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NATIONAL AGRICULTURAL STATISTICS REVIEW

FINAL REPORT

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FOREWORD

The Australian Bureau of Statistics (ABS) and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) have undertaken the National Agricultural Statistics Review (NASR) to consider all aspects of the current agricultural statistical system and assess its capacity to inform decision making.

Australia's agricultural, fisheries and forestry industries are increasingly knowledge-driven, and access to timely, high-quality statistical information is of critical importance to stakeholders across government and industry. However, there are a number of issues limiting the efficiency and effectiveness of the agricultural statistical system to meet these needs, which may cause constraints on the competitiveness and productivity of the industries themselves.

The NASR has provided an opportunity for the ABS and ABARES, as the principal producers of agricultural statistics, to hear directly from other statistical users and producers across government, industry and the research sector about these issues, and to identify opportunities to address them. Through the NASR, the two organisations have identified a pathway to establish a contemporary, best practice Australian agricultural statistical system for the future. The NASR has also enhanced the relationship between the two agencies and paved the way for further collaboration to provide stronger and more effective leadership across the system. There are opportunities for partnerships with other statistical users and producers to better coordinate effort and investment, and to work collaboratively to improve data quality and reduce respondent burden across the system.

The ABS and ABARES would like to thank the organisations and individuals who engaged with the review, contributed their views, and committed to improving agricultural statistics into the future. We look forward to continuing to work collaboratively with stakeholders across the system to build an effective and enduring agricultural statistical system.

Bruce Hockman
General Manager, Macroeconomic Statistics Division
ABS

Karen Schneider
Executive Director

ABARES

EXECUTIVE SUMMARY

Australia's agriculture, fisheries and forestry industries make a significant contribution to Australia's economy, society and natural resources. The productivity, competitiveness, sustainability and profitability of these industries are enhanced by having access to timely, high-quality and reliable statistics to inform decision-making by both government and industry. There has been criticism however that the current Australian agricultural statistical system is deficient in providing quality, timely data to meet these needs. Particularly in an environment of fiscal constraint, it is essential that the datasets produced within Australia's agricultural statistical system are targeted at the highest priority needs and are produced, disseminated and used in the most effective and efficient way.

Agricultural statistics in Australia

The Australian agricultural statistical system has evolved over time to support the information needs of decision-makers across government, industry and the broader community. Statistics on major crops and livestock have been collected as far back as the days of early settlement, and by the early part of the 20th century agriculture had become one of the major industry statistics produced by the Bureau of Census and Statistics (predecessor to the Australian Bureau of Statistics (ABS)), reflecting its importance to the national economy. Over time the agricultural statistical system in Australia has evolved to include a range of other Australian and state and territory government agencies, most notably the Department of Agriculture through the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES and its predecessors), which collects a range of statistical information on farming, forestry and fisheries. In addition, other stakeholders such as industry and research bodies began undertaking their own statistical collections, partly in response to perceived gaps in the availability of official statistics.

Agriculture, fisheries and forestry statistics support decision-making, planning and policy making by both government and industry. At the micro level, individual businesses use statistics to inform their management and investment decisions. At the macro-level statistics inform decisions by government on funding arrangements; provide critical market intelligence for industry; aid planning for emergency responses; guide long-term investment strategies; meet legislative requirements; and meet obligations for international reporting.

The Review

The National Agricultural Statistics Review (NASR) has been undertaken jointly by the ABS and ABARES. The objective of the review was to assess the agricultural statistical system in Australia and its adequacy for informing decision-making, planning and policy making, both now and into the future. Through extensive stakeholder consultation and research, the NASR has investigated the priority information needs of stakeholders, where these needs are not being met by existing sources of data, potential overlaps and inconsistencies in data, and opportunities to improve efficiency in the system.

The NASR developed a framework of five enduring goals for Australia's agriculture, fisheries and forestry industries. The enduring goals framework provides an approach to assessing the relevance and sustainability of the agricultural statistical system over time. Statistical assets that target these enduring goals are likely to meet the high level information needs of the agriculture, fisheries and forestry industries.

The enduring goals encompass the economic, social and environmental dimensions of the agriculture, fisheries and forestry industries and reflect the fact that changes in these industries can affect other aspects of the economy, including health policy, food safety, renewable energy production, emergency management, rural development and international trade competitiveness. This interconnectedness means that the need for information about agriculture, fisheries and forestry extends well beyond those industries themselves. The five enduring goals are:

- Competitive and profitable agriculture, fisheries and forestry industries
- Prosperous communities
- Sustainable natural resource use
- Growing trade and market access
- The protection of animal, plant and human health and welfare.

While the agricultural statistical system has informed government and stakeholder needs for more than a century, stakeholder consultations identified a number of deficiencies and concerns that compromise the capacity of the system to efficiently meet current and emerging information needs. Four key themes were raised by stakeholders in relation to the functioning of the current and future agricultural statistics system. These were:

- managing the 'red tape' burden on respondents (primarily farmers) resulting from survey activity
- improving the quality of statistics produced from the system
- enhancing the statistical infrastructure underpinning the system
- improving the coordination and governance arrangements in place to ensure the system functions efficiently and effectively.

There is increasing pressure on official sources to meet an ever-widening range of information needs and to produce more accurate, timely data down to fine levels of detail within existing resources. Dissatisfaction with a perceived inability of official sources to meet these needs has led to increasing fragmentation in the statistical system as a range of other stakeholders from government, industry and the research sector have stepped in to meet data gaps with statistical collections of their own. This has led, at times, to possible duplication of effort, inefficiencies in the production and use of statistics, and an increased burden on respondents. This burden is driving farmers, in particular, to disengage from surveys, leading to reduced response rates and lower data quality.

Stakeholders raised a range of quality concerns with agricultural statistics, including issues with the relevance, accuracy, timeliness, accessibility, interpretability and coherence of statistics produced across the system. These quality concerns included a number of key data gaps, such as data on industry supply chains, value adding, productivity estimates for some industries, regional scale data, upstream and downstream employment, domestic consumption and labour market supply and demand.

Concerns with the quality and availability of the statistical infrastructure (standards and classifications, tools and methods) underlying the statistics were also raised. Stakeholders reported that currently there is a wide variety of methods, systems and techniques used to collect, analyse and disseminate statistical data across the statistical system, consequently data are difficult to compare. Statistical infrastructure is not widely shared and this is leading to inefficiencies as organisations develop their own approaches in a siloed manner.

A recurring issue raised by stakeholders during the NASR consultation was the coordination and governance mechanisms in the current agricultural statistical system. For example, ABS' statistical leadership role is not well understood or recognised. In addition, stakeholders do not always understand the roles and responsibilities of other participants in the system. There are also differing expectations regarding the contributions of government and industry in meeting statistical needs, with some having the view that government should provide the majority of required statistics, and others seeing a stronger role for industry. The lack of a clear delineation of roles and responsibilities in the statistical system has led to a lack of coordination in statistical production, inefficiency, possible duplication and increased respondent burden.

Improving the agricultural statistical system

The NASR has identified a set of actions and initiatives for addressing the issues identified through the review. A number of these actions can be progressed by ABS and ABARES, working together to improve coordination, to reduce burden and to improve data quality. These include:

- better coordinating government statistical collection activities; encouraging the exploration of alternative data sources; improving survey form design; making better use of electronic forms; improving the integration of existing statistical collections; improving the value for respondents of participation in survey programs through partnerships with industry and returning results to participants in a usable and useful format
- encouraging and supporting other organisations to use best practice respondent engagement methods when conducting surveys, through providing technical advice, frameworks and ready access to best practice concepts, principles, practices and tools
- adopting new and emerging technologies wherever possible to improve the cost effectiveness and efficiency of collecting, managing, analysing and disseminating statistical data.

Towards a best practice agricultural statistical system

While these actions will go some way to improving the agricultural statistical system, the NASR has identified a broader set of systemic issues that require more time, investment, involvement and contributions from a wider group of stakeholders.

In response to these broader systemic issues, the review has identified a further set of actions and initiatives that would improve the agricultural statistical system for the long term, reduce survey burden, improve data quality, improve the efficiency of the system and address gaps in data. Stakeholders are in agreement about these priorities. The systemic issues and actions to address them are outlined below, some of which will require further investigation and possible investment to realise substantial benefit.

There is no overarching mechanism that is coordinating the contributions of all the various organisations producing agricultural statistics and no mechanisms for ensuring the production and use of statistics is effectively planned and coordinated across the system, nor a knowledge of the surveys planned in any one year.

To ensure there is strong coordination of the agricultural statistical system:

A. An agricultural statistics consultative forum should be established to engage stakeholders and drive effective coordination and improved outcomes across the Australian agricultural statistical system. The forum should pursue data gaps and overlaps and mechanisms to address them while identifying additional ways to improve data quality and reduce respondent burden.

B. An annual calendar of planned statistical collections requested of farmers, fishers and foresters should be published to improve public accountability of survey managers and to more effectively manage respondent burden through greater transparency. The calendar would guide planning by organisations undertaking surveys to minimise duplication and provide farmers, fishers and foresters and their industry bodies with information about the range of surveys being undertaken, their purpose and timing.

The current Australian agricultural statistical system has evolved without a strong central plan or strategy. Development has occurred in a somewhat reactive manner, as stakeholders have stepped in at different times to produce statistics in response to emerging needs and in response to dissatisfaction with the availability of official statistics. This has

resulted in some possible duplication and inefficiency and has limited the relevance of the data produced.

To guide a strategic approach to future investment by government and stakeholders in data collections:

C. A foundation dataset for agricultural statistics should be established to inform the enduring goals, address data gaps and better target future investment. The foundation agricultural dataset would provide a common reference for the assembly and maintenance of foundation level data in order to serve the widest possible variety of users. It would deliver a national coverage of the best available, most current, authoritative source of agricultural data, which is standardised and quality controlled.

Direct collection from survey respondents is still the predominant method in use among both official and non-official sources. However, there is an increasing range of alternative data sources available, such as administrative data, which appear to be under-utilised. These data should be explored for their potential to reduce respondent burden while meeting the demand for agricultural statistics in Australia.

To ensure best use of all available data sources, to maximise data quality, minimise respondent burden and collection costs:

D. An agricultural administrative data initiative should be established to develop methods for broader use of administrative data sources within the agricultural statistical system. The initiative should examine legislative, privacy and commercial barriers to the use of data collected by governments and industry with the objective of reducing survey burden on farmers and implementing a “collect once, use many times” approach. The initiative should also research and develop best-practice methods for integration of administrative data into the agricultural statistical system to ensure data quality standards are met, privacy and commercial concerns are addressed, and to maximise utility of the data. This initiative would complement the ABS’ lead role in improving the re-use of key Australian Government administrative datasets to minimise regulatory burden on citizens and businesses.

While there has been investment in new technologies and innovations in the agricultural statistical system by various stakeholders, including government, this investment could be better coordinated and targeted. The issues raised through the NASR indicate there are likely to be benefits from investing in technologies and innovations that reduce respondent burden and improve data quality, and that exploit the potential of modern technologies to provide timely new statistics relevant to current and emerging issues and decisions.

To ensure investment in, and use of innovative new technologies, methods and processes across the statistical cycle:

E. A more coordinated approach from research funders should be encouraged in support of the agricultural statistical system. Future research investments should be targeted at those technologies and innovations that have the widest application and that would support implementation of best practice principles. In particular, an increased focus on innovative technologies, methods and processes through the statistical cycle that would deliver potentially significant benefit to farmers, statistical organisations and ultimately, users of statistics.

While there is a range of agriculture, fisheries and forestry data publicly available within the current Australian agricultural statistical system, more could be done to fully institute a culture of ‘open data’ across the system. The issues and challenges in achieving this will differ between official and non-official statistics producers. The challenge lies in realising the full value of the data collected by improving its accessibility, discoverability and usability. However, the NASR also identified a gap in the availability of statistical learning resources for non-technical users of agriculture, fisheries and forestry statistics. Critical to drawing full

benefits from an open data culture is the development of sufficient statistical capability among users to be able to access and draw value from the available data sources.

To promote a culture of open data:

F. A one-stop-portal for agricultural statistics should be established to maximise the value of existing data sources and provide discoverability and accessibility to the foundation agricultural dataset. The portal would also deliver supporting statistical infrastructure (standards and classifications, tools and methods), educational resources to address statistical capability gaps of users and tools to enable self-management of Statistical Clearing House compliance by non-Commonwealth government organisations.

These collective measures would help to ensure that the ongoing productivity, competitiveness and sustainability of Australia's agriculture, fisheries and forestry industries is supported by a world-class, agile and cost-effective agricultural statistical system. Implementing these measures would in turn directly address stakeholder concerns: reducing respondent burden, improving data quality, enhancing statistical infrastructure and ensuring that there is strong coordination in the agricultural statistical system. These actions would deliver a modern agricultural statistical system based on best practice principles that underpins the future profitability of Australia's agriculture, fisheries and forestry industries.

CHAPTER 1 – Introduction

Agriculture, fisheries and forestry in Australia are diverse and vibrant industries that underpin the nation's prosperity. They contribute to economic growth and international trade, domestic and global food security, the employment, viability and vitality of communities, and to the management and sustainability of our natural resources.

Australia's farmers, fishers and foresters work in a complex environment of growing demand for food and fibre, increasingly competitive global markets, shifting consumer preferences, and structural changes within industries and communities. They face variable weather patterns, challenging biosecurity risks and increasing competition for scarce natural resources.

The importance of these industries and the array of challenges they face demand that management and monitoring, investment and policy development be based on sound evidence. The importance of high quality statistics to enable evidence-based decision-making is well recognised by stakeholders. Globally, demand for agricultural statistics is increasing in recognition of the importance of agriculture in addressing a number of contemporary global challenges, including food security and sustainable development[1]. In Australia, improving the productivity, competitiveness and sustainability of the farming industry is a focus of both government and industry and is seen as essential if Australia is to make the most of opportunities presented by the rising demand for food and fibre in Asia[2]. This is reflected in the increasing demand for high quality, comprehensive, reliable, up-to-date, accessible and consistent agricultural statistics by government and industry decision makers.

While demand for agricultural statistics has been increasing, there has been criticism however that the current Australian agricultural statistical system is deficient in providing quality, timely data to meet these needs. In Australia, increased pressures on official sources to meet the increasingly complex data demands of agricultural statistics users within existing resources has led to a range of non-government stakeholders stepping in to conduct statistical collections of their own. The result has been the development of an increasingly fragmented and decentralised agricultural statistical 'system' that is characterised by inefficiencies, duplication and a growing survey burden on respondents. In an environment of fiscal constraint, it is vital to ensure that the datasets produced within Australia's agricultural statistical system are targeted at the highest priority needs and are used in the most effective and efficient manner.

The National Agricultural Statistics Review

In this context, the Australian Bureau of Statistics (ABS) and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) have undertaken the National Agricultural Statistics Review (NASR). The purpose of the review is to assess the agricultural statistical system in Australia and its adequacy for informing decision-making in the agriculture, fisheries and forestry industries both now and into the future. The agricultural statistical system consists of agricultural **statistical assets**[3], **stakeholders** (users, producers and custodians of agricultural statistics), and the **principles** by which the statistics system operates, including the supporting **statistical infrastructure** and **governance** arrangements.[4] As the primary data producers, custodians and users of official agricultural

[1] World Bank, Food and Agriculture Organisation (FAO), and United Nations Statistical Commission (UNSC) 2011, *Global Strategy to Improve Agricultural and Rural Statistics,* Report No. 56719-GLB, Washington, DC: World Bank.
[2] Commonwealth of Australia 2014, *Agricultural Competitiveness Green Paper,* Canberra; National Farmers' Federation and Sefton and Associates 2013, *Blueprint for Australian Agriculture 2013-2020.*
[3] The NASR considered agricultural statistics to mean broadly the data, information, statistics or other knowledge that can be used to provide insights into agricultural activity (including fisheries and forestry activity), including from censuses, surveys, commissioned research or administrative data.
[4] Components of the system include: *Statistical assets*—the data and information generated to provide insights into agricultural activity now and into the future; *Stakeholders*—the organisations and individuals across government, industry, academia and the community who are involved in producing and using agricultural statistics; *Principles*—representing a set of

statistical information in the current system, the ABS and ABARES are well placed to undertake this review.

As part of its assessment, the NASR has investigated:

- the priority information needs of stakeholders
- where information needs are not being met by existing sources of data
- overlaps and inconsistencies in data
- opportunities for efficiency in the agricultural statistical system.

The NASR built on the outcomes of other recent reviews of agricultural statistics in Australia, including the ABS Environment and Agriculture Survey Program Review[5], ABARES internal program reviews, and research conducted by the Australian Farm Institute.[6] The NASR also drew on relevant national and international statistical initiatives, including the ABS' Essential Statistical Assets for Australia initiative[7], and the Global Strategy to Improve Agricultural and Rural Statistics[8].

The NASR engaged with agricultural statistics stakeholders through two phases of consultation in 2013-14. In total, 42 submissions were received, and 43 organisations participated in a series of targeted forums. Rich input was received from all stakeholders, including Australian government and state and territory government agencies, peak industry bodies, research and development corporations, academics and the community.

The first phase of the NASR culminated in the release of a Preliminary Findings report on 30 March 2014[9]. The preliminary findings:

- confirmed strong stakeholder support for the set of enduring goals for Australian agriculture proposed by the NASR as a framework for understanding high priority statistical needs across the system both now and into the future (see further below)
- identified the current high priority statistical information needs in the system against the enduring goals and assessed how well these were being met by the current statistical assets in the system
- identified unmet statistical information needs (where there were no statistical assets available to meet a given priority information need)
- identified a range of issues with the current system, including concerns regarding the survey burden placed on farmers, and a range of data quality issues, including relevance, timeliness, accuracy, coherence and accessibility
- identified some opportunities to address these issues, including innovations and opportunities for improving the efficiency and effectiveness of the system.

The release of the preliminary findings initiated the second phase of the NASR, which further engaged stakeholders in examining opportunities for innovation and collaboration between the producers, users and custodians of agricultural statistics to address issues with the current agricultural statistical system. This final report summarises the findings

characteristics and good practices of a statistics system that have a bearing on its ability to satisfy data and information needs, including: strong governance and coordination across the system; a clearly articulated strategy to guide future investment; use of best practice methods and data sources; investment in, and use of, innovative new technologies, methods and processes across the statistical cycle; a culture of open data; and *data and information needs* (summarised in the enduring goals)—which define the decision making needs of Australian agriculture.

[5] ABS 2011, *Discussion Paper: Environment and Agriculture Survey Program Review, 2011-12* (ABS Cat. No. 7105.0.55.001).

[6] Potard, G and Keogh, M 2013, *Is counting farmers harder than counting sheep? A comparison of the agricultural statistical systems of Australia, the United States and France*, Australian Farm Institute, Surry Hills.

[7] ABS 2013, *Essential Statistical Assets for Australia, 2013* (ABS Cat. No. 1395.0).

[8] World Bank, Food and Agriculture Organisation (FAO), and United Nations Statistical Commission (UNSC) 2011, *Global Strategy to Improve Agricultural and Rural Statistics,* Report No. 56719-GLB, Washington, DC: World Bank.

[9] ABS, *National Agricultural Statistics Review - Preliminary findings, 2013-14 (ABS Cat. No.* 7105.0.55.003).

from both phases of the NASR and develops a set of actions aimed at improving agriculture, fisheries and forestry statistics in Australia for the long term.

The importance of agricultural statistics

Statistics relating to Australia's agriculture, fisheries and forestry industries contribute to informed decision-making at both the micro and macro levels. At the micro level, individual businesses use statistics to inform their management and investment decisions. For example, businesses use market information, such as price trends, to decide when and where to sell their produce. Or they may use consumer demand information to adjust their production systems to target an emerging market. At the macro level, agricultural statistics support the following functions[10]:

- legislative requirements. For example, statistics on the gross value of production (GVP) of commodities are required to determine the level of matched government research and development (R&D) funding to Research and Development Corporations (RDCs) under the *Primary Industries Research and Development Act 1989*
- decision-making, policy-making and program monitoring within government and industry. For example, statistics on the uptake of support provided by government programs have been used to guide the development and monitoring of farm business and farm household assistance packages by government; data on farm performance have supported the design, delivery and evaluation of R&D and marketing programs by industry and the RDCs
- international reporting requirements and obligations. Statistics on Australian agriculture and fisheries are used by international bodies to monitor global food and fish stocks[11]; and data on chemical residues in food and feed commodities are exchanged with international bodies and with importing countries to support Australian industries to maintain access to international markets[12]
- supporting systems for the trading and distribution of agricultural products. Statistics on market prices and commodity stocks are used by industry organisations to monitor elements of demand and supply at both national and global levels and to support the sale, distribution and marketing of agricultural, fisheries and forestry products. Government uses statistics on export values and volumes to prioritise and progress its market access activities to target products and markets that yield successful outcomes for Australian industries
- cost sharing arrangements between the Commonwealth government, state governments and industry bodies. For example, Commonwealth, state/territory and industry cost sharing arrangements for emergency pest and disease responses is based on accurate calculations of the GVP of potentially affected industries
- information to guide decisions about long-term investment strategies by both government and the private sector. Governments and industry bodies use farm performance measures, for example, productivity growth, to identify research and development needs and priorities for agricultural producers.

