapping data requirements of other sectors, and address the need to

improve statistical capacity. Finally, it will propose a governance structure for coordination not only between the national statistical organisations and other country ministries, but also between national statistical organisations of other countries, donors, and regional and international organisations.

12. A key element of the strategic plan will be the better integration of agriculture into the national statistical system. Furthermore, the important global leadership role to be regained by FAO in agricultural statistics was confirmed.

13. It is also proposed that during several upcoming international conferences, including a satellite meeting to the International Statistical Institute (ISI) Meeting in 2009 and the next ICAS meeting (ICAS V) in Durban in 2010, this plan will be followed up by focusing on specific elements of agricultural statistics.

14. The review as requested by the CES Bureau and reported on in this document, and the initiative for the expert meeting on agricultural statistics differ on some main elements. The review concentrates on the current situation in the developed UNECE region, the expert initiative focuses on the global challenges in agricultural statistics for the coming 20 to 30 years. This review's main aim is to update knowledge and also, more specifically, governance in agricultural statistics in the UNECE region; the expert initiative focuses on reformulating the more basic requirements of a global system for agricultural statistics. For both the review and the expert initiative, understanding agriculture as an integral part of the mix of economic activities in rural areas and of the links between rural and urban economies and other sectors of societies and populations is a critical component that has to be considered.

C. The organization and structure of this review

15. This review is based on preparatory contributions from Eurostat, the Brazilian Institute of Geography and Statistics (IBGE) and the National Agricultural Statistics Service (NASS) of the United States Department of Agriculture (USDA). The main conclusions from these contributions are used to support the overall description in this review. The separate preparatory contributions of IBGE and NASS/USDA provide a valuable detailed set of information in the field of agricultural statistics. For this reason, the contributions from the organisations mentioned above are annexed. In a later stage more detailed information on the situation in the CIS countries will also be annexed. For compiling the review, use has been made of a variety of information on the current state and future challenges of agricultural statistics, a main input being the policy reviews on agricultural statistics issues of Eurostat, the Wye Group Handbook 'Rural Households Livelihood and Well-Being' (United Nations 2007) and the results of the 26th European Advisory Committee on Statistical Information in the Economic and Social Spheres (CEIES) seminar 'European agricultural statistics - Europe first or Europe only' (September 2004, Brussels).

16. As a result of the contributions from the above organisations, this review covers the situation for the majority of UNECE countries. Eurostat's experiences cover in full the 27 Member States and the 4 European Free Trade Agreement (EFTA) countries. The requirement for the acceding and pre acceding countries to comply with the regulations at the moment of accession means that the Western Balkan countries and Turkey are still developing their

standards to reach those of the EU. However, it must be clear that in these countries the situation both in agriculture and in agricultural statistics is more traditional, and at different stages en route for the EU model. For the other European EU neighbouring countries, the model is more based on the traditional Commonwealth of Independent States (CIS) approach to statistics. The contribution of the United States can be considered valid partly for Canada, Australia and New Zealand. Nevertheless, the description in this review might not fully cover the situation in these countries. Finally, the situation in Brazil is that of a specific country with a strong development in new technologies for statistics and a very specific agricultural situation.

17. In this review, agricultural statistics includes statistics on forestry and fisheries. It implicitly also includes statistics on trade in agricultural products (including forest and fishery products) as well as issues related to food safety. The definition of agricultural statistics is based on three conditions, all of which have to be met (Vogel, 2008). In this definition, agriculture consists of the use of land, the culture of a living organism through more than one life cycle, and ownership. Land is used for many purposes ranging from mining to recreational. Agricultural land supports the culture of living organisms and their ownership. This separates aquaculture from capture fishing and tree farming from forestry. Agriculture includes the management of water, the feeding and raising of organisms through several growth stages. Tree farming includes the management of the soil, fertilization, and pest management as the trees or other ornamental plants are raised through various stages of growth. In both cases, farmers have a choice over using the land for other purposes than aquaculture or raising tree crops.

18. In agricultural statistics in the UNECE region, the number of international and supranational organisations involved is currently rather limited. In the UNECE context, only the FAO and Eurostat play a role of any significance. The UNECE and the Organisation for Economic Co-operation and Development (OECD) are no longer heavily involved. At a global level, the number of organisations involved is very limited, this being the main reason for the decision of the United Nations Statistical Commission (UNSC) in 2006 to stop the Inter Secretariat Working Group on Agricultural Statistics. Both in Northern America as well as in Europe, however, there are many other organisations outside statistics involved in agricultural statistics and information. Traditionally, many of the agricultural organisations as well as the agricultural ministries are involved - as part of, for example, the Common Agricultural Policy (CAP) - in collecting and using information on agriculture. A complete overview of ongoing work in agricultural statistics, therefore, has to be complemented with information from other international organisations and branch organisations as well as involved ministries. However, the lack of a systematic overview makes such a complement very difficult to reach. Further analysis might be needed on this topic.

19. This review is structured as follows. In section 2, the current state of agricultural statistics is described. The main items to be discussed are the infrastructure for agricultural statistics, the information systems for collecting structural information, the statistics on production, the monetary elements, the added value on the production of agricultural statistics, other important sources and the relations with other statistics and the use of administrative data. In this chapter, fishery and forestry statistics are also discussed. In chapter 3, governance and horizontal issues are discussed in more detail. In chapter 4, some developments in demand for agricultural statistics and some challenges are discussed. Finally, chapter 5 focuses on the main recommendations for agricultural statistics.

II. CURRENT STATE OF AGRICULTURAL STATISTICS IN THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE REGION

A. Introduction

20. Agricultural Statistics in the UNECE region have a long history at national level and, especially in the European Union, the harmonised and integrated European system has evolved over the past five decades into a highly sophisticated and effective system. The priority attached to agricultural statistics in earlier years reflected the need for this statistical information for the implementation and evaluation of the agreed Common Agricultural Policy (CAP)¹ (and later also the Common Fisheries Policy (CFP)), and the share of agriculture in the economy, employment and land use, both in EU and in national budgets. Nevertheless, resources today are constant or diminishing and compared to some other fields developments and innovations in agricultural statistics are rather limited, thus showing that resources have been shrinking. As a result, in many countries the current priority of this domain of statistics does not reflect the attention it should receive considering the important position it takes, for example, in the conservation of nature and the impact of climate change. Only recently has an increase in attention become visible, mainly as a result of the recognition of the important relation agriculture has with environmental issues such as climate change and the emphasis on developments in small areas.

21. In recent years, several initiatives have been taken to review the effectiveness of the current system of agricultural statistics, especially in the EU. This is partly the result of the emphasis on better regulations but also a direct result of changes in the Common Agricultural Policy, shifting its main objectives from purely directing the market to a position where developments are followed more indirectly. As agricultural and rural development support mechanisms have also been changed, instruments to monitor developments also need to be renewed. A set of recommendations on renewing agricultural statistics were developed in 2004. Part of these initiatives related to restructuring and a part of them related to simplification.

22. The described developments are also valid for the rest of the UNECE region. However, the regions in Europe outside the EU and the (pre) acceding countries are still characterised by different degrees of a more traditional set of agricultural statistics. The main differences and changes that can be observed between the different systems relate to the main lines of resolution; geographical, temporal and subject oriented resolution for agricultural statistics.

23. In the next paragraphs, the developments in agricultural statistics are described along the lines of the main statistical infrastructures available. In these chapters, the emphasis is on the National Statistical Institutes as the data providers, or in the context of North America on the

¹ The creation of a Common Agricultural Policy was proposed in 1960 by the [European Commission](#). It followed the signing of the [Treaty of Rome](#) in 1957, which established the [Common Market](#). The six Member States individually strongly intervened in their agricultural sectors, in particular with regard to what was produced, maintaining prices for goods and how farming was organized. This intervention posed an obstacle to free trade in goods while the rules continued to differ from state to state, since freedom of trade would interfere with the intervention policies.

NASS and USDA. In many countries, however, in this domain there is a range of other governmental organisations collecting information on farms and the farming industry, for administrative reasons, but also for statistical purposes.

24. The situation in the US is a strong example of such wide involvement. While NASS collects agricultural data primarily through direct contact with farmers or farm-related businesses, other parts of the U.S. government also provide statistics relevant to American agriculture. The Census Bureau collects international trade statistics for all products and works with USDA to develop relevant product definitions for food and agriculture. The Agricultural Marketing Service collects market prices for a wide range of agricultural products. The Natural Resource and Conservation Service collects statistics on land use, soil quality and other environmental indicators. The Economic Research Service (ERS) in the USDA has worked with the Census Bureau and the Department of Health and Human Services to add modules to surveys of consumer behaviour and health status to support economic analysis of food security and food choices. ERS has also purchased private data to support research and analysis of consumer food choices.

B. The detailed description of individual agricultural statistics in the United Nations Economic Commission for Europe region

25. The description in the paragraphs 22 to 59 is restricted mainly to those sources that are managed by the statistical offices. Administrative use of farm data, especially for the bookkeeping of subsidies, premiums, etc. is an important issue in this basic and essential sector for society. These sources are very different in the countries concerned and ask for a different approach for the purposes of this review. For reasons of simplicity, only those that are reflected on the regional level are discussed in this review. A more detailed analysis in future could be used to shed light on the undeveloped possibilities for integrating these other sources in the compilation of official agricultural statistics. An endeavour that might fit very well with the aim to make as much use as possible of existing data sources.

26. An other issue which is difficult to avoid touching on in a discussion on agricultural statistics is the traditional relations with trade and customs statistics - food and agricultural products being very strongly related to agricultural production and for many countries and regions an important source for indirect income via taxes and levies. However, in this review, the description is limited to the statistics that fulfil the requirements as described in paragraph 13.

27. Farm registers. The availability of an up-to-date register of farms and farm holdings is considered a main feature of a good infrastructure for agricultural statistics and is seen as the basis for a coherent system and also, if coordinated with national business registers, a tool contributing to the integration of agricultural information with that of other sectors. The fact that farms registers often are not included in the business registers, or that farm registers are kept separately, poses problems when building the sample frames for the surveys. The EU has experienced technical and coordination problems with updating EU-level farm registers and protection of individual data. Several of the countries in the UNECE region, in relation to the Agricultural census, have developed a farm register. A farm register provides a basic tool as a frame for sampling and, provided that appropriate information is included, it may permit effective sample design with stratification by size, type and location. It could also call into

question the cost-effectiveness of full agricultural censuses. However, the coverage of a farm register should be carefully analysed, otherwise the costs for keeping it up-to-date could be too high. A possibility would be to improve household statistics to contain data on subsistence farming, i.e. small farm holdings not producing for the market, but merely/mainly for their own consumption.

28. However, recent experiences show that the overall support for such a register at EU level - opening a direction for EU sampling and EU surveys - is not yet sufficient. This way of substantially reducing the burden also allowing a linking of sources has until now been possible only in a limited number of countries. The development of farm registers with at least a minimum of common coverage, for example, containing only the market oriented farms as described above, could be regarded as an ideal situation and as an effective response to the future. In the EU, the discussion on a regulation including farm registers is not (yet) possible because of specificities in the agricultural statistical systems of the Member States. The fact that a common approach for a farm register is not yet possible can be considered a serious problem for further development, also in the light of effectiveness and reducing burden. For future strategic planning in this domain, it would be useful to have an overview of the countries that have and the ones that do not have a farmer register. Where a farm register is available its characteristics should be indicated and when no farm register is available an indication of alternatives on which the census of agriculture is based.

29. Farm structure surveys are considered in UNECE countries to be the back bone of the agricultural statistics system. Farm structure surveys together with the agricultural census make it possible to undertake policy and economic analysis on a detailed geographic level. This type of analysis at regular time intervals is considered essential. In the context of the FSS in the EU, several simplifications have been realised in recent years. The frequency from 2010 on will be reduced from every two to every three years. The decennial agricultural census carried out within the FAO framework will take place in most EU countries by 2010. Furthermore, not all the variables are subject to detailed geographical or temporal analysis. This allows the regular farm structure surveys to focus on a set of core variables and to be combined with specific modules with less geographical details and eventually more subject detail. In the coming years, such a system with a base farm structure survey and a set of specific modules on, for example, use of fertilisers and production methods will be developed. This method is considered to deliver an important contribution to reducing the response burden. Contrary to this development, however, is the increased pressure on adding new variables and items to the questionnaire. These new demands stem from the new developments mentioned above - production methods, water usage, etc.

30. For the EU countries, the design and basis content of the Farm Structure Survey is regulated by European law. For many Member States, the survey instrument is an ideal tool to which can be added some country specific questions. This so called 'gold plating' is a topic in many of the discussions on the burden of statistics, but also an issue that implicitly generates a more effective use of the survey instrument. In this light further extension of the scope of survey are in principle not recommended. Furthermore decision makers should be informed on the substantial costs of agricultural surveys, especially when no administrative data is available.

31. In Brazil, the situation in the Farm Structure Survey is in principle similar but in its implementation is more advanced than in the EU. The integration of the National Address List for Statistical Purposes with the Registers of the Census of Agriculture allows IBGE to construct the first List Frame of productive units completely computerized. This list will gather the data of all the 5.2 million agricultural producers of the Country, with their respective geographic coordinates. On the other hand, the rural area which encompasses all the sectors surveyed by the Census of Agriculture will form the Area Frame including all the information surveyed. Both, List and Area Frame, will be able to function as a source for the selection of the agricultural holdings to be researched by agricultural surveys based on probability sampling. These surveys, combined with the current surveys, will compose the National Brazilian Agriculture Statistics System, which is presently being developed.

