International Interests In Agricultural And Rural Statistics

R. Ronald Bosecker, Administrator

U. S. Department of Agriculture / National Agricultural Statistics Service

ABSTRACT

The paper discusses a number of interests we in the international agricultural statistics community face together. Establishing standards and sharing methodology to deal with the challenges we have in common are not only more efficient for the profession at large but also promote comparability across statistical programs over both distance and time. Of interest is the need (demand) for agricultural and rural data we face globally, the "necessary issues" we all face to produce (supply) the data, and the heightened responsibility of statistical agencies in today's world. The conclusion notes the current widespread emphasis on performance measurements for government services, the measures applied to statistical agencies, and our task of measuring the performance of agriculture.

I am greatly honored to address this international body where we share a common interest, . Our interest is of course in serving the information needs of agriculture and rural societies around the world.

I would like to begin with the words of the esteemed agricultural economist, Jim Bonnen, at Michigan State University. When he delivered the Elmhurst Lecture in Berlin at the 2000 meeting of the International Association of Agricultural Economists (IAAE), his conclusion noted "a growing international need now exists for publicly provided information, products and services for the creation of new institutions and new human capitol. It is important that we (economists) do our work and introduce the results well ahead of the political debate so that our analysis is absorbed and seen as useful, nonpartisan information and is not politicized by policy conflict."

Here, at this gathering of statistical information specialists, I think it is appropriate to emphasize Dr. Bonnen's expressed need for information, and to remember the importance he attaches for economists to be out front ahead of the policy debate. Since economists depend heavily upon accurate, unbiased statistical data in order to perform their economic policy analyses, it means the statistician must be even further ahead in addressing emerging issues to provide data most useful to economists, policy officials, and public data users.

Professor Bonnen also emphasized nonpartisanship and not letting analysis become politicized. The distributed statistical system in the United States has several different appointment routes for the Heads of the various statistical agencies. Among the 14 principal agencies who comprise the U.S. Interagency Council on Statistical Policy (ICSP), there are 8 of us (including Susan Offutt and myself here at MEXSAI) who are career civil servants and 6 who are Presidential appointments with Senate confirmation. Three of the 6 have fixed 4-year terms while the other 3 may be terminated at the end of an administration. Regardless of the mechanism for the

appointment, it is well recognized that the data produced by the statistical agency must be unbiased by political or financial interest. I know my colleagues at the other U.S. statistical agencies, with whom Susan and I meet monthly, are all extremely serious about maintaining an independence between statistical process and political process. Personally, I am very thankful that our work is non-political. I have worked through many Administrations, both Republican and Democrat, and each has recognized the importance of not even appearing to influence any statistical measures.

The MEXSAI Conference title, "Measuring Sustainable Agriculture Indicators" and the program topics are excellent for highlighting today's challenges. Sustainability is critical to long term food security and it is paramount that we make the necessary measurements to actively monitor the world's food security.

As I traveled the world meeting with statistical agencies during my career, a career very quickly approaching 40 years, I have always been struck by the commonality of issues we all seem to face simultaneously. This led, some time ago to a list I call the "Necessaries In Applied Survey Statistics." The list will look very familiar to you, but there are different ways to address these issues and there is much we can learn from each other.

My top 10 list of necessary issues that make our job interesting include:

1. The need to communicate with data users about what information is most needed, and with data providers about both the importance of the information and the data they can reasonably and accurately supply,
2. The need for a well defined sampling frame useful to our purpose.
3. The requirement to identify available resources and live within a budget (a necessity that is always an issue),
4. Dealing with reporting units that differ from the sampling unit,
5. The need for dedicated, well trained data collectors,
6. A way to deal with nonresponse and respondent burden,
7. A way to deal with sampled extreme observations (outliers),
8. The need to process, interpret, and safeguard reported data,
9. Determining best measures of both level and change, and maintaining statistical consistency over both space and time,
10. The need to report out survey results in a timely and most useful manner while protecting individual reports from disclosure.