[10] Adapted from Vogel, FA 2002, *Framework for Agricultural Statistics in Australia*, and from submissions provided to NASR by government departments and industry bodies about how they use agricultural statistics.

[11] The United Nations Food and Agriculture Organisation (FAO) uses agricultural statistics provided by ABS and ABARES to monitor global food security and the state of global agriculture in general. International obligations also require Australian fisheries data to be provided to international fisheries management bodies such as Regional Fisheries Management Organisations for stock assessment purposes—a reporting function undertaken by ABARES.

[12] The Department of Agriculture, through the National Residue Survey, reports on chemical residues in food and animal feed moving in international trade. Disclosure of residue information supports industries to maintain their international and domestic market access. The Department shares this information with overseas and international bodies, such as the Codex Committee on Pesticides Residues and the Codex Committee on Residues of Veterinary Drugs in Foods (established by FAO and WHO), to contribute to the setting and review of international residue standards.

Stakeholders are increasingly requiring timely, high-quality and integrated statistics to support informed decision-making in relation to all of the above functions. This was evident from the high level of participation in the NASR from stakeholders across Commonwealth and state/territory governments, industry and the research sector. While these organisations vary in their aims and functions, at the broadest level, stakeholders are generally working towards a common vision for Australia's agriculture, fisheries and forestry industries. This vision can be represented by a set of 'enduring goals', developed by the NASR to provide a framework for identifying priority information needs in the system and assessing the capacity of the system to meet these needs.

Enduring goals for Australian agriculture

The NASR developed a framework of five enduring goals for Australia's agriculture, fisheries and forestry industries. The framework was based on a desktop review of strategic plans, policy statements and mission statements by agricultural institutions and industry bodies[13]. The statistical assets that target these enduring goals are likely to meet the high level information needs of the agriculture, fisheries and forestry industries. In this way the enduring goals framework provides a means of ensuring the ongoing relevance and sustainability of the agricultural statistical system over time.

The enduring goals encompass the economic, social and environmental dimensions of the agriculture, fisheries and forestry industries and reflect the fact that changes in these industries can affect other aspects of the economy, including health policy, food safety, renewable energy production, emergency management, rural development and international trade competitiveness. This interconnectedness means that the need for information about agriculture, fisheries and forestry extends well beyond those industries themselves[14].

The five enduring goals are:

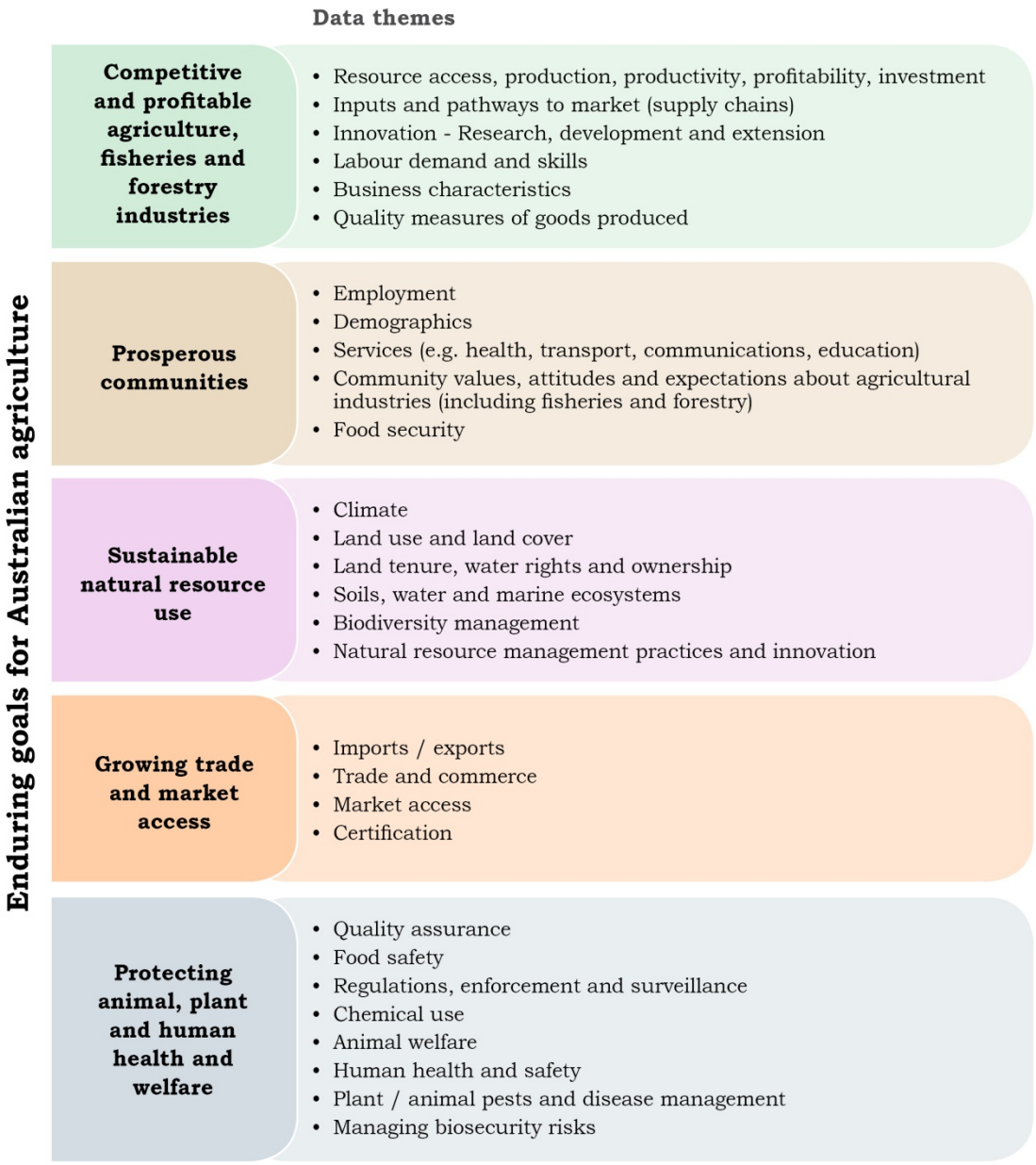
1. competitive and profitable agriculture, fisheries and forestry industries, encompassing a number of the economic dimensions of agriculture, including drivers of profitability and economic performance measures; the agricultural supply chain and information on the quality of commodities and value-added products; and innovation and R&D
2. prosperous communities, reflecting the economic and social benefits accruing to communities from agriculture, fisheries and forestry industries, including measures of employment, availability of services, food security and values that the community holds in relation to those industries
3. sustainable natural resource use, which captures the environmental dimensions of agriculture and seeks to provide an understanding of the sustainability of natural resources utilised by the agriculture, fisheries and forestry industries, management of these resources and the effect of these industries on the environment
4. growing trade and market access, reflecting the importance of the ability to access and maintain markets both domestically and internationally, including enablers for growing trade and market access such as certification and trade arrangements
5. protecting animal, plant and human health and welfare, which is fundamental to the economic, social and environmental viability of agriculture, fisheries and forestry industries, and encompasses elements of biosecurity, food safety, chemical use and regulation, and animal welfare and disease management.

[13] Documents reviewed included the Australian Department of Agriculture *Strategic Statement 2013*, National Farmers Federation *Blueprint for Australian Agriculture 2013-2020*, Dairy Australia's *A Strategic Framework for keeping the Australian dairy industry in business for the long term* December 2012, United States Department of Agriculture *National Agricultural Statistics Services Strategic Plan 2010-2015*, and New Zealand Ministry of Agriculture/Statistics New Zealand *Agriculture, Horticulture, and Forestry Domain Plan 2009*.

[14] Statistics Canada 2011, Agriculture Statistics Program Review

Figure 1 presents the enduring goals and associated data themes. The data themes assist in describing the range of economic, social and biophysical statistics that inform each goal. The data themes are not exclusive to particular goals - there are statistics that inform multiple goals. For example, employment statistics could be used to inform both 'competitive and profitable agriculture, fisheries and forestry industries' and 'prosperous communities'. Primary data collections in agriculture, fisheries and forestry are listed in **Tables 5, 6 and 7** in **Appendix 3**.

Figure 1 - Enduring goals for Australian agriculture, fisheries and forestry, and supporting data themes



The enduring goals were strongly supported by stakeholders during the first phase of consultation[15] as largely reflective of the Australian agriculture, fisheries and forestry industries.

[15] ABS 2013, *Discussion Paper: Submission Process for the National Agricultural Statistics Review, 2013-14* (*ABS Cat. No.* 7105.0.55.002), ABS, Canberra.

Chapters two and three of the report describe the current agricultural statistics system, the key statistical producers and datasets, and stakeholder feedback on the extent to which the system is meeting current needs. The remaining chapters set out a possible way forward, identifying the elements of best practice agricultural statistical systems internationally, assessing Australia's current system against these elements, and proposing a set of actions to achieve a best practice agricultural statistical system.

CHAPTER 2 – The current Australian agricultural statistical system

The Australian agricultural statistics system has evolved over time to support the information needs of decision-makers across government, industry and the broader community. Statistics on major crops and livestock have been collected as far back as the days of early settlement, and by the early part of the 20th century agriculture had become one of the major industry statistics produced by the Bureau of Census and Statistics (predecessor to the ABS), reflecting its importance to the national economy.[16] Over time the agricultural statistical system in Australia has evolved to include a range of other Australian and state and territory government agencies, most notably the Department of Agriculture through ABARES (and its predecessors[17]), which collects a range of statistical information on farming, forestry and fisheries. In addition, other stakeholders such as industry and research bodies, began undertaking their own statistical collections, partly in response to perceived gaps in the availability of official statistics.

The range and type of statistics collected has changed over time in response to the changing nature of the agricultural industry and emerging information needs. For example, growing concerns regarding the environmental impact of farming practices has resulted in increased interest in data on salinity and land degradation, chemical use and residues in food. Structural change in the industry resulting in fewer, larger farms, with concomitant impacts on rural employment, has led to interest in data on the social and economic impacts of agriculture on rural communities. In response, the scope of statistical collection by stakeholders has grown beyond commodity data to encompass topics such as farm business productivity, trade statistics, land management practices undertaken by farmers and their use of natural resources such as water, and the demographics of Australian farmers and the communities in which they live and work.

The agricultural statistical system in Australia faces a number of challenges in meeting the ever-changing demands of users for timely, reliable data. Australia's agriculture, fisheries and forestry industries produce a diverse range of products, expanding the scope of topics that the system must inform. These products are produced under variable climatic conditions, and in an economic environment highly exposed to international trade conditions, increasing the demand for frequent and coherent time series data. In addition, agriculture accounts for approximately half the nation's land use and water use, and affects the employment and social cohesion of rural communities. Users require sophisticated, integrated statistical products to understand the full economic, environmental and social impacts of the agriculture, fisheries and forestry industries in Australia.

This increasing and changing demand for high-quality and sophisticated statistical information is occurring at the same time as the costs of direct statistical collection are increasing. Difficulties in obtaining sufficient responses from businesses, recruiting trained field staff and maintaining and investing in new statistical infrastructure are affecting the sustainability of official data sources. Non-government organisations such as research and industry organisations have stepped in to conduct their own statistical collections - however these organisations face similar challenges in obtaining responses and in developing and maintaining their own statistical infrastructure.

The result of this evolution is a statistical system that is predominately centralised, with ABS and ABARES having central but differing roles in relation to agriculture, fisheries and forestry statistics, and other stakeholders, including other government, industry and research bodies, contributing variously to the statistical picture. In the current system, agricultural statistics are

[16] The Commonwealth Bureau of Census and Statistics was established in 1906, the year after the *Census and Statistics Act 1905* was passed. The Bureau became the Australian Bureau of Statistics in 1975, following the passing of the *Australian Bureau of Statistics Act 1975*.

[17] The Bureau of Agricultural Economics, the Australian Bureau of Agricultural and Resource Economics and the Bureau of Rural Sciences.

mainly collected by the ABS and ABARES, with support from industry through the Research and Development Corporations (RDCs). ABARES is the main provider of fisheries and forestry statistics, which it collates from state and territory governments and industry. Trade data and aggregate macroeconomic data on the agriculture, fisheries and forestry industries are provided by the ABS.

More information on the specific survey activities and data holdings of these stakeholders is outlined below.

Survey collection programs

Agriculture

ABS

The ABS has had an agricultural statistics program for more than a century, and produces a range of statistics relevant to agriculture through its other statistical programs. The principal agricultural collection of the ABS is the five-yearly Agricultural Census, which provides a key reference dataset on agricultural activity in Australia, including commodity production, natural resource management, farm business management and water use. The Agricultural Census is a source of comprehensive agricultural data across all agricultural commodities at a sub-state level. In inter-censal years an annual sample survey (currently termed the Rural Environment and Agricultural Commodity Survey – REACS) is conducted to collect similar information (see **Table 5 Appendix 3**). Data from the Agricultural Census and the annual survey, along with annual data collected by the ABS on the value of agricultural commodities produced, are critical inputs to measuring the contribution of agriculture to the national economy through the National Accounts[18].

ABS also produces a range of other data relevant to agriculture, including industry-specific surveys, land management practices data, trade data (imports and exports of goods[19]) and information about the characteristics of businesses in the agriculture, fisheries and forestry industries, including aggregate-level financial data, business entries and exits and business use of IT and innovation[20]. The ABS labour force survey provides quarterly employment estimates for agricultural sub-industries.

The Census of Population and Housing (Population Census) is a key national data set that contributes to understanding the individuals, households and communities related to agricultural industries. The Population Census provides fine scale (spatial and industry categories) employment data on persons participating in agricultural production and related supply chain industries. Further, the Population Census provides a range of variables, including age, gender, educational attainment, cultural diversity, Indigenous status, and income that enable the development of detailed farmer typologies across agricultural industries (see **Table 5 Appendix 3**). The Population Census is the principle data set for analysing and understanding households and communities related to agricultural industries, including monitoring and evaluating change brought about by economic, social and environmental phenomena.

[18] See for example the following ABS publications: *Australian National Accounts: Input-Output Tables* (ABS Cat. No. 5209.0.55.001), *Australian System of National Accounts* (ABS Cat. No. 5204.0).

[19] In general, ABS international trade statistics are not produced for industries, however a concordance between the Trade in Goods Classification (HS) and ANZSIC, which assigns different commodities to the industry most likely to have produced that product, is published in *International Trade in Goods and Services, Australia* (ABS Cat. No. 5368.0). The publication *Characteristics of Australian Exporters,* (ABS Cat. No. 5368.0.55.006) also provides some data by industry (for trade in goods only) using the ABN of the exporter and the business register ANZSIC. There is no data currently available that provides estimates of Trade in Services by industry.

[20] See for example the following ABS publications: *Selected Characteristics of Australian Business* (ABS Cat. No. 8167.0), *Australian Industry* (ABS Cat. No. 8155.0), *Counts of Australian Businesses, including Entries and Exits* (ABS Cat. No. 8165.0), and *Counts of Australian Business Operators* (ABS Cat. No. 8175.0).

The ABS agricultural statistics program is funded primarily through government appropriation with a component of user-funding. The overall level of funding varies by year because of the cyclical nature of the Agricultural Census and variations in the amount of user-funding. Program resources were $6.9 million in 2014-15; $5.9 million in 2015-16; and $8.5 million in 2016-17[21]. The appropriation funds the provision of the core data required to inform national and state agricultural policy and to measure agriculture's contribution to the national accounts. This includes data on the area and production of the agricultural commodities that contribute (in aggregate) the majority of value to the national economy, as well as data on natural resource use (including water) and on agricultural land management practices that are of national policy significance. These data are predominantly collected through the annual agricultural survey and Value of Agricultural Commodities Produced collection, and the five-yearly Agricultural Census. Data are produced for a range of geographic boundaries, including national, state/territory and sub-state areas, including those defined through the Australian Statistical Geography Standard (ASGS) (see **Table 5 Appendix 3** for details). Topics of specific interest to particular users are funded on a user-funded basis. These can include industry-specific collections (such as the Vineyards collection undertaken periodically by the ABS on behalf of grape and wine industry bodies, or more detailed data on specific commodities in the annual survey) or topics of policy interest to one or more government agencies (for example, the Land Management Practices Surveys funded by the Department of Agriculture).

Under the *Census and Statistics Act 1905* the Australian Statistician has the authority to direct respondents to complete ABS surveys collected under the Act. The ABS derives its functions and responsibilities in relation to statistical collection primarily from the *Australian Bureau of Statistics Act 1975* (ABS Act) and the *Census and Statistics Act 1905* (CSA Act)[22]. The ABS Act establishes the ABS as an independent statutory authority, defines its functions and establishes the office of Australian Statistician (among other things). The CSA Act provides the Australian Statistician with the authority to conduct statistical collections, and, when necessary, to direct a person to provide statistical information. The CSA Act also requires the ABS to publish and disseminate compilations and analyses of statistical information and to maintain the confidentiality of information collected under the Act. The ability of the ABS to protect the confidentiality of respondents' information, combined with the power to compel response where necessary, contributes to ensuring high response rates to ABS collections.

Under the ABS Act the ABS also has a legislated responsibility to help address the issues arising from multiple official statistical producers, by *"co-ordinating the operations of official bodies in the collection, compilation and dissemination of statistics and related information"*[23]. Through this role ABS encourages and promotes coordination between official statistics producers, promoting the use of common standards, classifications and definitions, and promoting best practice statistical methodologies. As part of this role the ABS hosts the Statistical Clearing House, which is the central clearance point for surveys of 50 or more businesses that are run, funded, or conducted on behalf of the Australian Government. It aims to minimise the burden of Australian Government surveys on businesses by reducing survey duplication and ensuring that proposed business survey methods and questionnaire designs are fit for purpose.

ABARES

ABARES has been a significant provider of agricultural statistics since the inception of the Bureau of Agricultural Economics (BAE) in 1945. ABARES is the research arm of the Department of Agriculture and provides professionally independent research, analysis, forecasting and statistics on the agriculture, fisheries and forestry industries. ABARES

[21] Source: *ABS Forward Work Program, 2014-15 to 2017-18* (cat.no. 1006.0, 'Agriculture Statistics' program section.
[22] For more information on ABS legislation see the ABS website, 'ABS Legislative Framework',
[23] ABS Act 1975 – Section 6 (1)(c) - source: National Statistical Service website,

annual collections of farm business data inform government, industry and other stakeholders about farm production, productivity and financial performance.

ABARES farm surveys currently provide national coverage of broadacre (grains, sheep and beef), dairy and vegetable farms and provide data on farm financial and physical performance. The broadacre and dairy surveys have been conducted annually since the late 1970s, and the vegetable survey has been conducted annually since 2005-06. In addition, a survey of irrigation farms in the Murray-Darling Basin has been conducted since 2006-07, although reduced funding resulted in the scope of this survey being reduced from ten to three regions in 2013-14.

The data collected in these surveys allow for detailed analysis of the farm financial performance and productivity by region and industry for the majority of broadacre agriculture. However, the survey program does not regularly cover many important industries such as sugar cane, wine grapes, fruit growing and intensive livestock. ABARES also undertakes a number of one off or as required supplementary and additional collections as commissioned work on a variety of topics or industries (see **Table 5 Appendix 3**).

ABARES farm surveys cover enterprises with an Estimated Value of Agricultural Operations (EVAO) of more than $40,000. ABARES' survey program utilises the ABS agricultural survey frame to develop its survey samples[24]. This sharing of the ABS survey frame improves the accuracy of ABARES' surveys, eliminates the need for ABARES to develop an independent business register and improves the comparability of the statistics derived from these surveys with those produced by the ABS.

ABARES core survey collections are funded primarily through Department of Agriculture appropriation, with contributions from RDCs and the Murray Darling Basin Authority. In 2012-13 the ABARES broadacre (Australian Agricultural and Grazing Industries Survey (AAGIS)) and dairy (Australian Diary Industry Survey (ADIS)) survey program cost approximately $3 million. Over the past five years, on average, around one-quarter of the cost of the AAGIS was funded by GRDC (18 per cent) and MLA (seven per cent), with the Department of Agriculture contributing the remaining three-quarters. This share has fallen substantially from the 53 per cent contributed to collection costs by RDCs in 2004-05.

