

From Nature to the Table and Beyond- Experiences in Implementing the System of Environmental-Economic Accounting for Agriculture, Forestry and Fisheries (SEEA AFF) for Australia

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Background in context

The agriculture, forestry and fisheries industries in Australia is significant in an economic, environmental, social and cultural context. Romantic notions of “life on the land” in Australian culture contrast with the reality of the industry. Whilst contributing a relatively small amount to the national economy, agriculture makes up a significant proportion of land use, water use and is a major employer in regional areas.

Data about the agricultural industry has traditionally focused on economic performance or production measures, usually based on surveys of producers. Data on environmental measures, such as energy use, are often not directly linked to agricultural productivity information.

The System of Environmental-Economic Accounting for Agriculture, Forestry and Fisheries (SEEA AFF) is a statistical framework that facilitates the description and analysis of agriculture, forestry and fisheries as economic activities and their relationship with the environment in an environmental-economic accounting framework. Developed by the FAO and UNSD, Australia has been involved in this process since its inception as a pilot country in 2013 and has contributed to the two global consultations in 2014 and 2015.

The ABS has published an information paper on its website, *Discussion Paper: From Nature to the Table: Environmental-Economic Accounting for Agriculture* (cat. no. 4632.0.55.001)¹, that explores the SEEA AFF framework and provides a set of experimental accounts for Australia. The discussion paper outlines a set of national level base accounts and combined presentations for a wide range of commodities and two smaller regional case studies.

The Agricultural Census is the longest running and largest business survey undertaken by the Australian Bureau of Statistics (ABS). Whilst the ABS is the national statistical office, it is far from the only organisation that surveys farmers, with other government and industry groups asking for statistical information. High respondent burden is an area of concern as it leads to lower response rates and data quality. Reducing this respondent burden is a priority, with newer technologies such as big data, administrative collections and satellite imagery being explored.

The SEEA AFF framework was trialled, in whole or in part, in a number of other countries, such as the Netherlands, Indonesia and Canada. This paper explores Australia’s initial experience to implement the SEEA AFF framework, the challenges and benefits with this, and possible future directions of the agricultural statistics program to better address the needs of data users.

¹ ABS, 2017, *Discussion Paper: From Nature to the Table: Environmental-Economic Accounting for Agriculture* (cat. no. 4632.0.55.001), <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4632.0.55.0012015-16>

Areas of focus

The production of *Discussion Paper: From Nature to the Table: Environmental-Economic Accounting for Agriculture* had four focal areas:

- Data availability and compilation of example tables
- Identification of data gaps and opportunities
- Policy drivers
- Uses of the framework and extensions

Where possible tables were completed for a 6 year period, from the 2010-11 to 2015-16 Agricultural Census years, and the aligning intercensal period. This highlighted the differences in data availability and time series. Tables covered national level data, and where possible a single year of state level data was also provided. This along with features on two Natural Resource Management (NRM) regions gave examples of the geographical flexibility of the accounts.

Data availability and compilation of example tables

There was a decision to limit modelling and imputation of data for the tables to highlight data gaps. A range of data sources were used including, ABS surveys, ABS administrative data collections, ABS environmental-economic accounts, government department reports, maps, data collections and academic research papers. Exploring sources beyond traditional ABS survey data allowed for greater completion of tables, but highlighted a number of opportunities for improvement.

For detailed information on methodology used, please refer to the discussion paper on the ABS website.

Identification of data gaps and opportunities

The use of multiple data sources highlighted opportunities for improvement and coherence. For example, the livestock asset account used data from different sources which highlighted a lack of coherence when combined, particularly when looking at year on year changes. Data on slaughters from monthly census of abattoirs, data on live exports from customs administrative dataset and livestock on holdings data from annual surveys contributed to the table.

Highlighting areas where data was lacking or inconsistent, showed where data needed to be improved and potential opportunities for future work.

Analysis of ABS website hits and searches suggested that there is interest in areas where data gaps currently exist. The physical flow accounts for fertilizers and pesticides received a significant number of downloads, despite being a data gap. The discussion paper was also accessed from searches relating to greenhouse gas emissions and agriculture, despite this only being represented in one physical flow table. There is significant value in the combined presentation tables, these had a lower than expected number of downloads. This suggests the value and content of these needs to be communicated more effectively with potential users.

For each thematic area, measurement gaps and future opportunities of the SEEA AFF framework have been identified.

Longer term SEEA AFF could be utilised as the framework to integrate national level estimates of the agriculture, forestry and fisheries industries that then feeds into other economic and environmental measures (eg SEEA-Water, SEEA-Energy and the agriculture industry in the National Accounts) as well as provide an ongoing account which is not necessarily dependent on a single data source.