These make up my statistical top 10 common interest list. There are certainly many more issues and others may develop a different list. My point is that we all share the need to deal with these things in one way or another whether the subject is agricultural production or rural household income. This conference and other international venues that promote sharing our methodology are therefore very important. It is also important to remember that the latest high-tech solution for these issues is not necessarily the best solution for a particular set of circumstances.

Having made that point about new technology, I did make use of some newly acquired software to illustrate to you the wide array of issues within issues that we face. NASS acquired this software to let data users access statistical results through a visual diagram rather than a linear

table of contents. Users can select maps, graphs or tables based on the 2002 U.S. Census of Agriculture by following the diagram to their area of interest. I have adopted this tool for presentation purposes by linking many of the statistical issues we face within a network. I thank our Australian Bureau of Stats friends for impressing upon me their emphasis on the benefits of visual representation for projects and programs. I thank our friends and colleagues in Mexico, Canada, China, Russia, and many other countries with whom we work closely for their perspectives on the wide variety of issues presented in the diagram. (To see the diagram, and move around within it, you can visit the NASS website at www.usda.gov/nass, select the Research page, and click on MEXSAI "Star Tree" diagram.

The diagram beginning, I maintain, is at the end of the statistical process. Start with the data needs and the desired information sought from the statistical inquiry. These determine the useful output variables to be presented to data users. For example, are we presenting production data for markets to operate efficiently or are the data providing economic information for policy decisions? This is also where we need to consider international standards and data comparability with other countries. Are the answers available via administrative data**,** through remote sensing, or is a survey required? Each choice will take you along a different path. If a survey is needed, should it be a census or sample survey? This choice depends upon the detail required either geographically or by subject matter. What are the resource needs and what are all the components that impact the project management plan? The project management portion of the diagram contains a wide variety of concerns for survey statisticians. Behind the multitude of issues included in the diagram could reside the documentation on design and procedures for reference at the click of a button.

The methodological issues highlighted above are familiar to us. We continue together to explore and share experiences as we determine how best to deal with them. I turn now to a newer concern for the world's statistical agencies. Food security has an additional, more ominous, aspect that has come to the forefront since Professor Bonnen's Berlin presentation in 2000. The safety of our food supply and the security of our agricultural system in today's world pose new questions for the statistical community to examine and to determine our full and proper role.

In the U.S. several USDA agencies are involved in maintaining security for crops and animals and responding to threats posed by outbreaks of pests and diseases in agricultural commodities. Some pests and diseases are so serious that if they remain unchecked, they can cause serious health problems or take a heavy economic toll. You are already well aware of the impact that mad cow disease, foot and mouth disease and other pathogens or destructive pests can have.

There are two agencies with primary statistical roles relating to U.S. crop and livestock production in the USDA. The National Agricultural Statistics Service (NASS) is the Department's data collector and is responsible for providing the official agricultural statistics. The Economic Research Service (ERS) provides critical economic data analysis for the Department. These two agencies interact in several ways to contribute to the homeland security efforts of the USDA.

Response to outbreaks consists of first, detecting the problem; second, impact and response evaluations; and third, containment and eradication. What are the tools we in statistics have

available to bring to bear in a crises situation: 1) a list frame of producers, 2) a summary data base on inventories and production in affected areas, 3) economic analysis expertise, 4) geographic information system (GIS) capabilities, 5) contingency plans for continuity of service, and 6) the eyes, ears, and local knowledge of field interviewers (in NASS over 2,000). I will quickly discuss each of these tools.

The list frame of farm operators can serve as an early educational tool as well as for notification of an existing problem together with instructions for producers. Early on, the list was viewed by some as a source of names, addresses, and data that could be entered into other databases for their use. We have since convinced the requesters that confidentiality restrictions preclude our making individual names and data available. We have also pointed out that this is not so great a liability in dealing with a problem because: a) we can contact producers as needed through our own field and telephone interviewer capabilities; b) addresses can be misleading about the specific location of land operated; and c) the list is never 100 percent complete. Therefore, localized inspection and quarantine actions will necessarily have to be done by canvassing the affected area on the ground to be sure of complete coverage.