For more than 10 years, approximately 50 per cent of the costs of the ADIS were provided by Dairy Australia (and its predecessors) with the Department of Agriculture contributing the remainder. However, in 2014-15 Dairy Australia ceased funding ADIS in order to expand its Farm Monitor benchmarking project.

The vegetable survey is well supported by Horticulture Australia Limited (HAL) providing more than $0.3 million a year, relative to a total cost of almost $0.5 million a year. A three-year contract is in place until 2015-16. The irrigation survey was only partially supported in 2013-14, resulting in a reduced sample of 400 farm businesses covering three regions, compared with previous years' targets of 900 farm businesses across 10 regions. Funds for this survey are negotiated each financial year.

The RDCs are funded through levies collected from industries as well as matched funding from the Australian Government for research and development activities. Hence the total government contribution to funding of these surveys is substantial. The role of RDCs and their funding arrangements are discussed in more detail in a later section.

Farm businesses are not required by law to respond to ABARES surveys – their responses are voluntary. Consequently ABARES spends significant time building relationships with farmers to improve response rates and ensure high data quality. Because it is an Australian government institution, ABARES is required to clear its business surveys through the ABS Statistical Clearing House.

[24] This sharing of the agricultural frame is enabled under Clause 6 of the Statistics Determination 1983.

In addition to its farm survey data collections, ABARES produces a range of integrated and modelled agricultural information products, including:

- *Agricultural Commodity Statistics* – an annual compendium of historical statistics covering the agriculture, fisheries, food and forestry industries. It provides a set of comprehensive statistical tables on Australian and world production, consumption, stocks and trade for a wide range of commodities. These include grains and oilseeds, livestock, livestock products, food, wool, horticulture, forestry and fisheries products. The report also contains statistics on farm inputs, agricultural water use and national macroeconomic indicators such as economic growth, employment, balance of trade, exchange rates and interest rates
- *Agricultural Commodities* – A quarterly production containing the latest national and international macroeconomic outlook for Australia's agriculture, fisheries and forestry industries. The report provides forecasts of prices, production and the value and volume of exports for Australia's major agricultural and natural resource-based commodities
- *Agsurf* – ABARES disseminate AAGIS and ADIS broadacre and dairy survey data through its online Agsurf portal. Custom cross tabulated data sheets can be produced based on geographic region, sub-industry and farm level variables, including livestock numbers, crop production, costs, fertilizer use, receipts and socioeconomic indicators
- *Australian Collaborative Land Use and Management Program (ACLUMP)*[25] – ACLUMP coordinates land use mapping in Australia to ensure consistent coverage of land use and land management practices. ACLUMP produces national-scale mapping using cost-effective modelling that links the agricultural statistics of various crops and pastures, time-series satellite data, and available spatial data on non-agricultural land use. ACLUMP is a consortium of Australian and State government partners
- *The Monitor*[26] – an online tool that delivers a broad range of climatic, production, biophysical and economic information, for various regions throughout Australia. The Monitor provides the ability to explore and report on spatial, temporal and point-based data and information at various regional scales. The *Monitor* also provides access to a mapping interface to view spatial data against several different region types.

Rural Research and Development Corporations – agriculture

There are 15 Rural Research and Development Corporations (RDCs) — 5 statutory corporations and 10 industry-owned corporations covering the major primary industries. Of the 15 RDCs, 12 represent agricultural industries. These are: cotton, dairy, eggs, grapes and wine, grains, horticulture, livestock export, meat and livestock, meat processing, pork, sugar, and wool. The Rural Industries RDC (RIRDC) is a cross-cutting RDC that supports smaller industries and sponsors research on national rural issues. The remaining two are the Fisheries Research and Development Corporation (FRDC) and Forest and Wood Products Australia (FWPA) — which are discussed in the sections on fisheries and forestry.

The rural RDCs are significant funders of research in agriculture, fisheries and forestry, investing $441 million in R&D in 2008-09.[27,28] According to the Council of Rural Research

[25] Australian Collaborative Land Use and Management Program

[26] The Monitor

[27] Council of Rural Research and Development Corporation Chairs, *Impact of investment in research and development by the rural research and development corporations* (2010)

[28] The Productivity Commission (2011) estimated that governments provide around 75 per cent of overall funding for rural R&D, with nearly two thirds of the public contribution coming from the Australian Government.

and Development Corporations, this includes $244 million of industry levies and $207 million in government matched funds (in most cases on a matching basis up to a limit of 0.5 per cent of industry gross value of production). The RDCs invest in and support research and development activities in areas that are priorities for government and industry, such as productivity growth, climate variability and natural resource management. In terms of agricultural statistics, each of the RDCs is involved in a variety of data collections relevant to their industries, including primary collections, administrative data collation, and commissioned research across a range of topics, including marketing, production and prices.

A number of surveys are funded by RDCs, including grower surveys and surveys of on-farm adoption of management practices. These are conducted by service providers other than ABS and ABARES. Examples of RDC surveys[29] are given in **Table 5 Appendix 3**.

RDCs collect these data to fill perceived gaps in information that supports their industries' sustainability, productivity and competitiveness. This includes greater detail and more frequent timing of data than that provided in official statistics as well as data on topics not covered in official statistical collections.

Businesses are not required by law to respond to requests for survey information from RDCs or private sector organisations and responses are voluntary. There is no requirement for data collections undertaken by non-Australian government institutions to be cleared by the ABS Statistical Clearing House.

Other organisations – agriculture

Other agencies contribute to the production, management and delivery of research, including the integration and dissemination of statistical assets that support agriculture. These include federal agencies such as the Department of Agriculture and the Department of the Environment, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Bureau of Meteorology, and Geoscience Australia; state and territory governments; Cooperative Research Centres (CRC) and universities; non-government organisations; industry groups; farming groups; private organisations and individuals.

[29] This is by no means a comprehensive list of all the surveys that RDCs are conducting, but gives examples based on publicly available information and information obtained during NASR consultations.

Fisheries

Fisheries statistics are collected by a number of organisations, including the Australian Fisheries Management Authority (AFMA), ABS, ABARES, state and territory governments and the Fisheries Research and Development Corporation (FRDC). As wild-capture fisheries are based on natural and publicly owned resources there is a range of data collected that relates to ecosystems and natural resource management practises.

Australian Fisheries Management Authority

The Australian Fisheries Management Authority (AFMA) is the agency responsible for the management of Commonwealth fisheries[30] with responsibility under the *Fisheries Administration Act 1991* and the *Fisheries Management Act 1991*. Other legislation, including the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* also requires AFMA to collect and verify data[31].

AFMA collects catch, effort, disposals data[32] and other information from operators in all Commonwealth fisheries under a number of programs. These include:

- catch and effort logbooks – these record the number or weight of fish caught by fishing vessels and the resources used to catch them. These are key data that are used for fisheries management, including assessing and analysing fish stocks, setting sustainable catch or effort limits and research
- on vessel observers – these complement the logbook program and provide independent, reliable, verified and accurate data on the fishing catch, effort and practices. These provide data on factors such as incidental catch that may not be well captured in logbooks
- vessel monitoring systems – these monitor the position and activity of commercial fishing vessels for compliance purposes
- catch disposal records – these record the weight and sale of landed catch and contribute to assessing and reporting total catch taken in a reference period
- electronic monitoring – this recent program complements log book data by providing independent, reliable, verified and accurate data on the fishing catch, effort and practices.

AFMA also funds data collections through external agencies on specific issues related to natural resource management, such as independent surveys of fish stocks.

States and Territories

State and territory government fisheries agencies have responsibility for collecting and reporting statistics on state and territory managed fisheries. All states and territories collect catch and effort data from commercial fishing operators, primarily through logbook programs, sometimes complemented by on board observer programs. Catch and effort data broadly inform fisheries management and are utilised for stock analysis and assessment. Some state and territory managed fisheries also employ a vessel monitoring system, which monitors and assesses the position and activity of commercial fishing vessels. State and territory government agencies also fund data collections on specific issues related to natural resource management.

[30] Australian Government Fisheries Management Authority

[31] Protected species interaction reports

[32] Catch: The number or weight of fish captured.
Effort: A measure of the resources used to harvest a fishery's stocks. The measure of effort appropriate for a fishery depends on the methods used and the management arrangements. Common measures include the number of vessels, the number of hooks set and the number of fishing days or nights.
Disposals: Catch disposal records (CDR) are weighed fish at unloading (Commonwealth fisheries).

ABARES

Since 1991 ABARES has compiled state, territory and Commonwealth data on fisheries production and trade to produce national statistics and has published these in the annual *Australian Fisheries and Aquaculture Statistics*[33] (see Table 5 **Appendix 3**). ABARES collects price data for key species in order to estimate the gross value of production for Commonwealth fisheries by species. State and territory fisheries agencies provide to ABARES their estimates of GVP for their wild capture and aquaculture sectors. The estimates of gross value of production from each jurisdiction are used as the basis to determine Commonwealth, state and territory fisheries research funding arrangements each year. These data also contribute to the fisheries components of the quarterly *Agricultural Commodities* and the annual *Agricultural Commodity Statistics*. *Australian Fisheries and Aquaculture Statistics* is supported by funding from the Fisheries Research and Development Corporation and the Department of Agriculture. These national statistics form the basis for international reporting requirements to the United Nations Food and Agriculture Organization (FAO) and the Organisation for Economic Co-operation and Development (OECD).

ABARES conducted ad hoc financial and economic surveys of selected key Commonwealth fisheries in the 1980s. Since 1992 there has been a program of regular surveys of selected key Commonwealth fisheries, providing a time series of financial and economic performance information published as the *Australian fisheries economic indicators* reports[34]**.** These provide data that inform ABARES assessment of the performance of Commonwealth fisheries management against AFMA's legislated economic objectives.

ABARES' annual *Fishery status reports* provide an independent assessment of the biological status of fish stocks that underpin Commonwealth fisheries, as well as reporting on the economic performance of Commonwealth fisheries. The *Fishery status reports* — undertaken since 1993 — provide a time series on the status of fish stocks. The reports are produced by ABARES with support from the Fisheries Resources Research Fund and the Department of Agriculture. ABARES also coordinates the evaluation of wild-capture fishery status reporting at the national level, including for state and Northern Territory jurisdictions. In 2014, ABARES in collaboration with FRDC and state and Northern Territory fisheries research agencies, produced the second *Status of key Australian fish stocks reports*.

ABARES is responsible for data provision to the regional fisheries management organisations to which Australia is a party, such as the Western and Central Pacific Fishery Commission.

Fisheries Research and Development Corporation

The FRDC is a co-funded partnership between the Australian Government and the fishing industry. The FRDC's role is to plan, coordinate and invest in fisheries research, development and extension (RD&E) activities. FRDC's investment in RD&E produces an extensive array of ecological, environmental, economic and social data and information. For example, the National Recreational and Indigenous Fishing Survey of Australia[35] was funded by Commonwealth and state governments through the FRDC. FRDC also initiated a social research program in 2009 that focuses on the social aspects of fisheries management, change management, community perceptions, RD&E adoption and industry communities' ability to adapt[36].

ABS

Prior to 1985 the ABS had a direct role in the collection and dissemination of Australian Fisheries Statistics through its then publication the 'Australian Fisheries Bulletin'. On the cessation of this publication the Fisheries Research and Development Corporation took a lead role in the creation of a set of statistics at the national level through provision of funding to ABARES to undertake the collections described above.

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[33] Previously the *Australian Fisheries Statistics*.
[34] Previously the *Australian Fisheries Surveys Reports*.
[35] National Recreational and Indigenous Fishing Survey
[36] FRDC Social Research Reports

The Population Census is a key national data set that contributes to understanding the individuals, households and communities related to the fisheries industry. The Population Census provides fine scale (spatial and industry categories) employment data on persons participating in fishery industries and related supply chain industries. Further, the Population Census provides a range of variables, including age, gender, educational attainment, cultural diversity, Indigenous status, and income that enable the development of detailed employee typologies across fishery industries. The Population Census is the principle data set for analysing and understanding households and communities related to fishery industries, including monitoring and evaluating change brought about by economic, social and environmental phenomena.

The ABS labour force survey provides quarterly employment estimates for fishery sub-industries. The international merchandise trade collection provides data on the value of merchandise imports and exports by industry of product (monthly) and exports and number of goods exporters by industry of exporter by a range of other dimensions (yearly) (see **Table 5 Appendix 3**).

Other organisations–fisheries

Other agencies involved in the production, collation, analysis and dissemination of fisheries statistical data include CSIRO, Seafood Cooperative Research Centre, Geoscience Australia, industry bodies, non-government organisations, research institutes and regional fisheries organisations.

Forestry

Forestry statistics are collected by a number of organisations, including ABARES, the ABS, the industry based research and development corporation (Forest and Wood Products Australia Limited (FWPA)), and other industry organisations. As some forestry production is based on natural ecosystems and public-owned resources, a range of data is collected that relate to these ecosystems and to natural resource management practises.

Forest and Wood Products Australia Limited

Forest and Wood Products Australia (FWPA) provides national, integrated research and development services to the Australian forest and wood products industry. In working with ABARES, the FWPA plays an important role in coordinating industry data and providing industry input for ABARES research. The FWPA has a Statistics and Economics Program that examines the timeliness and accuracy of forestry information and gaps in data available for decision-making.[37] The priority for this program is to improve availability of baseline data on the forestry industry, and the FWPA works extensively with ABARES to address this issue. A key collection by FWPA is the Softwood Timber Survey collating sales volumes for Australian softwood products (see **Table 7 Appendix 3**). FWPA also co-funds one of ABARES flagship reports, the *Australian Forest and Wood Products Statistics*.

ABARES

ABARES is the key body that coordinates national forestry and forest product statistics. ABARES collects forestry data through a number of long-running and well established surveys, and collects forestry data from the states and territories through the National Forest Inventory (see **Table 7 Appendix 3**). The National Forest Inventory is a partnership between the Commonwealth and state and territory governments established as the authoritative source of agreed integrated national forest data, to develop and promote the use of national standards and protocols for forest-related data collection and management, and to provide forest information products to support forest-related policy development, decision making, monitoring and reporting. Data from the National Forest Inventory, ABARES surveys, and a number of other national sources are compiled into the 5-yearly *Australia's State of the Forests Report* series.

[37] Forestry and Wood Products Australia, Statistics & Economics

The 'national wood processing' survey obtains up-to-date information on mill inputs, production, employment and ownership from Australian wood processors. The '*Australian plantation statistics*' report compiled by ABARES provides data on Australian plantations established for wood production. ABARES compiles annual national log harvest volume and gross value of production figures using data from state forest organisations, industry organisations, and businesses through the 'Gross value of production' survey. Production data for pulp and paper products is collected through the 'Pulp and paper' survey.

The data and information collected through these surveys are published biennially in *Australian Forest and Wood Products Statistics*. This publication reports a range of national and state data on the volume and value of log harvest, log prices, production and consumption of wood products, industry value-add, sales and service income, employment and detailed ABS trade data. The plantation statistics are published annually. Every five years a comprehensive spatial stocktake of the plantation estate and a log supply forecast are published.

States and territories

States and territory governments have responsibility for forest management in Australia. Forest inventory information on the extent, type, condition and location of forests is collected and published by state and territory governments. ABARES plays a key role in compiling this into national inventory data to inform a five-yearly State of the Forests Reports on the management, conservation and use of Australia's forests.

ABS

The ABS produces information on Australian imports and exports of forestry and logging products (see **Table 7 Appendix 3**). The Population Census is a key national data set that contributes to understanding the individuals, households and communities related to forestry industries. The Population Census provides fine scale (spatial and industry categories) employment data on persons participating in forestry production and related supply chain industries. Further, the Population Census provides a range of variables, including age, gender, educational attainment, cultural diversity, Indigenous status, and income that enable the development of detailed typologies of forestry industry employees. The Population Census is the principle data set for analysing and understanding households and communities related to forestry industries, including monitoring and evaluating change brought about by economic, social and environmental phenomena.

The ABS labour force survey provides quarterly employment estimates for forestry sub-industries (see **Table 7 Appendix 3**). The international merchandise trade collection provides data on the value of merchandise imports and exports by industry of product (monthly) and exports and number of goods exporters by industry of exporter by a range of other dimensions (annual).

Other organisations–forestry

Other agencies involved in the production, collation, analysis and dissemination of forestry statistical data include CSIRO, Geoscience Australia, industry bodies, non-government organisations, research institutes and regional forestry organisations. The URS Forestry Group, part of URS Corporation, conducts a quarterly timber market survey with funding from a range of government and industry bodies.[38]

Administrative data

Administrative data are collected by government agencies and service providers as a by-product of their administrative processes, for example, as part of the contact that is made with clients and through records of their transactions with agencies. While the type of information collected is intended to satisfy operational or service provision needs, some administrative data sources may usefully inform policy or research information needs in the agriculture, fisheries

[38] URS Corporation 2013, Understanding the Timber Market Survey, viewed 7 August 2014

and forestry industries. There are often technical and legislative barriers to using administrative data for other purposes, particularly relating to confidentiality and privacy of information.

Some key administrative data sets collected by agencies and service providers that contain potentially valuable policy and research information for primary industries, include:

- Commodity levy payer records – the Department of Agriculture administers an online system for levy payments and charges for a number of commodity groups, including dairy, livestock, chickens, pigs, wool, grains, cotton, rice, wheat, oilseeds, turf, honey, wine, apples and pears, citrus, nursery products, mushrooms and potatoes. Industry members pay primary industry levies and charges to fund R&D, marketing and promotion, plant and animal health programs and residue testing that benefit the industry. Levies are lodged quarterly and are based on recorded production levels by commodity.
- Export Documentation System (EXDOC) – the Department of Agriculture administers the export documentation system for exports of primary produce from Australia. Export documentation includes export permits that are required by the *Export Control Act (1982)* and export certificates required by importing countries. Data are recorded as a result of exporters or their agents applying for Department of Agriculture export permits or certificates. Information can include details of the consignment, transport, product and product preparation of meat, dairy, seafood, grains, eggs, skins and hides, horticulture and wool commodities. Export data are held in the EXDOC database for a 13 month period. The EXDOC team provides information from export data for internal use of the Department. Client privacy concerns must be taken into consideration in any reporting. The data are shared with ABS for trade statistics estimates and the National Accounts.
- Import Clearance System of Customs – import data are collected under the *Customs Act* (1901) with importers having a legal obligation to provide documentation to Customs. These data are used by the ABS to estimate foreign trade statistics such as the quantity, value and origin of goods brought into Australia. The *Customs Administration Act* (1985) allows Customs to pass these data to the ABS for statistical purposes.
- Australian Import Management System (AIMS) – the Department of Agriculture administers the import management system for the import of goods into Australia specified under the *Quarantine Act* (1908). Permit information, including product or commodity details, the proposed end use of the product and country of origin, is collected for some specified goods.
- The Australian Taxation Office collects information on business taxation – these data are used to produce estimates of the number of businesses engaged in agriculture, fisheries and forestry industries.
- The Australian Wool Testing Authority tests virtually all wool produced in Australia. The company collects data on wool production and quality including number of bales, weight of wool tested, fibre diameter, yield, wool type (fleece, skirting, carding), mulesing status and wool statistical area.
- National Livestock Identification System – a system for identification and traceability of Australian livestock. The database collects movement information for cattle, sheep and goats and recording this information is a mandatory requirement of State legislation. The data are used for livestock traceability supporting market access for Australian red meat products. Its use for other purposes is subject to agreement of the NLIS Advisory Committees made up of Commonwealth and state government representatives, and Peak Industry Councils.
- Pigpass is a system used to track the movement of pigs in Australia. A National Vendor Declaration must be filled in whenever pigs are moved from one property to another. This applies to all pig owners and producers. Information required for PigPass includes Property Identification Code (PIC), pig tattoo/brand number and ABN, pig owner's contact details, pig and property information, and Property to Property movement declaration. The information is used to provide quality assurance to customers of the safety, integrity and traceability of pork products, and also enables authorities to determine the source of a disease outbreak or food

safety emergency. The PigPass system is administered by Australian Pork Ltd on behalf of the pork industry.

Other examples of administrative data sources relating to agricultural industries include grains receivals and sugar mill receivals.

CHAPTER 3 – Stakeholder feedback on the current Australian agricultural statistics system

During the consultation phase of the NASR, four key themes were raised in relation to the functioning of the current and future agricultural statistics system. These were:

- the 'red tape' burden on respondents (primarily farmers) resulting from survey activity
- the quality of statistics produced from the system
- the statistical infrastructure underpinning the system
- the coordination and governance arrangements in place to ensure the system functions efficiently and effectively.

