Australian Government

Department of Agriculture, Fisheries and Forestry

Submission to

Senate Select Committee on Agriculture and Related Industries – Inquiry into food production in Australia

March 2009

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Introduction

The Australian Government Department of Agriculture, Fisheries and Forestry (the department) welcomes the opportunity to provide a submission to the Senate Select Committee on Agriculture and Related Industries Inquiry into food production in Australia.

This submission outlines the department's portfolio responsibilities prior to providing an overview of the Australian food industry and issues of relevance to the future performance and sustainability of the domestic food supply system.

This submission includes information and comments received from the Bureau of Rural Sciences (BRS) and Australian Bureau of Agricultural and Resource Economics (ABARE), and the Agricultural Productivity, Climate Change, Trade and Market Access, Sustainable Resource Management and Corporate Policy Divisions of the department.

Role of the Department of Agriculture, Fisheries and Forestry

The department's role is to develop and implement policies and programs that ensure Australia's agricultural, fisheries, food and forestry industries remain competitive, profitable and sustainable.

The department aims to:

- help Australian agricultural, food, fisheries and forestry industries become more competitive, profitable and sustainable;
- enhance the natural resource base on which these industries rely;
- deliver scientific and economic research, policy advice, programmes and services to help deal with the challenges faced by agricultural, food, fisheries and forestry industries;
- address issues relating to the integrity of Australia's food supply chain, from producer to processor to the consumer;
- safeguard the integrity of Australia's animal (including aquatic animals), plant and fish (including crustaceans and shellfish) health status;
- uphold quarantine, export inspection and certification and food safety standards activities, essential for maintaining Australia's highly favourable animal and plant health status; and
- improve trading opportunities for Australian agriculture and food industries, while protecting Australia's plant and animal health and environment.

The Department includes business units that provide specialist services to portfolio industries such as the Australian Quarantine and Inspection Service (AQIS), the Australian Bureau of Agricultural and Resource Economics, and the Bureau of Rural Sciences. There are a number of regulatory authorities, statutory marketing authorities, Research and Development Corporations and advisory bodies within the portfolio. Biosecurity Australia is a prescribed agency within the Department.

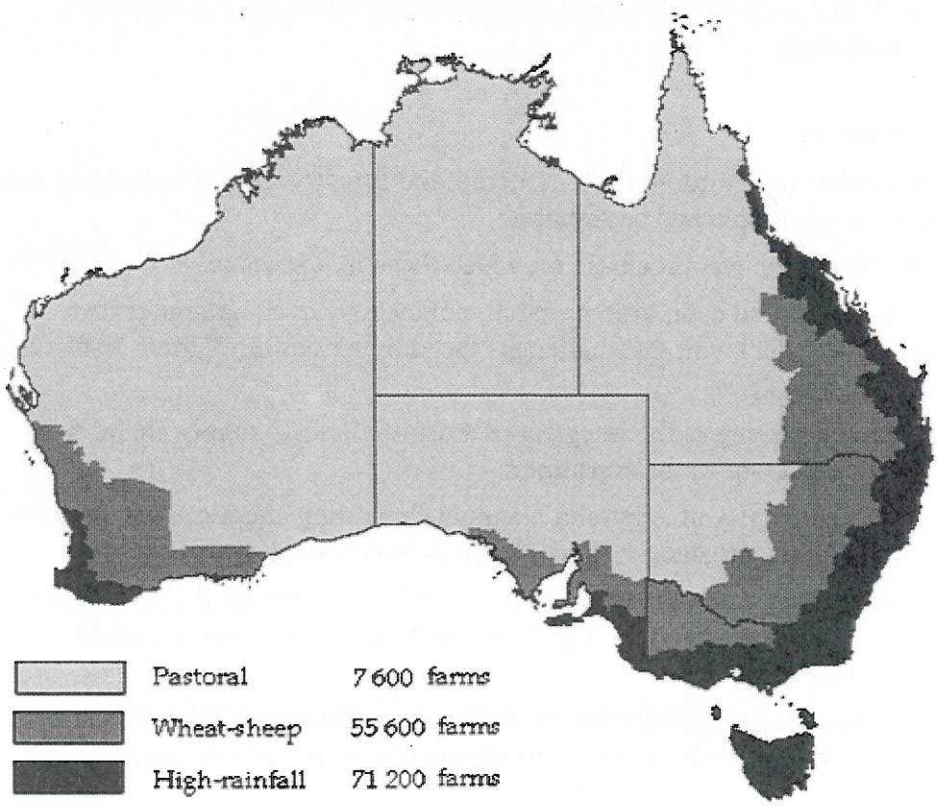
The Agriculture and Food Sector

Australian Agriculture

Agriculture represents a vital part of the Australian economy and is a significant player in world trade for several commodities. In 2001–02 there were 386 000 people employed in agriculture. By 2007–08 this number had fallen to 303 000 people. Similarly, in 2006–07 there were around 134 000 commercial farms spread across the continent, some 22 per cent fewer than in 1985–86.

Around 60 per cent of the Australian land mass is devoted to agriculture in one form or another, with the types of agricultural pursuit being dictated largely by climate, soil types and water availability. As indicated in Figure 1, there are three broad zones in which agricultural activity occurs. These are commonly referred to as the pastoral, wheat–sheep and high rainfall zones. Within these areas there is also some irrigation based farming, drawing on stored surface water (much of it from dams or major rivers and streams) and underground sources.

Figure 1: Australian agricultural zones, 2007



Much of the pastoral zone is characterised by low rainfall, relatively low soil fertility, and large area farming activities involving the grazing of beef cattle and sheep for wool and mutton. As the name implies, the principal farming activities in the wheat–sheep zone are cropping (principally winter crops), and the grazing of sheep (for wool, lamb and mutton) and beef cattle. Prime lamb, beef and wool production are undertaken in the high rainfall zone. The coastal part of the high rainfall zone is also where much of Australia's dairy industry is based (along with some dairying in inland irrigation areas).

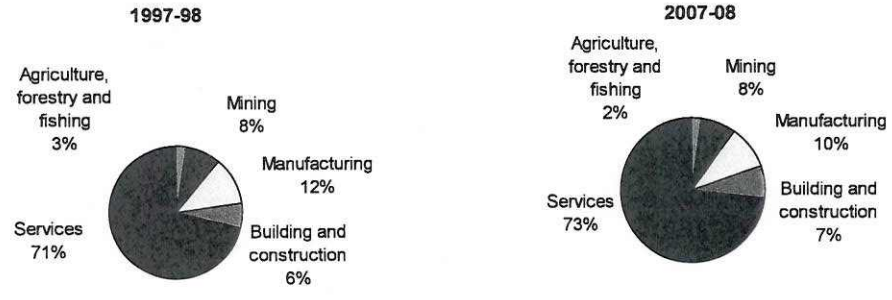
Between 1987–88 and 2007–08 the number of broadacre farms in Australia has fallen from around 80 000 farms to close to 61 000 farms. Over the same period the total land area operated by these enterprises fell by around 5 per cent. Strong demand for rural land during this period has resulted in a sharp increase in land values, raising the total capital value of farms. The average total capital value (in 2007–08 dollar terms) of broadacre farms has more than doubled over the 20 year time period to be $3.5 million in 2007–08.

Food and beverage processing covers a number of activities, including meat, dairy, seafood, fruit and vegetable processing, sugar, confectionery and beverage manufacturing, as well as flour milling and baking. In 2006–07 this part of the agriculture and food sector employed more than 191 000 people. Around half of the food processing firms and 40 per cent of employees are located in rural and regional areas. In 2007–08, employment in the food and beverage manufacturing sector increased by 7 per cent relative to 2006–07.

Economic Contribution

In terms of economic contribution, Australian agriculture represents a small but important part of the national economy (**Figure 2**). The contribution of agriculture to gross domestic product (GDP) and the relative shares of the other sectors of the economy are fairly typical of a mature economy, with the services sector now accounting for around three quarters of output.

Figure 2: Sectoral contribution to Australian GDP



Although the Australian economy almost doubled in size in real terms (net of inflation) from the early 1980s to 2007-08, the value of farm output only rose by 9 per cent. Not surprisingly, agriculture's share of GDP has declined — from around 3.8 per cent in the

early 1980s to 2 per cent in 2007-08. This decline in relative importance also reflects growth in the services, mining and manufacturing sectors.

