



Land management statistics - informing the relationship between Australian agriculture and the rural environment

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Background of Australian agricultural statistics

Like many countries, farming has been at the forefront of Australia's development. It has fed the growing population and provided an underlying economic lynchpin that has been vital to Australia's prosperity. Statistics have helped inform decision-making in relation to the industry throughout its history, and the demand for good quality data has increased further as Australian agriculture faces new challenges into the 21st century.

Agricultural area and production data has been collected for key commodities such as wheat, barley, sheep and cattle since Australian settlement, providing a rich time series of the development of the agricultural industry in Australia. As technologies improved, Australia's agricultural production increased and expanded beyond the needs of the Australian population enabling Australia to become one of the world's major food exporters during the 1920s and 1930s.

Since then, increases in productivity have been achieved through a combination of factors, including the adoption of innovative farming techniques, scientific developments in plant and animal breeding, advances in machinery and other technological developments, and improvements in the management of crops, livestock, land, water and pests. However these increases in agricultural production have been accompanied by increasing concerns about land degradation and the long term implications of land management practices on the sustainability of agricultural lands. The increasing salinity of the Western Australian wheat lands and the rapidly increasing water tables of the Murray-Murrumbidgee irrigation areas were two issues of particular concern towards the latter part of the last century.

The identification of the link between farming practices and land degradation led to increasing awareness among primary producers of the long term effects of individual land management practices. Improvements in farming techniques were adopted, and practices to conserve water assets through improved water application techniques and native revegetation were adopted to limit the damage to farmland in Australia. The adoption of new technologies has also been increasingly important for farmers trying to maintain profitability in the face of rising costs; variable terms of trade; and restrictions on land use and farming practices.

With farmers using over half of Australia's landmass, managing land and water-based natural resources remains a critically important issue, both environmentally and economically, for Australian agriculture in the 21st century. The Australian Bureau of Statistics (ABS) has experienced increasing demands for information on the management of natural resources and land practices within the agriculture industry, in addition to the traditional demand for commodity area and production data. To meet these needs, the ABS' Rural Environment and Agriculture Statistics Program (REASP) has been expanded to include the collection of water and land management data to better understand the environmental impact of the agricultural sector.

This paper outlines the policy drivers behind these demands, and uses the example of the ABS' Land Management Practices (LAMPS) survey to explore the challenges and opportunities this poses for the future of Australian agricultural statistics.

Meeting the information needs for Australian agricultural policy

The ABS's REASP has evolved over time in response to changing information requirements driven by both domestic and international developments. To achieve this, the ABS has increased its focus on strategic engagement, implementing a program of targeted and regular discussions with key stakeholders such as the Australian Government Department of Agriculture (DoA) and other key users across the government, business and community sectors. These discussions have informed regular reviews of the REASP program, and at present are informing a joint project with DoA on how Australia's agricultural policy needs can be supported not only by ABS, but by all the organisations producing agricultural statistics across the Australian statistical system.

Internationally, the ABS has been engaged in the *Global Strategy to Improve Agricultural and Rural Statistics* and this has provided a framework for understanding evolving needs both on a global scale and within the Asia-Pacific region. In addition, ABS has been working with the international statistical community to develop the System of Environmental-Economic Accounting (SEEA), chiefly through the process established by the United Nations Statistical Commission and the United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEA). The UNCEEA is currently chaired by the ABS and has representatives from the national statistical offices (NSOs) of other countries as well as international agencies – the UN Food and Agricultural Organisation, the International Monetary Fund, the Organisation for Economic Cooperation and Development, the United Nations Statistics Division, and the World Bank. Within Australia the ABS continues to work with relevant departments and agencies on improving the availability and quality of environmental information to feed into the accounts.

The demand for land management practices data has emerged at the same time as demand for an expanded view of agriculture for smaller regional areas, and interest in the triple-bottom-line view of the social, economic and environmental characteristics of agriculture. In Australia, the key government policy drivers for this data include: the Caring for our Country program, the National Greenhouse Gas Inventory, and the Carbon Farming Initiative.