The key findings from stakeholder feedback in relation to each of these themes is summarised below.

Red tape burden

A key concern raised by stakeholders during the review was the 'red tape' burden that survey activity places on respondents, particularly farmers.

A number of organisations are involved in agricultural data collection activity beyond the official statistics collection agencies, including industry bodies and private consultants. Stakeholders reported that farmers may receive multiple survey forms from different organisations, often at times of peak business activity, and have limited time to respond. Stakeholders conveyed a number of factors that contributed to their feelings of being overwhelmed and frustrated because of multiple requests for information. These are presented in **Table 1**.

Table 1 - Factors contributing to red tape burden

Factors	Factor description
Volume of different survey forms from multiple organisations	The more forms received, the more burden felt by respondents. Respondents believe they are being asked similar questions multiple times.
Time required to provide a response	Amount of time required to complete survey forms coupled with short timeframes to complete and submit surveys increased frustration and perception of burden.
Timing of receiving a survey	If timing conflicts with peak business activity, this can increase the level of burden.
Cumulative impact of the above factors	The mix of the above factors increased the perception of respondent burden.

Stakeholders referred to the sheer volume of requests for information by different organisations as a major source of frustration. Furthermore, stakeholders referred to instances of separate data collections by different organisations on what they perceived as similar survey topics or questions, and directed at similar respondent groups, industries or geographic regions. An example of perceived duplication in data collections was seen in the dairy industry. Some dairy farmers in a given year will receive requests to participate in multiple industry and government surveys (see **Appendix 4 – Analysis of duplication**). Analysis by the NASR found that the specific information requested in these data collections is different and not all dairy farmers would be requested or required to participate in a given data collection.

The amount of time required to complete surveys was a source of frustration. This was reflected in the Rice Growers Association submission, which highlighted the effort required to

undertake paddock-by-paddock assessments or source information that was not kept on-farm. Further, the time given to complete and return surveys was considered inadequate.

Stakeholders indicated that some farmers are disengaging from the survey process because of these issues, and because of a lack of understanding of why such information is being collected, how it will be used and concerns at how their confidentiality will be protected. The grains industry highlighted that data collections are undertaken by bulk grain handlers, private industry, consultants and government. Several stakeholders stated that these multiple requests are overwhelming for farmers who will disregard all requests except those from the ABS because of its legislated power to compel farmers to respond. Further, the RGA believes that farmers are at times taking a perfunctory approach to survey responses, undermining the quality of data collected.

Respondent burden affects the statistical system primarily through its impact on data quality. Farmers who are disengaged with the system are less likely to return survey forms and may not complete them fully or accurately, reducing the quality and/or completeness of the final results. This in turn requires greater effort by survey agencies to collect, check and validate survey data, adding to the time required to produce the survey outputs, affecting their timeliness.

Stakeholders referred to a need for greater coordination in the agricultural statistics system. There is no single body or organisation that monitors all agricultural data collection in Australia, although there are different mechanisms or protocols in place in individual organisations and in official organisations that attempt to coordinate the management of respondent burden and duplication in survey activity, such as the Statistical Clearing House in the ABS (**Box 1**). It is difficult to quantify the extent of respondent burden throughout the current system, as this would require an audit of all agricultural surveys currently being conducted, their content and scope, and the number and types of businesses being surveyed.

Box 1 - The Statistical Clearing House

The Statistical Clearing House is an existing body within the Australian Bureau of Statistics that aims to minimise the burden placed by the Australian government on businesses and reduce duplication of survey data collection.

The SCH acts as a central clearance point for all business surveys (of 50 or more businesses) that are run, funded, or conducted on behalf of the Australian Government

The key objectives of the SCH are to:

- reduce duplication in business collection activity
- minimise burden on business (as measured by the estimated time required to complete a survey)
- ensure surveys are fit for purpose
- encourage survey managers to utilise statistically sound principles and best practices in planning, design and implementation of business surveys.

In the clearance process, the SCH will also identify any improvements that can be made to enhance the value and usability of survey outputs.

Data quality

The NASR consultation identified a range of concerns about the quality of agricultural statistics. These are presented below categorised according to the ABS Quality Framework, which describes the following elements of quality in statistics[39]:

- relevance – how well the statistic meets the information need it was designed to address

[39] ABS 2009, *ABS Data Quality Framework, May 2009* (ABS Cat. No. 1520.0), ABS, Canberra.

- accuracy – how well the statistic describes the phenomenon it was designed to measure
- timeliness – how soon the statistic is made available after the reference period it relates to
- coherence – how well the statistic can be related to, or integrated with, other relevant data
- accessibility – how easily the statistic can be discovered, accessed and used
- interpretability – how easily the statistic can be understood, interpreted and used correctly.

In assessing the relevance of the statistical assets in the current system, stakeholders indicated that while currently available statistical assets were mostly meeting their needs, approximately one-third were falling short. Areas of deficiency included: the level of detail provided (such as a lack of data available for small geographic scales, detailed varieties of commodities or detailed industry breakdowns) and the scope or coverage of the dataset. For example, hobby farms are excluded from the scope of some collections because of their marginal economic significance but are important for users seeking to understand biosecurity and natural resource management issues. Stakeholders noted the lack of consistency in the definition of an agricultural business across statistical collections (**Table 2**), which makes comparability across data and statistics difficult.

Table 2 - Comparison of definitions of agricultural businesses in Australia

Source	Purpose	Definition of a relevant agricultural business
ABS	Agricultural Census Annual agricultural surveys	All businesses registered for an Australian Business Number with an EVAO, or equivalent, of $5,000 or more.
ABARES	Farm surveys	Farms with an EVAO of more than $40,000.
Australian Business Register (ABR)	Register of businesses	Businesses that declare they undertake agricultural activity, or are coded to an agricultural industry, and registered for an ABN. (It is compulsory to register for an ABN if turnover is above $75,000.)
Australian Taxation Office	Taxation statistics	Uses the ABR definition.
Industry	Farm monitor surveys	Levy payers who pay levies to the relevant agricultural industry organisation.

Note: EVAO – Estimated Value of Agricultural Operations.

Stakeholders also identified a range of areas where there are reportedly no statistics available. In most cases, the data gaps identified were specific to an individual or organisation's work program, or were items that required greater spatial, temporal or commodity detail. However, there were a number of data gaps identified by multiple stakeholders. These included: data on industry supply chains and value adding; post-farm-gate productivity estimates for transport, food processing and manufacturing; accurate employment estimates of particular industries[40]; data to enable estimates of productivity at a regional level; upstream and downstream employment figures; labour market supply and demand; the domestic consumption of agriculture, fisheries and forestry products; and investment and return on government investment in rural industry research and development. A summary of reportedly missing data themes is presented in **Table 3**.

Considerable concern was also raised in relation to the accuracy of agricultural statistics and the impact of this on the quality of decision-making and policy formation. Many of these concerns related to sample survey data, the quality of which can be affected by errors stemming from: the coverage of the survey (e.g. ensuring all relevant businesses are included); the sampling error associated with the survey estimates; and response or measurement error (non-response and/or incomplete or inaccurate responses). The impact of respondent burden on low response rates or poor quality of responses to surveys was noted, as outlined above. Stakeholders also raised concerns in relation to the sampling error associated with survey

[40] Especially for intercensal years and relating to differences in how stakeholders classify their industry.

estimates, with a number of users indicating these errors are too large to enable them to use the statistics with confidence. This was particularly the case for statistics on smaller industries and at smaller geographic areas where the sampling error tends to be higher. The variation between ABS preliminary and final estimates and the impact of this on users' confidence in the reliability of the data were also raised.

The timeliness of statistics from the ABS agricultural surveys and Census and ABARES' farm surveys was considered a major concern by many stakeholders. The lag between the reference period of the survey and the date of release reduces the usefulness of the statistics to support timely decision-making, strategic planning and forecasting.

The coherence of data sources in terms of the consistency between datasets across time and space, and the comparability of data from different sources was also raised as an issue. In particular, issues relating to spatial consistency, including the need for consistent classifications of spatial units between datasets, the need for spatial boundaries that align and concordances when changes occur, were noted by stakeholders. Inconsistency in the types of commodities collected and variation in the way in which these are aggregated and categorised from year-to-year causes frustration for users trying to establish a coherent time series. Changes to methodologies and definitions in official sources, which affect fundamental statistics such as counts of farm businesses, were also cited by stakeholders, with concerns raised at the lack of concordances provided to assist users to interpret the impact of the changes on the data series. Stakeholders also noted that there can be different figures produced from different data sources for the same topics, and noted their difficulties in understanding the differences between these figures and attempting to use them for analysis. It was noted that low coherence between different sources limits the use of agricultural statistics.

Table 3 - Agricultural statistical assets identified by stakeholders as important but not available

Enduring goal	Reportedly missing agricultural statistical assets
Competitive and profitable agriculture, fisheries and forestry industries	• supply chain costs and value-adding • production volume and value, financial and trade data (for intercensal years at finer spatial scales) all commodities • data to enable regional level productivity estimates • labour demand, vacancies and skills • domestic consumption of fishery and forestry products • post farm-gate productivity estimates for transport, food processing and manufacturing • farm debt (dimensions of debt and coverage across agriculture industries) • value of non-farm assets held by farmers • expenditure and return on investment in rural research and development
Prosperous communities	• economic and social contribution of agriculture, fisheries and forestry to communities (e.g. employment upstream in supply chain) • farmer financial literacy • employment derived from seafood imports • employment generated by native and plantation forests • employment in forest logging transport • regional and local food security statistics
Sustainable natural resource use	• publically accessible national water trade information • status of natural resources and impact of threatening processes • peri-urban land management practices and awareness • characteristics and motivations of Landcare participants and volunteers • recreational fishing participation, catch and effort
Growing trade and market access	• detailed import data (e.g. importer characteristics, product type and use) • costs for businesses and industry to comply with import/export regulation • inputs and pathways to market • chemical usage at farm, regional and industry scales
Protecting animal, plant and human health and welfare	• chemical use and residues regarding livestock and crop management practices • livestock populations and location (at regional/state spatial scale, real time) • benefits and costs of responding to and managing pests and diseases • genetically modified crops and genetically modified feed sources • peri-urban landholders' location and biosecurity practices/awareness

A number of issues were identified with the accessibility of agricultural statistics. The first related to a lack of discoverability of public and privately-held information. The discoverability of statistical assets held by ABARES and the ABS was raised by stakeholders. Access to

ABARES data via the AgSurf website[41] was considered adequate as the site was reported as being easy to navigate and produce custom data sets. However, the lack of accompanying metadata was raised as a concern and a barrier to understanding the quality level of a particular asset. The discoverability of data on the ABS website was a common issue raised by stakeholders, however, they acknowledged that accessibility of ABS statistical assets has improved in recent years.

Stakeholders indicated that there were potentially significant amounts of data held by private organisations that would be beneficial to industry. However, it was acknowledged that private organisations vary in their capacity and willingness to divulge and communicate their data holdings.

Cost was also raised as a barrier to accessing relevant statistical assets, including those held by government agencies such as the ABS, as well as private sector providers. For example the ABS has an information consultancy service that operates on a cost recovery basis and applies charges for customised data provision. Stakeholders felt that the ABS does not provide transparent or consistent information on the cost of accessing custom data sets. A number of government and industry stakeholders noted that they rely on the Global Trade Atlas, an online tool[42] that enables users to view import/export flows of world trade, which is run by a private data service for a fee based subscription.

The cost to industry of independently undertaking or commissioning collections was also raised. Industry groups valued the data produced by the ABS and ABARES, but noted that the costs of commissioning them to undertake data collection were considered too high. In response, a number of industries had initiated their own primary data collection programs that were more cost effective, however, it was reported that some of these collections were affected by poor response rates as they were not compulsory. Further costs associated with accessing survey frames from the ABS were identified by stakeholders as not consistent and seen as excessive.

Confidentiality requirements were identified as a factor limiting data accessibility. Feedback from users indicated that at times this prevents the release of data necessary to inform decision-making, particularly for small or emerging industries or small geographic areas that are particularly affected by confidentiality restrictions.

Stakeholders also noted difficulties with being able to effectively interpret the available statistics – that is, to understand what the statistics mean and how to use them appropriately. These concerns related to the accompanying information provided with the statistics, such as that provided by ABS and ABARES with their statistical publications. The feedback indicated that users find this information too technical and difficult to interpret, and that more guidance is needed for non-technical users.

Statistical infrastructure

During the NASR consultation, stakeholders raised concerns not only with the quality of agricultural statistics, but also with the quality of the underpinning statistical infrastructure. Statistical infrastructure refers to the physical systems, methods and processes used in statistical production and to conceptual tools such as classifications, standards and frameworks. These assist in ensuring that statistics are produced to the highest quality standards and are able to be integrated, related and compared with other statistics.

Stakeholders reported that currently there is a wide variety of methods, systems and techniques used to collect, analyse and disseminate statistical data across the statistical system. These methods and tools are not widely shared and this is leading to duplication of effort as organisations develop their own methods in a siloed manner. An example raised by stakeholders was the issue of multiple organisations, particularly within government, investing in the development of separate electronic data collection platforms when joint investment in a single platform could provide a more efficient solution. An inability to access systems and tools

[41] AgSurf website

[42] Global Trade Atlas is provided by Global Trade Information Service Inc.

for the analysis and dissemination of statistical data was also cited as an issue, particularly systems and processes for integrating data from multiple sources to present a more complete picture of the economic, social and environmental dimensions of agriculture.

A consistent theme raised by stakeholders was the impact of the use of non-standard methods and processes on the comparability and coherence of statistics across the system, and the lack of agreed 'best practice' methods and standards that affect the quality of the statistics produced. For example, the use of different frames and registers (i.e. lists of businesses or households) by organisations undertaking statistical collections makes it difficult to compare the resulting statistics. Stakeholders noted the difficulties in relating data from industry surveys, which are based on levy payer lists, to ABS data, which are based on the Australian Business Register (ABR), as the different numbers and types of businesses included in the two frame sources affects their comparability.

The lack of a standard definition of an 'agricultural business' was also noted as a critical issue for stakeholders, given that the number of agricultural businesses is key to understanding the state of the industry. The varying definitions in use across statistical collections are a cause for concern, as these definitions affect estimates of fundamental statistics such as the value and volume of production.

Issues with the current standard geographic classification for official agricultural statistics, the Australian Statistical Geography Standard (ASGS), were also raised. These included its limitations for presenting land-based statistics and the inability to provide a sufficiently fine level of spatial disaggregation to support analysis of regional trends.

Statistical infrastructure also refers to the people working within the agricultural statistics system and their level of statistical literacy and capability. Stakeholders noted issues with the depth of statistical literacy among both producers and users of statistics in the current system, and reported difficulties in finding and accessing educational resources that would improve this. In particular, they reported frustration at a lack of educational resources targeted to non-technical users of statistics.

Coordination and governance

A recurring issue raised by stakeholders across both phases of the NASR consultation was to the coordination and governance mechanisms in the current agricultural statistical system. Stakeholders were united in their concerns on this issue, which encompassed the respective roles and responsibilities of stakeholders, as well as the mechanisms for ensuring that the production and use of statistics was effectively planned and coordinated across the system.

The NASR identified that stakeholders—mostly those in agricultural industries rather than in fisheries and forestry—are not clear about the roles and responsibilities of the stakeholders within the agricultural statistics system, including the roles of government, industry and the research sector. The lack of central coordination is perceived to lead to an inefficient use of resources as organisations duplicate effort and/or operate in silos. Communication between different stakeholders was perceived as uncoordinated and fragmented. Particular mention was made of the lack of coordination between state/territory governments and between industry and government and that this is having an impact on the efficiency and effectiveness of the system. The need to recognise the critical role of survey respondents as stakeholders along with statistics producers, users and custodians was also noted. While it was recognised that ABS and ABARES, as the two organisations producing the majority of agricultural statistics used by stakeholders (see **Table 9 Appendix 4**), were best placed to play a leadership role in the agricultural statistics system, this role was not well defined or understood by stakeholders.

CHAPTER 4 – Principles of best practice agricultural statistical systems

The NASR sought to identify not only the current state of the agricultural statistics system but what an efficient, well functioning and sustainable system should comprise. In doing this, the NASR considered international and domestic statistical best practice and used this to identify five principles that underpin well-functioning, effective and efficient agricultural statistical systems. These are:

1. strong governance and coordination across the system
2. a clearly articulated strategy to guide future investment
3. use of best practice statistical methods and sources to maximise data quality and minimise respondent burden
4. investment in, and use of, innovative technologies, methods and processes across the statistical cycle
5. a culture of open data.

Each of these principles is outlined below.

1. Strong governance and coordination

Internationally there is a variety of coordination and governance models in place for agricultural statistics, each of which have been established to meet different national needs and may not be appropriate elsewhere. These models vary in the degree to which responsibility for agricultural statistics is centralised within the national statistical office, or decentralised to other agencies or organisations within the system. However, even in highly decentralised models[43], a few large agencies tend to dominate, usually the national statistical agency and relevant ministry of agriculture[44]. It is also usual for one agency to have the role of co-ordinating the statistical activities of the various departments[45].

The United Nations (UN) Food and Agriculture Organization (FAO) notes that both centralised and decentralised systems have their advantages and disadvantages, reflecting the respective areas of expertise of the national statistics agency and ministry of agriculture. Through the Global Strategy to Improve Agricultural and Rural Statistics, the FAO proposes a governance framework that leverages the strengths of both the national statistics office and the ministry of agriculture as part of an integrated statistical system[46].

In this framework, the FAO proposes that agricultural statistics should be integrated within national statistical systems to promote coherence between agricultural statistics and other economic, social and environmental statistics, enabling analyses of the interrelationships between agriculture and the wider economy and society. Governance over the system should include the national statistics agency and relevant ministries of agriculture, fisheries and forestry, and other organisations providing statistics or administrative data, with each of these stakeholders having a clearly defined role in contributing to data production within the system, based on their area of expertise.[47] A coordination mechanism should be employed between these stakeholders to provide a common voice for seeking resources for the agricultural statistics system within the framework of the national statistical system, and to ensure development of coherent national strategies for the development of agriculture, fisheries and

[43] United Nations 1980, *Handbook of Statistical Organisation: A study on the organisation of national statistical services and related management issues*, Department of International Economic and Social Affairs Statistical Office, Studies in Methods, Series F No. 28, New York; p. 14.
[44] World Bank, Food and Agriculture Organisation (FAO), and United Nations Statistical Commission (UNSC) 2011, *Global Strategy to Improve Agricultural and Rural Statistics,* Report No. 56719-GLB, Washington, DC: World Bank, p.27
[45] Ibid, p.14.
[46] World Bank, Food and Agriculture Organisation (FAO), and United Nations Statistical Commission (UNSC) 2011, *Global Strategy to Improve Agricultural and Rural Statistics,* Report No. 56719-GLB, Washington, DC: World Bank, p.27.
[47] Ibid, p.28.

forestry statistics[48]. The UN notes that centralised models, or at the least those with strong central leadership, are better positioned to provide this coherence and integration between the outputs of the statistical system than decentralised approaches[49].

2. A clearly articulated strategy to guide future investment

Best practice statistical systems are guided by an overarching vision, plan or strategy that describes the information requirements the system is designed to inform, and directs investment and effort towards positioning the system to support those information requirements, both now and into the future. It is usual for the development of these plans to be led by the relevant agency with responsibility for agricultural statistics, usually the national statistics agency or ministry of agriculture. Examples include plans developed by the US Department of Agriculture (USDA)[50], and Statistics Canada[51].

However, best practice plans go beyond the remit of a single agency and aim to develop a system-wide view of information priorities and the roles and responsibilities of the stakeholders in addressing these. An example is Statistics New Zealand's 'Domain Plans', which aim to achieve clarity and agreement from stakeholders about the main statistical priorities and the strategies for addressing these over a 5-8 year timeframe, and which promote shared responsibility and cooperation among agencies to achieve these strategies. New Zealand's Agriculture, Horticulture, and Forestry Domain Plan 2009[52] was jointly developed by Statistics NZ and the Ministry of Agriculture and Forestry in consultation with other government agencies and industry. It included a conceptual framework of agricultural statistics and a set of enduring topics representing the ongoing policy areas of interest to decision-makers in the industry. The plan outlines the main statistical priorities for the agriculture, horticulture, and forestry industries in New Zealand and the strategy for addressing these to 2017.