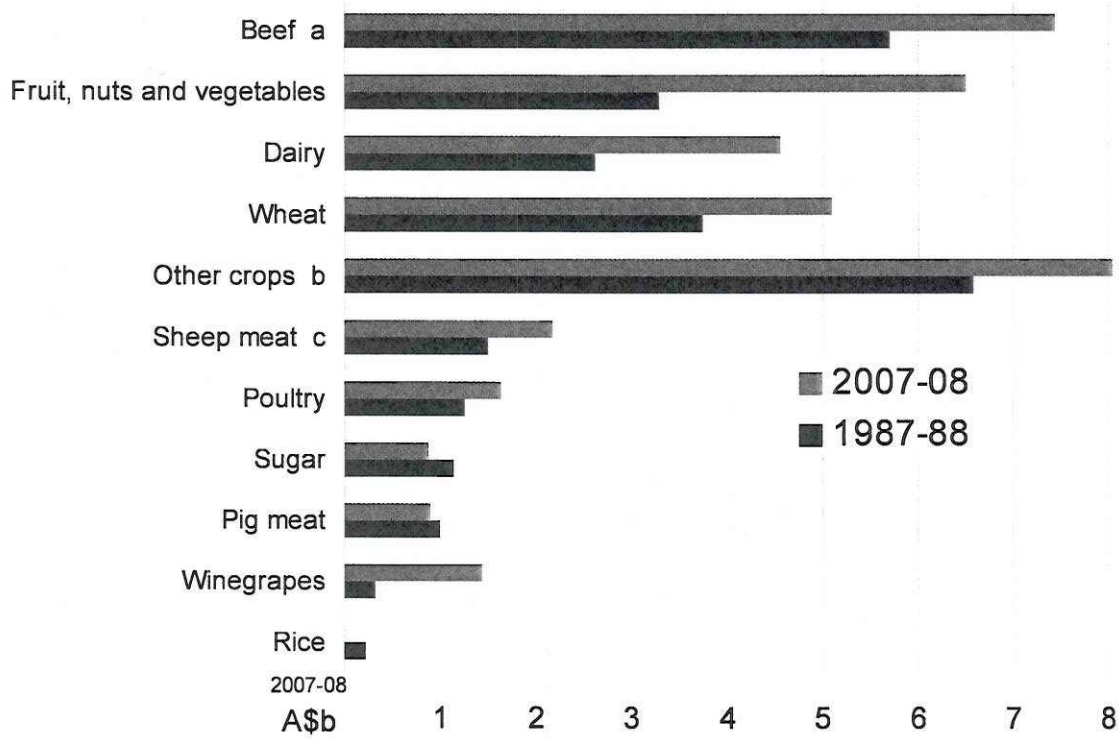
Although agriculture accounts for a relatively small proportion of national GDP, the recent drought demonstrated the importance of agriculture to overall economic performance in Australia. The 2006–07 drought is estimated to have reduced the rate of economic growth in Australia in 2006–07 by around 0.75 percentage points from what would otherwise have been achieved.

The processed food and beverage industry is Australia's largest manufacturing industry, with total sales and service income of $71.4 billion in 2006/07. In 2007-08, food and liquor retailing turnover was around $113 billion. The value added food processing industry contributed around $17 billion or 1.6 per cent to Australia's gross domestic product in 2006–07. Aggregate operating profit before tax for food and beverage manufacturers (including tobacco) for 2006-07 was $6 billion. This result represents an 11 per cent increase since 2004-05. The largest 50 food and beverage companies in Australia comprise around 75 per cent of total turnover in this sector. There is also increasing multinational investment in the Australian food and beverage industry, with multinationals producing around one third of Australia's food and beverages.

Industry Size

Within Australian farming there is a wide diversity of both industries and their relative size. A ranking of the major industries according to their gross values of production in real terms for 2007–08 is shown in **Figure 3**. The figure also illustrates how the relative magnitude of each industry has changed in the two decades since 1987-88.

Figure 3: Major Australian food producing farm industries: gross value of production



a Includes cattle exported live b Coarse grains, oilseeds and pulses c Includes lamb, mutton and sheep exported live

The gross value of production of most agricultural industries (related to food production) increased between 1987–88 and 2007–08. However, the value of rice production declined by around 96 per cent, the value of sugar production fell by 24 per cent, and the value of pig meat production declined by 10 per cent. This largely reflects the fall in production in 2007–08 (compared to historical highs), resulting from poor seasonal conditions, and masks the increases in the value of production between 1987–88 and 2005–06.

Noteworthy increases in the gross value of farm output since 1987-88 include:

- Beef increased by 30 per cent, largely reflecting the increase in cattle numbers and beef production and more cattle being finished in feedlots.
- Fruit, nuts and vegetables increased by 97 per cent, in part because of industry responses to growth in consumer demand for more and different fresh fruit and vegetables.
- Sheep meat increased by around 44 per cent, mainly reflecting the shift in the sheep industry away from wool towards lamb production.
- Dairy rose by around 76 per cent as milk production increased.

Natural Resources

Both land and water are the main resources used by agriculture. Any reduction in land quality, rainfall or water available for irrigation will impact on current and future levels of agricultural production. Australian land tenure is mostly under freehold title or some form of long term lease from the Crown, with freehold being predominant in the more productive and closely settled regions.

Access to irrigation water from bores or river systems is licensed by the states, which also own major storages on rivers. Distribution of irrigation water from state owned facilities is managed by private or public utilities, depending on the state. These utilities levy fees for delivery. Increased trading of water (usually on a temporary basis and mainly within the same river valleys at this stage) is contributing to a more economically efficient allocation of the resource between competing users. Such trade was particularly useful in ensuring that scarce water was available to higher value end uses in the 2007-08 drought.

Around 65 per cent of the water used in Australia is used for agriculture, with the output from irrigated land accounting for around 23 per cent of Australia's total gross value of agricultural production. The gross value of irrigated production in Australia in 2004-05 was just over $9 billion, with irrigated fruit and vegetables (excluding grapes) accounting for nearly 40 per cent of this value. Other major contributors were irrigated dairy ($1.6 billion), grapes ($1.3 billion) and cotton ($0.9 billion) (ABS, 2006).

Agriculture has been, and remains, an important contributor to regional and national income in Australia. However, in many places there has been degradation of the natural resource base. For example, an assessment of river health in the Murray Darling Basin (CSIRO, 2001) found that over 95 per cent of the river length had been environmentally degraded, with 30 per cent being substantially modified from original

condition. The assessment identified catchment disturbance and changes in nutrient and sediment loads to be major contributors to degradation.

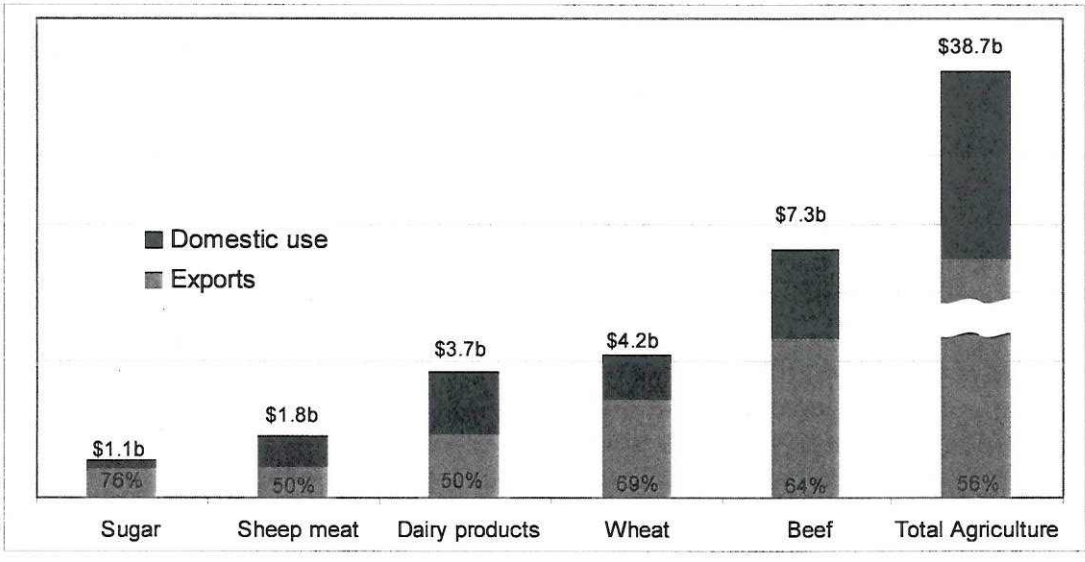
Government actions to address environmental sustainability are outlined on page 27.

Trade

Australian agriculture is strongly export oriented. In 2007–08, food exports were valued at $23.4 billion, accounting for approximately 13 per cent of Australia's total merchandise exports. Imports of food and food products in 2007–08 were valued at around $9 billion, nearly 40 per cent of the value exported.

The dependence of Australian farming on exports varies between industries. Over the period 2005–06 to 2007–08, around 56 per cent of the commodities produced on farms were exported (Figure 4). The average proportion of production exported during this period ranged from 76 per cent for sugar to 50 per cent for sheep meat and dairy products (principally in the form of manufactured products such as cheese, milk powders and butter).

Figure 4: Share of farm production exported (Average 2005-06 to 2007-2008)

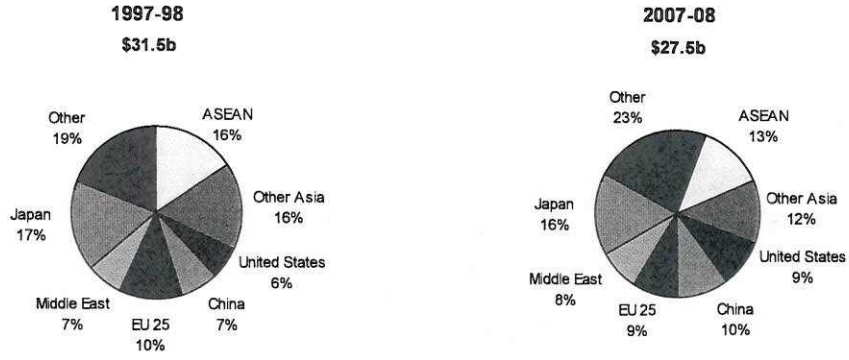


For Australian agriculture, changes in world prices and currency movements have an important impact on producer returns. This is because domestic prices for these commodities will generally be relatively closely correlated with those in international markets. This is particularly relevant for commodities of which a large proportion are exported, or which face competition from imports or domestically produced substitutes that are traded globally.

