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What is State of Environment reporting?

Every five years since 1996, the Australian Government has received a detailed report on the state of the Australian environment. The report is prepared by a panel of independent experts based on the best available information and analysis. The report aims to provide authoritative information on the state of the environment, an assessment of how effectively the Australian environment is being managed and what the key national environmental issues are. The most recent report was Australia state of the environment, 2016 (SoE 2016).

What drives changes to the environment?

In Australia, two key drivers of environmental change are population growth and economic activity. Drivers, or underlying natural and human-caused forces, generate pressures (immediate factors) on the environment that lead to changes in the state of the environment.

The extent to which drivers lead to environmental impacts depends on a range of factors, including:

• how many of us there are
• where and how we live
• the goods and services we produce (for both domestic and export markets) and consume
• the technologies we use to produce our energy, food, materials and transport, and
• how we manage the waste we produce.

Keeping impacts on the environment within limits is key to a sustainable future.

If not managed well, drivers can generate pressures that have immediate and long-term negative consequences for the environment. If managed well, however, drivers can be harnessed to achieve benefits for the environment and people.

Australia's population has one of the most geographically distinctive distributions of any country, with 90 per cent of people living in just 0.22 per cent of the country’s land area (NSC 2013). At June 2015, 15.9 million people—around two-thirds of Australia’s population—lived in a capital city, and these areas generally experienced faster population growth than the rest of the country. Many areas that experienced strong growth in recent years were on the fringes of capital cities, where more land tends to be available for subdivision and housing development (ABS 2016a).

The concentration of Australia’s population near the coast, mostly in urban areas, creates substantial pressure on coastal ecosystems and environments in the east, south-east and south-west of the country (ABS 2015).

Urban growth is already driving land-use change in Australia, with expansion in peri-urban areas (on the outskirts of cities and large towns) having direct impacts on the environment and the availability of farm land. This trend is expected to continue.

Well-planned, higher-density residential areas can reduce the need to expand into greenfield sites, and provide opportunities for more efficient energy use (a result of smaller dwellings) and more efficient transport. Poorly planned and executed urban growth can exacerbate environmental pressures and have direct impacts on biodiversity—for example, through land-use change and by changing the ability of ecosystems to mitigate floods.

Our economy requires energy and materials—metals, minerals, water, foods and fibre—all of which come from, and return to, the environment. The growth of the economy for both domestic and export can generate pressures on the Australian environment.

Australia is a major net exporter of energy, minerals and food (ABARES 2015a). Export markets generate environmental pressures through production, distribution, transport (e.g. powerlines, transport and loading facilities) and waste generation, including greenhouse gas emissions.

Rapid global economic growth has brought Australia many positive results, but, at the same time, increased global demand for food, materials, energy and tourism can increase pressures on the environment.

Successive SoE reports have highlighted the challenge of reconciling the longer-term perspective of environmental policies with the relatively short-term focus of social and economic policies.

The state of Australia's environment

The first state of the environment report, produced in
1996, noted that Australia has a beautiful, diverse and unique environment which is a priceless heritage and should be a source of pride to all Australians. The report noted that some aspects of the Australian environment are in relatively good condition, but there were some very serious environmental problems.

Fast forward 20 years and five reports later to the SoE 2016 and there have been some improvements in parts of the Australian environment. Our heritage (built, natural, cultural) and marine environments are generally in good condition, as is the Antarctic environment.

However, there remain areas where the condition of the environment is poor and/or deteriorating. These include the more populated coastal areas and some of the growth areas within urban environments, where human pressure is greatest (particularly in southeastern Australia); and the extensive land-use zone of Australia, where grazing is considered a major threat to biodiversity.

For some parts of the Australian environment, at least, effective policy and management have contributed to improved outcomes for the environment and people.

Since 2011, Australia’s conservation estate has increased, with significant additions to the National Reserve System, largely through the addition of new Indigenous Protected Areas. Forty per cent of Australia’s protected areas are under Indigenous management which provides an opportunity for Aboriginal people to reintroduce land management practices, such as traditional approaches to using fire in the landscape, that will help the land recover.

**Figure 1.**

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**Figure 2. Click on the map to interact with the data.**

**Pressures on the environment**

The main pressures facing the Australian environment today are the same as those reported in 1996 - climate...
change, land-use change, habitat fragmentation and degradation, and invasive species.

Evidence shows that some individual pressures on the environment have decreased since 2011, such as those associated with air quality, poor agricultural practices, commercial fishing, and oil and gas exploration and production in Australia's marine environment.

During the same time, however, other pressures have increased. These include those associated with coal mining and the coal-seam gas industry, habitat fragmentation and degradation, invasive species, litter in our coastal and marine environments, and greater traffic volumes in our capital cities.