3. Use of best practice methods and sources to maximise data quality and minimise respondent burden

Best practice agricultural statistical systems strive to develop statistical assets and supporting infrastructure to a quality standard that is fit-for-purpose for the information needs they are intended to inform. Around the world, national statistical offices have adopted quality frameworks that are used to assess and report on the quality of statistical data, and to assist those developing statistical collections to produce high quality outputs. The ABS Data Quality Framework is one such framework[53], as is the FAO Statistics Quality Assurance Framework[54]. These frameworks recognise that quality in statistics has a number of dimensions, including relevance, accuracy, timeliness, accessibility, coherence, and interpretability, and is a function of a range of elements, including the institutional environment within which the statistics are produced, as well as the statistical practices and processes used.

The FAO notes that quality depends on user perspectives, needs and priorities, which vary across groups of users:

> For this reason the major challenge is to achieve a compromise among the needs of the various possible users (current and potential) in order to produce and disseminate statistical outputs that satisfy the most important needs given constraints concerning available resources.[55]

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[48] Ibid, p.27

[49] United Nations 1980, *Handbook of Statistical Organisation: A study on the organisation of national statistical services and related management issues*, p15.

[50] United States Department of Agriculture (USDA) National Agricultural Statistics Service 2011, *National Agricultural Statistics Service Strategic Plan, FYs 2010-2015*

[51] Statistics Canada 2011, Agriculture Statistics Program Review

[52] Statistics New Zealand 2009, *Agriculture, Horticulture, and Forestry Domain Plan 2009*, Wellington: Statistics New Zealand.

[53] The ABS Data Quality Framework is based on the Statistics Canada Quality Assurance Framework (2002) and the European Statistics Code of Practice (2005) *ABS Data Quality Framework, May 2009* (ABS Cat. No. 1520.0), ABS, Canberra.

[54] United Nations Food and Agriculture Organisation (FAO) 2014, *The FAO Statistics Quality Assurance Framework*, FAO, Rome

[55] Ibid, p.6.

Effective engagement with users in the statistical system is required to understand and prioritise quality requirements, and engagement with policy-makers and funding bodies is required to ensure the statistical system is sufficiently resourced to meet these requirements.

Producers of statistics should also ensure that they choose the most appropriate method of developing or compiling the required statistics. A fundamental principle of best practice statistical production, accepted internationally, is that sources and methods of data collection should be chosen to ensure timeliness and other aspects of quality, to be cost-efficient and to minimise the reporting burden for data providers.[56] Best practice statistical organisations leverage a range of data sources to produce their statistics, recognising that each type of source (e.g. directly collected from respondents via surveys, or from administrative or other sources) has strengths and weaknesses and that sources can be combined to produce a better product. The US Department of Agriculture, for example, draws on a mixture of administrative and survey data, remote sensing and field observations to produce its statistics.

A challenge for producers of statistics is balancing the need to meet users' statistical requirements with the need to effectively manage the burden on respondents. Internationally, the importance of effectively improving the management of the relationship with survey respondents has been recognised by a number of statistical organisations, with agencies such as Statistics New Zealand and the Office of National Statistics in the UK implementing reviews and improvements to their engagement with survey respondents. Statistics New Zealand's *Respondent Experience Strategy 2013-20*[57] explicitly recognises that respondent engagement involves more than managing survey load, and that improving the respondent experience[58] is fundamental to significantly addressing the reasons behind the reluctance of respondents to comply with survey requests. The Strategy aims to achieve 'willing respondents, finding it easy to comply' through putting respondents at the centre of data collection. The Strategy involves: increased levels of advocacy for respondents' rights and interests; more rigorously balancing compliance against the benefits of what is collected; taking a more fit-for-purpose approach to compliance; working to 'get people on board' with compelling reasons and benefits for survey participation; and 'making it easy' to comply by either reducing the amount of data being asked for or by making it easier to provide that information.

4. Investment in, and use of, innovative new technologies, methods and processes across the statistical cycle

Statistical organisations around the world have long taken advantage of emerging technologies and new techniques to continually improve the efficiency and effectiveness of their statistics. Major developments have included the introduction of computers, and later the internet, into statistical collection and processing, and the development of sample surveys in place of censuses. In recent decades the imperative to stay abreast of emerging technologies has intensified as traditional survey methodologies have become increasingly expensive and resource pressures have forced organisations to search for alternatives. The increasing difficulties faced by organisations in achieving quality response rates from direct collection (i.e. surveying respondents through face-to-face, telephone or self-completed questionnaires) reflects in part an increasingly mobile respondent population that is difficult to capture via traditional mail or landline telephone data capture methods, as well as increasing respondent disengagement in response to survey burden.

[56] Principle 5 of the United Nations Statistics Division's *Principles Governing International Statistical Activities*, endorsed in 2005. A similar theme is found in Principle 5 of the *Fundamental Principles of Official Statistics*, endorsed by the UN Statistics Commission in 1994 and Principle 14 of the ABS-developed *National Statistical Service Key Principles*

[57] New Zealand Government's *Statistics New Zealand's Respondent Experience Strategy for 2013-20*, Wellington: Statistics New Zealand.

[58] Statistics New Zealand defines respondent experience as follows: "Respondent experience refers to the perceptions, feelings and reactions that a person has a result of completing our surveys. A respondent's experience is important as it affects their willingness to comply with our requests for data and also to provide complete and accurate information. This, in turn, impacts our ability to achieve our response rate and data quality targets and produce statistics efficiently." - source: New Zealand Government's *Statistics New Zealand's Respondent Experience Strategy for 2013-20*, Wellington: Statistics New Zealand, p. 1

At the same time, the opportunities presented by the increased interest in 'big data', Web 2.0 and 3.0, remote sensing and sensor technologies and other technological innovations offer the potential to be 'game changers' for statistical production in the 21st century. Smart technologies embedded in production systems and along supply chains provide the potential to collect data automatically at source, offering alternative data sources to surveys that would reduce respondent burden and potentially lead to improved data quality, particularly timeliness. Remote sensing has been in use for a number of years in some countries, including the United States, for collection of agricultural data and is being explored in a range of other countries as a means of improving estimation of agricultural production and yields[59]. As well as potentially providing data in a more timely and cost-effective way, use of these sources in place of direct collection has the potential to reduce respondent burden.

For statistical collections that require some form of direct collection, the use of e-forms and smartphone apps offer increased convenience and speed for survey respondents, thereby increasing engagement. Web dissemination modes such as social media provide new avenues for statistical producers to rapidly disseminate statistical products to a wide audience quickly, and to find and source new and existing data sources.

In addition to new technologies, new and improved statistical methods and techniques also create potential to improve the cost-effectiveness, efficiency and relevance of statistical products. Increasingly, statistical organisations are integrating data from various sources, for example through the use of frameworks such as accounting frameworks[60] or through use of a common presentation format, to assist users wanting to understand complex issues such as those involving social, economic and environmental phenomena. New and improved statistical techniques, including statistical data integration[61] and modelling offer new ways of deriving value from existing and new data sources. Improved confidentiality techniques also offer the potential for more data to be released for public consumption while protecting the privacy of individual businesses.

5. A culture of open data

Best practice statistical systems aim to maximise the ability of stakeholders to find and use existing data sources, standards and methods This avoids duplication of effort and maximises the quality and coherence of the statistics available by ensuring they are developed using commonly agreed and best-practice standards, methods and tools. Internationally accepted principles of official statistics emphasise the importance of making statistics publicly available (within the constraints of confidentiality and privacy requirements), and in documenting and making accessible the associated concepts, definitions, classifications and quality information[62].

In order to do this, many governments around the world are increasingly instituting a culture of 'open data' as an underlying principle, fostering greater accessibility and sharing of the outputs from their statistical systems, including statistical data, methods, tools, standards, and educational materials.

[59] See for example the FAO-hosted *Expert Group Meeting on Crop Monitoring for Improved Food Security* held in February 2014

[60] The System of National Accounts and related System of Environmental-Economic Accounts are two examples of internationally-accepted statistical frameworks which provide the capacity to integrate a range of data, expressed in both monetary and physical terms, in a systematic way. More information about the use of these frameworks in Australia is outlined in: ABS 2014, *Australian Environmental-Economic Accounts, 2014* (ABS Cat. No. 4655.0) and ABS 2013, *Australian System of National Accounts: Concepts, Sources and Methods (ABS Cat. No.* 5216.0).

[61] Statistical data integration involves combining information from different administrative and/or survey sources to provide new datasets for statistical and research purposes. More information about statistical data integration involving Australian Commonwealth Government data can be found at the *Statistical Data Integration* homepage.

[62] See for example the following principles from the UN Statistics Division's *Principles Governing International Statistical Activities*: 'Principle 1: High quality international statistics, accessible for all, are a fundamental element of global information systems' and 'Principle 4: Concepts, definitions, classifications, sources, methods and procedures employed in the production of international statistics are chosen to meet professional scientific standards and are made transparent for the users.' The *Principles Governing International Statistical Activities*

Open data is data that can be freely used, reused and redistributed by anyone - subject only, at most, to the requirement to attribute the source of the data and share it widely. The key features of openness are[63]:

- availability and access: the data must be available as a whole and at no more than a reasonable reproduction cost, preferably by downloading over the internet. The data must also be available in a convenient and modifiable form
- reuse and redistribution: the data must be provided under terms that permit reuse and redistribution, including the intermixing with other datasets. The data must be machine-readable
- universal participation: everyone must be able to use, reuse and redistribute — there should be no discrimination against fields of endeavour or against persons or groups. For example, 'non-commercial' restrictions that would prevent 'commercial' use, or restrictions of use for certain purposes (e.g. only in education), do not meet the requirements of open data

Australian governments at many levels have established open data initiatives to make public data and publicly-funded research data more accessible, discoverable and reusable. For example, data.gov.au provides an easy way to discover, access and reuse public datasets from the Australian Government.

An international example of open data relating to agriculture is the Global Open Data for Agriculture and Nutrition initiative, jointly led by the US Department of Agriculture and the UK Department for International Development. The initiative is the first global open data initiative spanning both public and private entities, including donors, international organisations and businesses. The initiative seeks to support global efforts to make agricultural and nutritionally relevant data available, accessible, and usable on an unrestricted basis worldwide, and to build collaboration and cooperation among existing agriculture and open data activities.

[63] Open Knowledge Foundation 2012, *Open Data Handbook Documentation, Release 1.0.0*

CHAPTER 5 – Assessment of the Australian system against the best practice principles

This chapter presents an assessment of the performance of the Australian agricultural statistical system against the best practice principles outlined in **Chapter 4**, drawing on the stakeholder consultation and research conducted during the review.

1. Strong governance and coordination

The current Australian agricultural statistical system, with its predominantly centralised structure (i.e. with ABS and ABARES as the main producers of agricultural statistics) delivers a number of the advantages of centralised systems described under Principle 1 in **Chapter 4**. In particular, these include the advantages conferred by having Australia's national statistical agency, the ABS, playing a leading role in the production of core agricultural statistics. The ABS enjoys a high degree of trust and goodwill supported by legislative powers to direct respondents to provide statistical data and to protect the confidentiality of the data. This ensures the ABS is able to achieve high response rates in its collections and produce high quality data while retaining the trust of respondents. ABS legislation also explicitly recognises the important statistical leadership role the ABS has as the nation's central statistical authority.

This role acknowledges that ABS and ABARES are not the only producers of important statistical information—there are a number of other organisations collecting agriculture, fisheries and forestry statistics. The NASR found that there are a range of organisations, including state/territory government, RDCs and industry bodies that produce agricultural statistics (see **Table 9 Appendix 4)** and that may be prepared to play a role in improving agricultural statistics. With such a range of organisations involved, coordination and collaboration is required to support the efficient production of statistical assets and maintain data quality, especially the integration and coherence of statistics. There is evidence that a number of stakeholders (producers and users) have established relationships for the efficient production and use of statistical assets. Examples of good co-ordination came to light in the review such as in national fisheries and forestry statistics production, which could provide models of co-ordination for statistics collections in other industries.

However, there is no overarching mechanism that is coordinating the contributions of all the various organisations, including industry bodies, producing agricultural statistics and no mechanisms for ensuring that the production and use of statistics is effectively planned and coordinated across the system, nor a knowledge of the surveys planned in any one year. This is distinct from the ABS' role through the National Statistical Service[64] to help coordinate the production of statistics in government agencies.

It is particularly apparent from the NASR consultation that the roles of ABS and ABARES in the statistical system are not sufficiently transparent. Stakeholders are unclear about the roles and responsibilities of each agency in producing statistics. ABS' statistical leadership role is also not well understood or recognised. In addition, stakeholders do not always understand the role of other participants in the system—other Commonwealth government agencies, state and territory governments, the rural Research and Development Corporations (RDCs), and other industry and research bodies. There are also differing expectations regarding the contributions of government and industry in meeting statistical needs, with some having the view that government should provide the majority of required statistics, and others seeing a stronger role for industry. The lack of a clear delineation of roles and responsibilities in the statistical system has led to a lack of coordination in statistical production, inefficiency, potential duplication and increased respondent burden.

To be sustainable and effective, the Australian agricultural statistical system requires contributions from all stakeholders, both government and industry. The roles of ABS and ABARES, including ABS' statistical leadership role, should be made clearer and communicated to stakeholders. The role of other government bodies, industry and the RDCs in contributing to the system should also be clarified.

[64] See *NSS website* for more information

The ABS could influence and support better coordination and collaboration between producers of statistics to improve the quality and coherence of statistics, including promotion of the use of common standards, classifications, best practice methods and tools. The collaborative relationship between the ABS and ABARES allows for ABARES' considerable industry knowledge and research expertise to be brought to the process of statistical collection. The sharing of statistical infrastructure between the two agencies in the use of a common frame, contributes to coherence of their statistical outputs and should be continued and further developed.

2. A clearly articulated strategy to guide future investment

The current Australian agricultural statistical system has evolved without a strong central plan or strategy. Development has occurred in a somewhat reactive manner, as stakeholders have stepped in at different times to produce statistics in response to emerging needs and in response to dissatisfaction with the availability of official statistics. This has resulted in some duplication and inefficiency and has limited the relevance of the data produced, as reflected by the stakeholder feedback in **Chapter 3** relating to deficiencies in available datasets and data gaps.

Official statistics sources have faced challenges in meeting the demands of users for an ever-widening range of statistical data, produced at greater levels of accuracy and timeliness and at finer levels of spatial or other disaggregation, within existing resources. ABS and ABARES have managed these challenges by targeting their efforts at collecting the highest priority data from a national policy perspective, with other statistical activity undertaken on a fully cost-recovered basis (in line with Commonwealth Cost Recovery Guidelines[65]). NASR feedback suggests that not all stakeholders understand how these priority data needs are defined, and there are differing views on what they should be. This is one driver behind the proliferation of survey activity by other organisations, including the RDCs.

This fragmented approach to data collection is unsustainable as both government and industry are increasingly unable to meet rising demand within current resources because of the rising cost of direct collection and increasing competition for resources as the number of issues of interest increases. There is a need for an overarching plan that articulates a clear strategy for achieving a best practice agricultural statistical system that is supported by enduring, sustainable funding. Investment across the system should be guided by this plan.

The plan should outline the core data requirements of all stakeholders, and the roles of government and industry bodies in meeting these requirements. The enduring goals (**Figure 1**) are a step towards establishing this whole-of-system view—these received strong support among stakeholders consulted through the NASR. The formulation of a foundational dataset would require the development of quality attributes of the data required to inform the enduring goals, and clearly articulate the stakeholders responsible for resourcing, producing and maintaining these data. The foundation dataset should include those data that are most important for informing strategic decision-making by government and industry. Stakeholders were strongly supportive of identifying a foundation dataset and the quality attributes of that data, as it will underpin the relevance of the statistical data produced, will improve coherence, and encourage the use of common standards and classifications. Strategies to address obvious data gaps should be developed immediately.

Both government and industry have a role to play in contributing statistical information, and it will not be possible for official statistics agencies to meet all needs, particularly in an environment of continuing fiscal constraint. The roles of government, industry and other stakeholders in contributing to the foundation dataset should be determined with regard to their responsibilities and capabilities.

[65] For more information, see the *cost recovery* webpage

3. Use of best practice methods and sources to maximise data quality and minimise respondent burden

Given the number of organisations involved in the production of agricultural statistics there is likely to be a degree of variability in the application of best practice statistical methods and utilisation of alternative sources of data. The quality of statistical assets will also vary along with the degree of burden placed on respondents. However, the review found that two-thirds of the statistical assets currently being used by stakeholders mostly met their needs. Stakeholder feedback indicated that a large proportion of agricultural statistical assets being used are produced by Commonwealth, State and Territory government agencies (see **Table 9 Appendix 4**). In many cases these government agencies apply best practice in the production of their statistical assets, for example the application of the ABS Quality Framework and the use of the Statistical Clearing House (see **Box 1 Chapter 3**). However, it is difficult to assess how widespread the application of best practice data quality frameworks is across all producers of agricultural statistics.

While there is a clear indication that the majority of end users are satisfied with the currently available agricultural statistical assets there is room for improvement with a number of stakeholders identifying issues with currently available data sets that affect the utility of the data (see **Chapter 3 – Data Quality**).

Improving the use of best practice statistical methods is not a straight forward process and even the application of best practice may not alleviate some issues with data quality. For example improving one dimension of quality may require trade-offs with other dimensions of data quality. NASR consultations indicate that priorities for quality improvement vary between users. For some, improvements in the timeliness and accuracy of 'headline' commodity statistics, for example the size of the national livestock herd, are the most important concern. For others, relevance is more important, specifically the availability of more detailed commodity data and/or data at finer levels of spatial disaggregation to support the needs of their industry or policy interest. Consideration should be given to the appropriate balancing of quality dimensions. For example, some users may be willing to trade-off reduced detail in a dataset for improved timeliness or increased accuracy.

While there are a variety of statistical methods and sources in use across the current Australian agricultural statistical system, direct collection from survey respondents is the predominant method in use among both official and non-official sources. This is affecting the sustainability of these statistical programs both in terms of cost (given the rising cost of direct statistical collection), and quality (given the increasing respondent burden and impact on response rates). Two strategies are required to improve the performance of the Australian system in this area: an increased use of alternative data sources, and a stronger focus on increasing respondent engagement and minimising burden.

There is an increasing range of alternative data sources, such as administrative data (see **Chapter 2**) that are potentially under-utilised and which should be explored for their potential to meet demand for agricultural statistics in Australia. The NASR identified a number of such sources, including commodity levy payer records, the National Livestock Identification System (NLIS) and Pigpass. Data held further down the supply chain by, for example, storage and transport bodies such as bulk grain handlers, testing and quality assurance bodies such as the Wool Testing Authority, processors and manufacturers, and retail and wholesale markets could also have a high degree of utility. Access to such data sources may not be straight forward because of confidentiality and privacy issues, and there is a need for a value proposition to encourage private sector bodies to share potentially commercially valuable data. Nevertheless, harnessing of these data sources could contribute to improving both the accuracy and timeliness of agricultural statistics.

Engagement with survey respondents could be improved in line with the best practice principles described in **Chapter 4**. Improved respondent engagement will have benefits for both the quality and timeliness of statistical collections. Organisations conducting statistical collections should make efforts to better coordinate their survey collections to reduce respondent burden; consider

making improvements to the timing and length of their surveys; investigate the use of collection modes that are more convenient for respondents, such as e-forms; and take steps to identify and manage unreasonable survey load. During the NASR consultation a survey calendar listing the dates of surveys undertaken by government and non-government agencies and the likely timing of key production activities was suggested as a simple means of reducing overlap, and consequently, respondent burden; and for informing survey respondents of the range of surveys undertaken each year, and the purpose and timing of each survey. There is also scope to improve the effective use of the Statistical Clearing House as a mechanism for minimising duplication in relation to Australian Government-led agricultural surveys, as it is clear from the NASR consultation that its role may not be fully understood or utilised.

While these strategies would help to manage respondent burden, the NASR consultation identified the need to improve the value proposition for respondents—specifically, finding ways to return data to respondents in a form that is more directly useful for their business. An example might be providing businesses with a benchmark comparison of their data against aggregate data from other businesses in their industry or region. Industry bodies offered to assist with identifying means of doing this through engagement with their constituents.

The burden imposed by statistical collection needs to be weighed against the benefits. Some level of survey burden is necessary to the extent that some core statistics may only be feasibly produced from direct collection. Other means of reducing burden, such as improving the timing and mode of collection, exploring alternative data sources, or removing survey duplication through better coordination, should be explored in preference to reducing any high priority content.

4. Investment in, and use of, innovative technologies, methods and processes across the statistical cycle

While there has been investment in new technologies and innovations in the agricultural statistical system by various stakeholders, including government, this investment could be better coordinated and targeted at those technologies and innovations that will best support the overarching strategy. The issues raised through the NASR indicate there are likely to be benefits from investing in technologies and innovations that reduce respondent burden and improve data quality, and that exploit the potential to provide new statistics relevant to current and emerging issues and decisions. The potential for technologies to improve data dissemination and output should also be explored to improve data accessibility and discoverability.