The relative importance of particular export markets for Australian agricultural products has been changing over time (Figure 5). Over the period from the early 1990s to the present, there has been a shift in emphasis from Europe to Asian markets. As can be seen in the figure below, there has been a 3 per cent increase in the share of agricultural exports going to China between 1997-98 and 2007-08, from 7 per cent to 10 per cent. Over the same period, agricultural exports going to the European Union have declined

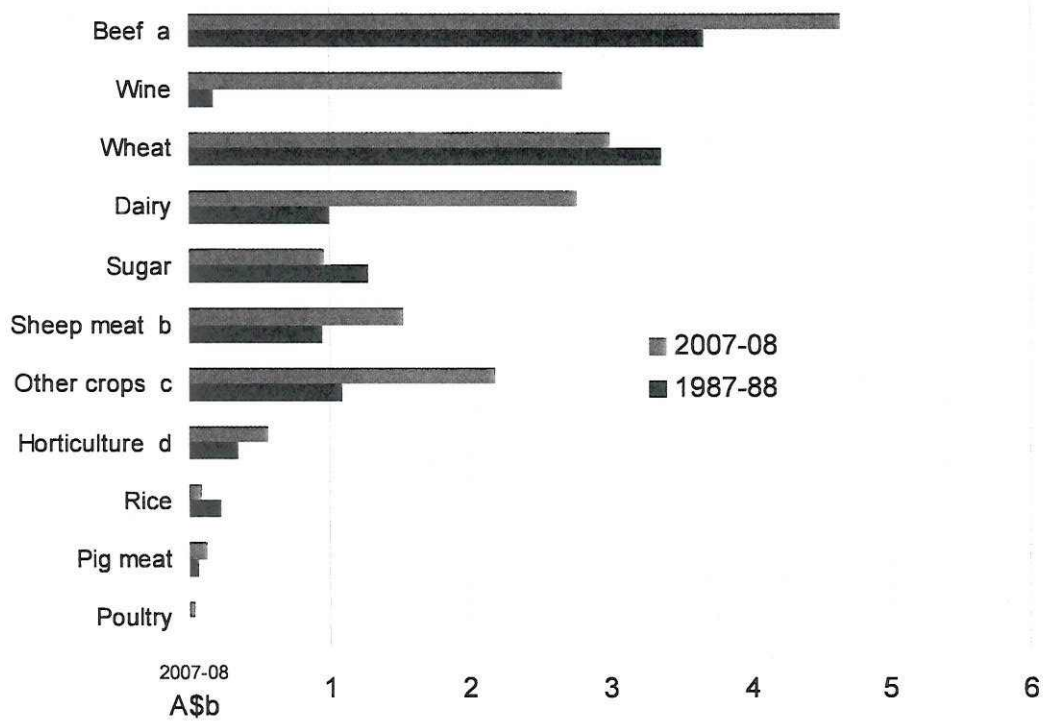
by 3 per cent from 12 per cent in 1997-98 to 9 per cent in 2007-08. The figures do not include exports of rice as this data is confidential. Because of this, growth in the share of exports to south Asian and Middle Eastern destinations is likely to be underestimated.

Figure 5: Markets for Australian agricultural exports



Australia's main agricultural exports ranked according to value for 1987-88 and 2007-08 are shown in Figure 6. Exports of beef, wine and dairy have increased particularly strongly over the period as these industries have responded to growing overseas demand for higher value products in these categories. The decline in the value of wheat exports reflects the decreased production caused by the drought in 2007-08.

Figure 6: Major Australian food related agricultural exports



a Includes cattle exported live b Includes lamb, mutton and sheep exported live c Coarse grains, oilseeds and pulses
d Value of minimally transformed fruit, nuts and vegetables, 1988-89 data in place of 1986-87

As has been the case for many years, Australia has a relatively small population, and it is growing slowly. This, along with the relatively high per person income which Australians already have, means that most of the future growth in Australian agriculture will depend on expanding export markets.

Future Patterns

Production

Over the medium term to 2013–14, production of wheat, coarse grains and oilseeds is forecast to increase relative to 2008–09. Australian coarse grains production is projected to increase by 10.5 per cent and wheat production by 19.8 per cent (Table 1). Export volumes of these commodities are expected to follow the same trend. Production of meat, however, is expected to be more variable. The production of beef, lamb, poultry meat and pig meat is expected to increase by 8.1 per cent, 7.6 per cent ,12.6 per cent and 9.0 per cent respectively between 2008–09 and 2013–14. However, over the same period the production of mutton is expected to fall by 18.7 per cent .

For sugar, projected relatively high sugar prices, the adoption of smut resistant sugar cane varieties and an assumed return to average seasonal conditions are likely to result in a small rise in Australian sugar production. Combined with ongoing yield improvements, Australian production of raw sugar is projected to increase to 4.9 million tonnes by 2013–14, an increase of 4.8 per cent over 2008–09 levels.

For dairy, Australian milk production is projected to recover slowly following a period of herd reductions due to high feed costs and restricted water access. Total milk production is forecast to increase by 12.4 per cent between 2008–09 and 2013–14, with growth for the production of dairy products such as butter, skim-milk and whole-milk powders.

Prices

Australian prices of wheat, coarse grains and oilseeds over the medium term are expected to decline relative to 2008-09. In constant dollar terms (2008-09 dollars) Australian wheat prices are projected to decline by 19 per cent and feed barley by less than one per cent. Livestock prices, in line with production trends, are expected to be more variable. The average saleyard prices for cattle are projected to decrease by 8.6 per cent and 4.4.per cent respectively between 2008–09 and 2013–14. Prices for poultry meat and pig meat are also expected to decrease over this period by close to 10 per cent and 12 per cent respectively.

Growing demand for biofuels is likely to mitigate falling world sugar prices over the medium term, despite steadily increasing sugar cane production in Brazil. The world indicator price for sugar is projected to reach 8.9 cents a pound (in 2008-09 dollars) in 2013–14, a decrease of 32 per cent from 2008–09.

Australian dairy prices are projected to fall for a couple of years as the global financial crisis affects world dairy demand. By 2013-14 Australian dairy prices are projected to recover as world demand recovers. However, between 2008–09 and 2013–14, the Australian price for milk is expected to decrease by 22 per cent. The volume of exports for butter, cheese, skim-milk and whole-milk powders are expected to increase considerably over the same period, by 9.1 per cent, 7.8 per cent, 8.3 per cent and 6.8 per cent respectively.

Table 1: medium term commodity outlook

	unit	2006 -07	2007 -08	2008 -09 f	2009 -10 z	2010 -11 z	2011 -12 z	2012 -13 z	2013 -14 z	% change 2008-09 to 2013-14
Wheat										
World price a										
– nominal	US$/t	212	362	261	248	250	255	258	263	0.8
– real b	US$/t	224	369	261	244	243	242	240	239	-8.3
Australia										
area	'000 ha	11 798	12 344	13 552	12 903	13 025	13 149	13 274	13 417	-1.0
production	kt	10 822	13 039	21 397	22 128	22 784	23 688	24 630	25 640	19.8
export volume	kt	11 196	7 408	10 220	14 684	16 454	16 790	17 044	17 650	72.7
APW 10 net pool return c										
– nominal	A$/t	240	423	325	315	293	291	294	296	-9.0
– real d	A$/t	253	431	325	309	280	271	267	263	-19.1
Coarse grains										
World price e										
– nominal	US$/t	157	218	174	168	173	185	194	196	12.7
– real b	US$/t	166	223	174	166	168	175	180	179	2.5
Australia										
area	'000 ha	6 216	6 576	6 563	6 461	6 519	6 561	6 586	6 617	0.8
production	kt	6 727	10 672	11 071	11 392	11 623	11 864	12 059	12 228	10.5
export volume	kt	3 255	4 428	5 217	5 215	5 327	5 469	5 615	5 732	9.9
price - real d										
feed barley	A$/t	291	312	192	186	187	192	195	191	-0.3
malting barley	A$/t	338	353	235	224	225	232	235	231	-1.8
grain sorghum	A$/t	225	264	201	193	192	196	200	201	0.3
Oilseeds										
World price g										
– nominal	US$/t	335	549	390	375	368	364	373	384	-1.4
– real b	US$/t	355	560	390	370	357	346	347	349	-10.3
Australia - Canola										
area	'000 ha	1 052	1 061	1 165	1 200	1 236	1 273	1 312	1 351	15.9
production	kt	573	1065	1615	1393	1507	1630	1763	1906	18.0
export volume	kt	228	472	939	975	1 115	1 190	1 287	1 392	48.2
Price										
– nominal	A$/t	530	696	591	570	558	564	569	575	-2.8
– real d	A$/t	559	710	591	559	534	526	519	511	-13.6
Sugar										
price										
– nominal	USc/lb	11.7	13.7	13.0	12.8	11.8	10.8	9.8	9.7	-25.0
– real b	USc/lb	12.3	14.0	13.0	12.6	11.5	10.3	9.1	8.9	-31.8
Australia h										
production i	kt	5 026	4 763	4 662	4 555	4 892	4 876	4 888	4 888	4.8
export volume	kt	3719	3493	3418	3284	3533	3538	3520	3494	2.2
Beef & veal										
saleyard price j										
– nominal	Ac/kg	292	286	298	305	312	312	310	307	2.9
– real d	Ac/kg	308	292	298	299	299	291	282	273	-8.6
slaughterings	'000	9 081	8 799	8 720	8 800	8 880	9 040	9 250	9 400	7.8
production	kt	2 226	2 155	2 165	2 185	2 205	2 245	2 300	2 340	8.1
export volume k	kt	974	930	928	920	950	970	990	1 010	8.8

Table 1: medium term commodity outlook (cont.)

