

RURAL WATER USE AND THE ENVIRONMENT: THE ROLE OF MARKET MECHANISMS

PRODUCTIVITY COMMISSION

SUBMISSION BY THE AUSTRALIAN BUREAU OF STATISTICS

February 2006

Introduction

The Australian Bureau of Statistics (ABS) is Australia's official national statistical agency. It provides statistics on a wide range of economic, social and environmental matters, and covers government, business and the population in general. On recognising the importance of water to Australia, the ABS had developed a program that aims to deliver water statistics to decision-makers, researchers and the public. In particular, the ABS is endeavouring to supply data that will assist with the assessment of the impact of Council of Australian Governments (COAG) water reforms. These reforms have increased demand for information on all aspects of water use and management at a detailed level and on a timely/regular basis.

A great deal of information is required to provide a comprehensive picture of water use by the Australian agricultural industry. An understanding of the temporal and spatial dimensions of water use can only be gained if comprehensive, timely, consistent and comparable information is available. Without such information, agricultural water use cannot be measured accurately nor can market mechanisms be established or assessed effectively.

This submission will concentrate on existing ABS statistics about water use, our plans for enhancing these statistics, and ways in which the ABS might assist in filling information gaps.

ABS Agricultural Water Use Related Products

The ABS produces two publications that relate directly to agricultural water use and water markets. These are the *Water Account, Australia* (ABS Cat. No. 4610.0) and *Water Use on Australian Farms* (ABS Cat. No. 4618.0). The *Water Account* sets water use by the agricultural industry in context of the whole economy and allows comparisons with other industries. *Water Use on Australian Farms* presents detailed information on irrigation water use and management. These publications are discussed in more detail below.

Water Account, Australia (Cat. No. 4610.0)

The flagship of the ABS's water statistics program is the *Water Account, Australia*. The *Water Account* describes the physical flow of water from the environment through the Australian economy using the International System of Integrated Environmental and Economic Accounting (UN 2003). The *Water Account* consists of water supply and use tables as well as information on water reuse, stocks, and environmental flows. Information on water supply and use is presented by industry, which makes it possible to make comparisons between different industries of the Australian economy and between states and territories. The *Water Account* also presents detailed information on water use within industries. For example, in the second edition, the chapter on agriculture provided details of irrigation methods used, area of crop and pastures irrigated and the water applied, and the gross value of irrigated agriculture. A further chapter presented information on water trading.

The first edition of the *Water Account* was published in May 2000 for the 1993-94 to 1996-97 reference periods, and was largely experimental. The second edition, for the reference period 2000-01, was published in May 2004. It had many methodological improvements that resulted in higher quality data. The third edition is currently being compiled for the 2004-05 reference period, which is due for release in May 2007. The *Water Account* is one of the few water accounts that exist in the world.

Water Use on Australian Farms (Cat. No. 4618.0)

Water Use on Australian Farms was developed in response to strong demand for nationally consistent information on irrigation water use, particularly from government agencies, and agriculture and related industries. The first edition presented information for the 2002-03 reference period and the second for the 2003-04 reference period. They were published in March and October 2005 respectively.

The first edition of *Water Use on Australian Farms* was comprehensive in its coverage. Information was presented on a range of irrigation management and finance subjects, such as:

- water entitlements;
- water purchases and sales, both temporary and permanent;
- irrigation methods and decision-making;
- changes to irrigation practices and associated barriers;
- irrigation expenditure; and
- gross value of irrigated agricultural production.

For the reference year 2003-04, financial information was not presented and information on irrigation management was restricted to irrigation methods and the number of establishments trading water.

Collections and Data

The ABS uses a variety of methods to collect information on water depending on factors such as cost and the availability of similar data from other sources. For example, *Water Use on Australian Farms* presents the results of ABS surveys. In contrast, the *Water Account* makes use of ABS survey data and data collected and reported by industry associations, such as the Australian National Committee on Irrigation and Drainage (ANCID), Australian Water Association (AWA), Water Services Association Australia (WSAA), Government agencies, and water suppliers. In total, over a hundred sources of data were used to compile the 2000-01 *Water Account*.

A brief outline of ABS Surveys undertaken in recent years to collect water use information is outlined below.

Water Survey - Agriculture

The ABS first conducted this survey in respect of the 2002-03 reference year. It has not yet been repeated. The survey was designed to provide a sound understanding of the volume, purpose and location of water use in the agricultural industry to assist the overall understanding of water use and management in Australia. Information was also collected on irrigation management and finance. The scope of the survey included all establishments that had answered positively to the irrigation trigger questions on the 2002-03 Agricultural Survey. Data were published in *Water Use on Australian Farms, 2002-03*.

Agricultural Survey

For the 2003-04 and 2004-05 reference years, water use questions were included on the Agricultural Survey. This is an annual survey designed primarily to collect commodities data (including area and production for crops, number of livestock and area irrigated). Every fifth year, a Census is conducted with sample surveys in intervening years. The next Agricultural Survey, conducted in respect of 2005-06, will contain a number of water use questions, specifically area irrigated and volume applied by crop type, and source of water. Data from this survey are published in *Water Use on Australian Farms* and will also be used in the compilation of the next *Water Account*.