The Caring for our Country program funds projects across Australia to achieve national targets in regard to environmental management and sustainable farm practices, such as improving soil management and water quality; protecting biodiversity and conservation; and building the capability of individuals, farmers, fishers and communities in relation to natural resource management. The National Greenhouse Gas Inventory, which conforms to the international guidelines adopted by the United Nations Framework Convention on Climate Change (UNFCCC), monitors and accounts for Australia's greenhouse gas emissions from land based sectors, and accounts for the methane and nitrous oxide emissions from livestock and crop production as well as carbon emissions from agriculture, deforestation and forestry. The data collection processes are important to ensure accurate and time series-consistent emissions data. The major sources of activity data are published by the ABS and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), which is an agency within the DoA.

The Carbon Farming Initiative (CFI) is a voluntary carbon offsets scheme which allows farmers and land managers to earn carbon credits by reducing greenhouse gas emissions (such as nitrous oxide and methane) and storing carbon in vegetation and soils through changes to agricultural and land management practices (also known as carbon farming). Following the introduction of the *Carbon Credits (Carbon Farming Initiative) Act 2011* by the Australian Government in September 2011, it was determined by the (then) Department of Agriculture, Fisheries and Forestry (DAFF), ABARES and the Department of Climate Change and Energy Efficiency (DCCEE) that existing datasets did not provide the level of land management practices information that was needed to inform decision-

making relating to the Act. The ABS worked with these departments to develop a biennial Land Management Practices Survey (LAMPS) to assist in informing decision-making in relation to the CFI, other programs such as Caring for Our Country and the National Greenhouse Gas Inventory, and to provide information for other government agencies, industry organisations and rural communities to use in understanding land management practices.

The Land Management Practices Survey (LAMPS)

The first LAMPS, in respect of the 2011-12 reference year, was despatched in August 2012 to approximately 50 000 agricultural businesses across Australia, using a combination of both paper and electronic (web-form) collection modes. The 2011-12 LAMPS collected information about a variety of land management practices relevant to the CFI and other policy needs as mentioned above, including those relating to the management of: crops; livestock; pasture; vegetation; soil (including fertiliser use); animal waste; feral animals; and water use. Data were released in June 2013 and were made available at the national, state/territory and regional levels.

In order to meet the particular information requirements of the LAMPS, which included outputs that were: cross-classified by both industry and region; able to be relatable and integrated with other data; and widely accessible and interpretable to a range of users, the ABS undertook a number of innovations and enhancements to its existing systems and processes for producing agricultural statistics, many of which will have benefits for other agricultural outputs from the REASP and for the wider ABS statistical program in general.

One of the key elements in developing the LAMPS was determining the most appropriate output geographic classification for stakeholders with different information requirements. A new geographical classification was developed in partnership with the primary stakeholder group based on agroecological regions, called the Australian Agricultural Environments (AAEs). This classification aligns with Australian Statistical Geography Standard (ASGS) boundaries which is a statistical geography used by the ABS and others to enable statistical outputs that are comparable and spatially enabled. The ASGS is utilised to output a range of social, economic and environment statistics and thus, by aligning the AAEs with this standard, output from the LAMPS can be easily integrated with other ABS statistics.

The LAMPS also provided an opportunity to invest in a range of enhancements to ABS processes and systems which aligned with the significant transformations ABS is undertaking corporately in order to meet increasing demand for new and innovative statistical assets in a tightening fiscal environment. ABS is partnering with a range of other NSOs in developing the next generation of statistical infrastructure to meet these demands, and some of these developments were leveraged by the REASP in order to meet the requirements of LAMPS and other future surveys.

The outcomes of these investments have included:

- The release of a wider range of data in a more accessible manner through new data visualisation and dissemination modes such as dynamic mapping tools and ABS.Stat¹;
- Developments to the ABS's electronic data collection platform to ensure it meets the needs of agricultural data providers and the associated data quality needs of the REASP;

¹ ABS.Stat is an interactive, free online tool that presents datasets in a searchable, flexible and dynamic way. ABS.Stat presents users with two options, a web browser to view, query and download data and a web service to facilitate machine to machine communication via the use of the Statistical Data and Metadata Standard (SDMX). The web service enables other organisations to interface with ABS.Stat and customise the data in their own environments.