Sheep meat										
saleyard price for sheep										
– nominal	Ac/kg	136	159	175	180	186	190	194	198	13.1
– real d	Ac/kg	143	162	175	177	178	177	177	176	0.5
saleyard price for lambs										
– nominal	Ac/kg	326	335	402	400	408	416	424	433	7.5
– real d	Ac/kg	344	341	402	392	390	388	386	384	-4.4
slaughterings										
sheep	'000	13 271	11 929	12 000	10 760	9 540	9 600	9 660	9 710	-19.1
lamb	'000	20 158	20 899	20 000	20 080	20 100	20 320	20 650	20 880	4.4
production l										
mutton	kt	271	258	252	231	204	203	204	205	-18.7
lamb	kt	413	435	407	418	420	426	433	438	7.6
exports										
mutton exports m	kt	162	158	151	146	124	125	127	129	-14.8
lamb exports m	kt	150	163	142	156	156	159	162	164	15.4
Pig meat										
saleyard price										
– nominal	Ac/kg	255	240	315	300	297	300	305	310	-1.5
– real d	Ac/kg	269	244	315	294	284	280	278	276	-12.4
slaughterings	'000	5 322	5 217	4 464	4 724	4 772	4 835	4 851	4 866	9.0
production	kt	382	377	321	340	344	348	349	350	9.0
exports no	kt	41.3	39.1	39.0	40.0	39.5	39.2	39.0	39.0	0.0
Poultry meat										
retail price										
– nominal	Ac/kg	490	534	540	530	532	535	542	550	1.9
– real d	Ac/kg	517	544	540	520	509	500	494	489	-9.5
production	kt	855	840	870	890	920	940	960	980	12.6
exports	kt	28	30	35	38	40	41	42	42	19.7
Dairy										
Australia										
production										
total milk	ML	9 583	9 223	9 400	9 550	9 791	10 037	10 299	10 569	12.4
butter p	kt	133	128	130	131	133	135	137	140	7.8
cheese	kt	364	359	365	371	376	381	385	393	7.8
skim milk powder	kt	191	164	166	165	167	174	181	179	8.4
wholemilk powder	kt	135	142	144	146	148	151	154	156	8.4
milk price q										
– nominal	Ac/L	33.2	49.6	40.0	34.5	30.5	31.5	33.5	35.0	-12.4
– real d	Ac/L	35.0	50.6	40.0	33.9	29.2	29.4	30.5	31.1	-22.2
export volume										
butter p	kt	81	57	58	59	60	60	62	63	9.1
cheese	kt	213	203	206	209	212	216	219	222	7.8
skim milk powder	kt	164	123	124	127	129	130	132	135	8.3
wholemilk powder	kt	94	82	94	99	101	102	102	100	6.8

a US hard red winter wheat fob Gulf, July–June. b In 2008-09 US dollars. c In 2008-09 Australian dollars. d Australian premium white wheat, 10 per cent protein. e US corn, fob Gulf, October–September. g Soybean, cif Rotterdam, October–September basis. h July–June years. i Raw tonnes actual. j Dressed weight equivalent. k Fresh, chilled and frozen, shipped weight. l Carcass weight. m Fresh, chilled and frozen, shipped weight. n Shipped weight. o Excludes preserved pig meat. p Includes the butter equivalent of butteroil, butter concentrate, ghee and dry butterfat. q Includes freight from farm gate to processor in some states f ABARE Australian Commodities (March 2009) forecast. z ABARE Australian Commodities (March 2009) projection.
Sources: Australian Bureau of Statistics; International Grains Council; US Department of Agriculture; International Sugar

Climate Change

There are a range of issues that the agriculture and forestry sectors could face as a result of climate change. Climate change is expected to affect agricultural productivity through increasing heat stress in animals and crops, decreasing water availability and increasing occurrences of pests and diseases. As a consequence, adaptation measures will need to be undertaken in the agriculture and forestry sectors to maintain productivity growth and international competitiveness. Mitigation efforts will also be needed to reduce emissions and increase carbon sinks.

Analysis has shown that in the absence of climate change Australian agricultural output is projected to increase 100 per cent between 2006 and 2050. With this projected growth as a 'reference case', when the effects of climate change are taken into account Australian agricultural output is projected to increase by 77 per cent between 2006 and 2050, without any planned mitigation or adaptation measures (Gunasekera et al, 2007). At the commodity level, the growth in output of major commodities will also be less than in the reference case. By 2050, production of some key Australian agricultural commodities is projected to be between 13 and 19 per cent below reference case levels (Table 2). Similarly, exports are expected to grow at a slower rate relative to the reference case as a result of climate change. By 2050 Australian exports of wheat and sugar are projected to be about 16 per cent and 79 per cent below reference case levels (Table 3). The significant reduction in sugar exports is projected to occur because of changes in international competitiveness resulting from relatively more severe climate change impacts in sugar-producing parts of Australia compared to other parts of the world, such as Brazil.

Table 2: Change in Australian agricultural output by commodity at 2050 as a result of climate change (assuming no planned mitigation or adaptation), relative to the reference case

	Australia	NSW	VIC	QLD	SA	WA	TAS	NT
% change								
Wheat	-13.3	-11.6	-13.4	-	-12.3	-13.4	-	-
Sheep	-14.2	-13.2	-12.9	-	-11.7	-13.2	-	-
Beef	-18.6	-3.0	-6.5	-33.5	-	-5.7		-33.2
Dairy	-18.2	-11.3	-10.0	-	-6.1	-	-12.5	-
Sugar	-14.5	-	-	-17.0	-	-	-	-

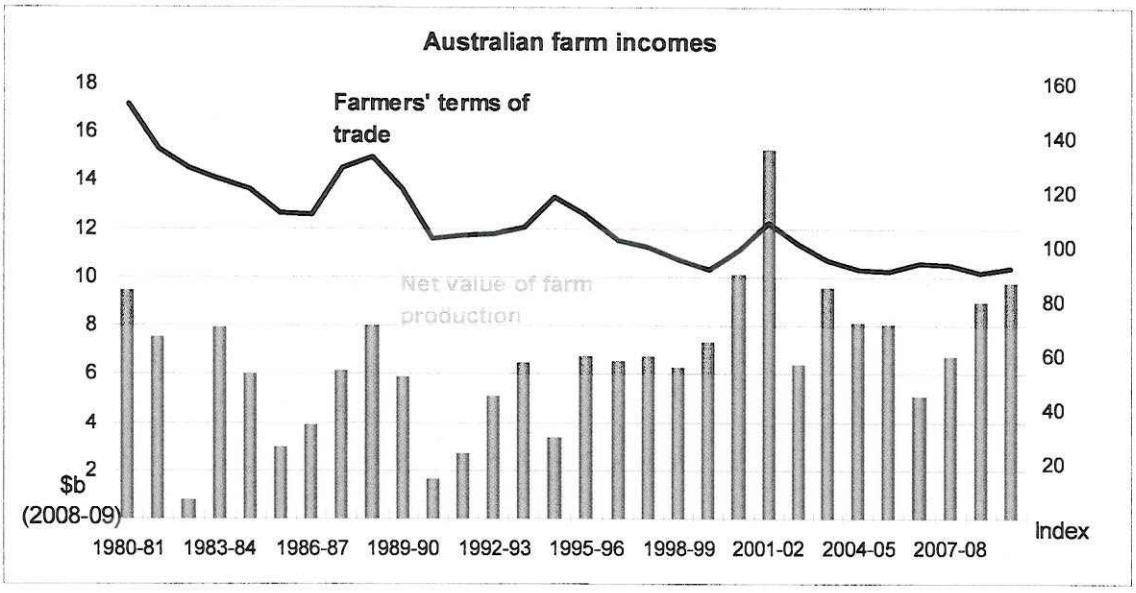
Table 3: Change in Australian agricultural exports at 2050 as a result of climate change (assuming no mitigation or adaptation), relative to the reference case

	Australia
% change	
Wheat	-15.5
Sheep	-21.4
Beef	-33.0
Dairy	-27.4
Sugar	-78.8

Farm Business Performance

Two important features of Australian farming are income volatility from year to year and the long term downward trend in farmers' terms of trade (the ratio of prices received to prices paid). These features are illustrated in Figure 7.