32. An issue that recently attracted much discussion in the context of the new EU Farm Structure Survey Regulation and also part of the preparations of the new regulations on Crops and Meat and Livestock is the reference to geographic entities. From the descriptions above, - and also from the description of the Brazilian and US situation - it is clear that there is an increased demand for small area estimates and on data that allows the description of land use and rural development on a small scale detail. This detail is requested also especially for the agri-environmental indicators. Geocoding or the reference to small geographical entities is, however, an issue that is discussed both with respect to confidentiality as well as with respect to increased burden.

33. In the EU, closely related to the Farm Structure Surveys is the management of the Community Farm Typology. This typology plays an important role in the classification of holdings by economic size and type. It functions as a bridge between the Farm Accounts Data network and the Farm Structure Surveys. Recently this typology has been updated to better take into account the recent changes in the Common Agricultural Policy to decoupled support.

34. The Farm Accounts Data Network (FADN) is a specific EU instrument, developed and managed by Directorate General Agriculture. This FADN is an important source for micro economic data relating to commercial holdings. For purposes of aggregation, the FADN sample results are linked to population results derived from the FSS using groupings based on the Community Typology. The creation of unique identifiers in the context of the agricultural register would enhance this linkage and, if privacy and confidentiality concerns could be dealt with satisfactorily, would permit more complex analysis, at least if FADN would be a subsample of the FSS's. The current status of confidentiality in both the FSS as well as the FADN does not, however, allow the combination of these two very rich surveys.

35. For the US, a similar situation as the FADN is described with the Agricultural Resource Management Survey (ARMS). Policy issues facing agriculture have also become increasingly complex in the U.S. In the past 20 years, government support for farmers has changed from being based primarily on supporting market prices to policies that include direct payments to farmers, government support for crop and revenue insurance, payments for environmental practices on working farm lands, and payments for not farming environmentally sensitive land. Increasingly complex agricultural policies require new types of data and at lower geographic scales. For example, land conservation programmes - payments for ecosystem services require information about land qualities or services provided as well as the value of alternative uses of

land. In the US, statistics on rental rates have been mandated in the recent farm bill for very small geographic areas. In addition, government support for risk management requires information to determine farmers' eligibility for insurance payments. The type of statistics required to support economic analysis of the new suite of farm programmes extend beyond those required for programme management. Farmers participate voluntarily in U.S. government programmes and data required to analyze the effects of programmes starts with information that affects programme participation including participation in off-farm employment and demographic characteristics. Other information needs include statistics on production decisions, technology choices, and farm financial outcomes. The ARMS provides the main source of farm business and farm finance data for US agriculture and is jointly conducted by NASS and ERS. ARMS data support indicators of farm sector health such as income and expenditures. Equally important, the microdata from ARMS serves as the basis for research on programme outcomes including informing ongoing international policy debates about the degree to which different types of payments are linked to distortions in agricultural markets.

36. A recent and very important development in agricultural statistics is the use of remote sensing, aerial photographs and the combination with in-situ observations. In the UNECE region, these methods for collecting information on rural areas have developed into a strong pillar of agricultural and land use statistics. The examples described in the USDA contribution and the contribution from IBGE illustrates this. The Land Use and Cover by Area Frame Sampling (LUCAS) of the EU is conceived as an area based sample, designed to provide timely estimates of the area of the principal crops with high precision and a relatively low level of geographic resolution with the advantage of a low response burden. Nevertheless for small or very heterogeneous countries the reduction of response burden by using LUCAS or other EU sample surveys could be smaller than expected, as they might need to be completed in order to have an usefulness at national level. The LUCAS survey has shown its usefulness and demonstrated its multi-purpose character. In the recent past, several LUCAS surveys have been carried out and analysed as a set of pilot studies and the next survey, covering all EU Member States, will be carried out in 2009.

37. The continuation of LUCAS is currently under consideration. For its original objective to calculate early estimates of cultivated areas, the LUCAS surveys had to compete with the more structural inventories, perhaps not with more geographical detail but with an expected higher level of accuracy as these are based on farmers' detailed information about their own parcels. Based on the evaluation of the potential use of LUCAS, a wider use of this survey is foreseen, not solely serving agriculture and changes in land use but focusing more on non-agricultural applications, such as environmental (soil, land use, ecosystems) issues. The possibility to combine the aerial interpretation with geo-referencing and observations on the spot allows the combined analysis of data on agriculture, environment, and more general land use issues. The use of a fixed sample, with observation points stable over more than one survey period, allows the building of panel data and monitoring of important developments in land use to a high level of statistical significance.

38. As the CAP has changed over the years, funding has focused more on developing rural areas than on price support for farmers. In order to monitor the changes, rural development statistics are needed (see also paragraph 59). These statistics are related not only to agriculture, but to all entrepreneurial activities in rural areas, as well as other socio-economic issues.

However, as there are several methods used to define rurality, the problem has been to decide at which regional level the data should be collected. The solution chosen so far in the EU has been to collect the data at the lowest available regional level, and then to flag these regions/districts as rural, semi-urban or urban, depending on the chosen methodology for the analysis at hand.

39. An issue specially to be mentioned here in the context of Rural development is the work of the Wye group. This group prepared the Handbook on Rural Households' Livelihood and Well Being (UN 2007). The Handbook gives an excellent overview of possible statistics on Rural Households.

40. The statistics described above are based on surveys on a more ad hoc basis or on regularly collected financial data based on administrative obligations of the farmers. However, most of the agricultural statistics are not based on ad hoc surveys but on a very well established and traditionally organised system of counting on a regular basis the stocks and changes therein as well as the number of handlings (slaughters and transports) and specific points in the chain from crop and product to food. The meat and livestock statistics, milk and crop statistics are examples of these statistics with a high frequency. Statistics on vineyards and orchards are normally characterised by a lower frequency of data collection. A development in most countries is an increased use of information technology on the reporting by farmers and from farmers to the statistical institutes. Automated systems support the modern farmer in monitoring the milk per cow, the food consumption of the animals, the use of specific extra nutrition, pesticides and fertilisers but also the use of water. Member States' statistical collection systems are more and more based on the use of internet and related systems to collect this regular information from the farms and holdings. However, this situation is absolutely not valid for all countries. The use of ad hoc surveys is also still considered an important instrument for collecting regular information on the flows in the production cycle.

41. Meat, livestock and egg statistics; these traditional animal and poultry products statistics still play a key role not only in the design, implementation and monitoring of the Common Agricultural Policy but they also contribute to ensuring food and feed safety in the European Union (EU). These statistics result from traditional regular livestock surveys as well as meat, milk and eggs statistics. European statistics on animals and animal products are regulated by specific EU legislation. Member States are obliged to send monthly, annual and multi-annual data to the European Commission within predefined deadlines. In addition, for several meat products and eggs, the Supply Balance Sheets provide the major type of resources and uses.

42. The first chronological animal data series in the EU were created for bovine animals in 1959, followed by series for sheep and goats in 1960, monthly meat production in 1964 and pigs and livestock in 1969. The statistical system was progressively improved and enlarged up to the present situation where Eurostat is receiving statistical information from 27 Member States broken down in roughly over 700 individual values per country, some of which are multiplied by 12 for monthly data or by 4 or 2 for quarterly and semesterly data, respectively.

43. For these traditional statistics, the recent years are characterised by a substantial effort on both the methodology applied by the countries on the improvement of the procedures for data transmission, in particular by using standard formats in the telecommunication net. For example, to achieve this goal, the new EU system Electronic Data files Administration and Management Information System (eDAMIS)/Web Forms Application has to considerably improve the data

transmission from the Member States to Eurostat and has allowed for an improvement not only of work efficiency but also of efficacy for both Eurostat and EU Member States. As a result, data quality has improved in parallel with the simplification of data treatment operations.

44. The milk statistics relate to production of milk produced by cows, ewes, goats and buffalos. It concerns milk collected by dairies (monthly and annually) at national and regional level, milk produced in agricultural holdings (farms), the protein content and the supply balance sheets. Triennial statistics provide information on the structure of the dairies. Data collection and pre-validation is launched through for example the use of Web forms system which assures the management of deadlines and reminders and monitors the data traffic.

45. The traditional statistics on crop production correspond in general to four families of data:

(a) The Early Estimates for Crop Statistics (EECP) which provide, for cereals and some main crops, data on area, yield and production before the harvest;

(b) The Current Crop Statistics which provide at national level, for a given product, the area, the yield and the production harvested during the crop year. For some products data are requested at regional level;

(c) The Supply Balance Sheets which give for a product or group of products the major type of resources and uses;

(d) The structural data for vineyards and orchards and the inter-annual changes for vines of wine grape varieties give information about age, density and variety of the different species.

Crop products statistics cover: the field of cereal production, of the other productions resulting from field crop, of the fruits and vegetables and the supply balance sheets for a large number of crop products. They also include two specialised surveys, one on vineyards with a basic survey every 10 years and an annual one on changes, and fruit trees plantations every 5 years.

46. For the United States, NASS collects and publishes, based on annual or monthly surveys, data on crop production, livestock inventories, livestock products, farm finances, sector demographics, chemical usage, and other key industry information. In contrast to statistical programmes in other countries, government statistical agencies in the U.S. are focused specifically on data needs relative to the Agency, Department or Cabinet area where they reside.

47. Eurostat transmits to the Member State the forecasts (for the running year) of the Eurostat *Agromet* model (obtained by extrapolation of the statistical trend) for area, yield and production. From February to October, the Member States react to these proposed data and transmit their own new estimations back to Eurostat. The objective is to obtain data on area and production for the main crops before the harvest. EECP is one of the main inputs used by DG AGRI for its short term forecasts and analysis of the agricultural markets on the commodities considered.

48. Surveys on vineyards are intended to collect information on vines and wine production in the Member States at different geographic levels (Member States and regions) and over time (follow up the changes). Thus, they provide basic information to follow and evaluate the

economy of the sector at production level and in particular they permit evaluations to be made and to measure the impact of the implementation of the Common Market Organization for wine. Member States on whose territory the total area of vines cultivated in the open air is more than 500 hectares have to do a survey on these areas. They have to conduct their surveys within a fixed time-frame and have to ensure high quality results. The scope of the basic survey is the area under vines, while the survey unit is the agricultural holding. In the case of the intermediate survey, only areas under vines for wine are surveyed.

49. The basic survey on plantations of certain species of fruit trees (apple, pear, peach, apricot, orange, lemon and small-fruited citrus) is carried out every five years, to determine the production potential of plantations from which fruit produced is intended for the market. Data is collected on the areas under fruit trees broken down by region (production zone), species, variety, density (number of trees/ha) and age of the trees.

50. The chronological crop data series start with data from the early 1960s. The statistical system was progressively improved and enlarged up to the present situation where Eurostat is receiving and publishing harmonised statistical information from 27 Member States broken down in roughly various thousands of individual values per country, some of which are multiplied by several (1 to 8) waves for the different updates taking place every year. As for meat and livestock statistics and animal products, a substantial effort has also been made recently for this field on improving the methodology applied by the Member States and the candidate countries and on the improvement of the procedures for data transmission, in particular by using standard formats and electronic ways in the data transmission.

51. Although validation procedures have improved recently, mainly because they were introduced into the data treatment process, there is still considerable room for further improvements, in particular on advanced validation.

52. Collection and validation of agricultural monetary statistics comprise (a) the economic accounts for agriculture and forestry, (b) the agricultural labour input statistics, and (c) the agricultural price in absolute terms and in indices. The agricultural accounts data at the national level is regulated through a legal act which prescribes the methodological concepts and definitions and also the data delivery. The accounts data at regional level as well as the agricultural price statistics are transmitted on the basis of gentlemen's agreements. Data for agricultural accounts are provided annually while price statistics are transmitted by the EU Member States on a quarterly and annual basis. In the CIS countries, due to considerable reduction in the number of supply-and-use tables and the simplification of their structure there are some problems with the integration of agricultural statistics with national accounts.

53. The programme of fishery statistics in the EU provides statistical information on fisheries needed for the management of the Common Fisheries Policy (CFP) of the European Union. The programme comprises the following elements: Catch statistics, Landing statistics, Aquaculture production statistics, Supply balance sheets for fishery products, Fishing fleet statistics, Employment statistics, Socio-economic data and Structural and sustainability indicators. The programme of work is designed primarily to provide statistical support for the management of the CFP and to meet the EU's commitments to international bodies of which the EU is a contracting party. Apart from meeting numerous *ad hoc* requests for data from EU institutions,

national and international organisations and public and private organisations and individuals, Eurostat meets routine requests for data from FAO. Fishing fleet statistics - thereby removing the obligation of Member States to supply the data, NAFO (North West Atlantic Fisheries Organisation) and other regional international organisations. Catch statistics to meet the EU's obligations as a contracting party of these organisations and ICES (International Council for the Exploration of the Sea). Catch statistics, under the terms of the Eurostat/ICES Partnership Agreement.