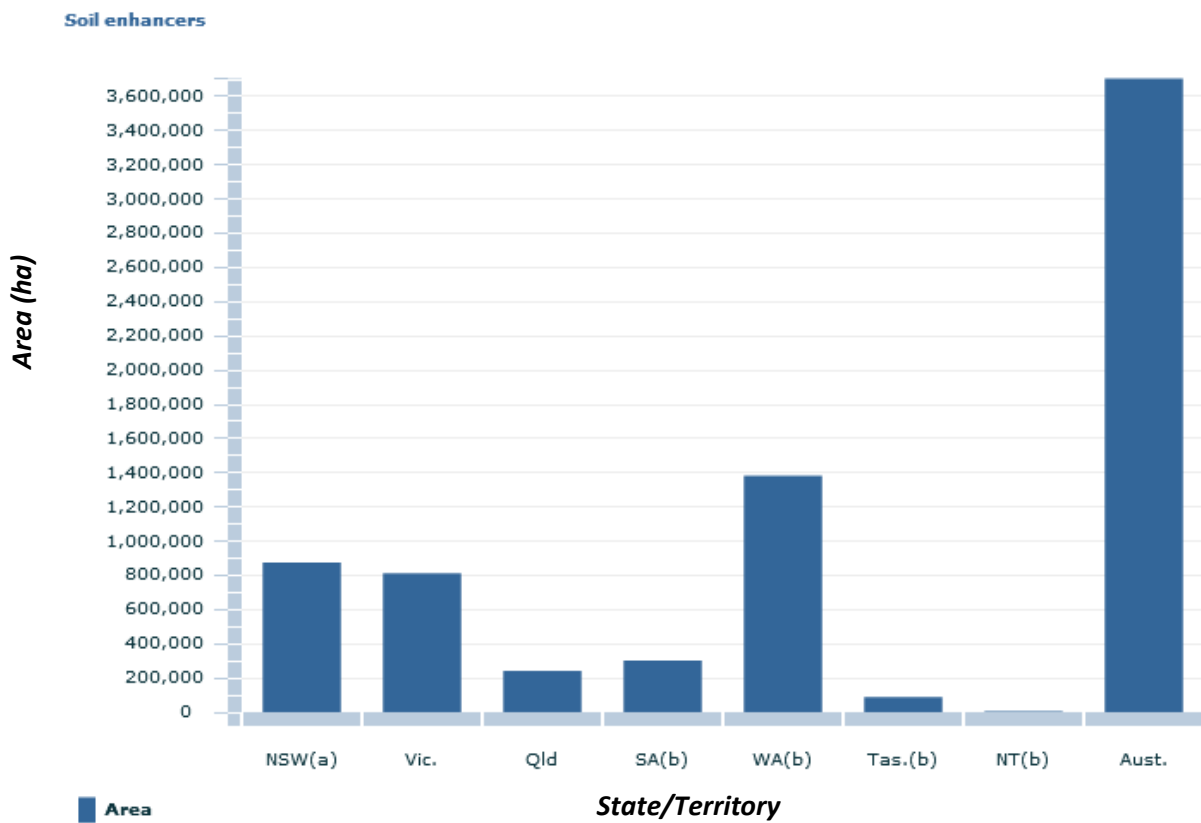
- Substantial improvements to the efficiency of the tools used to confidentialise the LAMPS data, which posed particular confidentiality challenges given the requirements to release cross-classified industry-by-region data;
- Investigations into the use of administrative data as part of the statistical cycle, aiming to reduce respondent burden and release efficiencies in the REASP's statistical cycle; and
- Investment in building capability in statistical data integration to enable the full utilisation of a variety of data sources to inform decision-making in the agricultural sector.