Figure 7: Australian farm sector income

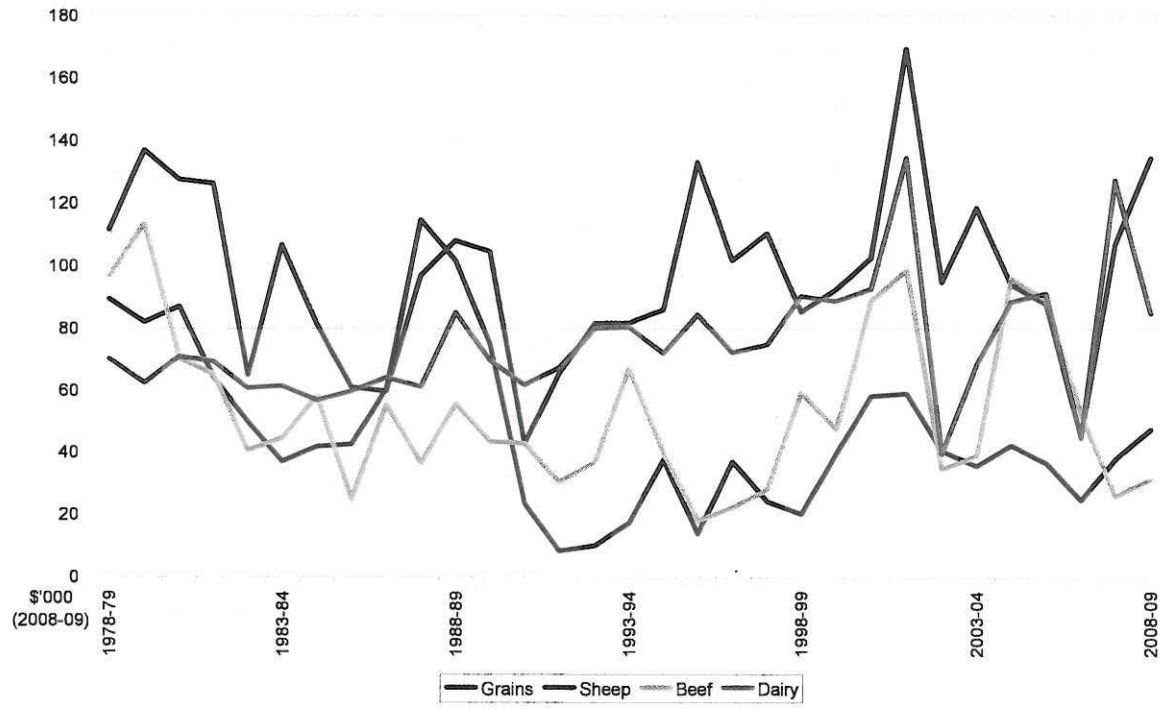


In addition to the influence of weather and climate, policy and market changes have a substantial effect on farm sector earnings. Years of substantial drought in Australia and accordingly low farm incomes include 1982–83, 1994–95, 2002–03, 2006–07 and 2007–08. These difficult years are represented in Figure 7 by the net value of farm production.

Declining terms of trade have been a long standing characteristic of Australian agriculture, and represent a significant challenge to the performance of the sector. Declining terms of trade simply reflect faster growth in the price of inputs used in farm enterprises than in the price of the outputs produced. This has been the case both domestically and globally in the Agriculture sector.

At the individual farm level, economic performance has been highly variable over an extended period across the major industries for which data are available (Figure 8). ABARE surveys of broadacre farms (grains, sheep and beef) and dairy farms highlight the disparity in performance between grains and livestock (sheep and beef) farm businesses since the collapse of the wool reserve price scheme in 1990–91. Consistently higher returns from cropping during the past decade have encouraged the movement of productive resources from sheep to grains production.

Figure 8: Average cash incomes of Australian broadacre and dairy farms



Farm cash income for the wheat and other crops industry rebounded in 2007-08 from the drought reduced income of 2006-07 on the back of record grains prices and production increases in some regions. This was despite large increases in expenditure on the key crop inputs of fuel, chemicals and fertilisers. In 2007-08 a reduction in the number of beef cattle sold, combined with lower prices per head for cattle sold, resulted in average total cash receipts falling by around 23 per cent. Average total cash costs were also reduced, by around 21 per cent , with expenditure on beef cattle purchases falling by 40 per cent. Fodder and agistment expenditure was reduced because of improved pasture availability compared with the severely drought affected 2006-07. With a larger fall in total farm receipts compared to the reduction in total farm costs, average farm cash income for beef industry farms declined in 2007-08.

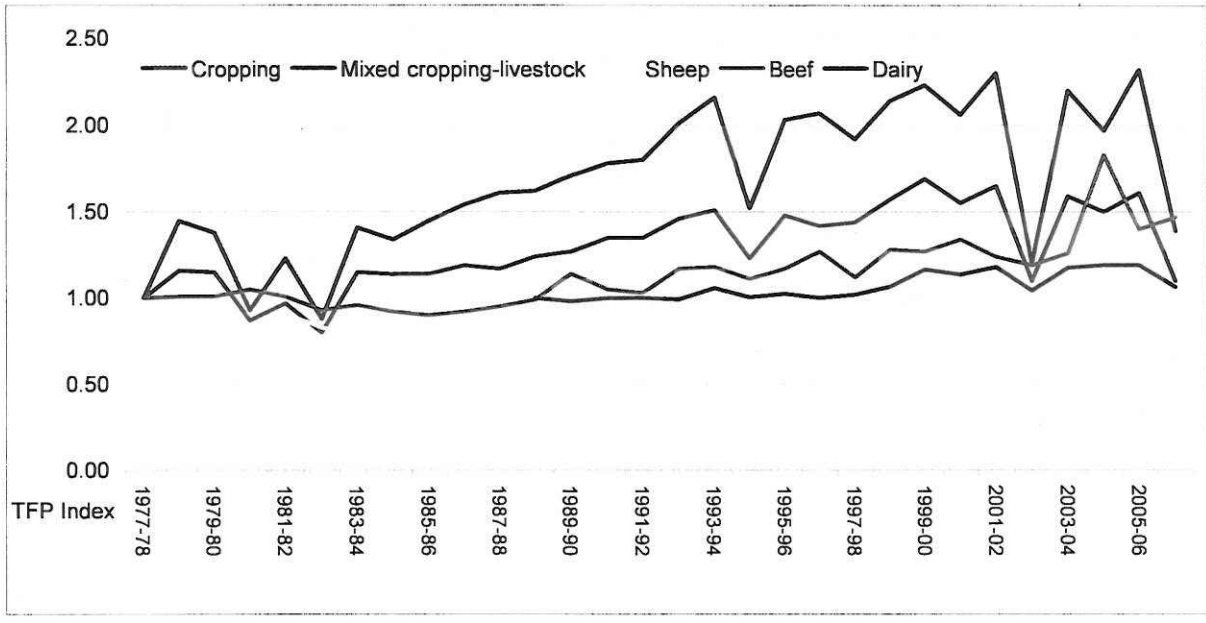
In 2007-08, higher wool prices together with increased turn-off of sheep and lambs led to a recovery in sheep industry farm cash income from the drought affected 2006-07. This was despite total cash costs increasing by around 8 per cent on average, mainly because of increases in interest rates. Farm cash income for Australian dairy farms almost tripled in 2007-08 to average $127 700 per farm, the highest average farm cash income recorded in the past 20 years. This was because of record farm-gate milk prices and occurred despite falls in average milk yield per cow as dry seasonal conditions restricted milk production. High total cash receipts were partly offset by increases in expenditure on major dairy farm inputs including hay, feed-grains, fertilisers, chemicals and fuel, resulting from higher input prices, together with higher interest rates and increased farm expenditure on repairs and maintenance. Average total cash costs rose by 20 per cent in 2007-08.

Productivity growth – trends and drivers

Productivity growth has been the main driver of growth in agricultural output in Australia, enabling farmers to remain internationally competitive and sustain their businesses and incomes. Agricultural productivity growth consistently exceeds productivity growth in other sectors with agriculture, fisheries and forestry productivity growth averaging 3.1% over the past 20 years, compared with 1% economy wide.

Productivity of Australian farms, measuring the efficiency of using inputs to produce a specific level of outputs, has risen strongly for cropping specialists and the mixed crop-livestock industry — averaging 2.1 per cent and 1.5 per cent a year respectively from 1977–78 to 2006–07. Beef specialists achieved the same average performance level as the mixed crop-livestock industry over the past three decades. Their productivity growth coincided with high output growth and relatively marginal growth in input use. The sheep industry continues to lag behind the broadacre sector in terms of long-term productivity growth. Between 1977-78 and 2006-07, the industry has experienced a decline in both output and input use (Figure 9).

Figure 9: Productivity growth on Australian broadacre farms and dairy farms



A possible reason for the under performance of the sheep industry is that it is mainly comprised of small farms, typically engaged in mixed operations with a combination of wool, lamb, sheep and other outputs. Output and input use in the sheep industry has changed over time in a different way to the overall broadacre industry. Growth in input use through the 1980s was not able to stimulate any significant productivity gains. During the 1990s, following the collapse of the wool reserve price scheme, there was a significant shift from wool into cropping as farmers took advantage of higher relative returns. As the industry was contracting, there was little investment, which may have limited the ability to introduce improved technology.

Broadacre productivity growth appears to be slowing since around the turn of the century. Similar to most industries, agriculture experienced a growth spurt in the 1990s,

with broadacre productivity growing by 3.4% on average during the 1990s compared to an average of 1.5 per cent over the last 30 years (1977-78 to 2006-07). In the last decade (between 1997-98 and 2006-07), there appears to be a possibility that productivity growth has slowed, falling to an average rate of 1.4% a year. Recurring drought has most likely had a significant impact on productivity growth with severe downturns in output during drought years 1994-95, 2002-03 and 2006-07.

Productivity growth has come from expanding outputs, while increasing efficiency in input use. This may include using fewer inputs overall, different input combinations, changing the output mix (e.g. shifting into cropping, away from sheep). Factors external to farm businesses that have influenced long term productivity over the past thirty years provide an indication of potential drivers of future productivity growth. These include:

- Drought, which has caused significant downturns in productivity
- Overseas demand – significant growth in overseas demand for Australian agricultural products has provided strong incentive to innovate and expand output
- Policy – for example, deregulation during the 1980s and 1990s caused dramatic adjustments in the agriculture sector, and policy action can stimulate or slow down productivity
- Water allocations and water markets, which continue to influence farm decision making and potential productivity gains
- Access to new technologies – facilitating access can enable productivity growth

Technological progress in particular is a major driver of productivity gains through shifts in the composition of inputs used. Most notable, labour use in agriculture has fallen at an average rate of 1.7 per cent a year over the last thirty years. Rates of growth in capital and land use (per unit of output) have also fallen. In contrast, there has been a notable rise in the use of materials and services in agricultural production. Use of these inputs – including fodder, seed, fuel, chemicals and fertiliser – have increased by 2.4 per cent a year over the last three decades.