Climate change is an increasingly important and pervasive pressure on all aspects of the Australian environment. The changes to Australia’s climate include increased average surface air temperature, increased incidence of heatwaves, decreased average rainfall in parts of the country, an increase in drought frequency and severity, sea level rise, more extreme daily rainfall events and flooding from intense storm activity.

Climate change is altering the structure and function of natural ecosystems, and affecting heritage, economic activity and human wellbeing. Rising temperatures, sea level rise and weather extremes create pressures on species and ecological processes and these changes interact with and amplify other negative pressures on the environment.

We continue to lose agricultural lands through urban encroachment and rural land clearing. From 2011 to 2016, land-clearing rates stabilised in all states and territories, except Queensland, where clearing increased.

Coastal waterways are threatened by pollutants, including microplastics and nanoparticles, which are largely unregulated by government and their effects on the environment and people are poorly understood.

Since 2011, the coast has experienced several extreme weather events, including cyclones, heatwaves and floods. Climate-related pressures of sea level rise, more frequent severe storms, and subsequent erosion and recession of the shoreline are expected to become increasingly significant for coastal regions in the future.

Population growth in our major cities, along with Australia’s reliance on private cars, is leading to greater traffic volumes, and increasing traffic congestion and delays.

There is evidence that the pressures on the environment interact in complex ways, resulting in cumulative impacts and amplification of the threats faced by the Australian environment. Because climate change will enhance existing threats, the capacity of the environment to adapt to climate change will be improved if other existing threats are addressed or ameliorated.

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**Cumulative pressures amplify the threat to the environment**

The environment can generally cope with individual pressures, but, when pressures overlap, their impacts can interact so the effects of low-level pressures can be amplified.

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**Looking to the future**

Some parts of Australia’s environment are not yet being managed sustainably, but there is hope that the situation will continue to improve. A variety of policies, tools, approaches and resources are being developed and used that could support a more sustainable path of development.

- Further improvements to the way environment is managed requires addressing the following challenges:
  - Lack of a national policy establishing a clear vision for the long-term protection and sustainable management of our environment.
  - Poor collaboration and coordination of policies, decisions and management arrangements.
  - Insufficient resources for environmental management and restoration.
  - Lack of understanding of, and capacity to measure cumulative impacts.

Opportunities are emerging for new partnerships to address environmental challenges. By combining the efforts of government, communities, science and the
private sector better outcomes for people and the environment are more likely.

There have been substantial improvements in knowledge about the environment. In recent years, citizen science has expanded, resulting in improved observations of the environment that, in turn, provides knowledge to support more effective management. FeralScan is a great example of the power of citizen science that provides communities with an easy way of documenting pest animal [invasive species] problems in their local area. Information recorded by the community is delivered directly into the hands of farmers, land managers, community volunteers, Indigenous groups and biosecurity stakeholders across Australia. FeralScan has been running since 2011, and has mobilised more than 25,000 Australians as citizen scientists to contribute in a meaningful way to the management and research of pest animals.

However, we need to accelerate the process of improving environmental information.

Technology is changing the way in which environmental managers and policy-makers are able to access and use information to support decision-making and environmental management. For example, the new digital platform for the State of the Environment has delivered improved transparency and access to environmental data, making it more accessible to decision makers (including the private sector) and the public, but there remain data gaps to be filled.

Overall, the outlook for Australia’s environment depends on our ability to effectively address the complex mix of drivers, pressures and risks discussed in the SoE 2016 report. This will require, leadership, effective engagement of the community and private sector, continued improvements in our understanding of the environment and the causes of change, effective management of the environment, ensuring that our economy does not harm the environment, and addressing climate change.

More information on Australia’s State of the Environment is available at https://soe.environment.gov.au/.

This article draws on the findings of SoE 2016 and on an article published in The Conversation https://theconversation.com/five-yearly-environmental-stocktake-highlights-the-conflict-between-economy-and-nature-73964.

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References


With China dominating world manufacturing and many of the countries of Asia building very competitive manufacturing sectors – can manufacturing have a future in Australia? The United States is prepared to enter a trade war with China and some of its trading partners to save some of its manufacturing industry. But, what can Australia do?

Currently, Australian manufacturers are optimistic about their future. They tend to accept that imposing new tariffs is not what they need because tariffs may lead to higher prices for their inputs. Basically, it appears that they just want help when moving into more innovative directions so that they can be competitive in the global market.

While manufacturing output is declining as a proportion of the economy, its output has been increasing over time and moving into many new directions. Just as the structure of the economy changed when the agricultural sector declined as a proportion of Gross Domestic Product (GDP), it is now changing as a result of the industrialisation of many Asian countries and the relative decline of manufacturing in Australia. This structural change is necessary as it helps us to maximise our productivity and therefore our living standards. However, governments need to support those manufacturers and employees who are affected adversely.