54. Eurostat is planning a re-design of the fisheries statistical database. The new design moves away from a global system of management of fisheries statistics to a system which is more focused on the needs expressed by users and of higher quality. With revised needs and uses for fisheries statistics and fewer resources available, there is a need to develop a more efficient and higher quality data environment and a decrease in the workload for data providers. An important consideration for this redesign is the decrease in overlap of data systems with those of other international organisations, more specific FAO.

55. The Forest Action Programme of the European Communities, adopted in 1989, and more specifically the regulation establishing a European Forestry Information and Communication System (EFICS)² are the basis for the collection of EU forestry statistics, not only on the present situation of woodlands and their structure and the production and consumption of wood, but also on developments in the afforestation of agricultural land, the forestry situation in the various regions of the Community and a description of the exploitation, processing and marketing of forest products³.

56. The co-operation between Eurostat, DG Agriculture, UNECE, FAO and the International Tropical Timber Organisation (ITTO), via the Intersecretariat Working Group on Forest Sector Statistics (IWG), in which OECD also initially participated⁴, has as an aim the optimisation of the use of scarce resources, so that each piece of information is collected only once from each country and there would be only one value for each transaction in all the international datasets. Together, the partners created the Joint Forest Sector Questionnaire (JFSQ) and its harmonised definitions in 1999. For each country, the JFSQ produces core data removals of roundwood from the forest, by type of wood and assortment, production and overall trade of primary wood products, by quantity and value, and overall trade in secondary processed wood and paper products, by value. Furthermore some additional parts of the JFSQ are only relevant to the EU or to the other partners.

57. These production data are very reliable when available directly from the countries. When not available, they are estimated from (as a minimum) export figures - which is unsatisfactory - or from other sources (e.g. industrial associations, company news on the Internet), which is very time-consuming. Agreement must be obtained from the country's correspondent to be able to publish the estimates.

² Regulation (EEC) N° 1615/89.

³ Recital, Regulation (EEC) N° 1615/89.

⁴ Eurostat document 'IWG Mandate Jan 1996' of 20.10.2003.

58. As a consequence of enterprises reducing activities in some countries and/or enterprise mergers, some of the production data can no longer be reported due to confidentiality rules. It would be possible to produce different kinds of aggregates if countries could be persuaded to supply the confidential data.
59. Some countries are experiencing difficulty in obtaining data on wood produced in private forests, so the total for those countries may be considerably underestimated. Another source of underestimation is likely to be the non-reporting of household use of roundwood or the direct sale of wood by forest owners to private households, mainly for heating purposes. It is clear that the reliability of the data produced could be improved by wood balances for each Member State and the EU as a whole, as was shown by the recent Joint Wood Energy Enquiry of UNECE⁵. Such data would also be a valuable source of information for energy statistics.
60. Data on trade has declined in quality ever since the introduction of simplified customs procedures for intra-EU trade in 1993. From then on, data was collected directly from companies, and threshold values - below which nothing has to be reported - were applied. As of 2006, further simplification allows Member States to drop the net mass of a product if a supplementary unit of measurement is reported. Several Member States have chosen to apply this option. As of 2008, only dispatches are foreseen to be reported, doing away with the data on arrivals. The possibilities for cross-checking anything are rapidly diminishing.
61. Integrated Environmental and Economic Accounting for Forests (IEEAF) uses a very exhaustive questionnaire. The data have been collected once as a test and a second time in 2007. The proposal is therefore to further simplify the questionnaire and to collect this data every 5 years, which would be adequate for the slow rate of change in forestry. The purely economic data for forestry and logging (output, intermediate consumption, net value added, entrepreneurial income, labour input, etc.) covered in one of the tables could be collected yearly.
62. The requirement to include environmental assessments in all policy areas has caused a set of 28 Agri-environmental indicators (AEI) to be collected in the EU, these have been selected from a group of 75 indicators that are usually collected. Many of these indicators relate to other environmental statistics already collected; only broken down by the agricultural sector. Some of them relate to specific policy actions and are therefore available from administrative sources, where other indicators have been developed specifically for the purpose. The basic principle in the EU is that already available data should be used wherever possible, new data collection should be used only when really necessary. The AEI data collection system is still under construction, partly because some of the indicators are still under development, partly because the needed data is not collected and proxies have to be used.
63. Rural development statistics are a relatively new domain and can be seen as a consequence of the reform of the Common Agricultural Policy, which gives a high importance to rural development. Eurostat started to collect indicators for a wide range of subjects (demography -

⁵ <http://www.unece.org/trade/timber/docs/stats-sessions/stats-29/english/report-conclusions-2007-03.pdf>

migration, economy - human capital, accessibility to services - infrastructure, social well-being) from almost all Member States on NUTS3 level. Most of the indicators are not of a technical agricultural nature. Data collected cover predominantly rural, significantly rural and predominantly urban areas according to the OECD typology.

64. The UNCEEA in cooperation with the London Group is preparing the revision of the System of Economic and Environmental Accounting. Many UNECE countries are involved in this process. The objective is to provide a framework that allows to develop indicators that allow to monitor and direct policy decisions where economy and environment are interlinked. Agricultural accounting and forest accounting are strongly related to this system and rather well established. This development of integrated accounting is considered one of the most useful developments to approach agriculture and environment in one consistent statistical framework. Sustainability of the ecosystems is also related to these topics. The developments in this domain, mainly initiated by the European Environmental Agency are in an early stage of development. However, they have not yet reached the phase of implementation.

65. Without doubt the overview given in the above paragraphs is not exhaustive and will not include some of the -for specific - countries - specific sources. In general however the overview reflects the main agricultural statistics in the UNECE region. Smaller data collections on endangered species, home farming and ornamental aquaculture are not included, however, might in a full description of the specific situation in a country prove to be very useful.

III. GOVERNANCE AND HORIZONTAL ISSUES

66. From a horizontal perspective, common issues in the statistics as described in paragraph 2, several are relevant for a review of agricultural statistics. These are the governance structures and the experiences in data collection, analysis and dissemination. The examples below are mainly taken from the contributions from IBGE and NASS/USDA, but are also valid for the rest of the countries.

67. On the governance of the statistical work chain traditionally UNECE countries have a well developed system of agricultural statistics as reflected in the overview above. Data collection and analysis are done via well established and documented procedures and rather good cooperation between the national institutes and other governmental organisations. In the neighbouring domains of trade and employment statistics this is also the case. However, in the relatively young domain of environmental statistics and ecosystems these statistical procedures are far from being well established. The agencies involved are still developing their methods and the availability and accessibility of many data sources is still not well described.

68. In the US there is a great variety of organisations involved in the data collection and analysis of agricultural and related issues. This holds also true for Europe. In 2005 the European Environmental Agency, the Joint Research Centre, Eurostat and DG Environment agreed to work together in the so-called Group of 4 on the development of a common concept for Data Centres on environmental (and related issues). Ten such Data Centres are in development, for example on Land Use, Forests, Water, etc. The objective of each data centre is to function as a portal to all the available information in that specific field and to create a virtual knowledge centre.

69. The recent EU communication on the Shared Environmental Information System (SEIS) even goes a step further by not only on the European level but also on the level of countries to promote the enhancement of the exchange of available data sources, avoid overlapping data collection methods and to promote the use of administrative sources and non-official statistics to supplement official statistics. This development is considered an important way forward in an efficient use of all the available information and will be an important asset in the work on combining agricultural statistics with several domains of environmental statistics.

70. On the UNECE level, the number of international and supra national organisations involved in agricultural statistics is rather limited. Including the domain of fisheries and forest FAO and Eurostat are main international organisations involved. OECD and UNECE were more involved, especially via the Inter Secretariat Working Group on Agriculture. The activities of these organisations in this field, however, are currently limited and there is presently no forum to discuss issues of agricultural statistics at the UNECE level (it exists only for forestry statistics).

71. In the early nineties of last century the cooperation in this field however has led to a set of so-called joint questionnaires via which in some of these fields data collection is efficiently coordinated. Changing demands of course ask for a regular updating of these JQ's. This regular updating, however, is not easy to organise, merely as the use of the data by the organisations after some years easy diverges.

72. FAO is collecting on a regular base an amount of information on agriculture that can be compared to the information Eurostat is collecting for the EU Member States. In coordination with FAO Eurostat tries to limit as much as possible the burden for the Member States avoiding overlapping questions to be raised. It can be concluded that the cooperation especially on the traditional agricultural statistics in this field needs improvement. In a recent EU-FAO meeting (Brussels December 2008) the need to have a stronger cooperation has been emphasized. For fishery and forestry the relations are considered to be good.

73. Compared to other fields of statistics, the international global cooperation in agricultural statistics has not resulted in many overarching groups like city groups, FoC groups, etc. The only relevant city group is the Wye group as mentioned earlier. More importantly for the functioning of the global governance structure for agricultural statistics seems to be the network around the International Conferences on Agricultural Statistics (ICAS) meeting and the network of regional conferences initiated by FAO.

74. From the description in chapter 2, a distinction can be made between the regular inventories on products and stocks, the ad hoc surveys and the special data collections via more advanced techniques such as remote sensing, etc. For the regular data collections, well established systems have been developed and these do not need to be discussed. Several specific problems, however, occur in the field of agricultural surveys. These problems are to an important extent not typical for agricultural statistics but also characterise data collection experiences in social and business statistics. These problems are extensively described in the NASS/USDA paper and are summarised below.

A. Respondent reluctance - privacy and burden concerns

75. Although the agricultural sector is somewhat unique and not directly aligned with the general population on a number of levels, concerns regarding personal security and privacy of information are similar across most population subgroups in the U.S., Brazil, and European countries. Due to incidences of personal information being released by businesses and government agencies, respondents now have one more reason for not responding to surveys. While this is not the only reason for increasing non-response levels on surveys, it represents a huge challenge for future data collection efforts. Strong protections afforded respondents by law are sometimes not enough, particularly considered alongside the other challenge faced by statistics of reducing respondent burden. With trends showing that fewer farms increasingly represent more of our country's agricultural production, respondents are being contacted multiple times within a sampling year.

76. As an example, NASS, in an effort to mitigate the reluctance of respondents employs a variety of practices, not only intended to encourage response to a specific survey, but also to demonstrate the value of good data. These strategies include personal contact by interviewers familiar with the respondents, small monetary incentives, sampling methodology that factors burden into selection probability, flexible use of multiple data collection modes, and public relation efforts demonstrating data uses. Over the past few years, NASS has dedicated resources specifically directed toward increasing response rates on the agency's two largest projects; the Census of Agriculture and the Agricultural Resources Management Survey (ARMS). Although resulting in some short-term increases in response, the efforts have not showed an overall decline in survey response rates or their concern for non-response bias. NASS is expending extra effort to better understand the characteristics of non-respondents so that they can first of all, describe them, make appropriate data adjustments, and better understand the potential magnitude of bias introduced. One could also surmise that changes in response rates are directly tied to the changing face of agriculture.

77. In the EU, the experiences with the Farm Structure Survey are similar, with Member States reporting increasing problems with response rates. This is the most cited reason for not wanting to increase the number of variables to be collected. Some countries have solved this issue by making response a legal obligation, but most have considered this not an appropriate answer to the problem. The method which is perhaps most used is to try to make use of administrative sources, making the respondents aware that data are collected only where it is really necessary. Other countries have reformed collection methods, combining for example, computer-aided telephone interviews with pre-filled questionnaires sent in advance. Obviously, there is no unique solution available, problems like these must be solved based on the cultural and value-related situation for each respondent group, with, for example, bigger enterprises being treated in a different way to the small part-time farmer.

78. The increased demand from users for micro data from the farm structure surveys also creates a problem in the EU. The confidentiality rules do not allow this data to be disseminated, not even within the group of restricted users under the EU confidentiality regulation. The process to make the micro data of the FSS available to researchers is not yet approved by the Member States and as some have indicated that they will use their veto right on their data, this clearly

hinders the further increase in the use of this data for advanced analysis and via that in their credibility.

B. Small and diversified farm operations

79. For agricultural statistics in general, the coverage (for the different crops such as acres of corn or the number of cattle represented by the farms on the frame) is a very important issue. Both for the EU as well as the NASS survey programmes, an important quality measure is this commodity coverage. In the regulations used for EU statistics, the desired accuracy and coverage are described in detail. Furthermore, countries are requested to provide detailed meta data and quality information.

80. In general, active records eligible for survey samples account for 80% to 95% of total U.S. production for most major items. Medium to larger size operations are typically sampled at higher rates as they represent a greater proportion of production being measured. This is adequate for the survey programme where the major focus is agricultural totals at the U.S. and State levels. For the census programme, the focus is county level data on farm numbers by type and size, demographics, acreage, production, inventory, sales, labour, and other agricultural census items. Consequently, adequate coverage of all types and sizes of farms is needed to ensure reliable census results.

81. Even though NASS publishes coverage adjusted census data, a specific issue for the U.S is the need for an adequate list frame coverage for all types and sizes of farms to ensure reliable county level data for all census items. Although coverage goals are established to generate increased agency attention to list building needs, coverage of the total number of farms has been decreasing over the last few censuses. These decreases are due primarily to the increasing number of small farms which are difficult to locate through traditional list-building approaches. Also, they are difficult to properly maintain on the list frame due to their borderline “farming/not farming” status. Small farms routinely enter and exit at a faster pace than larger, more commercial size farms. To keep coverage high for farm numbers, NASS must keep rebuilding its lists. Additionally, prior to conducting the 2007 Census of Agriculture, NASS recognized the extensive interest in minority farm numbers and specialty commodity farms and attempted to improve the reliability of this data through extensive list building efforts.