Food Manufacturing

Most food and fibre produced on Australian farms requires various levels of transformation before being consumed. This transformation involves a range of activities post farm gate that convert commodities into a form which is readily usable by consumers. For example, milk is converted into a number of products (including pasteurised fresh milk, butter, cheese, milk powder, ice cream and yoghurts), while the processing of livestock into consumable form (carcass, cuts, boneless or packaged meat) is an essential part of the supply chain from farms to consumers.

For most commodities produced on Australian farms, post farm-gate processing or value adding is becoming more important as producers, wholesalers and retailers endeavour to satisfy consumer demands for more convenient foods and for differently presented and packaged products. For commodities such as fresh horticulture, products may be packaged or branded, especially into high value markets such as Japan. Beef is being marketed increasingly to domestic and export customers as a branded product with quality assurances.

In the five years to 2007-08 around 24 per cent of food and beverage manufacturing sales originating from Australia were to export markets. In 2007–08 Australian exports of substantially transformed food products (including meat, seafood, dairy products and wine) were valued at $16.5 billion. Principal export markets were Japan, the United States, Indonesia and the Republic of Korea. Imports of substantially transformed food products were valued at $8.2 billion, with the main sources being New Zealand, the United States, China, Thailand, and Ireland. Principal categories of food imports include seafood, fruit and vegetables, and some processed foods.

Large multinational food and beverage companies, seeking to generate a competitive advantage and tap new growth opportunities, have been steadily increasing their presence in Australia. The growing competition has increased pressure on the larger Australian companies to rationalise and restructure to improve economies of size, reduce costs and innovate in order to compete more effectively in both the domestic and international markets.

In 2007-08, supermarkets accounted for around 61 per cent of sales in the retail sector. The large supermarket chains are increasingly contracting some of their requirements for fresh horticulture directly from larger growers and meat from feedlots with integrated processing facilities. However, packaged products such as cereal foods and frozen foods and pre-prepared meals are typically sourced from processor intermediaries.

Food retailing in Australia is highly competitive and includes such diverse businesses as green grocers, fresh food markets, delicatessens, specialty bakers, butchers, and the independent and major chain retailers (also see page 26). These major retailers are focusing on developing premium 'house' brands to grow margins and maintain competitive advantage. This development is expected to have a significant impact on food and beverage manufacturing operations and product lines, especially as the control of product development shifts from the manufacturer to the retailer. Costs are being eliminated by removal of waste and inefficiency in the supply chain and improved delivery systems. This is possible through the implementation of improved logistics and distribution capabilities supported by technology improvements.

With respect to the farm to retail supply chain, the value of raw commodities has tended to represent a declining proportion of the final sale price of food products, despite competition at all levels of the supply chain (Whitehall Associates, 2004). The growing gap between farm-gate and retail prices is mainly a reflection of the rising cost of services (including transport, storage, handling, distribution and retailing) and the incorporation of additional attributes (packaging, presentation and qualities) in the final product in response to consumer demands.

Food supply and consumption trends

Domestic production of most major food groups equals or exceeds domestic consumption of those groups. This production/consumption balance has remained largely unchanged since 2002 (Table 5). Specifically:

- Production of the following food categories exceeded domestic consumption: cereals, sweeteners, pulses, meat, milk and animal fats.

- Production of the following food categories equalled, or nearly equalled, domestic consumption: starchy root vegetables, vegetables, fruit and eggs
- Production of the following food categories did not meet domestic consumption: seafood and vegetable oils.

Table 5: Food balance sheets. Supply and consumption of major food groups in Australia. *Source*: Australian Food Statistics (2002 and 2007 editions).

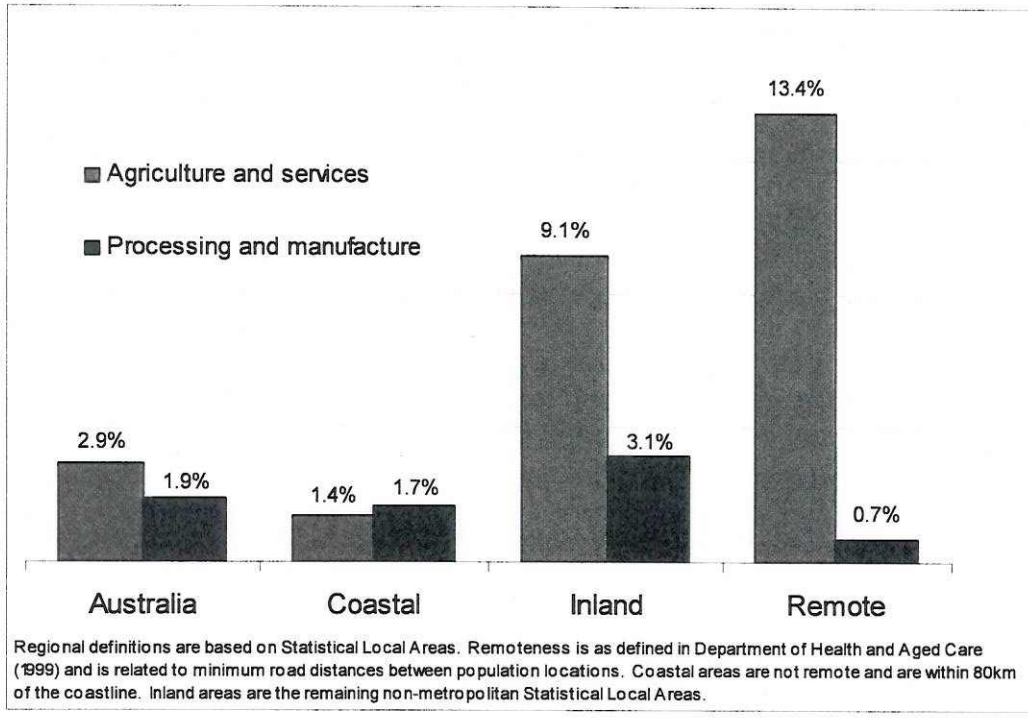
Food group	Domestic production (kt)	Imports (kt)	Exports (kt)	Domestic consumption (kt) *	Production as % of consumption
Cereals, 97-99 avg	32,478	133	22,794	9,716	334%
Cereals, 01-03 avg	31,893	340	17,651	11,253	283%
Starchy roots, 97-99 avg	1,334	84	43	1,376	97%
Starchy roots, 01-03 avg	1,300	95	64	1,334	97%
Sweetners, 97-99 avg	5,699	43	4,364	1,091	522%
Sweetners, 01-03 avg	4,979	102	3,357	1,579	315%
Pulses, 97-99 avg	2,574	12	1,082	1,523	169%
Pulses, 01-03 avg	2,013	11	2,084	390	516%
Vegetables, 97-99 avg	1,790	189	247	1,740	103%
Vegetables, 01-03 avg	1,969	274	236	2,003	98%
Fruit, 97-99 avg	2,786	270	476	2,595	107%
Fruit, 01-03 avg	3,456	478	533	3,401	102%
Meat, 97-99 avg	3,469	25	1,508	1,986	175%
Meat, 01-03 avg	3,847	57	1,637	2,266	170%
Eggs, 97-99 avg	145	1	1	145	100%
Eggs, 01-03 avg	144	2	1	145	99%
Seafood, 97-99 avg	214	402	131	486	44%
Seafood, 01-03 avg	236	501	203	534	44%
Milk, 97-99 avg	9,842	365	5,528	4,759	207%
Milk, 01-03 avg	11,045	496	5,813	5,545	199%
Vegetable oils, 97-99 avg	351	213	111	449	78%
Vegetable oils, 01-03 avg	234	270	119	412	57%
Animal fats, 97-99 avg	725	20	585	160	453%
Animal fats, 01-03 avg	768	40	572	215	357%

Regional Australia

The agriculture and food industries' economic importance in rural and regional Australia is particularly significant because of the income it brings into communities in the form of direct spending on goods and services and on employment, both directly and through service industries.

Across the Australian economy as a whole, the agricultural sector accounts for only around 2.9 per cent of total employment. However, as shown in Figure 10, the dependence on agriculture for jobs is significantly higher in inland and remote Australia than for the nation as a whole. At the time of the 2006 census, around 13.4 per cent of those employed in remote areas were engaged in agriculture and services to agriculture. The sector also accounted for 9.1 per cent of those employed in the rest of inland Australia. Within these broad regions there is also considerable variation.

Figure 10: Agriculture and food processing share of employment, by region 2006



Regional definitions are based on Statistical Local Areas. Remoteness is as defined in Department of Health and Aged Care (1999) and is related to minimum road distances between population locations. Coastal areas are not remote and are within 80km of the coastline. Inland areas are the remaining non-metropolitan Statistical Local Areas.

The food processing and manufacturing sector is also a significant employer of labour in regional Australia. The sector accounted for only 1.9 per cent of total Australian employment at the time of the 2006 census, however, food processing and manufacturing provided a larger share of employment in inland Australia at 3.1 per cent. The sector also accounted for 0.7 per cent of total employment in coastal Australia (ABS, 2008).

Food processing and manufacture — particularly meat processing, wine manufacturing, dairy product processing and fruit and vegetable processing — employ significant numbers of people in inland areas. Out of a total of 46 350 persons employed in food processing and manufacture in inland (non remote) regions in 2006, around 24 per cent were in meat processing, 20 per cent in wine production, 10 per cent in dairy product manufacturing and 10 per cent in fruit and vegetable processing.

Rising Cost of Farm Inputs

The Australian agriculture sector operates in a dynamic and complex environment and faces a number of pressures, including drought, declining terms of trade and higher input costs. In particular, fuel and fertiliser represent a significant portion of average farm production costs. The sharp depreciation of the Australian dollar in late 2008 has

partially offset the benefits of the easing in international prices of imported farm inputs, including fertiliser and fuel.