It is important that some people are not made worse off as we strive to make everyone better off. Unfortunately, the world appears to be currently experiencing a very negative view of free trade, globalisation and structural change because many have been made worse off while others prosper. This has had a domestic political impact in several countries and may now lead to trade wars rather than free trade agreements. Britain’s vote to leave the European Union is just another indicator that some people have had enough of free trade and globalisation.

This article will examine the situation in Australia by focusing on the relative decline of manufacturing and the changing structure of the Australian economy. It will examine some of the:

- historical trends in the structure of the economy
- more recent trends in manufacturing
- possible future directions for manufacturing in Australia.

**Historical trends**

In an economy, structural change occurs when there is a major change in the relative size of the different industries. Often these changes can occur due to changes in technology, but they can also occur due to changes in the composition of imports and exports. Currently, globalisation and international economic integration, are key factors influencing structural change in many economies.

All economies, however, experience structural change as they develop. The general pattern is that an economy first experiences an improvement in productivity in the agricultural sector which leads to an agricultural revolution. Output is able to increase without the need for more workers. The surplus workers are then freed up to work in the manufacturing sector which is also able to apply new technology and create an industrial revolution and an industrial economy. Employment not only moves into manufacturing, but also into those industries, such as mining and transport, that support manufacturing.

The next stage in the general economic development process is structural change which sees the relative sizes of both the agricultural and manufacturing sectors decline while the services sector grows. This stage is known as the post-industrial economy. It should be noted that while the relative sizes of the agricultural and manufacturing sectors decline, the total output of each is likely to continue to increase and be supported by further improvements to technology and innovation.

In the 1900s Australia received much of its manufactured goods from Britain. Much of our agricultural output, however, was exported to Britain. Australia was said to be ‘riding on the sheep’s back’. There were mining booms, for example the gold rushes of the 1850s, and also the growth of a strong services sector, especially in transport and communications. The services sector was about half of all output and agriculture about one-third. Manufacturing was small.
From 1900 to the mining boom in 2010 a massive change occurred to the structure of the Australian economy. Graph 1 shows the progressive decline in the relative share of employment in the agricultural and mining sectors and the continued rise in the size of the services sector. Manufacturing, however, rose from about 15 percent of employment in 1900 to over 25 percent from the mid-1940s to the mid-1970s. From there it declined to under 10 percent by 2010. It should be noted that manufacturing’s share of employment was always close to its share of GDP.

So where did all of the employment in the services sector go to? For the period from the mid-1960s to 2010 this is indicated in Graph 2. The greatest growth occurred in this period in social services, business services and personal services.

And what happened to the share of exports from manufacturing over this period? This is presented in Graph 3. Had it not been for the growth in mining output from the mid 2000s the share of manufactured exports would have remained high. But, of particular note in this graph is the continuation of the long-term decline in the share of agricultural exports – to a stage where they were about the same share as manufacturing in 2010.

The growth and then relative decline in the size of the manufacturing sector can basically be explained over this period by two factors. These are:

- the level of protection offered to manufacturers
- our trading relationships with other countries.

Following the First World War governments in Australia encouraged the growth of manufacturing output by imposing tariffs, (which tax imports of goods that compete with domestically produced goods). The war had seen Australia’s trading links with Britain severed by the German navy and Britain devoting its industrial output to the war. Australia’s iron and steel industry evolved and our production of munitions and motor vehicles grew. This was fortunate because when Japan entered the Second World War our trading links were disrupted by both the German and Japanese navies, air forces and armies and we had to be largely self-sufficient. After the war protection was seen as a good thing and maintained until tariff cuts started in the 1970s. Then the mood had changed to supporting free trade, free trade agreements and trade within our region, even with our former enemies. Our trading links with Britain declined when it entered the European Union.
More recent trends in manufacturing

Graph 4: Manufacturing Indicators

Graph 4 shows that in the 2000s manufacturing output virtually stabilised in absolute terms, whereas the share of manufacturing output and employment in the economy continued to fall. However, the level of investment by manufacturers remained high. So, while the local car production industry has closed and the steel industry needed a rescue package, many other manufacturers have maintained output levels despite the adverse business conditions caused by the high value of the Australian dollar during the mining boom. The sub-industries in Graph 5 account for about 80 percent of Australia’s manufacturing output.

Graph 5: Manufacturing Output

In terms of international comparison, Graph 6 shows that the relative size of manufacturing in Australia to be much the same as in the United States, where there has been political support for higher tariffs for manufacturers.

Graph 6: Manufacturing Output and Employment

What emerges is that those long-term trends in the changing structure of the Australian economy have continued, refer Graph 7. The mining boom has subsided and mining’s share of output is continuing to fall. Surprisingly, the relative size of the retail and wholesale industry is also falling.

