

Challenges to Agriculture Statistics in an Environment of Government Restraint

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Increased client expectations and sophistication, improvements in technology, and new approaches to sampling methodology and population frames, have created significant challenges to the provision of high quality agricultural statistics in an environment of government restraint. This paper examines the major challenges facing statistical organizations attempting to satisfy the increasingly sophisticated demands placed on them by users of agricultural statistics. Challenges in maintaining relevant population frames, improving the efficiency of sample design, and providing more relevant statistics in an environment of government restraint are discussed in this paper. Practical solutions to these challenges are presented and discussed in the context of the Australian situation. The paper also examines the opportunities presented to organizations through rigorous reviews of procedures and output.

1 Background

The role of the Australian Bureau of Statistics (ABS), as specified in the ABS mission statement, is to "...assist and encourage informed decision-making, research and discussion within governments and the community by providing a high quality, objective and responsive national statistical service".

In relation to the agriculture sector, the ABS and its predecessors have been doing this for over 140 years. However the type and range of agricultural information we now collect is substantially different to that collected over 100 years ago. This is not surprising given the changes which have taken place in agriculture and the current sophistication of users of statistical data.

Over 100 years ago, the agriculture industry accounted for around 20% of Australia's Gross Domestic Product (GDP). In addition, almost 30% of the male population and just over 10% of the female population were employed directly in the agriculture industry. However at the start of the 21st century the industry accounts for around 3% of GDP and 3.5% of employment.

This decline in share of GDP and employment reflects structural changes in the economy, rather than any decline in the size of the industry. Australian agriculture, like agriculture in most developed countries, has moved from a labour intensive industry to one that is capital intensive, using modern machinery and other technology to undertake tasks previously done manually. At the same time, the national economy has become more diverse, reflected most dramatically in the rapid growth of the services sector, which now contributes almost half of GDP.

However, despite the relative decline in GDP, agriculture is still a very important sector from other perspectives. It utilizes a large proportion of natural resources, accounting for 70% of stored water use and almost 60% of Australia's land area. In regional and rural areas, it is a significant employer and the life-blood of many rural towns. At a more personal level, Australian agriculture directly affects every person in Australia (and a significant proportion of people living in many other countries) through the quality and availability of the food it produces.

2 Expansion in demand for data

In recent times, and in particular the past 10 years, demands for data have changed significantly, with an increasing interest in issues relating to environmental and economic sustainability. Demand for data on traditional items of production and yields remains strong, with these new demands an additional requirement.

Traditionally, core agricultural data focused on production data, specifically area of each crop planted, the quantity harvested and numbers of livestock held and sold for each type of livestock. This information was used by National Accountants to estimate agriculture's contribution to the economy, and by other users to monitor the development of the agricultural industry in terms of types of commodities produced and the areas in which particular commodities and activities were expanding or contracting.

For most of the 20th century this information was sufficient to meet the needs of policy makers involved in the agricultural industry. However towards the end of the 20th century, there has been increasing pressure to expand the dataset to include more information on matters relating to the sustainability of the industry. Policy makers are now asking questions such as:

- Can the current rate of expansion in agriculture be maintained in the long term?
- Are natural resources being utilized by the most efficient industries?
- Is the cost to natural resources exceeding the benefits received from their exploitation?
- Are farmers earning enough to maintain the natural resource base in an acceptable condition?
- What management practices do the more profitable farmers use?

Data to provide answers to these questions are not easy to find, and increasingly the satisfaction of these demands results in additional challenges for statistical organisations. With the increasing sophistication and power of models used to measure, for example, the impact of agriculture on the environment, users now require data at very fine geographic levels so that regional issues can be examined in detail. Indeed, data is required for input to Geographic Information Systems (GIS), so that it can be overlaid with other spatial data. This demand for more information and finer level data comes at a time when additional funding is difficult to obtain.

3 How do we achieve more with less?

There are a number of strategies which the ABS has adopted to help satisfy increasing demand for agricultural statistics within an environment of government funding restraint. Most important has been the realization that it is not just agriculture statistics that are now subject to a more rigorous justification of their existence. Almost all government agencies and private organizations are subject to similar constraints.