Key findings from the LAMPS

On 28 June 2013 the full suite of statistics from the first LAMPS was released within twelve months of the reference period. The report revealed important information about contemporary land management practices undertaken on Australia's farms. Although the ABS has published farm land management statistics in the past, the LAMPS produced data that was the most comprehensive stocktake of these practices to date. For example, the data for the first time showed that farmers had taken steps to protect and/or re-generate vegetation on nearly 70 million hectares of land in 2011-12.

The report also includes information on fertiliser use, livestock, crop and pasture management. Highlights of these statistics showed that 3.7 million hectares of agricultural land had soil enhancers applied to improve the soil; this was mostly in Western Australia where 1.38 million hectares had enhancers applied, the majority (71.5%) of this being lime or dolomite. Refer figures 1 and 2 overleaf.

Figure 1: Total area of soil enhancers used in Australia, by State/Territory, 2011-12



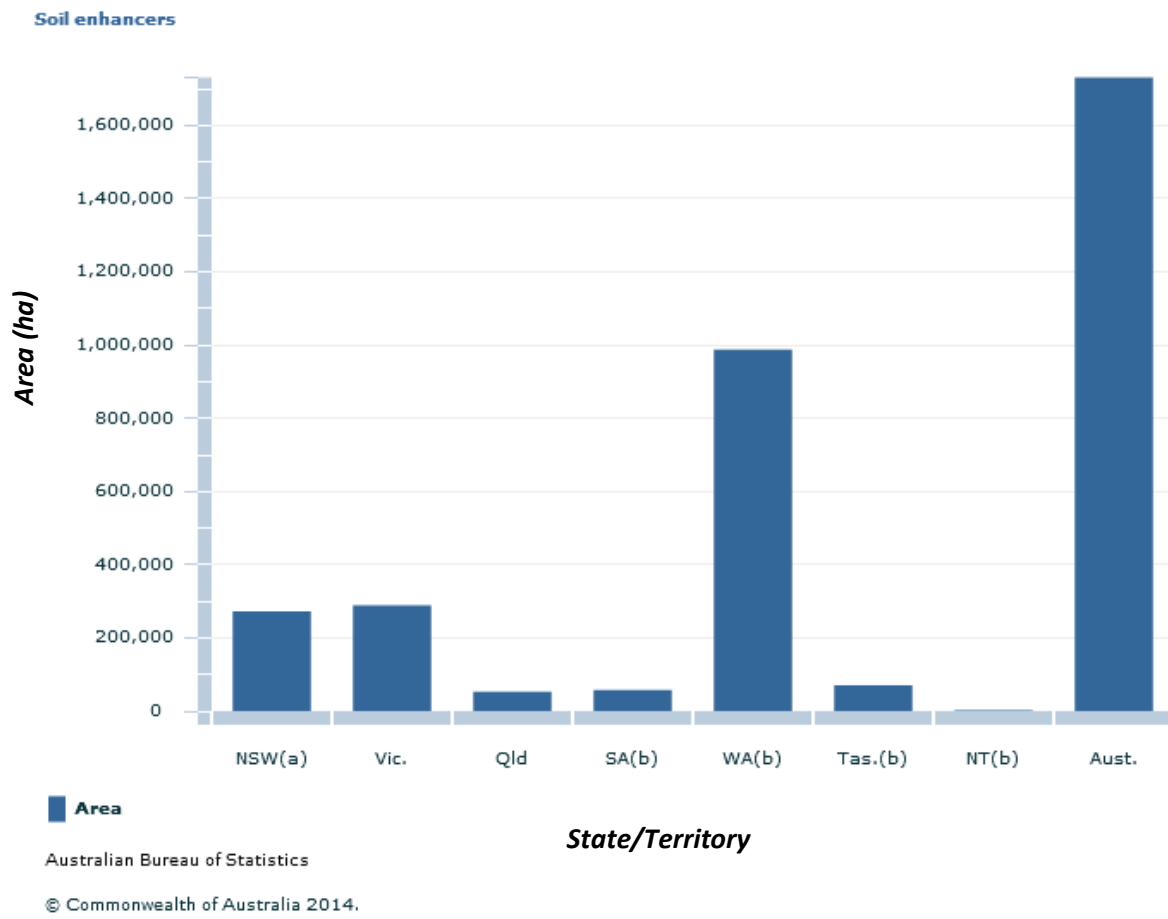
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Footnote(s): (a) Includes ACT. (b) Zero values may represent data that is not available for publication due to confidentiality restrictions.