The NASR consultation identified a number of potential innovations and technologies for further consideration. These ranged across the full statistical cycle, including data collection, data processing, analysis, and dissemination. For example, greater use of e-forms and smart phone apps in the data collection phase has potential to improve the respondent experience and the timeliness and quality of responses. The USDA has been using Electronic Data Reporting forms for the US Agricultural Census since 2007 and reported reductions in processing time and increased cost-effectiveness as a result of this shift[66]. Other ways of collecting data should also be investigated, including ‘big data’, remote sensing and sensor technologies embedded in production systems and supply chains that could offer potential efficiencies through automated collection of data, and lead to improved data quality, particularly timeliness. Similarly, improved use of data integration in the data processing, analysis and dissemination phases could enable the production of new, value-added statistical products from existing sources. The integration of frameworks such as accounting frameworks would improve the coherence of data sources by enabling them to be organised according to common standards, definitions and classifications.

To explore the potential of these and other options, coordinated research and development should be encouraged and guided by the overarching objectives of reducing burden, improving data quality and delivering efficiencies to the agricultural statistical system. Ideally, this would

[66] *Surveying America’s Famers online – An innovation in collecting Ag stats*

involve government and industry, and involve exploration of partnerships with the private sector to develop and implement new technologies.

5. A culture of open data

While there is a range of agriculture, fisheries and forestry data publicly available within the current Australian agricultural statistical system, more could be done to fully institute a culture of 'open data' across the system. The issues and challenges in achieving this will differ between official and non-official statistics producers. ABS and ABARES already disseminate and share data widely. Their challenges lie in improving the accessibility and discoverability of their data and asserting a stronger leadership role in encouraging other stakeholders to release more data. Protecting confidentiality in published statistics is important for ensuring the trust and cooperation of businesses[67]. At the same time, the ABS needs to explore mechanisms for providing secure access to microdata sets to realise the full public policy benefits of its data resources. For other government agencies and industry, real and perceived barriers to data sharing (for example legislative and policy considerations, cost and privacy issues) may need to be addressed before data can be shared more widely. In the case of private industry, aligning incentives to encourage the release of commercially-valuable data would need to be considered.

Critical to deriving full benefits from an open data culture is the development of sufficient statistical capability among users to be able to access and draw value from the available data sources. The NASR identified a gap in the availability of statistical learning resources for non-technical users in relation to agriculture, fisheries and forestry statistics. Work is needed to address this gap, drawing on existing resources such as the ABS Statistical Capability Framework and Learning Hub[68]. ABS and ABARES should work with stakeholders to identify specific capability gaps and develop learning resources to address them.

Stakeholders consulted in the NASR suggested the establishment of a one-stop portal for agriculture, fisheries and forestry statistics could improve the accessibility and discoverability of both statistical data and supporting statistical infrastructure (such as classifications, standards, best practice methods, and statistical capability materials). The portal could provide services that identify existing agricultural data assets, enable access to those data services, provide resources for survey design and set up, facilitate access to survey sample frames, and could make agricultural data available as open data. A portal may also encourage the development of analysis and dissemination services by the private sector, further improving the value of the data.

[67] Survey Participant Information: *How the ABS Keeps Your Information Confidential*

[68] The ABS has developed a Statistical Capability Framework which describes what is required for someone to be statistically capable, and covers the ability to: discover and effectively use statistical information (statistical use); produce statistical information (statistical production); and influence and champion the development of statistical data and enabling infrastructure (statistical leadership). *A Learning Hub* has been developed based on this framework and containing a range of resources aimed at building capability against those three dimensions.

CHAPTER 6 – Towards a best practice agricultural statistical system

The Australian agricultural statistical system has evolved over the past 100 years to serve decision-making in relation to the agriculture, fisheries and forestry industries; however this has occurred in a fragmented and uncoordinated way. The NASR has undertaken extensive consultation across government, industry and research communities about the agricultural statistical system in Australia and its adequacy for informing decision-making both now and into the future. This process has explored the priority information needs of stakeholders, where these needs are not being met by existing sources of data, overlaps and inconsistencies in data, and opportunities for efficiency in the system. The NASR examined international and domestic statistical best practice and developed a set of guiding principles that underpin a well-functioning, effective and efficient agricultural statistical system.

While the agricultural statistical system has been effective in informing government and stakeholder needs, a number of deficiencies and stakeholder concerns have been identified that if addressed would improve the capacity of the system to efficiently meet current and emerging information needs. The review has identified a set of actions and initiatives to reduce survey burden, improve data quality, improve the efficiency of the system and address gaps in data.

A number of these actions can be progressed by ABS and ABARES, working together to improve coordination, to reduce burden and to improve data quality. These include:

- better coordinating government statistical collection activities; encouraging the exploration of alternative data sources; improving survey form design; making better use of electronic forms; improving the integration of existing statistical collections; improving the value for respondents of participation in survey programs through partnerships with industry and returning results to participants in a usable and useful format
- encouraging and supporting other organisations to use best practice respondent engagement methods when conducting surveys, through providing technical advice, frameworks and ready access to best practice concepts, principles, practices and tools
- adopting new and emerging technologies wherever possible to improve the cost effectiveness and efficiency of collecting, managing, analysing and disseminating statistical data.

While these actions will go some way to improving the agricultural statistical system, the NASR has identified a broader set of systemic issues that require more time, investment, involvement and contributions from a wider group of stakeholders.

In response to these broader systemic issues, the review has identified a further set of actions and initiatives that would improve the agricultural statistical system for the long term, reduce survey burden, improve data quality, improve the efficiency of the system and address gaps in data. Stakeholders are in agreement about these priorities. The actions to address the systemic issues are outlined below, some of which will require further investigation and possible investment to realise substantial benefit.

To ensure there is strong coordination of the agricultural statistical system:

A. An agricultural statistics consultative forum should be established to engage stakeholders and drive effective coordination and improved outcomes across the Australian agricultural statistical system. The forum should pursue data gaps and overlaps and mechanisms to address them while identifying additional ways to improve data quality and reduce respondent burden.

B. An annual calendar of planned statistical collections requested of farmers, fishers and foresters should be published to improve public accountability of survey managers and to more effectively manage respondent burden through greater transparency. The calendar would guide planning by organisations undertaking surveys to minimise duplication and

provide farmers, fishers and foresters and their industry bodies with information about the range of surveys being undertaken, their purpose and timing.

To guide a strategic approach to future investment by government and stakeholders in data collections:

C. A foundation dataset for agricultural statistics should be established to inform the enduring goals, address data gaps and better target future investment. The foundation agricultural dataset would provide a common reference for the assembly and maintenance of foundation level data in order to serve the widest possible variety of users. It would deliver a national coverage of the best available, most current, authoritative source of agricultural data, which is standardised and quality controlled.

To ensure best use of all available data sources, to maximise data quality, minimise respondent burden and collection costs:

D. An agricultural administrative data initiative should be established to develop methods for broader use of administrative data sources within the agricultural statistical system. The initiative should examine legislative, privacy and commercial barriers to the use of data collected by governments and industry with the objective of reducing survey burden on farmers and implementing a “collect once, use many times” approach. The initiative should also research and develop best-practice methods for integration of administrative data into the agricultural statistical system to ensure data quality standards are met, privacy and commercial concerns are addressed, and to maximise utility of the data. This initiative would complement the ABS’ lead role in improving the re-use of key Australian Government administrative datasets to minimise regulatory burden on citizens and businesses.

To ensure investment in, and use of innovative new technologies, methods and processes across the statistical cycle:

E. A more coordinated approach from research funders should be encouraged in support of the agricultural statistical system. Future research investments should be targeted at those technologies and innovations that have the widest application and that would support implementation of best practice principles. In particular, an increased focus on innovative technologies, methods and processes through the statistical cycle that would deliver potentially significant benefit to farmers, statistical organisations and ultimately, users of statistics.

To promote a culture of open data:

F. A one-stop-portal for agricultural statistics should be established to maximise the value of existing data sources and provide discoverability and accessibility to the foundation agricultural dataset. The portal would also deliver supporting statistical infrastructure (standards and classifications, tools and methods), educational resources to address statistical capability gaps of users and tools to enable self-management of Statistical Clearing House compliance by non-Commonwealth government organisations.

These collective measures would help to ensure that the ongoing productivity, competitiveness and sustainability of Australia’s agriculture, fisheries and forestry industries is supported by a world-class, agile and cost-effective agricultural statistical system. Implementing these measures would in turn directly address stakeholder concerns: reducing respondent burden, improving data quality, enhancing statistical infrastructure and ensuring that there is strong coordination in the agricultural statistical system. These actions would deliver a modern agricultural statistical system based on best practice principles that underpins the future profitability of Australia’s agriculture, fisheries and forestry industries.

APPENDIX 1 – METHODS

Defining the scope for the National Agricultural Statistics Review

The National Agricultural Statistics Review (NASR) considered agricultural statistics to broadly mean the data, information, statistics or other knowledge that can be used to provide insights into agricultural activity (including fisheries and forestry activity). These include:

- agriculture, fisheries and forestry censuses and surveys
- commissioned research
- reports containing information, data or statistics
- administrative data
- datasets residing in any agency's databases.

The agricultural statistics system incorporates the Australian agriculture, fisheries and forestry industries and includes:

- agricultural statistical assets
- users, producers, custodians and providers of agricultural statistical assets and information
- standards, frameworks and classifications
- physical systems
- coordination and governance frameworks.

The NASR investigated best practice statistical systems and reflected upon recent reviews of agricultural statistics to provide background for the review and to inform the consultation process with a wide range of stakeholders.

Assessing the adequacy of agricultural statistics

In order to address the objectives of the NASR, the review developed an approach to assessing the adequacy of Australia's agricultural statistics system. The first step was a review of relevant literature on agricultural statistics systems presented in a range of documents. The following questions emerged from this review:

- why do we collect statistics?
- what do we collect?
- how do we collect these statistics?
- who is involved?

Based on these four questions and the literature review, the NASR developed a framework for the Australian agricultural statistics system, consisting of four components. These components are summarised as follows:

1. **Enduring goals for Australian agriculture**
2. **Statistical assets**
3. **Principles of good practice**
4. **Stakeholders.**

1. Enduring goals for Australian agriculture

The Australian agricultural statistical system exists to inform policy and decision making across the economic, environmental and social dimensions of the nation's agricultural industries. Based on a desktop literature review[69], which considered strategic policy statements, thematic vision

[69] Including materials from Australian government, industry organisations and international agricultural organisations such as the Australian Department of Agriculture, United States Department of Agriculture, New Zealand Ministry of Agriculture and Dairy Australia.

statements, mission statements or sustainability frameworks for agriculture, the NASR developed five enduring goals for Australian agriculture, forestry and fisheries industries (refer to **Figure 1 Chapter 1**). Together, these proposed enduring goals represent a vision for a sustainable and profitable Australian agricultural sector and define the ongoing information needs into the future.

The enduring goals were then used as a framework for the structured collection of evidence (using questionnaires and face-to-face interviews) from a range of agriculture, fisheries and forestry stakeholders to determine their information needs and whether these were being met in relation to these goals.

2. Statistical assets

These are the data and information that is generated to provide insights into the agriculture, fisheries and forestry industries (as guided by the enduring goals) now and into the future.

A number of processes were used to collect information about agricultural statistical assets in order to review their relevance against the enduring goals. Processes included stakeholder consultation (described further in this appendix), including the collection of detailed information on data priorities and specific data assets that stakeholders were using. An analysis of this evidence was undertaken to determine the adequacy of available agricultural statistics.

The questions that stakeholders were asked in order to gather evidence for the review were as follows:

- what statistical assets stakeholders were using to inform their work programs
- who produces these assets
- how well the statistical assets informed the needs of stakeholders
- what are the deficiencies in the statistical assets
- what statistical assets were absent from the current system
- what are the barriers to collecting, producing and/or using agricultural statistics
- in what ways might efficiencies be gained in the system.

3. Principles

The NASR considered a set of criteria for assessing the adequacy of the Australian agricultural statistics system. These criteria were developed through a desk top review of characteristics and good practices for statistical systems[70]. Principles of 'good practice' were developed that have a bearing on the system's ability to satisfy data and information needs. The principles are grouped into the broad themes of:

1. strong governance and coordination across the system
2. a clearly articulated strategy to guide future investment
3. use of best practice methods and data sources to maximise data quality and minimise respondent burden
4. investment in, and use of, innovative new technologies, methods and processes across the statistical cycle
5. a culture of open data.

These were used to assess the current state of the agricultural statistical system. These were also used to further explore system issues and potential opportunities to address the issues and have been used as the structure for this report presented in **Chapters 4** and **5**.

[70] In particular, the Food and Agriculture Organization of the United Nations (FAO) published a framework of 'principles' of good practice as part of the *Global Strategy to Improve Agricultural and Rural Statistics*.

4. Stakeholders

Stakeholders are the organisations and individuals across government, industry, academia and the community who are involved in producing and using agricultural statistics. Stakeholders interact with all the components of the system.

The NASR undertook an analysis of stakeholders active in the Australian agricultural statistics system to identify key producers, custodians and users of agricultural statistical assets. This assisted in designing the consultation processes used in the review and formed the basis for investigating data issues, the stakeholder demand for data and whether the demand was being met.

Key users, producers and custodians of agricultural statistics were identified using stakeholder networks of the Department of Agriculture and the ABS. Stakeholders consisted of government agencies (primarily those with direct responsibility for agriculture, fisheries and forestry sectors) as well as a number of other government, industry and non-government stakeholders.

Stakeholder consultation processes

Consultation for the NASR was conducted across two phases (as captured in **Figure 2**), commencing with the release of a brief discussion paper through the ABS website in December 2013: Discussion Paper: Submission Process for the National Agricultural Statistics Review, 2013-14 (cat. no. 7105.0.55.002). This paper provided an overview of the NASR, the review's objectives and outlined a formal public submission process.

The discussion paper aimed to:

- engage and consult with stakeholders across government, industry, community and academia
- verify the enduring national goals for Australian agriculture
- begin understanding the highest priority issues impacting the quality of agricultural statistics.

Public submissions provided both high level responses to questions posed by the NASR as well as detailed information about agricultural statistical assets that are required to inform decision making. In addition to the public submission process, during this first phase of consultation the NASR engaged with stakeholders across government (including within ABS and the Department of Agriculture including ABARES) and industry.

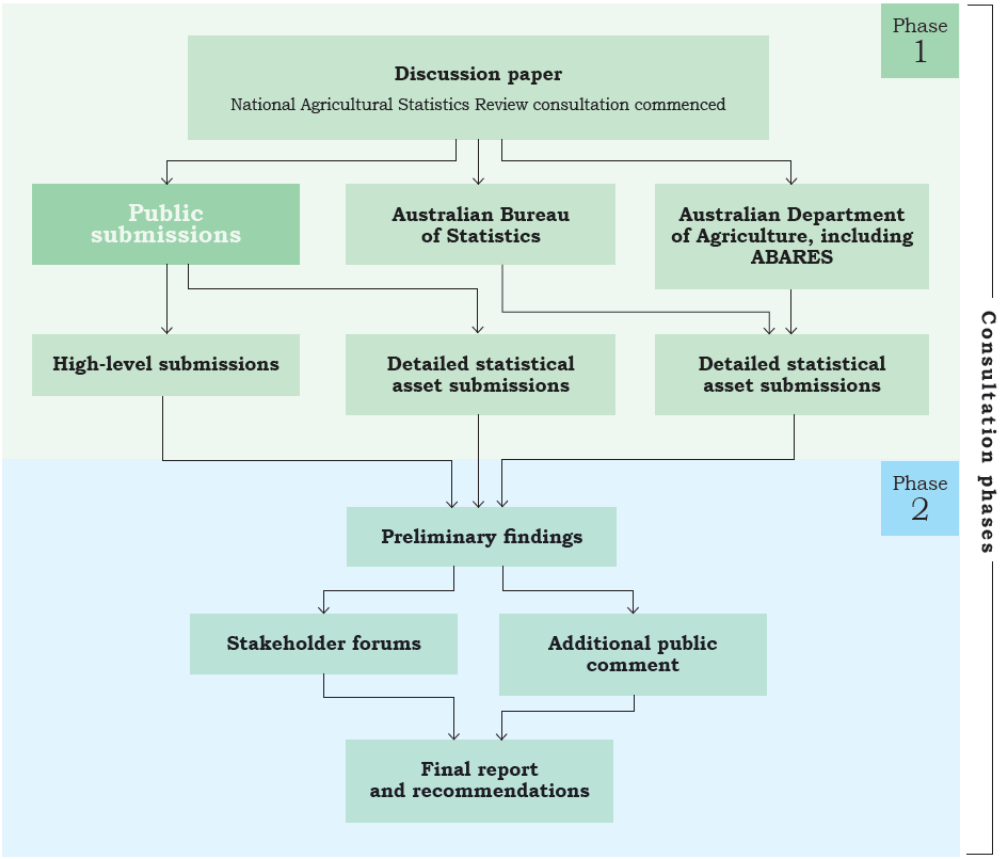
Submissions remained open until the 14 February 2014. In total 38 submissions were received from across government (Australian and state/territory), industry and academia. Submissions provided to the NASR were qualitatively analysed to distil common themes and issues raised by stakeholders across the national agricultural statistical information system. The outcomes of this analysis were published in March 2014 on the ABS website: National Agricultural Statistics Review - Preliminary findings, 2013-14 (cat. no. 7105.0.55.003).

The release of the preliminary findings initiated the second phase of consultation for the NASR. This consultation included an option to provide further public comment on opportunities for innovation and collaboration between the producers, users and custodians of agricultural statistics, including options for resourcing the agricultural statistical system.

Comment was able to be provided either in writing, verbally over the telephone to a series of questions posed by the NASR or via one of the NASR's Stakeholder Forums. The NASR engaged the services of a professional facilitator for these forums to ensure an additional level of independence and objectivity was present in the review process. Many stakeholders provided further comment to the NASR in the stakeholder forums, with 43 organisations represented, including 16 government and 27 industry organisations. A further 4 written submissions were received in addition to the 38 from the first phase of consultation. **Appendix 2** contains a list of organisations which contributed to the NASR.

Input from both the first and second phases of consultation has directly shaped the outcomes of the NASR and its associated actions.

Figure 2 - Stakeholder contributions to the National Agricultural Statistics Review



APPENDIX 2 – CONTRIBUTORS TO THE NASR

Table 4 - Contributors to the NASR—submissions and forums

Animal Health Australia
Apple and Pears Australia Limited
Australian Bureau of Agricultural and Resource Economics and Sciences
Australian Bureau of Statistics
Australian Egg Corporation
Australian Export Grains Innovation Centre
Australian Farm Institute
Australian Pork Limited
Australian Refrigeration Association
Australian Wildlife Health Network
Australian Wool Innovation
AusVeg
Bureau of Infrastructure, Transport and Regional Economics
Bureau of Meteorology
Business SA
Canegrowers
Commonwealth Scientific and Industrial Research Organisation
Cotton Research and Development Corporation
Dairy Australia
Department of Agriculture
Department of Agriculture and Food Western Australia
Department of Finance
Department of the Environment
Department of Primary Industries and Regions SA
Empirical Capital Proprietary Limited
Fisheries Research and Development Corporation
Forest and Wood Products Australia Limited
Geoscience Australia
Growcom
Grain Producers Australia
Grain Producers SA
Grape and Wine Research and Development Corporation
Harness Racing Australia
Horticulture Australia
HyChill Australia Pty Ltd
Individual submission
Meat and Livestock Australia
Murray-Darling Basin Authority
National Council of Wool Selling Brokers of Australia
National Farmers' Federation
Neil Clark & Associates
New South Wales Farmers
New South Wales Department of Primary Industries

Table 4 – continued.