Far from being a problem, the ABS sees this dilemma as a way of achieving more useful and relevant statistics as a result of more rigorous assessment of all new and existing data requirements.

To improve our ability to satisfy new demands for agricultural statistics in an environment of restraint, the ABS has adopted the following strategies, (further details of which are given below):

- a) the use of Information Development Plans for each major field of statistics, to ensure that correct priorities are assigned to data needs
- b) increased use of sample surveys rather than undertaking complete enumerations
- c) increased use of alternative sources of data, particularly the use of administrative data and linking of existing datasets
- d) use of latest technology to process and disseminate data more efficiently
- e) undertaking regular reviews of processes to ensure that the most effective methods and business structure are used in production of statistics
- f) investigating all potential sources of funding for high priority data needs

3.1 *Use of Information Development Plans*

Information Development Plans (IDPs) aim to establish an agreed understanding of Australia's statistical priorities and establish a shared responsibility between the ABS and major users and data custodians for collaborative work that will address identified unmet statistical needs.

An IDP is an agreement, developed as a joint effort between key stakeholders, that defines the suite of information required to support policy in a particular field of statistics. Each IDP embodies three kinds of knowledge, and a shared commitment, to statistical development activity:

- demand for information - a picture of the statistics that would ideally support informed design and evaluation of policy, other decision-making, research and community discussion
- supply of information (including raw data that might be used to create statistics) - a picture of the existing data pool that might satisfy the demand for information

- agreed statistical development activity - identified through the comparison of demand and supply, together with a rigorous assessment of relative priorities of unmet data needs.

Some of the agreed outcomes from the Agriculture IDP include:

- a renewed focus on methods to improve timeliness and accuracy of agricultural data from the existing agricultural collections
- testing of a strategy to link data from the Census of Population and Housing with the Agricultural Census
- a proposal to classify 2005-06 Agricultural Census data to meshblocks (small geographic areas comprising around 30 households, the boundaries of which also take into account significant natural features such as rivers, mountain ranges, and local government area boundaries) to allow fine level geographic data to be released from the census. This outcome will be subject to funding by users of the data.
- a realization by users of statistics that the ABS cannot fund all high priority data needs alone.

3.2 *Increasing use of sample surveys*

The use of sample surveys to satisfy new demands for high quality agriculture related data has enabled the ABS to satisfy these demands with minimal additional cost and provider load.

Commencing in 1997-98 the ABS replaced the (previously annual) Agriculture Census with a sample survey for four years out of every five. This approach continued to satisfy essential data needs while producing significant savings in resources as well as provider load.

Since then, new surveys have been developed to collect information about important environmental issues. These include a survey to measure the extent of dryland salinity and the strategies adopted by farmers to manage and prevent it; and a survey on water usage and irrigation management on farms.

Both these surveys selected respondents based on answers to trigger questions contained on prior Agricultural Census/Survey collections. This approach enabled the survey to target those respondents who were involved in the issues which were the subject of the survey. This method provides much higher quality data from a much smaller sample than would have been the case if a random sample of farmers had been selected for the collection.

It is worth noting that the move to sample surveys has created challenges in maintaining an up to date population frame for agricultural statistics. The solution to this challenge has been to adopt the Australian Business Register (ABR) as the new population frame for agriculture surveys commencing from 2005-06 reference period. The ABR was

created as part of recent taxation reform initiatives implemented in Australia and is maintained by the Australian Taxation Office.

3.3 Alternative sources of data and linking of datasets

Identifying alternative sources of data, including administrative data held by government agencies and private organizations, offers the potential to significantly improve the ability of statistical organizations such as the ABS to meet new and existing demands for data.

Many organizations such as tax and inland revenue offices, customs offices, licensing authorities, local and state government authorities and some private organisations hold various information on households and businesses. Much of this information is available (at the aggregate level and subject to privacy laws) to the public, but its existence is not widely known.