C. Estimates for small domains and areas

82. An issue already reflected on earlier in this document is the increasing demand for data for small domains. In agriculture, these small domains could be geographic areas or unique commodities. Legislators are more frequently seeking data at lower levels of aggregation. In order for survey based estimates to be reliable, the sample sizes would be required to increase beyond the organisation’s capacity to pay. NASS’s approach has been to augment probability based survey estimates with non probability based survey data. Much effort is put into investigating statistical methods for small area estimation that use models borrowing strength from other data sources such as administrative data or other areas. This procedure allows estimates that can have a proven measure of error.

D. Uses of data for unintended purposes

83. For many years, NASS has estimated crop and livestock production at the National, state, and in some instances county level. NASS stakeholders have utilised published estimates for marketing and production decisions, agricultural research, legislative and policy decisions, and implementation of farm programmes. Data needs have evolved over the past several years resulting in uses of NASS information to establish USDA farm programme payment levels and calculate USDA's Risk Management Agency's (RMA) insurance indemnity payments to farmers.

84. The RMA has provided group risk insurance products, Group Risk Income Protection (GRIP) and Group Risk Plan (GRP), to farmers for a number of years. These policies were designed as risk management tools to insure against widespread loss of production of the insured crop in a county. NASS county yields for insured crops are currently used in determination of payments to farmers. The NASS county estimates were not originally designed for such use. The estimates for a "small area" (such as a county) are often not as precise as one would desire as the basis for insurance policies. However, the NASS estimates are the only source of data at the county level available to RMA.

E. Programme content and stakeholder input

85. The countries' statistical offices work very hard to understand the needs of the data user community, although the future cannot always be anticipated. As the primary statistical agency for USDA, NASS services the data needs of many agencies inside and outside of the Department. Partnerships have been in place with State Departments of Agriculture and land-grant universities through cooperative agreements since 1917 to ensure statistical services meet national, state, and local needs without duplication of effort. This coordination maximizes benefits while minimizing respondent burden and costs to the taxpayers. NASS also considers the thousands of voluntary data suppliers as partners in the important task of monitoring the nation's agricultural output, facilitating orderly and efficient markets, and measuring the economic health of those in agriculture.

86. NASS uses numerous forums to obtain programme content and customer service feedback. For many years, NASS has sponsored data user meetings which are a primary source of customer input that keeps the NASS agricultural statistics programme on track with the needs of the user community. Data user responses have played a vital role in shaping the agency's annual and long-range planning activities.

87. For the EU, the Standing Committee on Agricultural Statistics (CPSA) as well as several other committees in the EU function as the sounding board for initiatives to be taken in the field of agricultural statistics. Most of the initiatives come from coordination meetings at expert level, often generated by policy debates in the EU council and parliament.

F. Funding for agricultural statistics

88. Agricultural statistics and especially the Farm Structure Surveys are an expensive method for data collection. In the EU, the European Commission co-finances the data collection work of

the FSS and furthermore also finances the LUCAS survey. For the 2010-2013 round of the FSS, the European Commission has reserved a budget of around €100 million. An important part of the work has, however, to be funded by the countries themselves.

89. The funding situation for NASS as a national statistical institute responsible for agricultural statistics is different. As the need for data continues to grow, so does the NASS budget. From its inception as an agency in 1961, the NASS appropriated budget has grown from under \$10 million annually to its current level of about \$140 million. In addition to appropriated funding, NASS receives approximately \$15-\$20 million annually through reimbursable work for other federal agencies, state governments, and agricultural commodity groups. The NASS funding level increases have come about primarily due to a corresponding increase in workload. However, NASS continues to find ways to become more efficient and currently employs fewer personnel than it did in its early years as an agency.

G. Legal procedures

90. An issue specific for the situation in the EU is the procedure for the agreement of EU Council and EU Parliament on new regulations. The organisation of this process is rather complex and time consuming; however, in the context of the necessary legal base for statistics, it is strongly needed. The preparations comment with a route via task forces and working groups with Member States before arriving at the level of the Standing Committee on Agricultural Statistics or the Statistical Programming Committee who then agree that the proposal be submitted for discussion with the other services of the Commission and afterwards the Council and Parliament.

91. The way the regulations are organised ensure that the requirements for the statistics to be collected and delivered by the Member States are described in detail. Changing or adding these requirements, or actively integrating new developments in the data collection process is therefore almost impossible. This means that the instruments are well developed but rather inflexible. It also allows via so called 'gold plating' Member States to be able to add/change on their own initiative questions/variables to the questionnaires for their own use.

IV. DEVELOPMENTS IN DEMANDS FOR AGRICULTURAL STATISTICS AND CHALLENGES

92. Agricultural statistics (and fishery and forestry) are statistics with a rather long history. The subject is well described. A main reason for this review is the recognition that a reorientation of agricultural statistics to become more integrated in the whole system of statistics is necessary. New demands on environmental impact and ownership of rural areas, water and energy use, etc. have been signalled and need to be included. Recent conferences concluded that globalisation and issues like climate change demand a different approach for statistics, considering the important role of agriculture in the global economy, the sustainability of the global economy and more in general modern society, and this clearly includes agricultural statistics. More information is needed on the demand side and the non-food use of agricultural products. Furthermore, these conferences concluded that especially in developing countries the capacity to produce agricultural statistics has decreased.

93. There is an increased demand for information for small areas and the relation between rural and agricultural issues as well as issues of the cohesion in territories has become an important issue in many countries. Coastal areas, small island economies, urban and rural areas all ask for a specific set of indicators that reflect the integration/cohesion and development of these areas. There is an increased demand for indicators for these types of areas. The request for spatial information combined with socio-economic information and environmental data is, for example, expressed in several communications from the European Commission. Agricultural statistics will be pushed to deliver small area information. Surveys based on samples are an important instrument (with a sufficient coverage, of course). Multi purpose surveys with a geo-reference are seen as important sources for data to be complemented with spatial agricultural information. Next to this approach, aggregated municipal or regional information (Nuts 3) is also considered important information on this level.

94. On the aggregated level, sound indicators that give a good insight into the mechanism of agricultural society in relation to economy and environment are needed. The integration of agricultural statistics with other fields of statistics is a process that is tackled especially from the viewpoint of Integrated economic and environmental accounting. The UNECE region is actively participating in the preparations of the revision of the System of National Accounts (SNA 2008) where the relevance of satellite accounts is emphasized. The related revision of the System of Environmental and Economic Accounting is on track with the work of the London Group. Agriculture is well represented in the discussions. The process of building these integrated systems, the extraction of valid sets of indicators and the adjustment of the basic statistics to these more systematic approaches is still a medium term project.

95. Farm Structure Surveys are considered to be the back bone of agricultural statistics, delivering micro information that allows the analysis in detail of mechanisms on individual farmers and farms behaviour. The response burden described in paragraph 3 forces investment in the use of more efficient instruments for collecting the data. Linking sources is a way forward in combination with a permanently updated farm register and area frame. Such frames facilitate sampling, but in themselves can already supply a lot of basic information. In many countries these farm registers are built or are in development.

96. Modern technologies for data collection for agricultural and land use statistics are being implemented in many countries. As in many surveys, the use of CAPI and CATI data collection has become more the rule rather than the exception. NASS and many EU countries have used the Blaise software for such interviewing for many years now. A more recent development is Internet Web questionnaires mainly used for many of the annual and monthly inventories. Both NASS/USDA and IBGE have built up an impressive experience in using modern technologies in data collecting. For IBGE, there is the experience in electronic collection of the 2007 Census of Agriculture, integrated with the Population Count and with the construction of a National Address List for Statistical Purposes. This operation covered all the 8.5 million km² of the National Territory, collecting information from 5.2 million agricultural establishments, in 5,564 municipalities, and from 110 million persons, in 28million households located in 5,435 municipalities. In the Censuses, the integration of these surveys was facilitated by the use of a hand-held computer, the Personal Digital Assistant - PDA, equipped with the Global Positioning System - GPS, in the stage of field operation.

97. The use of this technology enabled the construction of a more consistent Rural Address List. For the first time, Brazil conducted an operation of this magnitude, using only digital collectors (PDA), which allowed a better control of the quality of data obtained in the fieldwork, both at the stage of collection and in the supervision of the central bureau. This operation required the use of 82,000 PDA's with GPS and the participation of 90 thousand persons. The electronic transmission of the data directly from the PDA of the census takers to the central computer of the IBGE reduced the time of data processing and accounted for significant economy of resources, since it eliminated the stages of transportation, storage and digitization of the characters, essential ones when paper questionnaires are used.

98. The use of the PDA's in combination with other remote sensing tools formed a unique combination for data collecting. The PDA were equipped with GPS and helped to associate the collected agricultural data with the geographic coordinates of the 5.2 million rural units visited. Each agricultural holding could be visualized by means of Google Earth images, combined with the grid of the rural census sectors. This procedure allowed IBGE to monitor the evolution of all the data collection operation more closely.

99. The information about the positioning (geo-referencing) of the agricultural holdings creates new possibilities of release of information from the Census of Agriculture, such as the publication of Agriculture Maps, with the description of the process of occupation of the national territory, according to the diverse products, agricultural techniques, areas of forest reserves and biomes, hydrographic basins, Indian lands, and several other instances of geo-referenced information. For the future design of Lucas in the EU, the design used by IBGE is an important example. NASS has a long history of using geographic information system (GIS) techniques to assist fulfilling its mission. In the NASS contribution, some recent developments are described in great detail. It is evident that the methods described above are an important addition to the development of good statistics on Land Use. The request for detailed spatial information requires the use of these types of new tools.

100. An important development to be mentioned is the request for up-to-date and accurate (small area) estimates. The demand for early estimates for in advance warning on crops and the results for small domains continue to increase. In agriculture these small domains could be geographic areas or unique commodities. Statistical methods are being used for small area estimation that use models and modelling techniques borrowing strength from other data sources such as administrative data or other areas.

101. The overview of recent developments is not complete without mentioning the permanent need to update the existing list of products, goods, etc.: crops for bio-fuels and Genetically Modified products, Organic Production Methods, etc.

V. MAIN RECOMMENDATIONS FOR AGRICULTURAL STATISTICS.

102. The elements of this review give rise to a set of general recommendations to be considered in the further development of agricultural statistics.

A. On the governance of international agricultural statistics

103. Enhancing the priority of global agricultural statistics and the cooperation between countries and international organisations is needed to make maximum use of the global statistical infrastructure to improve agricultural statistics. Cooperation in Joint Questionnaires but also in the sharing of experiences has been relatively weak in the last decennium. With respect to the increased need for high quality agricultural statistics, stronger cooperation and leadership is needed, also in relation to the need to link with other fields of statistics. Considering the rather low involvement of some international organisations, the Inter Secretariat Working on Agricultural Statistics was considered to be not that useful. However, in the context a more embracing statistical system, a formalised UN communication structure on agricultural statistics could still be very useful.

104. Action: The CES Bureau considers proposing the set up a group (for example, in the form of an Inter Secretariat Working Group) with a mandate that explicitly covers the relations with the related domains of statistics and a membership that also includes those organisations active at the margins of agricultural statistics. The mandate will focus on core agricultural statistics and the problems at the basic level, but also to identify the links to other statistical areas, like environment, water, energy, land use, natural resources, etc. . Eurostat will prepare a proposal for such a new Inter Secretariat Working Group for the February 2009 meeting of the Bureau.

105. Joint Questionnaires are considered an excellent tool to reduce burden on national statistical institutes. However, updating of the JQ should be better organised.

106. Action: The CES could consider scheduling discussions as an obligatory part of the regular reviews on the burden of these statistics on data providers as well as on methods to decrease the burden or keep it to a minimum. A country should only have to report one on overlapping information.

B. On the governance on the national level

107. Create a good cooperation with the main stakeholders active in agricultural statistics at the national level. The review showed clearly the involvement of many governmental organisations in the collection and use of agricultural statistics. In this schema National statistical institutes play an important role as data provider but as well as a reference for data quality issues. For efficient use of available information, good coordination is needed, both on the level of data collection and analysis as well as on the description of the needs for statistics and the feasibility of collecting certain types of data.

108. Action: the CES Bureau could consider updating this review with a more exhaustive overview of sources, possible data and stakeholders in agricultural statistics. This could be described as a follow up action of this review. Statistics Ne Zealand already offered to take part in this initiative.

C. On a theoretical framework for agricultural statistics

109. It is recommended that stronger integration is actively sought between agricultural statistics and other fields of statistics.

110. Based on the review, agricultural statistics can still be characterised as a rather traditional sector in statistics where only recently it has been recognised that linkages with other fields like the environment and socio economic issues are relevant. The agricultural statistical system is rather inflexible. This is partly due to the way the system is built up (many regulations) but can also be related to the relatively low priority given in recent years to modernisation. Recent developments clearly indicate a need to liaise strongly with environmental and spatial statistics and, in the context of rural development strategies, a stronger interrelation with social and other economic statistics.