Northern Territory Department of Primary Industry and Fisheries
Northern Territory Department of Treasury and Finance
Nursery and Garden Industry Australia
Plant Health Australia Limited
Primary Industries and Regions South Australia
Queensland Department of Agriculture, Fisheries and Forestry
Queensland Farmers' Federation
Queensland Trade and Treasury
Ricegrowers' Association of Australia Inc.
Rural Industries Research and Development Corporation
RSPCA
Seafood Importers Association of Australia
Tasmanian Department of Premier and Cabinet
Tasmanian Department of Primary Industries, Parks, Water and Environment
Tasmanian Farmers and Graziers Association
The Winemakers' Federation of Australia
Victorian Department of Environment and Primary Industries
Western Australian Farmers Federation
Wine Australia Corporation
Wine Grape Growers Australia
Winemakers' Federation of Australia

APPENDIX 3 – PRIMARY DATA COLLECTIONS IN AGRICULTURE, FISHERIES AND FORESTRY

Table 5 - Primary data collections—agriculture

Agriculture	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABS	Agricultural Census[71]	5 yearly	National, State/Territory, Statistical Area 4 (SA4), Statistical Area 2 (SA2), Natural Resource Management (NRM) regions, Murray Darling Basin (MDB) (for water data items only)	A census of all businesses undertaking agricultural activity recorded on the ABS Business Register (ABSBR) with an EVAO, or equivalent, of $5,000 or more.	Predominantly ABS with a component of user funding.	Commodity production area and volume, natural resource management practices, farm business characteristics, and water use.	1
	Rural Environment and Agricultural Commodities Survey (REACS)[72]	Annual	National, State/Territory, SA4, NRM regions, MDB (for water data items only)	A sample survey of approximately 35,000 businesses undertaking agricultural activity as recorded on the ABSBR with an EVAO, or equivalent, of $5,000 or more.	Predominantly ABS with a component of user funding.	Commodity production area and volume, natural resource management practices, farm business characteristics, and water use.	1

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[71] Outputs from the Agricultural Census are published in *Principal Agricultural Commodities, Australia, Preliminary (ABS Cat. No.* 7111.0)*; Agricultural Commodities, Australia (final data)* (ABS Cat. No. 7121.0); *Value of Agricultural Commodities Produced, Australia*.(ABS Cat. No. 7503.0)*; Gross Value of Irrigated Agricultural Production* (ABS Cat. No. 4610.0.55.008); *Water Use on Australian Farms* (ABS Cat. No. 4618.0).

[72] REACS was instituted annually from 2012-13 and replaced the previous biennial Agricultural Resource Management Survey (ARMS) and Agricultural Survey (ACS) which were conducted in alternate years between the five-yearly Agricultural Census. Outputs from REACS are published in the same publications as listed above for the Agricultural Census, and an additional publication: *Land Management and Farming in Australia*, (ABS Cat. No. 4627.0).

Table 5 – Continued

Agriculture	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABS	Value of Agricultural Commodities Produced (VACP)[73] and Gross Value of Irrigated Agricultural Production (GVIAP)[74]	Annual	VACP: State/Territory, SA4, SA2 (Agricultural Census year only), NRM regions GVIAP: National, State/Territory, NRM regions and MDB.	VACP: Value estimates for commodities are derived from quantity data and price data. Price data are obtained from a variety of sources, including the ABS livestock collections (including traders, producers and wholesalers) and administrative sources. Quantity data are obtained from ABS REACS, Agricultural Census and livestock collections, and non-ABS sources. GVIAP: Is produced from VACP estimates and data from the ABS REACS and Agricultural Census.	ABS funded	Gross value and local value[75] of agricultural commodities produced (VACP). Gross value of agricultural commodities that are produced with the assistance of irrigation (GVIAP).	1, 5
	Land Management Practices Survey (LAMPS)[76]	Biennial	National, State/Territory and Australian Agricultural Environments[77]	A sample survey of approximately 50,000 businesses undertaking agricultural activity as recorded on the ABSBR with an EVAO, or equivalent, of $5,000 or more.	Department of Agriculture	Land management practices data to inform the Carbon Farming Initiative and the National Greenhouse Gas Inventory.	3

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[73] For more information on VACP refer to *Value of Agricultural Commodities Produced, Australia*, (ABS Cat. No.7503.0).
[74] For more information on GVIAP and how it is calculated, refer to *Gross Value of Irrigated Agricultural Production*, (ABS Cat. No. 4610.0.55.008).
[75] Gross value is the value placed on recorded production at the wholesale prices realised in the market place. Local value is the value of agricultural commodities at the point of production.
[76] Data from the LAMPS are published in *Agricultural Resource Management Practices*, Australia, (ABS Cat. No. 4630.0)
[77] Note: full definition of Australian Agricultural Environments are provided in Appendix 4 – Glossary

Table 5 – Continued

Agriculture	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABS	Livestock collections[78]: • Livestock Slaughtering • Poultry and Game Birds Slaughtered • Wool Receivals, Purchases and Sales	Monthly: Livestock Slaughtering Quarterly: all livestock collections	National, State/Territory	Livestock Slaughtering: Large abattoirs and other slaughtering establishments that service both the domestic an export markets. Poultry and Game Birds Slaughtered: Larger commercial poultry slaughtering establishments. Wool Receivals, Purchases and Sales: All wool brokers and dealers registered with an Australian Business Number (ABN).	ABS and user funded	Number slaughtered and meat produced for livestock and poultry, and receivals of taxable wool by brokers and dealers. (Data on exports of live sheep and cattle and exports of fresh, chilled, frozen and processed meat are included in the quarterly publication *Livestock Products, Australia* and are sourced from ABS International Trade Statistics.)	1
	Agricultural Land and Water Ownership Survey (ALWOS)[79]	Irregular[80]	National, State/Territory	A sample survey of approximately 11,000 businesses registered on the ABSBR with an EVAO, or equivalent, of $5,000 or more. The target population for the survey is all businesses owning or operating agricultural land for agricultural purposes in Australia.	ABS	Foreign ownership of agricultural businesses, agricultural land and water entitlements used for agricultural purposes.	1

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[78] Data from the livestock collections are published in: Livestock Products, Australia, ABS. Cat. No. 7215.0 (quarterly), and Livestock and Meat, Australia, ABS. Cat. No. 7218.0.55.001 (monthly)

[79] Data from the ALWOS are published in Agricultural Land and Water Ownership, ABS. Cat. No. 7127.0

[80] The first ALWOS was conducted in December 2010. Following the release of this survey, the ABS was funded to undertake further collection of data on foreign ownership of agricultural businesses, land and water assets via standalone ALWOS surveys in 2013 and 2018, and via additional information to be collected from the 2015-16 and 2020-21 Agricultural Censuses.

Table 5 – Continued

Agriculture	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABS	Census of Population and Housing[81]	5 yearly	All ASGS[82] classifications down to SA1	All households and individuals who are in Australia on Census Night, excluding foreign diplomats and their families	ABS	Census data of relevance to agriculture, fisheries and forestry statistics, including: demographics of farmers and farm managers; of individuals employed in the agricultural workforce; and characteristics of households with one or more persons employed in agriculture.	2
	Labour force survey[83]	Quarterly	ASGS State and territory	All persons aged 15 years and over with some exceptions. Data are obtained from a sample of approximately 26,000 private dwellings and a sample of non-private dwellings (hotels, etc)[84]	ABS	Estimates of employment by industry and occupation, including Agriculture, Fisheries and Forestry (Division A) and industry subdivisions (agriculture; aquaculture; forestry and logging; fishing, hunting and trapping).	1, 2
	International Merchandise Trade	Monthly Annual	Merchandise trade data can be cross-classified by Australian state of origin for exports and Australian state of final destination for imports, as a special data request	ABS merchandise trade statistics are compiled from information submitted by exporters and importers or their agents to the Australian Customs and Border Protection Service. Adjustments for coverage, timing and valuation are made to international merchandise trade data to convert them to a balance of payments basis.[85]	ABS	Value of merchandise imports and exports by industry of product (monthly); Value of merchandise exports and number of goods exporters by industry of exporter by a range of other dimensions (annual).[86]	4

[81] More information on the ABS Census of Population and Housing including data, can be found at the Census homepage

[82] ASGS – Australian Statistical Geography Standard – is defined in the Glossary.

[83] The Labour Force survey is conducted monthly, however data on industry and occupation of employment is only collected quarterly. This data is published in *Labour Force, Australia, Detailed, Quarterly* (ABS. Cat. No. 6291.0.55.003)

[84] For more information on the methodology used in the ABS Labour Force Survey, refer to *Labour Force, Australia,* (ABS. Cat. No. 6202.0) – Explanatory Notes.

[85] More information on the methodology behind ABS international trade statistics can be found in *International Merchandise Trade, Australia, Concepts, Sources and Methods, 2001,* (ABS. Cat. No. 5489.0)

Table 5 – Continued

Agriculture	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABARES	Australian Agricultural and Grazing Industries Survey (AAGIS)	Annual	National, State and ABARES regions	Sample size approximately 1600 businesses. Minimum EVAO cut-off $40,000.	Department of Agriculture, GRDC, MLA	Broadacre farm business performance, livestock numbers, crop production, costs, fertiliser use, receipts, and farmer and spouse characteristics (demographics, education, off-farm income and hours worked).	1
	Australian Dairy Industry Survey (ADIS)	Annual	National, State and ABARES regions	Sample size approximately 300 businesses. Minimum EVAO cut-off $40,000.	Department of Agriculture, Dairy Australia (Until 2013-14)	Dairy farm business performance, milk production, costs, fertiliser use, receipts, and farmer and spouse characteristics (demographics, education, off-farm income and hours worked).	1
	Vegetable survey	Annual	National, State and ABARES regions	Sample size approximately 300 businesses. Minimum EVAO cut-off $40,000.	Department of Agriculture, HAL	Vegetable farm businesses (including lettuce, cucumber, cabbage, broccoli, cauliflowers, carrots, tomatoes, beans, peas, pumpkins and potatoes) performance, production, costs, fertiliser use, receipts, and farmer and spouse characteristics (demographics, education, off-farm income and hours worked).	1
	Irrigation survey	Annual	National, State and ABARES regions	Sample size about 300 businesses. Minimum EVAO cut-off $40,000.	Department of Agriculture, Department of Environment, MDBA, National Water Commission	Rice, cotton and horticulture farm business performance, production, costs, fertiliser use, receipts, and farmer and spouse characteristics (demographics, education, off-farm income and hours worked).	1, 3

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[86] In general International Trade statistics do not have an industry dimension; however a concordance is available between the Trade in Goods Classification (HS) and the Australian and New Zealand Standard Industrial Classification (ANZSIC) which assigns different commodities to the industry most likely to have produced that product. Data is published using this concordance in *International Trade in Goods and Services, Australia* (ABS. Cat. No. 5368.0), Tables 32a and 35a. The publication Characteristics of Australian Exporters (annual) uses the ANZSIC of the ABN of the exporter (as recorded on the ABS Business Register) to publish data by industry. See *Characteristics of Australian Exporters,* (ABS. Cat. No. 5368.0.55.006) Tables 2 - 5 and 7 – 9. (There is no data currently available on international trade in services by industry, only goods.)

Table 5 – Continued

Agriculture	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABARES	Supplementary topics or additional surveys	As requested	National, State and ABARES regions	Subject to client requirements	Varies	Includes topics such as land management practices, cost of production, new dairy technology, and on-farm occupational health and safety. Or additional surveys of the sugar, wine grapes or honey bee industries.	1, 3
Meat and Livestock Australia	Livestock Market Surveys	Weekly	National	Sheep and cattle market data collected from key auction and direct market enterprises	Meat and Livestock Australia	Enterprise level data used to compile over the hooks, wholesale, feeder cattle, skin, hide and slaughter reports.	1
Grains Research and Development Corporation	Grower Surveys	Biennial	National	Sample of 1 200 grain growers representing 17 agro-ecological zones[87] in Australia (last conducted from May to June in 2014).	GRDC	Farm characteristics, grain production levels, crops grown, on- and off-farm income, grower sentiment, and adoption of new grain varieties, farming practices and technologies. Corporate measures include grower satisfaction with GRDC's performance, attitudes towards paying the grains levy and the extent to which GRDC specific activities have influenced on-farm practice change.	1, 3

Note: This is by no means a comprehensive list of all the surveys that RDCs or industry associations are conducting, but gives examples based on publicly available information and information obtained during NASR consultations. The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[87] GRDC Agroecological Zones

Table 5 – Continued

Agriculture	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
Dairy Australia	National Dairy Farmer Surveys	Annual	8 major dairy farming regions in Australia	Sample of 1 000 dairy farms (conducted in March)	Dairy Australia	Dairy farmer confidence, sentiment and expectations about industry future, including anticipated profit, estimated production growth and intentions to invest.	1
	Dairy Farm Monitor	Annual	Victorian and NSW dairying regions	Sample of 75 Victorian and 30 NSW dairy farm businesses (conducted June to August)	Dairy Australia, Vic DEPI and NSW DPI	Farm level data on profitability and productivity, including income, assets, equity, inputs (incl. labour, fertiliser, feed, water), costs and liabilities, milk production, as well as dairy farmer confidence.	1
	Animal Husbandry Surveys	Biennial	8 major dairy farming regions in Australia	Random sample of 400 dairy farmers (conducted September to October)	Dairy Australia	Farm level data on on-farm livestock management practices and animal welfare, including disbudding, tail docking, calving, bobby calf transport and management, and disease risk management and staff training.	3, 5

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

Table 6 - Primary data collections—fisheries

Fisheries	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABS	Census of Population and Housing[88]	5 yearly	All ASGS classifications down to SA1	All households and individuals who are in Australia on Census Night, excluding foreign diplomats and their families	ABS	Census data of relevance to fisheries statistics includes: demographics of individuals employed in commercial fisheries or aquaculture industries[89]; and characteristics of households with one or more persons employed in commercial fisheries or aquaculture industries.	2
	Labour force survey[90]	Quarterly	ASGS State and territory	All persons aged 15 years and over with some exceptions. Data are obtained from a sample of approximately 26,000 private dwellings and a sample of non-private dwellings (hotels, etc)[91]	ABS	Estimates of employment by industry and occupation, including Agriculture, Forestry and Fisheries (Division A) and industry subdivisions (agriculture; aquaculture; forestry and logging; fishing, hunting and trapping).	1, 2

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[88] More information on the ABS Census of Population and Housing including data, can be found at the Census homepage

[89] Including downstream industries such as seafood wholesaling and processing.

[90] The Labour Force survey is conducted monthly, however data on industry and occupation of employment is only collected quarterly. This data is published in *Labour Force, Australia, Detailed, Quarterly* (ABS. Cat. No. 6291.0.55.003)

[91] For more information on the methodology used in the ABS Labour Force Survey, refer to *Labour Force, Australia* (ABS. Cat. No. 6202.0) – Explanatory Notes.

Table 6 – continued

Fisheries	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABS	International Merchandise Trade	Monthly Annual	Merchandise trade data can be cross-classified by state of origin for exports and state of final destination for imports, as a special data request	ABS merchandise trade statistics are compiled from information submitted by exporters and importers or their agents to the Australian Customs and Border Protection Service. Adjustments for coverage, timing and valuation are made to international merchandise trade data to convert them to a balance of payments basis.[92]	ABS	Value of merchandise imports and exports by industry of product (monthly); Value of merchandise exports and number of goods exporters by industry of exporter by a range of other dimensions (annual).[93]	4
ABARES	Fisheries survey - Commonwealth fisheries	Major fisheries biennially	Australia	Commonwealth fisheries	Department of Agriculture	Financial and economic performance. Key data collected in the surveys include boat level information on fishing receipts and business input costs, and business asset values. Economic performance for the fishery as a whole is derived from this boat level information.	1

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[92] More information on the methodology behind ABS international trade statistics can be found in *International Merchandise Trade, Australia, Concepts, Sources and Methods, 2001*, (ABS. Cat. No. 5489.0)

[93] In general International Trade statistics do not have an industry dimension; however a concordance is available between the Trade in Goods Classification (HS) and the Australian and New Zealand Standard Industrial Classification (ANZSIC) which assigns different commodities to the industry most likely to have produced that product. Data is published using this concordance in *International Trade in Goods and Services, Australia* (ABS. Cat. No. 5368.0), Tables 32a and 35a. The publication Characteristics of Australian Exporters (annual) uses the ANZSIC of the ABN of the exporter (as recorded on the ABS Business Register) to publish data by industry. See *Characteristics of Australian Exporters,* (ABS. Cat. No. 5368.0.55.006) Tables 2 - 5 and 7 – 9. (There is no data currently available on international trade in services by industry, only goods.)

Table 6 – continued

Fisheries	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABARES	Australian Fisheries and Aquaculture Statistics	Annual	Australia	State and Commonwealth fisheries	FRDC	Volume and value of fisheries production and trade. Production statistics are broken down to a species level across the wild capture and aquaculture sectors for each jurisdiction. Trade data are provided across species at a national and jurisdictional level.	1, 3
	Fishery Status Reports	Annual	Australia	Commonwealth fisheries	Department of Agriculture	Status of key commercial species, economic performance of fisheries, environmental interactions, natural resource management practises.	1, 3
	Status of key Australian fish stocks reports	Biennial	Australia	State and Commonwealth fisheries	FRDC, Department of Agriculture, State/Territory fisheries agencies	Status of key commercial species, natural resource management practises.	1, 3
	Supplementary topics or additional surveys	As requested	National, State, regional and fishery specific	Subject to client requirements	Varies	Includes topics such as responses to management changes, social and economic evaluation of game-fishing, productivity, responses to management changes, industry training needs.	1, 2, 3

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

Table 6 – continued

Fisheries	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
States/ Territories	State/Territories catch and effort log book	Ongoing	States/ Territories	State/ Territory fisheries	States/ Territory fisheries agencies	Production volumes and value, status of key species, natural resource management practises.	1, 3
AFMA	Commonwealth catch and effort log book	Ongoing	Australia	Commonwealth fisheries	AFMA	Catch, effort, gear type and location of fishing operation.	1, 3
	Commonwealth catch disposal records	Ongoing	Australia	Commonwealth fisheries	AFMA	Catch disposal location, fishing method, port unloaded, fish receiver.	1, 3
ABS	Census of Population and Housing[94]	5 yearly	All ASGS classifications down to SA1	All households and individuals who are in Australia on Census Night, excluding foreign diplomats and their families	ABS	Census data of relevance to forestry statistics: demographics of individuals employed in the forestry and logging[95] industries; characteristics of households with one or more persons employed in the forestry and logging industries.	2

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[94] More information on the ABS Census of Population and Housing including data, can be found at the Census homepage

[95] Including downstream industries such as timber, paper product and pulp processing and manufacturing.

Table 7 - Primary data collections—forestry

Forestry	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABS	Labour force survey[96]	Quarterly	ASGS State and territory	All persons aged 15 years and over with some exceptions. Data is obtained from a sample of approximately 26,000 private dwellings and a sample of non-private dwellings (hotels, etc)[97]	ABS	Estimates of employment by industry and occupation, including Agriculture, Forestry and Fisheries (Division A) and industry subdivisions (agriculture; aquaculture; forestry and logging; fishing, hunting and trapping).	1, 2
	International Merchandise Trade	Monthly Annual	Merchandise trade data can be cross-classified by state of origin for exports and state of final destination for imports, as a special data request	ABS merchandise trade statistics are compiled from information submitted by exporters and importers or their agents to the Australian Customs and Border Protection Service. Adjustments for coverage, timing and valuation are made to international merchandise trade data to convert them to a balance of payments basis.[98]	ABS	Value of merchandise imports and exports by industry of product (monthly); Value of merchandise exports and number of goods exporters by industry of exporter by a range of other dimensions (annual).[99]	4

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

[96] The Labour Force survey is conducted monthly, however data on industry and occupation of employment is only collected quarterly. This data is published in *Labour Force, Australia, Detailed, Quarterly* (ABS. Cat. No. 6291.0.55.003)

[97] For more information on the methodology used in the ABS Labour Force Survey, refer to *Labour Force, Australia* (ABS. Cat. No. 6202.0) – Explanatory Notes.

[98] More information on the methodology behind ABS international trade statistics can be found in *International Merchandise Trade, Australia, Concepts, Sources and Methods, 2001*, (ABS. Cat. No. 5489.0)

[99] In general International Trade statistics do not have an industry dimension; however a concordance is available between the Trade in Goods Classification (HS) and the Australian and New Zealand Standard Industrial Classification (ANZSIC) which assigns different commodities to the industry most likely to have produced that product. Data is published using this concordance in *International Trade in Goods and Services, Australia* (ABS. Cat. No. 5368.0), Tables 32a and 35a. The publication Characteristics of Australian Exporters (annual) uses the ANZSIC of the ABN of the exporter (as recorded on the ABS Business Register) to publish data by industry. See *Characteristics of Australian Exporters,* (ABS. Cat. No. 5368.0.55.006) Tables 2 - 5 and 7 – 9. (There is no data currently available on international trade in services by industry, only goods.)

Table 7 – continued.