Source(s): [Agricultural Resource Management Practices, Australia \(cat. no. 4630.0\)](#)

Figure 2: Total are of Lime or Dolomite used in Australia, by State/Territory, 2011-12



Footnote(s): (a) Includes ACT. (b) Zero values may represent data that is not available for publication due to confidentiality restrictions.

Source(s): [Agricultural Resource Management Practices, Australia \(cat. no. 4630.0\)](#)

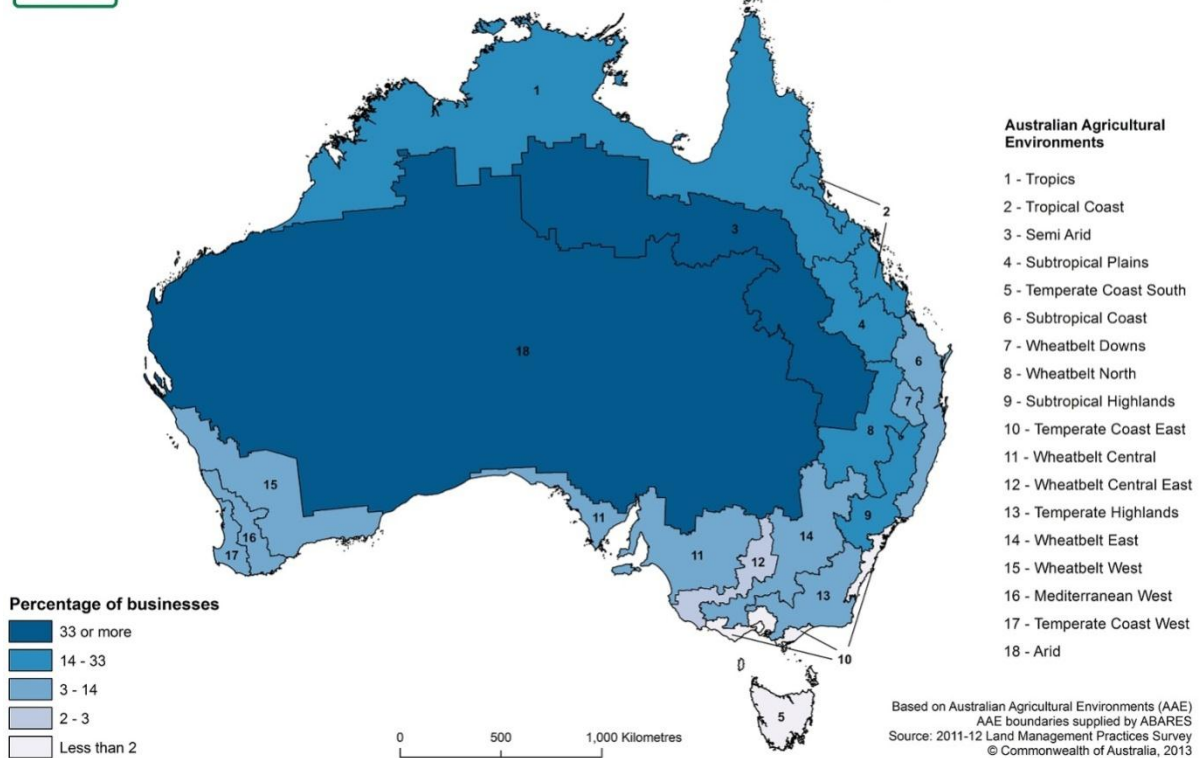
Information on feral animal management practices, data not previously released by the ABS, showed that around 13,000 agricultural businesses in Australia (or 10% of the total) undertook some activity to reduce feral animal populations on their agricultural holding. The data indicated the geographic distribution of this activity – almost half (47%) of the agricultural businesses managing feral animals were in New South Wales, whilst 41% were in Queensland. The data also indicated the distribution by AAE region: of the 129 agricultural businesses managing feral camels, 95% (or 123 of the agricultural businesses) were located either in Australia’s Arid or Semi-Arid regions (refer Figure 3 overleaf). The information also showed that all feral water buffalo management was reported only in the Tropics region.