111. Action: The CES might suggest as a direct follow up and first action to the Group created according to recommendation of paragraph 99, the organisation of a (special) CES seminar possibly in 2010, on the issue of integration of agricultural statistics and other domains of statistics. This seminar could also contain sessions on the recommendations in paragraph 103, 104, 105 and 106.

112. This integration should be in questionnaires and analysis, and also on the level of theoretical frameworks: based on interaction with main users, it is suggested to redefine more explicitly the conceptual framework on which agricultural statistics is based. Changes in the instruments are not that easy or fast to generate. To prepare for the future, a fundamental re-thinking seems to be genuinely needed.

113. These theoretical frameworks should include considerations on the optimal use of new methodologies and a flexibility for inclusion of indicators on new production methods, crops, etc.

D. On data collection methods

114. The Farm Structure Surveys have to be designed as multi-source multi-domain surveys, allowing combination with farm registers and area frames. The possible use of administrative sources and other data to supplement the information deserves much attention to answer to the strong pressure to not increase the burden.

115. Best practices on the use of modern IT tools to increase efficiency of data collection should be communicated. Surveying and collecting information via remote sensing in combination with in situ observations as well as modern methods for estimations have proven to be important innovations that result in enhanced quality in agricultural statistics.

E. On analysis and dissemination

116. The access to micro data for researchers is an important development to increase the value and the credibility of agricultural statistics. Solutions for the issue of confidentiality have to be found both in IT as well as in legal structures.

117. More emphasis should also be given to the use of accounting principles in the development of indicator sets. The integrated accounting systems have proven to be consistent and coherent for economic statistics, and to give the best tools for evidence based policy making.

118. Action: It is proposed that the CES Bureau ask the UNCEEA and the London Group to include in their work the relations between agriculture, forestry and fisheries and to organise an outreach of this type of integrated accounting to agricultural statistics.

F. On some general conditions

119. Considering the importance of food and food safety issues, high quality agricultural statistics deserve a high priority in national and international agendas. This should be reflected in adequate funding systems.

120. Generally it is considered that at the UNECE level the priority in agricultural statistics is mainly on improving the quality and cost-efficiency of agricultural statistics, and furthermore on improving cooperation and coordination at all levels, as well as integration with other fields of statistics.

121. Action: Eurostat was asked to prepare the Terms of Reference for future work on agricultural statistics in the UNECE region.

ANNEX 1**STATISTICS ON AGRICULTURE, FORESTRY AND FISHERIES IN THE EUROPEAN UNION**

Note prepared by Eurostat

I. AGRICULTURAL PRODUCTION

1. Crop production statistics cover (on the basis of existing legislation) the field of cereal production and the other productions resulting from field crops, the production of fruits and vegetables, the supply balance sheets of wine (on a legal basis) and of other crop products. Animal statistics cover (on the basis of existing legislation) livestock surveys as well as meat, milk and eggs statistics. The crop and animal statistics not only play a key role in the design, implementation and monitoring of the common agricultural policy (CAP) but also contribute to ensuring food and feed safety in the European Union.

2. These statistics (mainly short-term statistics) and the derived production forecasts provide key information for day-to-day market management. The Agricultural Information System (AGRIS) plays an important role in validating the consistency and coherence of these statistics.

A. Crop products statistics

3. Crop products statistics cover: the field of cereal production, of the other productions resulting from field crop, of the fruits and vegetables and the supply balance sheets for a large number of crop products. They also include two specialised surveys, one on vineyards with a basic survey every 10 years and an annual one on changes, and fruit trees plantations every 5 years.

B. Livestock, meat and eggs statistics

4. Under this module statistics related to meat and eggs production are covered including: cattle, pig, sheep and goats livestock surveys, meat production, trade of live animals, production forecasts, supply balance sheets, eggs for hatching and trade of chicks.

C. Milk and dairy products statistics

5. Under this module, statistics related to production of milk are covered: cows, ewes, goats, and buffalos. It concerns: milk collected by dairies (monthly and annually), milk produced in agricultural holdings (farms), the protein content and supply balances sheets. Triennial statistics provide information on the structure of dairies. Activities are handling of data transmitted by the Member States, Accessing and Candidate countries, data validation, elaboration and update of the metadata.

II. AGRICULTURAL STRUCTURES

6. Statistics on agricultural structures include the Farm Structure Survey (FSS) as well as the Survey on Agricultural Production Methods (SAPM), the orchards and vineyards surveys and the information required for processing these data. This statistical information plays a key role in the design, implementation, monitoring and evaluation of the common agricultural policy (CAP). The EU farm structure surveys are the backbone of the agricultural statistical system. They provide micro-data on the agricultural labour force, land use, livestock, equipment and non-agricultural activities and they are the statistical basis for sample surveys on land use, livestock and agricultural income. The farm typology processed on the FSS is the key used in the farm accountancy data network. The implementation of the new NUTS enables Eurostat to manage regional time series without putting an additional burden on Member States.

7. Farm Structure Survey statistics play a key role in the design, implementation, monitoring and evaluation of the Common Agricultural Policy (CAP). The main role is likely to increase over time with enlargement and CAP reform (shift from product to producer support - environmental compliance - rural development. The EU farm structure surveys (FSS) - censuses every ten years and intermediate sample surveys (every three years) in between - are the backbone of the agricultural statistical system. They provide micro data on agricultural labour force, land use, livestock equipment and they are the statistical basis for sample surveys on land use, livestock and agricultural income; The EU farm typology (linked to farm structure survey and farm accountancy data network) has to be revised in accordance with CAP reform.

III. LAND USE AND LAND COVER

8. Land cover and land use are of high importance in the definition and evaluation of common agricultural and environment policies. The Lucas project is dealing with the application of area frame techniques. The objective was to set up area frame surveys for the provision of (a) coherent and harmonised statistics on land use and land cover, (b) early crop area estimates, (c) information on the environment, landscapes and sustainable development, (d) ground evidence for calibration of satellite images, and (e) a register of points for specific surveys.

IV. AGRICULTURAL ACCOUNTS AND PRICES

9. Economic Accounts for Agriculture (EAA) and prices play a key role in the design, implementation and monitoring of the common agricultural policy (CAP) as well as in the evaluation of the impact of the CAP on the economic and financial situation of the agricultural community. Quarterly price indices will continue to be collected and disseminated. The Agricultural Information System (AGRIS) plays an important role in validating the consistency and coherence of agri-monetary statistics.

V. FORESTRY STATISTICS

10. For this theme Eurostat cooperates extensively with international bodies (FAO, UNECE and ITTO) in the use and development of the Joint FAO/ECE/Eurostat/ITTO Forest Sector Questionnaire (JFSQ), with which annual data on wood and wood-derived products are collected

worldwide, thus avoiding any duplication of effort. The responsibility for collection and management of the data is shared; Eurostat is responsible for the replies of the EU Member States and the EFTA countries. This data is the basis for international comparisons and is provided on request to the Commission departments, in particular DG Enterprise, DG Environment and DG Agriculture, to officials working on the EU Forest Action Plan 2007-2011 and to the Ministerial Conference for the Protection of Forests in Europe (MCPFE). It also provides some of the indicators needed for the sustainable management of forests and primary wood-based industries, work which needs to be further developed in the future.

11. In this area, Eurostat works in close cooperation with the UN Economic Commission for Europe (UNECE), the Food and Agriculture Organization of the United Nations (FAO) and the International Tropical Timber Organization (ITTO). Representatives of Eurostat and each of these organizations form the Intersecretariat Working Group on Forest Statistics (IWGFS).

12. The objectives of the IWGFS are as follows:

13. To provide a better service to users of statistics;

14. To collect and disseminate the statistics more efficiently, particularly by avoiding duplication of work.

15. A result of this cooperation is the joint FAO/ECE/Eurostat/ITTO Forest Sector Questionnaire (JFSQ), with which data on removals of wood from forests, production of wood and wood-based products and foreign trade in these products are collected. The content of the questionnaire is agreed between the organizations and the data, after validation following common rules, are shared by all. Responsibility for collection and management of the data is also shared. EUROSTAT is responsible for the replies of the EU Member States and EFTA countries, UNECE for other ECE countries, ITTO for producers and consumers of tropical timber and FAO for the rest of the world. This data is the basis for international comparisons.

16. Eurostat also co-operates with the Joint Research Centre (JRC) and the European Environment Agency (EEA) as far as data production and management is concerned.

VI. FISHERIES STATISTICS

17. Provide the European Union with a high quality statistical service in the field of fisheries. This includes the collection of annual data on catches by fishing region, on aquaculture production and landings of fishery products. The data are from Member States and other countries through close collaboration with international Fishery organisations. Development work will cover the data on employment in fishery sector, supply balance sheets and sustainable development indicators for fishery.

VII. AGRI-ENVIRONMENTAL STATISTICS

18. The aim of agri-environmental statistics is to develop and maintain a system of agri-environmental indicators for monitoring the integration of environmental concerns into the CAP.

The work is based on the conclusions drawn in Commission Communication COM(2006) 508 and the subsequent comments from the Agriculture and Fishery Council. A memorandum of understanding has been drawn up between DG AGRI, DG ENV, JRC, Eurostat and the EEA to ensure that already available data are fully used and to pool the different skills and resources of these partners, with the long-term objective of setting up a system for and collecting data on the relation between agriculture and environment for the assessment of the impact of the agricultural policy decisions on the environment. The Commission Communication identified three short-term objectives: consolidating the selected set of indicators, extending the coverage to the new Member States and correcting existing weaknesses. Efforts need to be made for the conceptual and methodological improvement of these indicators and for the collection of the necessary data or better access to existing data, in particular at regional level and on the use of inputs in agriculture.

VIII. RURAL DEVELOPMENT AND MARITIME POLICY STATISTICS

19. The Commission's rural development policy has become the second pillar of the CAP. The aim for Eurostat is to provide the European Union with high quality statistical information in the field of rural development. Development work covering the collection of appropriate statistics (social, demographic, economic, etc.) to evaluate the sustainable development of rural areas. The Commission services, in close co-operation with Member States, have defined a list of indicators, which address the three main objectives for rural development policy: improve competitiveness of agriculture and forestry; improve environment; enhance the quality of life in rural areas and promote diversification of economic activities through measures targeting the farm sector and other rural actors. Eurostat undertakes the compilation of the statistics focussing mainly on indicators targeting the issue 'enhance the quality of life in rural areas', based entirely on data already available either in Member States or in Eurostat. In addition, Eurostat works with other Commission services and Member States to develop new indicators of rural development within the EU.

20. In 2007 the Commission proposed a more integrated approach to the development of maritime policy across the EU (COM(2007) 575). One of the key actions defined in the proposal is the improvement of socio-economic data on the maritime economy especially in coastal regions. Good quality information is required to monitor and assess the EU maritime policy and its programmes, to provide contextual information for sustainable coastal and ocean development, and to understand the linkages between socio-economic activities and the environment. In consultation with other Commission services, Eurostat manages the development of a harmonised statistical database that brings together relevant regional and national statistics from different statistical domains.

ANNEX 2

IN DEPTH REVIEW OF AGRICULTURAL STATISTICS

Note prepared by Brazil

I. INTRODUCTION

1. The international interest in agricultural statistics has increased significantly in recent years. There has been visible renewal of the strategic importance of agricultural activity, due to the current world crisis and to the rise of food prices, together with the growing concern with food security and with the environment.
2. Agricultural activity has taken a central role in the discussions about rural poverty, about its contribution to the renewal of the energetic sources of countries, and also about environmental conservation.
3. The understanding of these aspects related to agricultural activity requires updated and comprehensive statistical information, which will be used by the community in order to evaluate the contribution of each country to the process of sustainable development.
4. The significant expansion of world economy in recent years has caused the importance of agriculture on economy development to be relegated to second place. As a consequence, some key issues such as food scarcity and rise of food prices; agricultural expansion and environment; production of food or biofuel, have not been among the main issues discussed by the international community, not even by National Statistical Offices.
5. Nevertheless, in 2007, the IV International Conference of Agricultural Statistics promoted by FAO, in Beijing, called the attention of the international statistical community to the need of promoting the strategic integration of agricultural statistical systems with other systems for evaluation of the economic development process.
6. Currently, there are visible weaknesses in the production of agricultural statistics by many countries. In several of them, technologies and methodologies are outdated; there are few specialists in this specific field of statistics; and the national statistics offices have enormous difficulties in conducting the Census of Agriculture as recommended by the UN Statistical Commission for the 2010 Round.
7. So, if on the one hand there is the need of updated and comprehensive agricultural statistics, on the other, it can be seen that the production of agricultural statistical data in several countries, including the big producers and exporters of food and raw material, is not adequate to the current scenario.
8. There is an enormous limitation to programs of agricultural statistics. In some countries, these statistics are restricted to information about prices, production and foreign market. In 2004,

in the III International Conference about Agricultural Statistics (III ICAS, Cancun), the central issue was measurement of indicators of agriculture sustainability, with emphasis on rural development. In this conference, there was a proposal for the broadening of agricultural statistics coverage aimed at the analysis of the relationships existing among the systems of agricultural production, their social impacts on income, employment and reduction of poverty and on the environment.

9. The report of III ICAS presents some ideas for the development of new methodologies in the production of agricultural statistics, all of which still need to be more discussed by the international statistical community.