Fertiliser

Agricultural industries have different requirements for fertilisers and as such are affected to variable degrees by changes in fertiliser prices. ABARE farm surveys data shows that on average fertiliser makes up around 15 per cent of cash costs for grain producers, 12 per cent of mixed cropping and livestock costs and 7 per cent of total dairy farm costs.

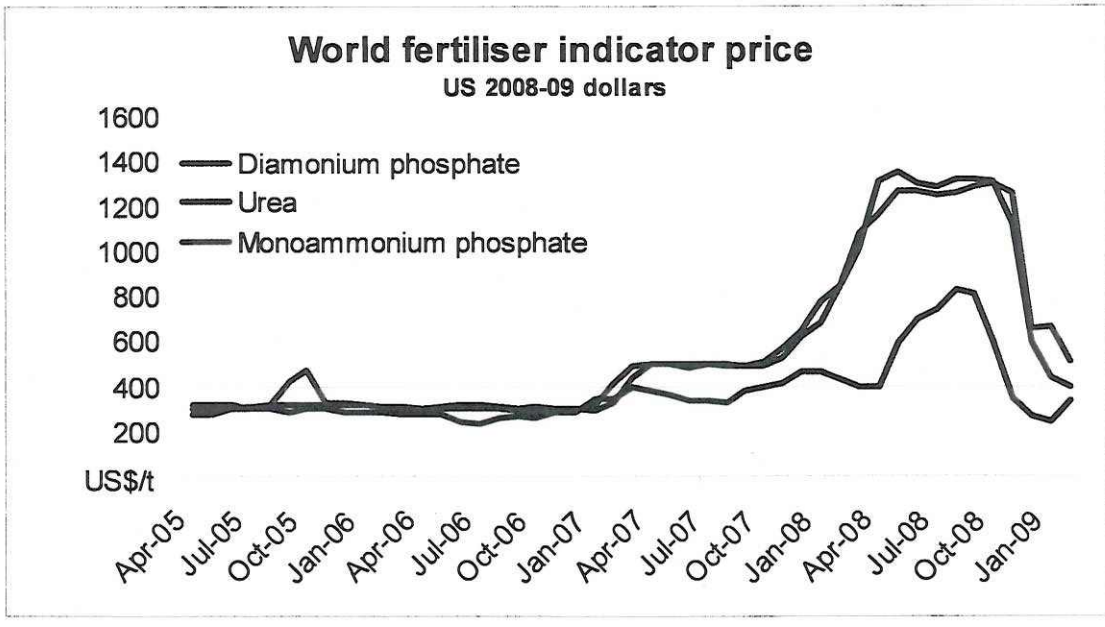
Movements in Australian domestic fertiliser prices generally track developments in world markets as Australia is a net importer of fertilisers. Australian farmers have little choice but to absorb increases in fertiliser costs as there is limited scope to substitute between these and other farm inputs.

Australian cropping enterprises mainly use ammonium phosphates and urea, and pasture enterprises predominately use superphosphate. The sugar and horticulture industries use a combination of different nitrogen, phosphate and potassium fertiliser blends.

World fertiliser indicator prices increased significantly throughout 2007 and most of 2008, as a result of increased world demand for fertiliser and an increase in the cost of producing and transporting fertilisers. Natural gas, for example, is a major input accounting for 70 to 90 per cent of the cost of producing nitrogenous fertilisers.

Nitrogenous fertilisers such as diammonium phosphate (DAP) and monoammonium phosphate (MAP) increased by 113 per cent year on year and by 123 per cent respectively(Figure 11). Not shown is phosphate rock prices, which have risen from around US$47 a tonne to US$250 a tonne in the space of two years. Phosphate rock is imported into Australia for use in manufacturing super phosphate.

Figure 11: World fertiliser indicator prices (*)



* - reported in constant 2008-09 US dollar terms.

Since late 2008 world indicator prices for fertiliser have dropped significantly from earlier highs as a result of declining international oil and gas prices. Prices paid by Australian farmers are expected to fall considerably in 2009-10, relative to prices paid in the previous two years.

Fuel

Fossil fuels, and inputs derived from fossil fuels such as lubricants and fertilisers, are essential inputs for almost all energy intensive agriculture production systems, fishing enterprises and supply chains.

The price of fuel such as diesel in Australia is linked to the international price of crude oil, as around two-thirds of the oil used to distil fuels in Australian refineries is imported. The fall in world oil prices since mid-July 2008 reflects current financial market volatility which has led to slower global economic growth and falling global demand for oil. Australian diesel prices are also closely linked to the international benchmark price for fuel, the Singapore Gasoil price, which rose considerably from the beginning of 2007 to late 2008, but has been declining since. This reflected robust global demand for fuel from the transport sector. Fuel prices in Australia also reflect a range of domestic factors, such as transportation and storage costs within Australia and wholesale and retail selling margins.

Given the importance of different fuels to the primary industry sector, the fuel tax credit scheme was expanded on 1 July 2008. It now includes all fuel types in addition to diesel used on farms for agricultural activities.

Biotechnology and Agriculture

Biotechnology is expected to play an increasing role in helping farmers produce affordable food, while remaining competitive and viable, ensuring farm sustainability and adapting to the challenges of climate change. Biotechnology has already provided benefits in many countries around the world, including Australia, particularly through the uptake of genetically modified (GM) crops. In addition to the production of GM crops, biotechnology is now commonly applied to accelerate plant and animal improvement programs, for example using recombinant DNA technology in marker-assisted breeding of 'conventional' non-GM crops and improving animal breeds.

Biotechnology has been used to introduce novel traits into GM crops, such as insect-resistance and herbicide-tolerance. GM varieties of insect-resistant and herbicide-tolerant soybean, maize, cotton and canola are grown by farmers in the USA, Canada, Brazil, India, China and other countries.

Australia has grown GM insect-resistant and herbicide-tolerant varieties of cotton since 1996 and 2000 respectively. The benefits of these varieties for the Australian cotton industry include:

- increased profits and ease of growing when compared to conventional cotton
- a reduction in the amount of insecticide sprayed (up to 85 per cent)
- improved environmental credentials including negligible detection of endosulfan in rivers in cotton-growing areas

- lower carbon emissions resulting from reduced spraying and fuel use
- improved weed control and significant replacement of residual herbicides
- a move to minimum-tillage, retaining biomass in soils and so reducing carbon emissions

GM herbicide-tolerant canola was grown commercially in Australia for the first time in 2008 following changes to the moratorium arrangements in Victorian and NSW. GM canola is expected to offer Australian farmers agronomic, environmental and economic benefits over conventional canola varieties including:

- Increased production per unit input cost, due to the replacement of lower yielding non-GM triazine-tolerant (TT) canola varieties
- increased options for in-crop weed control, including management of herbicide-resistant weeds
- changes to herbicide regimes which may lower environmental impacts

GM crops may also offer novel benefits for consumers, such as the production of healthy omega-3 oils from oilseed crops and pasture species with reduced pollen allergens. A review conducted in 2007 by the University of Melbourne reported that specialty oil canola varieties are being rapidly adopted in Canada (12 per cent of the market share in 2005) and that hybrid GM canola varieties are adding further gains in this market.

Plants can also be genetically engineered to produce novel pharmaceutical and industrial products which could provide opportunities to diversify from traditional food and feed markets into new markets. Growing such alternative crops could maintain or increase the profitability of farms if climate change or increased competition from overseas producers makes traditional crops unprofitable.

The use of modern biotechnology is one of many strategies which will need to be applied to help farmers adapt to and mitigate climate change. Biotechnology will have an important role in the development of new crop and pasture varieties that are able to continue to produce a competitive yield under predicted climate change. Tools such as molecular markers can provide greater accuracy and speed up conventional crop and pasture breeding programs, while genetic modification techniques can provide access to a greatly increased diversity of genes for developing plant varieties.

Biotechnology also has a role to play in reducing greenhouse gas emissions from agriculture and in increasing soil carbon. A 2008 UK study estimated that worldwide the combined GM crop-related carbon dioxide emission savings from reduced fuel use and additional soil carbon sequestration in 2006 were equal to the removal from the roads of nearly 6.56 million cars.

Australia has a robust and transparent regulatory framework which enables biotechnology to be safely applied in research, development and commercial applications, so that it may be of benefit to Australian primary industries. Biotechnology is likely to make a significant contribution not only to the development of improved and novel crop varieties and pastures, but also to sustainable

farming, helping farming enterprises remain competitive and viable, and maintaining or increasing primary production for food.

Commonwealth Support for the Food Industry

Through diverse programs and organisations the Commonwealth contributes over $500 million to the more than $1.3 billion worth of primary industries R&D conducted annually in Australia. The principal vehicles are:

- Rural Research and Development Corporations and Companies (RDCs) ($224 million in Commonwealth funds in 2007-08);
- Cooperative Research Centres (CRCs) ($105 million in direct funding);
- The Commonwealth Scientific and Industrial Research Organisation (CSIRO) (>$250 million);
- The Bureau of Meteorology (BoM);
- Australia's Farming Future administered by DAFF: the Australian Government's climate change initiative for primary industries. It provides $130 million over four years for a number of programs to help primary producers adapt and respond to climate change (further details are provided at page 29).

The Agriculture, Fisheries and Forestry portfolio's chief contribution to agri-food industry science and innovation is through the 16 rural research and development corporations and industry-owned companies (RDCs). This program is a partnership between government and rural industry in priority setting and funding of R&D. Industry expenditure on eligible R&D is matched by the Australian government (up to 0.5% of each industry's gross value of production) to address market failures, government priorities for improved industry productivity and the provision of public goods.