Graph 7: Industry Share of Output

It is, however, encouraging that the volume of manufactured exports is continuing to rise, refer Graph 8.
Among Australia’s manufacturers are some world class businesses, which when ranked in terms of 2017 revenue, are: Fonterra (dairy products), Caltex, Shell, BP (oil refining), Amcor (packaging), Bluescope Steel, Perth Mint (making money), CSL (pharmaceuticals), Toyota, ExxonMobil, Visy (paper packaging and recycling), JBS (beef and pork processing), Coca-Cola, Orica (explosives), Sims Metal, Lion Nathan, Boral, Orora (packaging), Ford and Alcoa (aluminium products). Other big manufacturers, but not in the top 20, are: Treasury Wine Estates, James Hardie, CSR, George Weston, Nestle, Goodman Fielder, Hanson, Carlton, Dulux and Unilever.

In terms of the future, one thing is ‘for sure’—some of these businesses are going to reduce their output and source their products from overseas and some are going to continue to increase their domestic production. In addition, there will be some new businesses that start up and prosper, such as the business producing carbon fibre wheels for cars.

Key factors promoting business success are: the desire for innovation through research and development, the skilled nature of the Australian labour force, the ability to export within the region and government support for business. Factors with an adverse effect are: the small scale of the Australian market, the growth of manufacturing in Asia, the relatively high wage rates of Australia’s less skilled workers and unpredictable rises in the value of the Australian dollar.

The future of Australian manufacturing appears to depend on us building on our strengths and focusing on advanced manufacturing with:

- advanced knowledge: a high degree of research, development and innovation
- advanced processes: using state of the art technology
- advanced business models: serving niche markets with customised products.

Already Australian manufacturing allocates $4.5 billion each year to research and development. That is about one quarter of total private sector expenditure in this area. The contribution of manufacturing to innovation, technological change and our external trade balance is substantial.

However, well targeted assistance from government is important for future success. In 2015-16 the Federal government committed to spend about $9.7 billion in research and development in:

- the business sector, mainly through research and development tax breaks ($3.2 billion). These have been cut in the 2018-19 Federal Budget.
- universities ($2.8 billion)
- government research organisations, such as the CSIRO, ($1.8 billion)
- other areas, such as medical, rural, energy and environment ($1.9 billion).

And in December 2015 it announced the National Innovation and Science Agenda, ($1.1 billion over 4 years), which it hoped could be used to:

- promote greater collaboration between the research and development organisations listed above
- turn smart ideas into commercial realities by helping to finance the commercialisation process
- have governments as leaders in supporting innovation by investing in traditional and digital infrastructure, such as research laboratories and the National Broadband Network. Additional support for this has been provided in the 2018-19 Federal Budget.

More recently, in May 2017, the government announced a new $100 million Advanced Manufacturing Fund to enhance competitiveness and enable manufacturers to take advantage of the growing markets in Asia. It should also be noted that the government’s tax cuts for small to medium sized businesses has also supported 3.2 million Australian businesses.

In hindsight, the loss of the motor vehicle producers, Ford, Toyota and General Motors, in 2017 has cast a spell of doom on traditional manufacturing in Australia. It is now up to all those concerned to support the ideals of the National Innovation and Science Agenda to enable high value manufacturing to compete fully in the competitive global market.
1. Briefly explain the concept of structural change when it applies to an economy.

2. How can structural change help to improve the standard of living of a country?

3. Why are some countries resisting further structural change and becoming more protectionist?

4. Identify two factors that facilitate structural change in an economy.

5. Explain why structural change is important in an economy’s economic development process.

6. Examine Graph 1 and identify the main changes in the relative size of Australia’s major industries.

7. What factors contributed to the decline in the relative size of the agricultural sector in Australia?

8. Using Graphs 1 and 2 explain the economic significance of the growth of the services sector in Australia.

9. Discuss the reasons why the relative size of the manufacturing sector rose and then fell in the period from 1900 to 2010.

10. Referring to Graph 3, explain how the international competitiveness of the manufacturing sector has been affected by the long period of tariff cuts starting in the early 1970s.

11. Examine Graph 4 and identify the main trends affecting the manufacturing sector over the last 20 years.

12. Examine Graph 6 and compare and contrast Australia’s performance with that of the United States, Germany and Japan.

13. Examine Graphs 7 and 8 and describe how structural change has continued in Australia over the last 10 years.

14. Identify some large Australian manufacturers that produce goods that you like to buy.

15. List the key factors that contribute to the success or decline of manufacturing businesses in Australia.

16. Discuss the likely future direction of manufacturing in Australia.

17. Examine some of the policies that the Australian government is using to assist manufacturers in Australia.

18. Essay: Discuss the arguments for and against higher levels of protection for Australian manufacturing businesses.

References


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