II. SCOPE

10. The survey program of agricultural activity is supposed to encompass:

(a) The Census of Agriculture;

(b) Current surveys about agricultural harvest estimates: animal production; prices of agricultural products; income and expenses of rural families; and

(c) Social-economic surveys about rural employment and labor; rural poverty and welfare. Several national programs of agricultural statistics are much more limited, nevertheless.

11. The expansion of the current survey program of agricultural production and prices involves new measures and different types of investigation. However, from the perspective of statistical information quality, all the surveys have a common denominator: the necessity of direct investigation of the agricultural holding.

12. Direct investigation may ensure more accuracy of the statistics produced, because it allows one to monitor the evolution of each type of producer, according to: the size of the agricultural exploration unit; the production technology and its environmental impact, such as the use of irrigation and chemical inputs; the nature of the product itself, such as organic, transgenic or standard.

13. On the other hand, indirect surveying methods for agricultural information, through specialized informants, or by means of images (photographic and orbital), contribute to the production of general output estimates. However, such methods do not allow the detailed analysis of the characteristics of each production process.

14. This way, the National Statistical Offices need to be aware of the international recommendations for an extended and combined program to produce agricultural statistics. Compilations of good experiences and recommendations, such as those of the Program for the 2010 Round of the Census of Agriculture of FAO, of the Manual of the Wye Group, are fundamental and must be encouraged.

III. STATISTICAL INFRASTRUCTURE

15. The interaction of food and energy markets, the new technological qualifications of food products (transgenic, organic, etc), and the growing integration of productive chains require the review of the classification systems adopted nowadays. Effort must be made towards the standardization of concepts and nomenclatures, in order to guarantee the comparability of agricultural statistics from several countries.
16. A fundamental condition for the improvement of agricultural statistics lies in the quality of statistical infrastructure, especially concerning frames and reference systems, including geographic location and positioning.
17. Considering the characteristics of agricultural activity (high risk; the seasonal nature of production; transformation of the legal agrarian base; the big number of producers; and new frontiers of agricultural expansion, as in Brazil), it can be said that area frame and list frame are equally important.
18. New data capture technologies, the digitization of administrative registers and the broader use of (phytosanitary and environmental) control instruments of the production origin, currently provide the best conditions for the maintenance of the list frame of agricultural holdings.
19. The broad use of GPS as a spatial location tool contributed to the use of geographical coordinates as an essential part of the address of each agricultural holding. In several countries, the methodology of agricultural unit georeferencing can be adopted so as to improve the quality of outdated methods of rural addresses registration.
20. The increased use of the most advanced techniques for location and registration of the agricultural holdings will allow the monitoring, with more accuracy and at smaller intervals, of the evolution of agricultural activity in several countries.
21. This progress may even accelerate the process of modernization of agricultural statistics. However, it requires high initial investments in new equipments and in technical qualification, which, in general, occur throughout the year in which a Census of Agriculture is being conducted.
22. So, the implementation of an alternative model to the registration of units for rural production and continuous agricultural surveys start in the Census of Agriculture. However, the scope of the Questionnaire of this Census can be reduced significantly, taking into consideration the possibility of conducting new surveys in subsequent years.
23. A Census of Agriculture conducted with this intention consists of an operation of (1) survey of data about production, employment, technology, land distribution structure and many other relevant statistical data and (2) register of agricultural holdings for statistical purposes.
24. This Frame can be used in the selection of the informants for future continuous statistical surveys which will help monitor the evolution of the productive structure, prices, employment

and other aspects of a country's rural life. Therefore, investing in the creation and maintenance of list frames may be a prior recommendation likely to produce very positive results.

25. Another strategic question concerns the obtaining and the sharing of frame information among Statistical Offices and other government organizations. The reply to this new question will depend on the statistical secrecy legislation in each country.

IV. INTEGRATION TO THE STATISTICAL SYSTEM

26. For a better integration with other institutions of the national statistical system, it is advisable that the statistical survey of agriculture be under the responsibility of a Statistical Office. This recommendation also fulfills the need of independence, regularity and exemption of statistical production.

27. The engagement of companies which consume agricultural raw material is another important aspect of the agriculture scenario with a considerable impact on the statistics of the sector.

28. When the access to agricultural inputs is vital for the determination of their competitiveness, industrial companies establish their own agricultural units, without, however, forming an independent legal entity. Sugar and alcohol plants produce the sugar cane they consume; metallurgical plants produce or try to control the production of the charcoal they use; wood companies produce, extract and process the raw material they use in production and export products derived from wood.

29. This business mentality brings additional difficulties to agricultural estimates, since accounting information relative to the operations involving the different units of production of the same company is seldom available.

30. Another relevant issue refers to the relation between household surveys and the investigation of agricultural households in agricultural surveys, especially in countries where family agriculture is considerably significant.

31. This is a vital topic for the structuring of agricultural surveys. Countries with enormous difficulties to accomplish the results expected from the Census of Agriculture may estimate income, employment and analyze the life and housing conditions of rural producers' families by means of the Population Census.

V. THE RECENT EXPERIENCE OF BRAZIL IN ELECTRONIC COLLECTION OF THE CENSUS

32. After 10 years of considerable transformations in the agricultural activity of the country, in 2007, the Brazilian Institute of Geography and Statistics (IBGE) conducted a new Census of Agriculture, integrated with the Population Count and with the construction of a National Address List for Statistical Purposes.

33. This operation covered all the 8.5 million km² of the National Territory, collecting information from 5.2 million agricultural establishments, in 5,564 municipalities, and from 110 million persons, in 28 million households located in 5,435 municipalities.

34. In the Censuses of 2007, the integration of these surveys was facilitated by the use of a hand-held computer, the Personal Digital Assistant - PDA, equipped with the Global Positioning System - GPS, in the stage of field operation.

35. The use of this technology enabled the construction of a more consistent Rural Address List. For the first time, Brazil conducted an operation of this magnitude, using only digital collectors (PDA), which allowed a better control of the quality of data obtained in the fieldwork, both at the stage of collection and in the supervision of the central bureau. This operation required the used of 82 thousand PDA's with GPS and the participation of 90 thousand persons.

36. The electronic transmission of the data directly from the PDA of the census takers to the central computer of the IBGE reduced the time of data processing and accounted for significant economy of resources, since it eliminated the stages of transportation, storage and digitization of the characters, essential ones when paper questionnaires are used.

37. Thanks to the saving of time, the supervision work could detect and correct some problems, while census takers were still involved in field work. In previous experiences, these problems were only noticed at the stage of data verification, after the data collection and the dismissal of census takers. Therefore, with the use of the PDA, the quality of census data has certainly improved.

38. The use of the PDA equipped with GPS helped to associate the collected agricultural data with the geographic coordinates of the 5.2 million rural units visited. Each agricultural holding could be visualized by means of Google Earth images, combined with the grid of the rural census sectors. This procedure allowed IBGE to monitor the evolution of all the data collection operation more closely.

39. Information about the positioning (georeferencing) of the agricultural holdings creates new possibilities of release of information from the Census of Agriculture, such as the publication of Agriculture Maps, with the description of the process of occupation of the national territory, according to the diverse products, agricultural techniques, areas of forest reserves and biomes, hydrographic basins, Indian lands, and several other instances of georeferenced information.

40. This way, the Brazilian Census of Agriculture will fulfill the growing need of agricultural statistics, associated to territorial and environmental information.

41. The integration of the National Address List for Statistical Purposes with the Registers of the Census of Agriculture will allow IBGE to construct the first List Frame of productive units completely computerized. This list will gather the data of all the 5.2 million agricultural producers of the Country, with their respective geographic coordinates.

42. On the other hand, the rural area which encompasses all the sectors surveyed by the Census of Agriculture will form the Area Frame including all the information surveyed.

43. Both, List and Area Frame, will be able to function as a source for the selection of the agricultural holdings to be researched by agricultural surveys based on probability sampling.

44. These surveys, combined with the current surveys will compose the National Brazilian Agriculture Statistics System, which is presently being developed.

VI. LATIN AMERICA

45. The scope of the agricultural surveys conducted in Latin America is relatively homogeneous. The main objective of these surveys is to collect data about the agricultural production, without engaging in detailed analyses of the productive and land structures, or of production technologies.

46. The main comprehensive source of information is the Census of Agriculture, which should be conducted every ten years. However, due to lack of financial resources, few countries of the region have succeeded in achieving this goal. As a consequence, in several countries, agricultural data, besides limited, are obtained by means of indirect municipal surveys, conducted through probing methods.

47. In the last few years, many projects of agricultural surveys based on probability sampling were established in Latin America with the objective of improving the quality of data of the agricultural sector. In most of cases, area frame was adopted. In other cases, dual frame was used. This type of survey had restricted use in Brazil and was adopted in Nicaragua, Honduras, El Salvador, Guatemala, Colombia, Chile and Ecuador, with variable pattern of quality and regularity.

48. The national programs of agricultural surveys of Latin America countries have found diverse obstacles, but mainly financial ones, affecting the maintenance and the update of registers and the execution of field work operations.

49. Because of this, the model of the Census of Agriculture conducted by Brazil and Mexico, in 2007, with the use of the PDA and GPS may represent a new step towards the construction of a List and Area Frame which may be available in coming years.

50. Also, the technology adopted by the Statistical Offices of Brazil (IBGE) and Mexico (INEGI) may be shared with the Statistical Offices of other countries, through the temporary cession of equipment (PDA) and the transfer of methodological knowledge and training as well.

51. It is important to mention, nevertheless, that the success of this Project of international cooperation will require the support of international organizations. Once this Project is structured, the National Statistical Offices will have provided a bilateral and multilateral response to the Principle of International Cooperation, in order to improve the official statistics of countries.

ANNEX 3

AGRICULTURAL STATISTICS IN THE UNITED STATES

Note prepared by the United States National Agricultural Statistics Service

I. OVERVIEW

1. Statistics necessary to support efficient markets, policy decisions, and long term investments for U.S. agriculture span the sector from consumers to the land and resources that produce food. The National Agricultural Statistics Service (NASS) is the United States Department of Agriculture's (USDA) statistical agency and the primary government organization within the United States (U.S.) statistical system responsible for collection, analyses, and dissemination of agricultural data. NASS' mission is to provide timely, accurate, and useful statistics in service to U.S. agriculture. The agency accomplishes this by conducting a 5-year Census of Agriculture and sample surveys annually or monthly that capture information describing the agricultural sector. NASS collects and publishes data on crop production, livestock inventories, livestock products, farm finances, sector demographics, chemical usage, and other key industry information. In contrast to statistical programs in other countries, government statistical agencies in the U.S. are focused specifically on data needs relative to the Agency, Department or Cabinet area where they reside. For example, forestry and fisheries data are the responsibility of the U.S. Forest Service and Department of Commerce, respectively.
2. While NASS collects agricultural data primarily through direct contact with farmers or farm-related businesses, other parts of the U.S. government also provide statistics relevant to American agriculture. The Census Bureau collects international trade statistics for all products and works with USDA to develop relevant product definitions for food and agriculture. The Agricultural Marketing Service collects market prices for a wide range of agricultural products. The Natural Resource and Conservation Service collects statistics on land use, soil quality and other environmental indicators. The Economic Research Service (ERS) in the USDA has worked with the Census Bureau and the Department of Health and Human Services to add modules to surveys of consumer behavior and health status to support economic analysis of food security and food choices. ERS has also purchased private data to support research and analysis of consumer food choices.
3. NASS data are vital as an unbiased source of information for commodity markets, USDA farm programs, other government regulatory programs, policy decision-makers, and public and private researchers. Agencies, such as ERS, provide critical economic analyses for the agricultural sector through extensive use of NASS data sets. As one of NASS' primary data users, ERS works closely with NASS to identify critical data needs for established and emerging program areas.
4. NASS achieves, on average, well respected survey response rates of 75 to 80 percent primarily due to respondent trust and respect achieved through years of relationship and good-will building. NASS also guarantees respondents complete confidentiality of their personal

information, which includes all descriptive information on their name, address, farming operation, and survey data reported to NASS. The agency protects record-level data at all costs through employee training and certification, use of secure data encryption systems and databases, and execution of well-tested secure estimation processes. Individual respondent data have strong protection through Federal laws.

5. NASS utilizes multiple data collection modes including mail, telephone, and personal interview, in addition to offering respondents the option of web-based data collection. Collection modes are selected based on questionnaire length, data collection time frame, and project resources. Pre-determined, well advertised publication dates drive all dates relative to the administration of NASS surveys.

6. Once data are collected from farmers and farm businesses NASS statisticians analyze secure record-level indications and establish area (state, county, or U.S.) estimates that are reviewed by a panel of experts; the Agricultural Statistics Board (ASB). Data not considered market sensitive are reviewed by National program statisticians, as opposed to the entire ASB. Release of official estimates always occurs on a pre-determined schedule ensuring data are available for everyone at the same time. Results of NASS surveys are released through the dissemination of over 500 reports per year primarily through the NASS website and wire services.

II. EVOLVING FOOD AND AGRICULTURE SECTOR DRIVES CHANGES IN DATA NEEDS

7. During the 20th century, the food and agriculture sector in the United States evolved rapidly from a subsistence agrarian economy to a technology driven modern sector. Agricultural statistics evolved in tandem with the sector to track changes in technology and input use, living standards of farmers, and the increasing importance of international markets. The pace of change continues to be rapid posing ongoing challenges for statistics.