Initiatives such as the development and maintenance of directories of all known available datasets relating to a particular subject matter are an important source for those attempting to find information about a particular subject. Work associated with the development of these directories is very useful and in many cases identifies information which otherwise would have required the development of a new statistical collection in order to obtain it.

The ABS also makes extensive use of alternative datasets relating to agriculture to confront data collected by ABS. This approach is one of the tools used by ABS to ensure that significant errors or coverage issues are identified prior to publication of the data.

One other way of satisfying new demands for data is to make better use of existing ABS datasets by linking them. Extensive investigations are currently underway into the linking of the Census of Population and Housing and the Agricultural Census. Should this be successful, it will provide data users with a much more detailed dataset than can be obtained from each of the collections separately.

The use of external datasets (for example data held by the Australian Taxation Office) to supplement data collected by the ABS provides significant savings in data collection costs and provider load for a number of ABS collections.

3.4 Use of latest technology

The ABS invests heavily in evaluating the latest technology available for statistical organizations, and designs much of its own software associated with collection processing.

Technology relating to data capture (for example scanners, character reading software and on-line editing software), survey design (relating to stratification, sample selection), survey processing (used for dispatch and collection control, editing data, imputing for non-response and reporting of estimates) are all used extensively by the ABS.

The stringent evaluation and use of the latest technology ensures that technology is used to best advantage and contributes maximum savings and efficiencies to the agriculture program.

3.5 Regular review of processes and structures

The ABS conducts regular reviews of its processes and structures to ensure that it remains an effective organization able to fulfill its obligations to government and the community.

In response to technological advances, and the continuing need to realize productivity gains to generate capacity for future statistical work, the ABS commenced a major review of its structure and operations in 1999. In early 2002, following two years of extensive investigation into various options, and much consultation with staff, a decision to proceed with what is known as 'the Business Statistics Innovation Program (BSIP)' was announced.

BSIP involved establishing:

- an Economic Statistics Data Centre (ESDC) - a common, nationally managed environment for pre-input editing functions for all business collections
- Business Statistics Centres (BSCs) - responsible for the production of regular ABS outputs, including analysis
- National Statistical Centres (NSCs) – responsible for providing statistical leadership in a designated field of statistics focusing on issues mainly to do with the future.

The implementation of BSIP provided ABS with opportunities to adopt the latest technology and business processes with minimal disruption to ongoing statistical collections and staffing. Without this significant restructuring, the ABS could not continue to accommodate new demands for data in the current environment of government restraint.

3.6 Investigating all potential sources of funding

The ABS is very aware that without additional sources of funding, a number of important statistical initiatives would not proceed. One of the important roles the ABS has in the current climate is to bring to the attention of policy makers and other users of statistics, the fact that only the highest priority statistical collections are funded by the ABS.

This leaves a significant portion of important statistical work that needs to be funded by other means. The ABS works with users to try and identify solutions to this problem which may include:

- partial funding by ABS (with the remainder being funded by the client)

- the formation of a syndicate of users who may either pay the entire cost or a portion of the total cost with the remainder funded by the ABS
- encouraging policy departments to plan ahead in relation to their statistical needs so that funding for statistics can be planned for and entered into future budgets allocations.

The ABS also has the option of approaching government to obtain additional funding to cover proposals which it cannot fund itself but deems to be worthy of ABS funds. This option is undertaken rarely and then only after significant worthwhile proposals have been unable to be funded within the ABS budget.

4 Summary

The ABS has adopted a range of strategies for dealing with finite levels of resources. These have included becoming more efficient through the use of latest available technology, restructuring business processes, reviewing statistical procedures and devising ways to effectively identify and prioritize unmet statistical demands.

In addition the ABS has increasingly adopted the use of sample surveys to satisfy users needs where possible, rather than attempting large complete enumerations of the population.

The use of alternative data sources, in particular administrative datasets, and the linking of existing data sets are two more ways in which the ABS has been able to more effectively provide value for money in terms of the statistics it produces.