Figure 3: Agricultural businesses undertaking feral animal management by Australian Agricultural Environments (AAE)



Agricultural businesses undertaking feral animal management, 2011-12

by Australian Agricultural Environments



Future challenges and opportunities in producing fit-for-purpose land management practices statistics

The 2011-12 LAMPS provided valuable, detailed data on land management practices to support a range of Australian Government policy needs and to inform industry and community in general. The ABS is incorporating these learnings into the second cycle (in respect of 2013-14) currently under development, with data collection commencing from mid-2014. The enhancement program will continue and will have benefits not only for improving the efficiency, quality and accessibility of the LAMPS data but other aspects of the ABS REASP.

The challenges and opportunities for the ABS in future iterations of LAMPS and in collecting land management statistics in general include: the need to maintain the policy relevance of statistical outputs; and continuing to improve the efficiency and effectiveness of statistical production processes, including exploring the potential of alternative sources such as administrative data.

Future iterations of the LAMPS will also be an opportunity for the ABS, as one of only two Australian Government statistical data integrating authorities, to further develop capability in using agricultural administrative data sources to inform decision making for the agricultural sector. Integration of statistical assets will realise efficiencies for the ABS' REASP in the long term, but will require investment in the short-term to develop the required people capability, methodologies and improving or changing current processes and infrastructure. In addition, there is a balancing act between the need to continue to deliver critical statistics whilst also fostering innovation and transforming the way in which the REASP conducts its business.

The final iteration of the LAMPS is scheduled for the same reference period as the 2016 Agricultural Census, which is the second largest collection that the ABS undertakes and the largest business-based collection. This timing provides an opportunity for the ABS to be innovative in its approach to meet the information requirements of both collections and to minimise the burden placed on data providers. There are also opportunities to explore the potential for integration and/or collaboration with the 2016 Population Census, particularly given the demand for social and economic data on farming households.

The Australian agricultural policy environment is continuing to evolve and the ABS will need to continue its program of strategic engagement to stay relevant to the needs of the key policy agencies and organisations. Two recent developments in particular that may impact include: the recent change of government at federal level and the impacts of this on the structure and policy priorities of Australian agencies with an interest in agricultural policy; and the joint project ABS is undertaking with ABARES, the National Agricultural Statistics Review (NASR).

The NASR is considering all aspects of the Australian agricultural statistical information system and the system's ability to inform decision making. It will involve identifying the priority information needs of stakeholders and where there are gaps, overlaps or inconsistencies in meeting these needs, with the objective of creating a more effective system for users. The Review may identify new and unmet demands for information on land management practices and/or other aspects of the environmental, social and economic aspects of agriculture. This will pose both opportunities and challenges for how the ABS and ABARES, in collaboration with each other and with other organisations, meet these information needs across the system. In the current tight fiscal environment across Government, it will be increasingly important for Australia to ensure agricultural statistics are collected as efficiently and effectively as possible.

Finally, although restricted by the fiscal environment, the ABS will continue to be engaged in international developments including the ongoing implementation of the Global Strategy, the SEEA, the World Program of Agricultural Censuses and ongoing collaborations with other NSOs in the development of relevant statistical standards, frameworks and infrastructure. Through continued engagement the ABS will be well positioned to work with its key partners both within Australia and globally to meet the continued and emerging demands for relevant, timely and high quality land management practices statistics for agriculture.

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