8. Technology continues to drive increases in scale and complexity of farms with consequences for the collection of statistical information. The number of farms with sales of \$250,000 or more grew steadily between the 1982 and 2002 Censuses of Agriculture, with sales measured in constant 2002 dollars. The growth in the number of these larger farms was accompanied by a shift in sales in the same direction. The most rapid growth was for farms with sales of \$1 million or more. By 2002, million-dollar farms alone accounted for 48 percent of sales, compared with 23 percent in 1982. The management practices of these large scale commercial farms pose challenges for data collection including use of contracts for marketing and input purchase, multiple operators and multiple locations, and complex arrangements for access to inputs (e.g., credit and land) and ownership of assets. At the same time, small farms remain a vibrant part of American agriculture and rely on off-farm income for their livelihood requiring measurement of total household income to assess farm sector well-being.

9. The markets for products and services from American agriculture have become increasingly diversified with revenue coming not just from sales for products used as food, but also energy and a very small, but emerging market for environmental services. The food market

has become more complex with increasing differentiated products, some in response to consumer demands for specific production practices (e.g., organic) with associated calls for statistics for these categories of products that may represent small shares of consumer demand. The emergence of agriculture as a supplier of energy has created the demand for statistics to measure the use of agricultural products in biofuel production to assess the effects on markets as well as future infrastructure needs. Other new demands include markets statistics for by-products from biofuel production such as dried distillers grains (DDGs). Markets for environmental services have emerged for protection of farmland for development, water quality improvements, and carbon sequestration leading to requests for statistics to track both markets and the nature of the services provided. All the new types of products and services are sold into global markets further complicating the provision of statistics.

10. Policy issues facing agriculture have also become increasingly complex. In the past 20 years, government support for farmers has changed from one based primarily on supporting market prices to policies that include direct payments to farmers, government support for crop and revenue insurance, and payments for environmental practices on working farm lands and payments for not farming environmentally sensitive land. Increasingly complex agricultural policies require new types of data and at lower geographic scales. For example, land conservation programs, payments for ecosystem services require information about land qualities or services provided as well as the value of alternative uses of land. In the US, statistics on rental rates have been mandated in the recent farm bill for very small geographic areas. In addition, government support for risk management requires information to determine farmers' eligibility for insurance payments. Economic research and experience show that insurance can cover more risk when triggers for payments closely mirror farm specific characteristics (e.g., yield loss represents a small area to capture local weather phenomena) creating a trade-off between the cost of statistics and program goals.

11. The statistics required to support economic analysis of the new suite of farm programs extend beyond those required for program management. Farmers participate voluntarily in U.S. government programs and data required to analyze the effects of programs starts with information that affects program participation including participation in off-farm employment and demographic characteristics. Other information needs include statistics on production decisions, technology choices, and farm financial outcomes. The Agricultural Resource Management Survey (ARMS) provides the main source of farm business and farm finance data for US agriculture and is jointly conducted by NASS and ERS. ARMS data support indicators of farm sector health such as income and expenditures. Equally important the microdata from ARMS serves as the basis for research on program outcomes including informing ongoing international policy debates about the degree to which different types of payments are linked to distortions in agricultural markets.

III. ISSUES FOR SURVEYS AND OFFICIAL STATISTICS IN AGRICULTURE

12. Numerous challenges face U.S. statistical agencies as the resource base for government organizations continues to shift, both in terms of staffing and funding. Of particular interest to agencies collecting or using agricultural statistics are significant shifts in population

characteristics, farm structure, and the impact of rapidly emerging data needs and uses. Perhaps most challenging though are declining response rates from once cooperative respondents.

A. Respondent reluctance – privacy and burden concerns

13. Although the agricultural sector is somewhat unique and not directly aligned with the general population on a number of levels, concerns regarding personal security and privacy of information are similar across most population subgroups in the U.S. Due to numerous incidences of personal information being released by businesses and government agencies, respondents now have one more reason for not responding to surveys. While this is not the only reason for increasing non-response levels on NASS surveys, it represents a huge challenge for future data collection efforts. Strong protections afforded respondents by U.S. law are sometimes not enough, particularly considered alongside the other challenge NASS faces in reducing respondent burden. With trends showing that fewer farms increasingly represent more of our country's agricultural production respondents are being contacted multiple times within a sampling year.

14. In an effort to mitigate the reluctance of respondents NASS employs a variety of practices, not only intended to encourage response to a specific survey, but also to demonstrate the value of good data. These strategies include personal contact by interviewers familiar with the respondents, small monetary incentives, sampling methodology that factors burden into selection probability, flexible use of multiple data collection modes, and public relation efforts demonstrating data uses. Over the past few years, NASS has dedicated resources specifically directed toward increasing response rates on the agency's 2 largest projects; the Census of Agriculture and the Agricultural Resources Management Survey (ARMS). Although resulting in some short-term increases in response, the efforts have not slowed an overall decline in survey response rates or our concern for non-response bias. NASS is expending extra effort to better understand the characteristics of our non-respondents so that we can first of all, describe them, make appropriate data adjustments, and better understand the potential magnitude of bias introduced. One could also surmise that changes in response rates are directly tied to the changing face of agriculture.

B. Small and diversified farm operations

15. For the NASS survey programs, an important quality measure is commodity coverage, such as acres of corn or number of cattle represented by the farms on the frame. In general, active records eligible for survey samples account for 80% to 95% of total U.S. production for most major items. Medium to larger size operations are typically sampled at higher rates as they represent a greater proportion of production being measured. This is adequate for the survey program where the major focus is agricultural totals at the U.S. and State levels. For the census program, the focus is county level data on farm numbers by type and size, demographics, acreage, production, inventory, sales, labor, and other agricultural census items. Consequently, adequate coverage of all types and sizes of farms is needed to ensure reliable census results.

16. Even though NASS publishes coverage adjusted census data, adequate list frame coverage is needed for all types and sizes of farms to ensure reliable county level data for all census items.

Although coverage goals are established to generate increased agency attention to list building needs, coverage of the total number of farms has been decreasing over the last few censuses. These decreases are due primarily to the increasing number of small farms which are difficult to locate through traditional list-building approaches. Also, they are difficult to properly maintain on the list frame due to their borderline “farming/not farming” status. Small farms routinely enter and exit at a faster pace than larger, more commercial size farms. To keep coverage high for farm numbers, NASS must keep rebuilding its lists. Additionally, prior to conducting the 2007 Census of Agriculture, NASS recognized the extensive interest in minority farm numbers and specialty commodity farms and attempted to improve the reliability of these data through extensive list building efforts.

C. Estimates for small domains

17. The demand for estimates for small domains continues to increase. In agriculture these small domains could be geographic areas or unique commodities. Legislators are more frequently seeking data at lower levels of aggregation. In order for survey based estimates to be reliable, the sample sizes would be required to increase beyond the organization’s capacity to pay. NASS’ approach has been to augment probability based survey estimates with nonprobability based survey data. The agency will be investigating statistical methods for small area estimation that use models borrowing strength from other data sources such as administrative data or other areas. This procedure allows estimates that can have a proven measure of error.

18. In the United States, some examples of this are for counties, election districts, or watersheds. County level agricultural production information is helpful to producers, suppliers, rail companies, and many other agribusinesses to plan for the future. The county data are also used for government supported insurance programs and other government programs for farmers and ranchers. The desire to have chemical use data for local watersheds is important for assessing agriculture’s impact upon the environment. Additionally, in the political world, law makers and those who influence the law makers want to know about their constituents. Unfortunately, as a data provider for the public we can not always control the uses of our data which are sometimes for purposes that the design does not support.

D. Uses of data for unintended purposes

19. For many years, NASS has estimated crop and livestock production at the National, state, and in some instances county level. NASS stakeholders have utilized published estimates for marketing and production decisions, agricultural research, legislative and policy decisions, and implementation of farm programs. Data needs have evolved over the past several years resulting in uses of NASS information to establish USDA farm program payment levels and calculate USDA’s Risk Management Agency’s (RMA) insurance indemnity payments to farmers.

20. The RMA has provided group risk insurance products, Group Risk Income Protection (GRIP) and Group Risk Plan (GRP), to farmers for a number of years. These policies were designed as risk management tools to insure against widespread loss of production of the insured crop in a county. NASS county yields for insured crops are currently used in determination of

payments to farmers. The NASS county estimates were not originally designed for such use. The estimates for a “small area” (such as a county) are often not as precise as one would desire as the basis for insurance policies. However, the NASS estimates are the only source of data at the county level available to RMA.

21. Based on this example of new, unintended uses of NASS data and other similar needs, the agency is retooling a major survey program to improve the precision of county estimates by altering the sample design and researching different estimation techniques.

E. Program content and stakeholder input

22. NASS works very hard to understand the needs of the data user community, although we cannot always anticipate the future. As the primary statistical Agency for USDA, NASS services the data needs of many agencies inside and outside of the Department. Partnerships have been in place with State Departments of Agriculture and land-grant universities through cooperative agreements since 1917 to ensure statistical services meet National, state, and local needs without duplication of effort. This coordination maximizes benefits while minimizing respondent burden and costs to the taxpayers. NASS also considers the thousands of voluntary data suppliers as partners in the important task of monitoring the Nation’s agricultural output, facilitating orderly and efficient markets, and measuring the economic health of those in agriculture.

23. NASS uses numerous forums to obtain program content and customer service feedback. For many years NASS has sponsored data user meetings which are a primary source of customer input that keeps the NASS agricultural statistics program on track with the needs of the user community. Data user responses have played a vital role in shaping the agency’s annual and long-range planning activities. The transfer of the census of agriculture program to NASS brought with it an Advisory Committee which now provides guidance on the entire agricultural statistics program. Continual feedback from these forums helps foster a relevant and timely statistical program. Additionally, even with significant stakeholder interest program content is sometimes driven by availability of funds

F. Funding for agricultural statistics

24. Although NASS can trace its history all the way back to 1863 when USDA established a Division of Statistics, it was not until a USDA reorganization in 1961 that the Statistical Reporting Service was established, known today as NASS. Congress passed the first appropriated budget for NASS (aka Statistical Reporting Service) in 1962. Since that time, the NASS budget has experienced several major funding increases but by far the largest infusion of appropriated dollars occurred in 1997 when the quinquennial Census of Agriculture was transferred from the U.S. Census Bureau to NASS.

25. As the need for data continues to grow, so does the NASS budget. From its inception as an agency in 1961, the NASS appropriated budget has grown from under \$10 million annually to its current level of about \$140 million. In addition to appropriated funding, NASS receives approximately \$15-\$20 million annually through reimbursable work for other Federal agencies,

State governments, and agricultural commodity groups. The NASS funding level increases have come primarily due to a corresponding increase in workload. However, NASS continues to find ways to become more efficient and currently employs fewer personnel than it did in its early years as an agency.

26. Funding challenges do exist in development of newer program areas and in support of traditional, on-going data series; particularly in tighter budget years. However, in an effort to maintain program relevance, NASS proactively conducts internal program reviews and reaches out to all stakeholders for program input. Additionally, NASS is in the process of developing a Long Range Plan that will involve a thorough review of people, products, and programs.

IV. RECENT DEVELOPMENTS IN AGRICULTURE AND OFFICIAL STATISTICS

27. Technology and a multitude of readily available data sources has encouraged and in some cases dictated rapid advances in agricultural statistics in the U.S. From Electronic Data Collection (EDR) to expanding processes used for product dissemination, NASS has vastly shifted their business model of 20 years ago. With expanded access to data sources and tools, initiatives have been undertaken to maximize external resources for improved products and services and to more efficiently use agency resources.

A. Electronic dissemination of products and tools

28. NASS' Agricultural Statistics Board currently releases over 500 reports per year from our Washington, DC headquarters location. While our primary release product continues to be paper reports, most of our data users receive our data products via the Internet or an email message. Concurrent to the paper report being released, our dissemination process includes electronic copies of the report (PDF, Text, and CSV formats) being posted to 2 different websites, a text version of the report being emailed to subscribers for that particular report, highlights published to an RSS feed, and most of our data are published to an online database (Quick Stats). In addition to these procedures, many of our Field Offices compile state-specific data into reports which are emailed to a list of subscribers who are interested in that particular state.

29. The market sensitive nature of some of our reports, combined with the need to produce timely world supply and demand forecasts by the USDA World Agricultural Outlook Board, necessitates that all of our release dates are published well in advance. Most of our reports are released at 3:00 PM; however, in 1994 a group of commodity traders requested that major crop reports be released at 8:30 AM, as is the practice for other Principal Economic Indicator reports.

B. Technology and it's continuing impact on data collection

30. Another area where technology has had significant impact on NASS business processes is data collection. Prior to 2003, NASS generated various paper versions that were used for mailings, face to face interviews, and telephone calling. For these forms, there was a limited ability to control content and format as quality control was through manual observation. NASS also collected data using Blaise Computer Assisted Telephone Interviewing (CATI) – software built and maintained by Statistics Netherlands. NASS' successful partnership with the

Netherlands began in 1992 and Blaise is still used to collect data for the agency's large, complex National surveys.