Water Supply Survey

The ABS Water Supply Survey is designed to address user requirements for timely, consistent and comparable information on the supply and use of water in Australia. Several organisations currently produce regular (annual, biennial or less frequent) statistics that cover parts of different components of the water industry. The Water Supply Survey will allow the ABS to produce comprehensive statistics that cover the whole industry, and that in turn, will facilitate comparisons between components and between reference years. The survey will be conducted on an annual basis beginning with the 2004-05 reference year. The scope of the survey covers all urban water and sewerage service providers and irrigation water and drainage service providers in Australia. Data from the Water Supply Survey will be published in the second half of 2006, as well as being included in the next *Water Account, Australia*.

Natural Resource Management Survey

The ABS Natural Resource Management (NRM) Survey is designed to address the increased demand for an extensive range of environmental and NRM statistics to support NRM planning and decision-making, as well as assist with the implementation and evaluation of major programs such as the Natural Heritage Trust, National Water Initiative and National Action Plan for Salinity and Water Quality. The survey will be conducted on a biennial basis beginning with the 2004-05 reference year. Information will be collected on water-related problems, activities undertaken to prevent or manage water-related problems, and the time spent and financial cost of preventing or managing water-related problems. The first results from the ABS Natural Resource Management Survey are expected in mid 2006.

Additional Activities

In addition to collecting and presenting data on water, the ABS also undertakes a range of related activities. These activities include:

- development and promulgation of national and international standards;
- participation in a range of forums concerning water e.g. Executive Steering Committee for Australian Water Resource Information (ESCAWRI), Australian Government Water Research Coalition (AGWRC), Water 2010, National Land and Water Resources Audit (NLWRA); and
- assisting with the identification and use of data for indicators.

Research Agenda

The ABS has a research program aimed at developing methods for producing regional estimates of water use without the need for costly, resource intensive data collection. A research paper is currently being prepared that explores a methodology for calculating river basin level estimates of agricultural water

use using data from the 2000-01 Agricultural Census and 2000-01 *Water Account*. This paper responds to demands from users for regional information at finer boundaries than the ABS typically uses in the design and output of its surveys. The research paper is expected to be released during 2006.

Water Trading and Pricing Information

Information on water trading and pricing was published in the 2000-01 *Water Account* for several Australian states. However, owing to the limited availability of data from public sources, a comprehensive picture of water trading in Australia could not be presented at the time. Comparisons between states were also difficult as the information collated differed in its content and level of detail for each state. The ABS is currently collating water trading and pricing data from state and territory government departments for the 2004-05 reference year, for publication in the third edition of the *Water Account*.

Data on water trading have also been published in *Water Use on Australian Farms*, collected from surveys of irrigating establishments. Although they form a significant component of the water market, irrigating establishments are not the only participants involved in water trading. Consequently, administrative data from government-maintained water registers are likely to provide the most comprehensive information on water trading and pricing.

Since the last *Water Account* was published, signatory governments to the National Water Initiative have agreed to "*have in place pathways by 2004, leading to full implementation by 2006, of compatible, publicly-accessible and reliable water registers of all water access entitlements and trades (both permanent and temporary) on a whole of basin or catchment basis*" (paragraph 59, NWI). The ABS expects these registers will assist in providing more comprehensive and accurate water market information.

Information Requirements

Comprehensive, timely, consistent and comparable information is an essential part of the development of effective market mechanisms. Market mechanisms must also be set up so that information, such as statistics on water trading and prices paid, can be readily compiled. Information assists participants assess markets and so builds confidence, and helps in the development of markets and market mechanisms.

A case also exists for making such information assessable to the public to avoid the situation where buyers and sellers have asymmetric information about the market, which favours the participant with better information than the other.

The usefulness of data will depend on the level of data collection. For example, pricing data are most useful at the regional/river basin level as they are likely to reflect the scarcity and value of water in that region (assuming there is sufficient depth in the market). It is also important to note that at the regional level (and also at some state levels), the volume of water bought may not equal the volume of water sold due to inter-region or inter-state trading.

ABS role in filling information gaps

Strong demand currently exists for good quality and ongoing statistical information on agricultural water use and water markets. Some information will be available from the ABS and other sources, but it is likely that additional information will be required if effective market mechanisms are to be established and assessed. Following the Commission's *Inquiry into rural water use and the environment: the role of market mechanisms*, there are a number of ways in which the ABS could assist in filling such information gaps. They could involve:

- adding irrigation management questions to the annual Agricultural Survey;
- developing new collections or indicators. This development would require an assessment of user requirements to understand fully actual needs and proposed uses of any new data;
- assisting others in the collection/collation of water trading and pricing data;
- producing more frequent Water Accounts (such as annually); and
- leading the development of consistent standards, frameworks and concepts.

While the ABS remains committed to its existing work program in this area, the ABS has limited capacity to expand its work program without additional funding. Should the Inquiry recommend that the ABS take action on some or all of these issues, the ABS would need to seek resource commitment from government and/or industry sources.

Contact Information

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6 February 2006