Policy drivers

In Australia, policy development and implementation in the areas of agriculture, forestry and fisheries involves governments at national, state/territory and local levels, as well as private organisations. These cover a wide range of concerns encompassing economic, social and environmental dimensions of these industries, and address matters such as economic competitiveness, community health, the resilience of businesses and the sustainable use of natural capital.

Due to the multi-disciplinary nature of issues facing Australian agriculture, forestry and fisheries, policy makers from across all relevant disciplines should be able to speak to the same information, thus allowing the data to support dialogue between economists, scientists, agronomists, water managers, farmers, foresters, aquaculturists, social scientists, conservationists and business owners. The capacity to deliver information to support decision making across a range of policy areas is a major benefit of the SEEA AFF framework.

For each thematic area, policy relevance and potential uses of the SEEA AFF framework have been identified.

Uses of the framework and extensions

In addition to highlighting uses for policy, the framework can be used to develop combined presentations to focus on specific topics and the development of key indicators.

Combined presentations are a powerful mechanism for bringing together data on complex topics where insights are required into the relationships between cross-cutting themes like employment, water use, production, consumption, and environmental impacts. They use consistent concepts and methods (e.g. reporting years, indexation), classifications (e.g. consistent industry standards) and units of measure to combine diverse indicators for initial analysis. This provides a window into the underlying detailed data.

The SEEA AFF framework provides examples of combined presentations on a range of themes. These were completed at the national level for a single year and highlighted data gaps by thematic areas.

As an extension to the prescribed accounts, information about the links between biodiversity and agricultural production is included. Biodiversity is identified in the SEEA Experimental Ecosystem Accounting (EEA) and refers to: 'Species that provide regulating ecosystem services, such as ... bees (pollination) can also be linked to biodiversity and land cover accounts.' (section 4.109) This provides an obvious and significant link between biodiversity and the agricultural industry. Available data and research indicates that risk awareness and management of links between biodiversity and crop yields are required for agricultural security.

Species accounts for pollinators and insectivores were produced along with commentary, for the featured NRM regions. Key crops in these regions were identified, along with pollinators for these crops and insectivores that provide pest control of insects that harm food crops. Ensuring adequate pest control species are supported in a region means farmers potentially have less inputs in the form of pesticides. This extension highlighted the links between the economic and the bio-physical which can occur within environmental-economic accounts to answer key policy questions around future sustainability and productivity of the dominant agricultural industries in those NRM regions.

Future directions

Traditional collection of agricultural data has been primarily through statistical surveys, with a focus on statistics on major commodities and farming practices. This limits the ability of data to inform decisions on cross-cutting topics and will not be enough to support future understandings of the agriculture, forestry and fisheries industries in Australia. A more dynamic, responsive and holistic approach is required.

There have been a number of major recent reviews, from both industry and government, into agriculture and the data required to support it. These have highlighted duplication in the collection of data across both industry and government – this is creating burden on farmers and reducing response rates and data quality. These reviews have also highlighted the changing environment in which Australian agriculture operates, including:

- A focus on low greenhouse gas emissions agriculture as well as managing the risk of extreme climatic events,
- Changing customer expectations around environmental sustainability and animal welfare,
- Emerging technologies that are changing farming methods as well as the data needs and available sources,
- The connection with regional communities that are important for social fabric, labour, services and infrastructure.

These factors mean that statistics on commodities or farming practices alone will not support a future understanding of agriculture in Australia.

This has led the ABS to redefine the role it plays in the Australian agriculture data ecosystem in order to provide agriculture statistics that are able to be flexibly integrated with other statistical information using a range of variables including location. This will enable a more holistic view of agriculture statistics within the lens of the economy, the environment and regional well-being to inform the complex issues facing agriculture. The ABS is also looking to move towards a modelled data approach for producing agriculture statistics. This will reduce reliance on traditional survey methods and enable greater use of administrative, industry, earth observations and survey data to produce more responsive, accurate and trusted data.

The SEEA AFF framework has the potential to integrate with this future vision for agriculture statistics. It can assist in providing data that can better address the needs of data users due to the flexibility of combining different outputs to address policy and broader questions. Using an environmental-

economic accounting approach allows to tie together data relating to linked themes and topics will contribute to informed decision making. Standardising data and being able to provide data at different geographies allows greater flexibility for users. Building on the core tables to produce indicators, combined tables and report cards can give data users a snapshot on change.

A holistic approach to data is needed to address the broader perspectives on the agriculture, forestry and fisheries industries now and in the future. The SEEA AFF framework is an ideal system for integrating data to answer these important questions on how we produce food and fibre as the agriculture, forestry and fisheries industries and the country goes forward.