31. In 2000, with the U.S. government e-Gov mandate to offer respondents an electronic means for reporting, NASS pursued adding on-line reporting to our data collection tools. With this added requirement further emphasizing the need to efficiently create and manage multiple survey, state, and mode combinations of questionnaires, NASS developed a client-server based Questionnaire Repository System (QRS). The QRS stores formatted questions that can be used to build paper and on-line questionnaires. In the next phase of development, NASS has tested the use of the Electronic Data Collection (EDC) system which is a CATI-like system built to handle small to medium surveys and meant to complement Blaise. Similarly, all EDC instruments are built from the NASS QRS. All of these products have allowed NASS to realize time-savings as well as provide design staff total control over format, content, and standard use of question components for paper and web forms.

C. Uses of existing administrative data in combination with survey and census data

32. In an effort to gain further efficiencies and reduce respondent burden, NASS has also been aggressively evaluating administrative data uses. According to NASS policy, administrative data refers to data and reports obtained from agribusiness firms, regulatory agencies, and other government agencies. NASS routinely uses these data for frame development, in evaluating the performance of censuses and sample surveys, and for setting official crop and livestock estimates. On a more limited basis, administrative data are used in lieu of collecting survey data.

33. For many years NASS has obtained names and addresses of known and potential farmers from a variety of governmental and private organizations for list development. The most significant governmental sources include other USDA agencies, particularly the Farm Service Agency, and Federal Tax Information, which identifies individuals who report profit or loss from farming. Private organization sources typically include membership lists for commodity organizations, membership lists for community-based organizations that service agriculture, and subscriber lists for agricultural-orientated publications.

34. Two other major uses of administrative data are very much related – for evaluating the performance of censuses and sample surveys and for setting official crop and livestock estimates. Both of these function use aggregate commodity data (e.g., number of acres corn planted in a state). Although there is not an administrative data source that accounts for one hundred percent of the quantity of any commodity, there are several that provide reliable benchmarks. Comparing census and survey results with these benchmarks can identify shortcomings in those processes as well as providing valuable information for setting official commodity estimates.

35. Although used less frequently, NASS also uses administrative data in lieu of collecting survey data. This generally occurs when a sampled farmer is either unavailable or uncooperative for a survey. If administrative data are available for such situations, they can be used to either estimate survey answers, or to simply determine if the farmer is still in-business.

36. Although administrative data are of great benefit to NASS, they also pose some challenges. In no particular order, these include: (1) the inability to thoroughly assess the quality of administrative data, (2) the sometimes lengthy process of establishing necessary memorandums of understanding with organizations in order to obtain their administrative data, (3) the resources necessary to perform record linkage to match individual units on the administrative data source with individual units on NASS' list frame, (4) the ability to understand and address domain and definitional differences between NASS' data and the administrative data, and (5) issues related to understanding the metadata associated with the administrative data.

37. Maximizing the use of administrative data offers the potential to simultaneously increase efficiency and decrease respondent burden – two noble endeavors. While some such uses have been realized, it is an ongoing process at NASS to seek ways to maximize the benefit of administrative data, while overcoming their challenges and limitations.

D. Geographic Information Systems and their uses in agricultural statistics

38. NASS has a long history of using geographic information system (GIS) techniques to assist its fulfilling its mission. NASS has used satellite data for the past three decades as a key input for developing U.S. crop acreage estimates. Perhaps the two most notable GIS applications include the development of the NASS area sampling frame, which provides complete coverage of American agriculture, and the creation of Cropland Data Layers (CDL) in twenty states. Additional GIS applications currently in production include: the production of county estimate survey and Census of Agriculture thematic and reference maps; crop season visualization graphics; weekly Advanced Very High Resolution Radiometer (AVHRR) vegetative index maps during the growing season; creation and maintenance of a GIS citrus grove layer for Florida; the production of Cropland Data Layer county maps for Web atlases; and real-time mapping of major weather events that have a significant impact on agriculture, such as mapping the June 2008 floods over the Midwestern United States.

39. The methodology for creating Cropland Data Layers has been refined over the years. These refinements include: the satellite system was upgraded to provide five day repeat coverage, versus 16 days in the previous system, with 56 meters resolution; data for ground truthing now leverages existing USDA administrative data; software applications are now the commercial remote sensing industry standard and modernized with a classification and regression tree (CART) approach that allows for the inclusion of ancillary datasets to separate the non-agricultural land use/land cover. The CDL program historically provided end-of-season county indications, but now provides state-level acreage indications for several major commodities in key production states. Additionally, NASS supports a cooperative remote sensing yield program with the Agricultural Research Service/Hydrology and Remote Sensing Laboratory. The yield program is currently creating state and county yield indications for select major commodities in key production states.

40. Expanding GIS usage in NASS is not without obstacles. The applications and products currently being developed and deployed are highly technical and require a new and complex skill set to expand and leverage GIS programs across NASS. The relative priority of GIS applications versus other competing projects needs to be elevated when competing for resources. The ability

to use Global Positioning Systems (GPS) to assist in collecting field data surveys promises to increase efficiency and automatically generate digital data for analysis. These new capabilities will require procurement of new hardware and training of interviewers which will add to data collection costs, but these costs should be offset by productivity gains in collecting and recording data.

41. An additional program obstacle is lack of deployed Web mapping services for the dissemination and analysis of CDL imagery and no dynamic thematic map services integrated with NASS' survey/census data and graphic charts. Web mapping services provide efficient customer service by delivering online GIS data/mapping products and services to the public. Issues to be resolved include: access to Web servers with adequate storage capacity, firewall security, application design and development, web server centralization, and coordination of efforts with ITD.

ANNEX 4

AGRICULTURAL STATISTICS IN THE COUNTRIES OF THE COMMONWEALTH OF INDEPENDENT STATES

Note prepared by the Interstate Statistical Committee of the Countries of the Commonwealth of Independent States

1. Countries of the Commonwealth of Independent States (CIS) countries compile and publish a considerable amount of data characterizing the major aspects of economic process in agriculture, forestry and fisheries. These refer to the number of agricultural enterprises, output in current prices, broken down by major types of enterprises: agricultural organizations (relatively large enterprises with different type of ownership – state, collective and private), holdings of population and holdings of farmers, indices of volume of agricultural output in constant prices (the same breakdown by types of enterprises), output of major agricultural commodities (both crop and animal products) in physical units, data on agricultural land used for production of specific commodities, data on livestock (by type), data on development of private farms and holdings of population. The countries also publish data on stock of various types of agricultural machinery, use of fertilizers. These data provide the basis for analysis of state and development of agriculture and this information is essential for policy makers. These data are also used for compilation of national accounts and this makes it possible to assess the changing role of agriculture in the economy, to study interrelationship between the agriculture and other industries. The list of indicators of agricultural statistics of the CIS countries collected and disseminated by CIS-STAT is given in the annex to this note.
2. There is also a general understanding of the need of further improvement of agricultural statistics on the basis of the international standards. The common view is that the work on improvement of agricultural statistics should focus on compilation of additional analytical indicators essential for taking decisions on managing the agriculture. These refer to indicators of resources available to producers, financial indicators (assets and liabilities of producers, profits and losses, subsidies from the budget) productivity, income of farmers etc. The reliability of figures on basic agricultural activities of farmers and holders of personal plots of households obtained from the sample surveys is believed to require serious attention in a number of countries. It is also commonly recognized that it is essential to secure improvement of statistics of prices of agricultural goods sold at different prices at different markets and different channels of realization.
3. It should be emphasized that statistics of agriculture in the CIS countries has undergone significant changes during the last 16 years of existence of the CIS. The changes in statistics reflect to a considerable extent the transformation of centrally planned economies into market oriented economies in all sectors of economies and in agriculture, in particular. As a result of economic reforms in agriculture a number of large agricultural enterprises (with state or collective ownership) were liquidated and significant number of small and medium size private enterprises and farms were created in their place. This development resulted in considerable problems with collection of primary data needed for compilation of agricultural statistics relating

to various aspects of economic process in this sector of economy. Under these conditions a system of sample surveys had to be introduced in order to obtain data on activities of numerous small private farms and personal plots of households which were to supplement the data from the reports submitted to statistical authorities by agricultural organizations (relatively large enterprises with different type of ownership).

4. The transition from the Material Product System (MPS) to the System of National Accounts (SNA) required introduction of new concepts of output and intermediate consumption in order to ensure compilation of production account for agriculture consistent with the SNA requirements. The CIS countries were assisted in this endeavor by the Statistical Office of the CIS (CIS-STAT) which did it in the context of more general work associated with implementation of the SNA 1993 by the CIS countries. The issue which requires attention in this context refers to treatment of the work in progress as prescribed in the SNA, treatment of different types of subsidies, adjustment of figures on seasonality. Besides, using the above concepts in practice required a considerable work associated with collection of primary data both on output and input and achieving consistence of the estimates based on the data from different sources. It should be reminded that in the former USSR an essential element of agricultural statistics used for compilation of the most important tables of the MPS was a wide and detailed system of supply and use tables compiled for major groupings of agricultural products (both in physical and value terms) compiled in breakdown by the major types of agricultural enterprises (state farms, collective farms, personal plots of members of collective farms, personal plots of employees, etc.). Data from this system of tables were used for computation of agricultural output, major elements of input and some items of disposition of agricultural goods (final consumption, increase in stocks, etc.). Unfortunately, during transition to market this system of tables was considerably reduced and the structure of tables was simplified. As a result agricultural statisticians face serious problems associated with provision of data for compilation of major SNA accounts in strict compliance with the adopted definitions and classifications. For example, the structure of supply and use tables currently used by many CIS countries does not make it possible to isolate the consumption from own production which is to be valued in basic prices as the SNA requires.

5. There are certain problems with using sample surveys carried out to obtain data on activities of numerous small private farms. The coverage of these surveys in some cases is not complete and as a result the accuracy of figures decreases. In any case measuring output of small farms, personal holdings of households is a problem for a number of countries. In cases, when sample surveys do not secure the reliable results some adjustments are introduced on the basis of analysis of different sources and also using experts estimates.

6. Under these conditions the importance of agricultural censuses was recognized in majority of the CIS countries. CIS-STAT prepared some materials to assist the CIS countries in this area and, in particular, it worked out a model questionnaire for conducting agricultural censuses; this model was worked out on the basis of recommendations of the Program of the World Agricultural Census of Year 2000 prepared by the European Economic Commission and FAO: some adaptations were introduced in the model in order to take into account peculiarities in organization of economy and statistics of the CIS countries.

7. During recent years a number of the CIS countries carried out agricultural censuses: Kyrgyzstan in 2002, Georgia in 2004, Azerbaijan in 2005, Kazakhstan in 2006, Russia in 2006. As a result of these censuses valuable information of state and development of agriculture (in the country as a whole and for individual regions) was obtained. For example, data on a number of agricultural enterprises were updated and they can be used for planning and organizing different sample surveys. As a rule, censuses provided data not only for the whole country but also for regions. The most important directions of future work in the above countries are the following:

- (a) Permanent actualization of general population of agricultural enterprises;
- (b) Improvement of methodology of sample surveys;
- (c) Retrospective revision of past series of data.

8. In such countries as Armenia, Belarus, Moldova, Tajikistan, Turkmenistan, Uzbekistan and Ukraine the agricultural censuses are intended to be carried out in foreseeable future.

I. A LIST OF DATA OF AGRICULTURAL STATISTICS OF COUNTRIES OF THE COMMONWEALTH OF INDEPENDENT STATES CURRENTLY COLLECTED BY THE STATISTICAL OFFICE OF THE COMMONWEALTH OF INDEPENDENT STATES

Crop production

Stock and structure of agricultural land used by agricultural producers – total and in breakdown by major types of enterprises – agricultural enterprises and organizations, holdings of farmers, holdings of other types of households

- total agricultural land
 - of which
 - total area of agricultural land of agricultural producers
 - of which
 - total area of arable land used by agricultural producers
 - area of mowing ground used by agricultural producers
 - area under crops
 - of which
 - area under cereals and leguminous crops
 - area under industrial crops (cotton, sugar beats, flax and so forth)
 - area under potatoes, vegetables and melons
 - area under fruits and berries
 - area under grapes
- Gross production of crops
- of which
 - cereals and leguminous crops
 - industrial crops
 - potatoes, vegetables and melons

- fruits and berries
- grapes

Production of animal products

Number of livestock and poultry
of which

- number of cattle
- number of pigs
- number of sheep and goats
- number of horses
- number of camels
- number of poultry
- production of meat (slaughtering weight)
- production of cattle
- production of milk
- production of eggs
- production of wool

Value indicators of agricultural production

- Gross output of agriculture in current prices (broken down by major types of producers)
- Gross output of production of crop products in current prices (broken down by major types of producers)
- Gross output of production of animal products in current prices (broken down by major types of producers)
- Indices of volume of agricultural production (constant prices) broken down by major types of producers
- Indices of volume of production of crop products (constant prices) broken down by major types of producers
- Indices of volume of production of animal products (constant prices) broken down by major types of producers
- Sales of agricultural products by all producers (all channels) broken down by major types of organizations engaged in purchases of goods
- Sales of major types of agricultural products by all producers (separately by type of product)
- Average prices of major agricultural products
- Price indices of agricultural products

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