With regard to determining the size of the problem posed by an affected area, summary data relating to localities are available for a wide variety of crop and livestock commodities. Some commodity measures are provided on an annual basis down to county level and all are available for census of agriculture years. These data provide the relative scope of the problem faced when an outbreak occurs in a given area. They also provide the basis for an evaluation of the likely economic impact resulting from the outbreak. Basic data are therefore useful for decision making about the resources needed to combat the problem and the amount of disaster assistance likely to be needed to mitigate the economic impact of the problem.

The Economic Research Service is able to employ a geospatial economic analysis that forecasts the economic damage likely to occur given a particular kind of outbreak in a given location. ERS has developed their GIS system at the request of the Secretary's Office to provide the Department's senior leadership with information for their decision-making in case of an agricultural bioterrorism event.

In case of an act of agricultural bioterrorism, ERS' geospatial economic analysis can display the outbreak so its spatial dimensions can be visualized by decision makers, determine the effect of alternative quarantine boundaries, and calculate the upstream and downstream economic damages initially and over time if the outbreak spreads. This is an extremely important tool to U.S. policy makers.

Another useful GIS based tool comes from the National Agricultural Statistics Service remote sensing program. We can use satellite images to generate a mosaic of crop fields with the crop type labeled by field. This is called a cropland data layer and would be quite useful to map the locations of susceptible crops relative to fields containing a particular problem. This cropland data layer is currently a standard product for several States on an annual basis but the methodology is in place to apply where needed.

Another component of homeland security, a concern which all statistical agencies face, is having the ability to continue service in the event of terrorist activities. Agricultural commodity markets depend upon official statistics to operate normally. There is a high cost associated with uncertainty in the market place. Therefore the agencies have developed alternative procedures to provide official statistics with the least disruption to scheduled release dates while maintaining data security prior to release. In September 2001, we were able to release reports scheduled for September 12th on the 14th. The rescheduling was announced very quickly and questions from data users about whether security had in any way been compromised were answered to their satisfaction.

Finally, we can't overlook the value of our human assets all over the nation. Early detection is a critical component in the war on the spread of pests or diseases. Our field staff, both office workers and interviewers, travel extensively. Training them in what to watch for, with the help of the staff in the Animal and Plant Health Inspection Service, provides additional detection capability for the USDA. Our people are at the farmsteads and are even inside the crop fields taking measurements for our objective yield forecasting program. While they can help with spotting problems, we certainly do not want them to transmit problems to other fields. When they spot suspicious situations, we want them to bring the potential problem to the attention of the producer and their supervisor before proceeding further.

In summary, statistical agencies in USDA are active in using their capabilities for education to prevent or minimize problems, for vigilance to provide early detection, for data to facilitate response planning, for information systems to use for evaluation, containment, and economic compensation, and for contingency planning to minimize the disruption to the normal economic activity in the agricultural sector and related marketing system.

I will conclude with a final observation about the importance of indicators. Another common initiative shared within the international statistical community today is the strong emphasis on performance measurements. At issue is how we prove our programs are timely, accurate, relevant, and efficient. We therefore set about the business of reporting the precision of our estimates and the amount of error in our forecasts (a fundamental statistical practice), documenting our discussions and feedback from data providers and users (a prerequisite for providing a useful service), tracking the costs of producing the statistical data (a sound business practice), and looking at other measurements that surround our statistical practices. In addition, and more importantly, as leaders in providing agricultural statistics services, we need to emphasize to others that a central purpose of our work is to measure the performance of each nation's agricultural and rural sector. Therefore, by implication, we play a critical role in measuring the effectiveness of public policy and private business decisions that influence national agricultural performance.

I thank you for this opportunity and for your gracious attention.