Forestry	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
ABARES	Australian Sawmill survey / National Wood Processing Survey	Every 2 years depending on funding availability	Australia	Participating sawmill companies / wood processors	ABARES and FWPA	Australia's sawmills and panel mills covering ownership, log input by source and production output by type and value.	1
	Australian Plantation Statistics	Annual	Australia and by major plantation region	Plantation owners and managers; regional private forestry organisation	ABARES	Total plantation area, new plantation established and plantation area removed, ownership and species.	1, 3
	Gross value of production survey	Annual	Australia	Participating timber companies and agencies	ABARES	National log harvest volume and gross value of production.	1
	Pulp and paper survey	Annual	Australia	Participating pulp and paper companies	ABARES	Annual production of pulp and paper.	1
	Australian forest and wood products statistics	Biannual	Australia	N/A	ABARES, FWPA and Department of Agriculture	Time series data on forest and wood products resources, consumption, trade and employment.	1, 3
	National Forest Inventory	5-yearly	Australia	National Forest Inventory is a partnership between the Commonwealth and all states and territory governments for the collection and dissemination of forest data. Scope is all forest (native and plantation) in all states and territories	ABARES, Department of Agriculture	Reported against the Montreal Process Criteria and Indicators for sustainable forest management, in the 5-yearly *Australia's State of the Forest Report* series.	3

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

Table 7 – continued.

Forestry	Collection	Frequency	Geography	Scope	Funding	Output themes	Informs enduring goals
FWPA	Softwood Timber Survey	Monthly	Australia	Participating timber companies	FWPA	Sales volumes for Australian plantation softwood products.	1
URS Forestry Group	Timber Market Survey	Quarterly	Eastern Australia	Participating timber companies	Forestry Corporation of NSW, VicForests, Hancock Victoria Plantations, HQ Plantations, Forestry SA, DAFF Queensland Government, and Green Triangle Forest Products	Timber price movements in Australia for softwood timber, panel and engineered wood products.	1
States/ territories	State/territory forest agency data collections	Varies – depends on state/territory	All states and territories	Forests and plantations	States and Territories	Forest extent, type, condition, tenure and production data.	1, 3

Note: The enduring goals referred to in column 8 are: 1 – competitive and profitable agriculture, fisheries and forestry industries; 2 – prosperous communities; 3 – sustainable natural resource use; 4 – growing trade and market access; 5 – protecting animal, plant and human health and welfare.

APPENDIX 4 – ANALYSIS OF DUPLICATION

This appendix contains analyses undertaken by the review team to support key findings in the body of this report relating to potential duplication in survey activity. The analyses were developed using information provided by stakeholders during consultations, including public submissions received by the NASR, which detailed the agricultural statistical assets that are currently used in work programs, and was supported by a desktop review.

Potential duplication in survey activity

The review team considered the question of whether there was significant duplication in collection of agricultural statistics. Potential duplication in survey activity referred to by stakeholders included instances where there were similarities in survey topics, respondent groups, sectors and/or geographic regions.

Stakeholders from across government and industry provided detailed information about the statistical assets that their organisations relied on for their work programs. Information about these assets included:

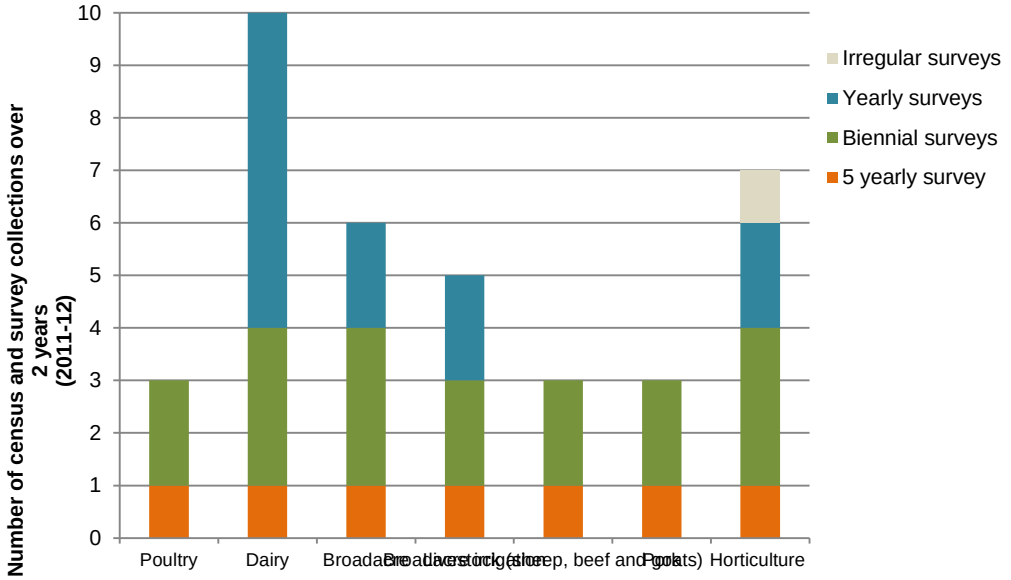
- type of organisation collecting the data (e.g. government, industry or other private organisation)
- population the data was collected from (e.g. agricultural businesses, brokers, bulk handlers)
- agricultural industry the data was collected from (e.g. horticulture, grains, livestock, dairy)
- geographic output level (e.g. natural resource management region, SA1, SA2 etc)
- frequency of collection (e.g. yearly, biennial or monthly).

Using this information, the NASR developed a list of large scale censuses and surveys[100] where data was requested directly from businesses engaged in agriculture, fisheries or forestry production activities, in order to identify where there may be duplication in primary data collections in the current agricultural statistical system.

Figure 3 summarises these agricultural censuses and surveys for the 2011 and 2012 calendar years and shows the frequency with which agricultural businesses had the potential of being surveyed during that time period (based on a number of assumptions – see table notes).

[100] The list developed by the NASR was based on the agricultural statistical assets reported by stakeholders as being currently used in work programs and as such, is not exhaustive. In addition, the list does not describe the detail of individual questions on census or survey forms.

Figure 3 - Agricultural censuses and surveys involving businesses during 2011 and 2012



Notes: The list of census and surveys undertaken in 2011 and 2012 only included large scale regular primary data collections (i.e. information collected directly from agriculture, fisheries and forestry businesses), which were identified by stakeholders of the NASR and desktop sources. Surveys included in this analysis were: ***5 yearly surveys***—Agricultural Census (ABS); ***Biennial surveys***—Agricultural Resource Management Survey (ABS), Land Management Practices Survey (Department of Agriculture, ABS), Animal Husbandry Survey (Dairy Australia), Grower Survey (Grains Research and Development Corporation), Vineyards (ABS); ***Yearly surveys***—ADIS (ABARES), National Dairy Farmers Survey (Dairy Australia), Dairy Farm Monitor (Dairy Australia), AAGIS (ABS), Murray Darling Basin Irrigators (ABARES), Vegetables (ABARES), Mushrooms (AMGA); ***Irregular surveys***—Drivers of Practice Change–Horticulture (ABARES). There are a number of sample surveys in the list, meaning that not all businesses participate in all sample surveys. In addition, the sample surveys may have specifically focussed on data collection for a particular jurisdiction or commodity. ABARES supplementary surveys are included in the main survey collections of AAGIS and ADIS and not as separate surveys, except for a component of Drivers of Practice Change, which was conducted separately for the horticulture industry in 2011.

The dairy industry is highlighted in **Figure 3** as an industry where there may be duplication in current survey activity, with some farmers in the sector potentially receiving ten surveys across 2011 and 2012. Further, there was potential for duplication in the topics of the surveys for the dairy sector, reported in **Table 8**, with three of the surveys focussed on commodity production; two on land and natural resource management topics; two on detailed farm business performance, including inputs, receipts, off-farm income, assets, costs and liabilities; one on farmer confidence and intentions for on-farm investment. A number of the surveys request similar details about farm business characteristics, such as the area of holding, location of property, land sales and leases and Australian Business Number.

The geographic scale of the dairy surveys was also investigated,` with the NASR finding that while there may be duplication at the national level in topics, there is minimal duplication in sub-state geographic regions at which the data are produced.

Dairy Australia, in its submission to the NASR, highlighted that survey duplication is a risk in the dairy industry for collections relating to dairy farm performance. However, Dairy Australia does not highlight duplication as a major issue. This may be because of the value that dairy levy payers place on the data collected, analysed and disseminated by Dairy Australia, which provides a comprehensive suite of data to the

industry relating to dairy farm performance, operational activities, production, sales, attitudes and confidence levels, and at national, state and regional scales.

Table 8 - Dairy industry surveys and topics 2011-12

Collection	Occurrence	Funding	Commodity production area and volume	Farm business performance	Farmer confidence, sentiment and expectations	Natural resource management practices	Farm business characteristics	Water use	Livestock management practices and animal welfare	Disease risk management and staff training
Agricultural Census	1	Australian Bureau of Statistics	✓				✓	✓		
Agricultural Resource Management Survey[101] (ARMS)	1	Australian Bureau of Statistics				✓	✓	✓		
Land Management Practices Survey (LAMPS)	1	Department of Agriculture				✓	✓			
Australian Dairy Industry Survey (ADIS)	2	Department of Agriculture, Dairy Australia		✓			✓			
National Dairy Farmer Surveys	2	Dairy Australia			✓					
Dairy Farm Monitor	2	Dairy Australia, Vic DEPI and NSW DPI	✓	✓	✓					
Animal Husbandry Surveys	1	Dairy Australia							✓	✓

[101] Conducted in inter-censal years only; ARMS replaced by REACS from 2013.

Dairy Australia is taking an active role in managing potential duplication for its levy payers, through liaising with the ABS and ABARES, However there is no single body or organisation that monitors all agricultural data collection activity undertaken in Australia. There are different mechanisms or protocols in place in individual organisations and in official organisations that attempt to coordinate the management of respondent burden beyond individual surveys and promote best practice in survey implementation, such as the Statistical Clearing House (refer to **Box 1 Chapter 3**).

This dairy sector example indicates that understanding survey burden and quantifying it in the current agricultural statistical system is difficult, particularly when working with a limited amount of information about surveys undertaken in the Australian agricultural sector.

Stakeholders involved in producing and using statistical assets

The NASR undertook an assessment of the number of organisations currently involved in producing and using agricultural statistics and whether these were government, industry or private sector organisations, based on stakeholder feedback.

A guide to the number of organisations producing statistical assets that are relied upon by the agriculture sector is shown in **Table 9**. This not only demonstrates the reliance on ABS and ABARES for agricultural statistics, but also provides an indication of the large number of organisations (including state/territory governments, RDCs and industry bodies) that collect agriculture, fisheries and forestry data. It also gives an indication of the number of users who rely heavily on the statistical assets they produce.

Future coordination activities need to include representation from these statistics producers. A number of submissions suggested possible efficiencies if coordination between industry, research and development corporations (RDCs), and government was improved to establish high-priority statistical assets.

Table 9 - Number of government and industry produced statistical assets that are being used by stakeholders

Statistical assets produced by		Number of statistical assets used by stakeholders	Number of statistical assets used by Department of Agriculture, including ABARES
Government	ABARES	9	99
	ABS	31	16
	Other Australian government	7	50
	State/Territory government	22	1
Industry		31	11
Other (private)		8	-
Other (public)		1	12
Total		*102*	*189*

Notes: Frequency of use of agricultural statistical assets is based on a list developed by the NASR of the agricultural statistical assets stakeholders reported they were currently using in work programs and as such, is not exhaustive. *Industry*—includes Research and Development Corporations and industry associations. *Other (private)*—includes private consultants. *Other (public)*—includes international governments, commissions, academic institutions and the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

APPENDIX 5 – FREQUENTLY ASKED QUESTIONS (FAQs)

What is the NASR about?

The National Agricultural Statistics Review (NASR) assessed the agricultural statistics system in Australia and its adequacy for informing decision-making in the industry both now and into the future. The review identified a range of opportunities for addressing issues in the Australian agricultural statistical system and for positioning the system to align with international best practice.

Who has undertaken the NASR?

The NASR has been a joint project between the Australian Bureau of Statistics (ABS) and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES).

Why have the ABS and ABARES been leading the NASR?

A range of organisations provide statistical data and other information to inform decision making in the agricultural sector. The ABS and the ABARES have led the NASR as Australia's major collectors of official agricultural statistics in Australia and as Australia's national statistical organisation and independent research bureau respectively.

What has the NASR achieved?

The NASR identified:

- priority information requirements of stakeholders
- where those information needs are not met by existing data sources
- overlaps and inconsistencies in existing information requirements
- opportunities for efficiencies in the national agricultural statistical information system.

What is the Essential Statistical Assets (ESA) for Australia and how is it different to the NASR?

The ESA for Australia initiative is being led by the ABS as a key National Statistical Service (NSS) strategy. The aim of this initiative is to allow for effective prioritisation of investment, focus and effort within the national statistical system, by identifying those essential official statistical assets that are critical to decision-making in a complex and sometimes fragmented information environment across Australia. The NASR has been an assessment of the 'agriculture' component of the Australian statistical system and extends beyond official statistics to provide a holistic understanding of the agricultural statistics system ability to inform decision making by governments, industry, and the community.

What is the National Statistical System?

The national statistical system is the grouping of organisations within Australia that collect, process and disseminate official statistics (government statistics).

What is the agricultural statistics system?

The agricultural statistics system incorporates the Australian agriculture, fisheries and forestry industries and includes:

- agricultural statistical assets
- users, producers, custodians and providers of agricultural statistical assets and information
- standards, frameworks and classifications
- physical systems
- coordination and governance frameworks.

What are 'agricultural statistical assets'?

Agricultural statistical assets are datasets and the statistics that are drawn from them. Agricultural statistics are broadly taken to mean the data, information, statistics or other

knowledge that can be used to provide insights into agricultural activity (including fisheries and forestry activity). In scope have been:

- agriculture, fisheries and forestry censuses and surveys
- commissioned research
- reports containing information, data or statistics
- administrative data
- datasets residing in any agency's databases.

Why are non-official statistics in-scope of the NASR?

In order to gain a holistic picture of the statistics collected, produced and used for decision making with respect to agriculture, the NASR's scope has not been limited by official statistics. This means that in addition to official agricultural statistics which are collected and produced by Australian and state/territory governments and agencies, statistical assets collected and produced by non-government organisations have been included in the scope of the NASR.

Who did NASR consult with and how did they provide feedback?

NASR consulted widely across Australian and state/territory governments and agencies, industry, research and development corporations, academia and the community. Further detail about the NASR consultation process can be found in **Appendix 1** and a full list of contributors in **Appendix 2**.

Is this report available to the public and if so, how can it be accessed?

This final report is available to be viewed and/or downloaded by the public on the ABS website.

What will happen after the NASR?

The Australian Government, in consultation with stakeholders, will consider the actions and initiatives for improvement of the agricultural statistical system contained in this report.

APPENDIX 6 – GLOSSARY

Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) – is a research bureau within the Department of Agriculture providing professionally independent research, analysis and advice for government and private sector decision-makers on significant issues affecting Australia's agriculture, fisheries and forestry industries.

Australian Bureau of Statistics (ABS) – is Australia's National Statistical Office, which exists to assist and encourage informed decision making, research and discussion within governments and the community, by leading a high quality, objective and responsive National Statistical Service.

Australian Bureau of Statistics Business Register (ABSBR) – is a list of organisations which undertake economic activity in Australia. The data on the ABS Business Register is primarily sourced from the Australian Business Register, the Australian Taxation Office and via ABS' profiling of large, and/or complex businesses.

ABS Data Quality Framework (ABS DQF) – provides standards for assessing and reporting on the quality of statistical information. For further information see the ABS website: The ABS Data Quality Framework

Accessibility – Accessibility is the seventh dimension of quality in the ABS DQF. Accessibility refers to the ease of access to data by users, including the ease with which the existence of information can be ascertained, as well as the suitability of the form or medium through which information can be accessed.

Accuracy – Accuracy is the fourth dimension of the ABS DQF and refers to the degree to which the data correctly describe the phenomenon they were designed to measure.

Administrative data – Administrative data collection is the set of activities involved in the collection, processing, storage and dissemination of statistical data from one or more administrative sources. Administrative data is sourced from an administrative activity and associated records as opposed to survey data collection.

Australian Statistical Geography Standard (ASGS) – The statistical geography used and developed by the ABS. It is the framework for understanding and interpreting the geographical context of statistics published by the ABS.

Australian Agricultural Environments (AAE) – A special geography developed for the ABS Land Management Practices Survey. The AAE regions are based on agroecological regions and have been aligned to Statistical Area 2 (SA2) boundaries from the ASGS to make output comparable with other ABS data.

Coherence – Coherence is the fifth dimension of the ABS DQF and refers to the internal consistency of a statistical collection, product or release, as well as its comparability with other sources of information, within a broad analytical framework and over time.

Critical Asset – A data or information asset, which is considered vital to inform the ongoing administration of a work program or an element of a work program.

Data Users – A person, group or organisation involved in accessing and investigating integrated datasets for statistical and research purposes. Data users include academics working in research institutions and employees undertaking research in Commonwealth and state/territory agencies, industry and the community.

Data Producers – Are agencies, government departments, industry and academic groups, involved in the collection, storage, analysis and transformation of data for the production of statistical outputs and the dissemination of those outputs and information describing them.

Data Custodians – Data custodians are stakeholders responsible for managing the use, disclosure and protection of source data used in a statistical data integration project. Data custodians collect and hold information on behalf of a data provider (defined as an individual, household, business or other organisation that supplies data for either statistical or administrative purposes). The role of data custodians may also extend to producing source data, in addition to their role as a holder of datasets.

Detailed statistical asset public submission – Public submissions to NASR, providing detailed information relating to specific statistical assets that currently exist and are being utilised in the statistical information system.

Department of Agriculture – The Australian Government Department of Agriculture leads the development of policy advice and provides services to improve the productivity, competitiveness and sustainability of agriculture, fisheries, forestry and related industries.

Essential Statistical Assets (ESA) for Australia initiative. The aim of the initiative is to allow for effective prioritisation of investment, focus and effort within the NSS, by identifying those essential statistical assets which are critical to decision-making in a complex and sometimes fragmented information environment across Australia.

External Stakeholder – An individual, agency, government department, industry organisation or other organisation with direct interest in agricultural statistics. For the purposes of the NASR, stakeholders are defined as users, producers or custodians of agricultural data.

Government – Refers to Australian and state/territory government unless elsewhere specified.

High level public submission – Public submissions providing answers guided by the five key questions in the 'How to make a submission' section of the 7105.0.55.002 – Discussion Paper: Submission Process for the National Agricultural Statistics Review, 2013-14.

Institutional Environment – Institutional Environment is the first dimension of quality in the ABS DQF and refers to the institutional and organisational factors which may have a significant influence on the effectiveness and credibility of the agency producing the statistics.

Interpretability – Interpretability is the sixth dimension of quality in the ABS DQF. Interpretability refers to the availability of information to help provide insight into the data.

NASR – National Agricultural Statistics Review.

National Statistical Service (NSS) – is a community of government agencies led by the Australian Bureau of Statistics, working to build a rich statistical picture in order to better inform Australia. The NSS embraces all levels of government, and includes all official bodies involved in the production and use of official statistics. It also includes custodians of administrative datasets which contribute to official statistics.

Public Submission – The formal process of stakeholders, excluding the Department of Agriculture, ABARES and ABS, submitting comment to the NASR.

Qualitative analysis – Non-numerical examination of supplied textual data

Research and development corporations (RDCs) – are the Australian Government's primary funding bodies for rural research and development (R&D) in Australia and cover a broad spectrum of agricultural, fisheries and forestry industries.

Relevance – This second dimension of the ABS DQF refers to how well the statistical product or release meets the needs of users in terms of the concept(s) measured, and the population(s) represented.

Respondent – An individual or organisation providing a response to a request for information/data from either an official or non-official body. Respondents may provide information via survey collection (both paper and electronic) or verbal interview collection methods.

Statistical Clearing House (SCH) – was established in 1997 within the ABS to be the central clearance point for business surveys that are run, funded, or conducted on behalf of the Australian Government. The SCH helps minimise the burden of Australian Government surveys on businesses by reducing survey duplication and ensuring that proposed business survey methods and questionnaire designs are fit for purpose.

Statistical Area (SA) – A geographical unit within the ASGS. Their aim is to represent a community that interacts together socially and economically. There are 4 levels of SAs (SA1 to SA4). As an example, SA2s have a population range of 3,000 to 25,000 persons, and have an average population of about 10,000 persons. Further information can be found in catalogue 1270.0.55.001 – Australian Statistical Geography Standard (ASGS) Volume 1

Statistical Cycle – A model comprising of phases of statistical activity for the production of a statistical output. The statistical cycle is comprised of seven phases; planning, content development, data collection, data processing, analysis, dissemination and evaluation.

Statistical data integration – The process of combining information from different administrative and/or survey sources to provide new datasets for statistical and research purposes.

Timeliness – Timeliness is the third dimension of quality in the ABS DQF. Timeliness refers to the delay between the reference period (to which the data pertain) and the date at which the data become available; and the delay between the advertised date and the date at which the data become available (e.g. the actual release date).

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