Total expenditure on rural R&D in 2007/08 under these arrangements is estimated to be $516.6 million which included an industry contribution of $267 million in statutory levies. Industry contributions to R&D are usually made via statutory levies on particular commodities (though in some cases industries also use voluntary contributions). As the levies are payable on a commodity basis, producers contribute to this R&D investment regardless of their system of production.

Most of the RDCs were established in 1990-91 as statutory, single-focus, RDCs with the intention of improving the performance of the national R&D effort for rural industries. The RDC Model, as it has come to be known, was enabled by the *Primary Industries and Energy Research and Development Act 1989*. It was intended to provide best value for money for the Government, industry and the broader community in pursuing the objectives of:

- Increasing economic, environmental and social benefits;
- Achieving sustainable use and management of natural resources;
- Making more effective use of human resources and skills; and
- Improving accountability for expenditure.

The key elements in the model are:

- The broad scope of rural research activities that may be funded by an RDC;
- A rational and integrated approach to R&D priority setting and a strong focus on outcomes;
- Close involvement of industry throughout the whole process of priority setting and reporting;
- Governance by independent boards that are charged with taking a strategic approach to rural R&D;
- dual accountability to both industry and the Parliament.

The Commonwealth also has a number of specific programs, administered by DAFF, designed to enhance the competitiveness of the food industry. These include:

- The Regional Food Producers Innovation and Productivity Program: a four-year, $35 million program that aims to boost the productivity and competitiveness of Australia's regional food and seafood industries through innovation and technology improvements;
- Promoting Australian Produce: a three year, $5 million program that aims to assist Australian food industries develop their capacity to promote and market Australian produce more effectively to both domestic and export markets; and
- Promoting Australian Produce (Major Events), which aims to improve collaboration and cooperation in food and fibre industries. The program is a discretionary grants program, with $3 million available until 30 June 2009.

ACCC Inquiry into Grocery Prices

Global food prices have been increasing in recent years as a result of a number of global and domestic factors including:

- Drought and water shortages that have reduced yields due to climate change;
- Worldwide shortfalls in grains, partially driven by increased competition for inputs from the biofuels sector, and
- Rising affluence in emerging economies which is increasing consumption of meat and dairy products, in turn exacerbating demand for grain as feedstock.

On 22 January 2008 the government requested the Australian Competition and Consumer Commission (ACCC) undertake a review of grocery prices, including an evaluation of the Horticulture Code of Conduct (the code). The ACCC report, which provides a comprehensive analysis of competition in the grocery market and the underlying determinants of price, was provided to government on 31 July 2008 and released by the Hon. Chris Bowen, the Assistant Treasurer on 5 August 2008. The ACCC received 250 submissions to its grocery inquiry and 28 submissions relating to the Horticulture Code of Conduct issues paper. Hearings were conducted in all state and territory capital cities and some regional centres.

The ACCC found that the grocery retailing market in Australia is workably competitive with the rising global price of food, increases in costs of production and domestic weather conditions largely responsible for the 21 per cent rise in Australian food prices over the past five years. Less than five per cent of the increase in food prices over this

time was estimated to be directly attributable to increased supermarket margins. The ACCC found little evidence to support the proposition that retail prices have risen while farm-gate prices have stagnated or declined, contrary to the claims of some rural lobby groups that made representations to the inquiry. In general, the ACCC found that movements in shelf prices broadly reflect changes in wholesale prices over time.

In response to the inquiry the government will introduce a mandatory unit pricing regime, implement a creeping acquisition law, support GROCERYchoice as a means of empowering consumers to locate the best supermarket deals and take action to address anti-competitive aspects of state and local zoning and planning laws.

Environmental Sustainability

Sustainable Agriculture

Sustainable agriculture is an evolutionary concept; however, a commonly used definition is based on the Standing Committee on Agriculture's definition[1] which is the use of farming practices and systems which maintain or enhance the natural resource base, other ecosystems which are influenced by agricultural activities, and the economic viability of agricultural production.

The Australian Government is working closely with land managers, industry groups, community groups, other jurisdictions, regional bodies and non-government organisations to increase the uptake of best management practices leading to an environment that is healthy, better-protected, well-managed, resilient, and that provides essential ecosystem services in a changing climate.

The major initiative through which the Australian Government is promoting sustainable agricultural practices is Caring for our Country, a new $2.25 billion integrated approach to natural resource management which commenced on 1 July 2008. Caring for our Country has one goal, a business approach to investment, clearly articulated outcomes and priorities and improved accountability.

The initiative integrates delivery of the Australian Government's previous natural resource management programs - the Natural Heritage Trust, the National Landcare Program, the Environmental Stewardship Program and the Working on Country Indigenous land and environmental program.

Caring for our Country is administered by the Australian Government Land and Coasts (AGLC) team, which is a joint initiative involving the Departments of Agriculture, Fisheries and Forestry and Environment, Water, Heritage and the Arts. It focuses on achieving strategic results and investment in six national priority areas, including sustainable farm practices.

Climate change is a key consideration in the future success and viability of Australia's primary industries. Operating alongside and complementing Caring for our Country is

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[1] Standing Committee on Agriculture, (1991), *Sustainable Agriculture, report to Australian Agricultural Council by a Working Group on Sustainable Agriculture*, SCA Technical Report Series No. 36. CSIRO, Melbourne

Australia's Farming Future (AFF), which is the Australian Government's key climate change initiative for primary producers, providing $130 million over four years to help primary producers adapt and respond to climate change (further information on the program is provided below). It is managed by the Department of Agriculture, Fisheries and Forestry.

Governments have responded to natural resource degradation by introducing a number of other policies designed to improve and maintain the quality of environmental assets. For example, a cap was imposed on the volume of water that could be diverted from rivers for consumptive use in the Murray Darling Basin in 1995. Subsequently, State and Territory signatories to the National Water Initiative agreed to prepare water plans that would help identify the appropriate balance between consumptive and environmental use, and to increase environmental flows in over-allocated and stressed river systems. Further information on water initiatives is provided below.

The Commonwealth Government has also made investments to improve biodiversity conservation and the sustainable use of natural resources since 1997. Funds were delivered through the Natural Heritage Trust Foundation program, the National Action Plan, and today through the Caring for our Country program.

Note: the Departments of Agriculture, Fisheries and Forestry and Environment, Water, Heritage and the Arts have also lodged a submission with the Senate Standing Committee on Rural and Regional Affairs and Transport which is examining 'Natural Resource Management and Conservation Challenges'.

Broader Departmental and Government Initiatives

Caring for our Country – Sustainable Farm Practices

The sustainable farm practices priority element of Caring for our Country will directly assist farmers to manage natural resources in the production landscape by supporting farmers and land managers to increase the adoption of sustainable production practices and building land manager's capacity to deliver a wide range of ecosystem services. This will be achieved by: supporting on-farm actions and investments that improve natural assets and reduce the impact of invasive species; providing targeted information to enable farmers to make better decisions in a changing climate; and working with community and industry organisations, including landcare, to accelerate the adoption of more sustainable farm management. Planning and reporting will also be improved as this year a number of industries will receive support to assess and understand their impact on the resource base, prioritise practices to change and better report on their progress.

Support for sustainable farm practices is also a key component of the Reef Rescue Plan ($200 million over five years) and the Northern and Remote Australia investment priority areas of Caring for our Country. The Reef Rescue Plan aims to improve the water quality of the Great Barrier Reef lagoon by increasing the adoption of land management practices that reduce the run-off of nutrients, pesticides and sediments from agricultural land adjacent to the reef. Investments will result in farmers being better able to respond to emerging threats to productivity and to maintain or enhance the condition of natural resource assets.

Australia's Farming Future

The $130 million Australia's Farming Future (AFF) initiative provides a multi-pronged approach to help build adaptable and resilient producers and industries and strengthen their ability to manage climate change into the future.

AFF will support research and development projects (through the $46.2 million Climate Change Research Program announced on 7 July 2008), communication and awareness activities, training (through the $26.5 million FarmReady program announced on 29 July 2008), community networks and capacity building, advice and assistance for those who choose to leave farming (through the Climate Change Adjustment Program).

Water Management

Water management remains a high priority for Australia. The Department of the Environment, Water, Heritage and the Arts (DEWHA) has portfolio responsibility for water. The Australian Government introduced the Water for the Future package in 2008 to manage water on a comprehensive national basis. This year, the Council of Australian Governments agreed to the development of a new work program for water reform and several projects are underway to address priority water issues. The National Water Initiative, agreed to by the Council of Australian Governments in 2004, has also been reaffirmed by governments as the national blueprint or roadmap for water reform.

As part of the $12.9 billion Water for the Future plan, administered by DEWHA, the Australian Government has committed $5.8 billion to increase water use efficiency in rural Australia and another $3.1 billion to purchase water entitlements for the environment from irrigators. Through the Sustainable Water Use and Infrastructure Program (a program under the Water for the Future plan), the government aims to modernise irrigation infrastructure to save water, increase efficiency of water use and improve the sustainability of irrigated agriculture. These policies and programs will help improve the environmental condition of riverine ecosystems.

Irrigators in the Murray-Darling Basin also have access to programs, administered by DAFF, that are specifically designed to help them manage their businesses through this period of low water allocations.

- The Murray-Darling Basin Irrigation Management Grants program provides a one-off grant of up to $20 000 to irrigators in the Basin suffering reduced water allocations as a consequence of decisions by water regulators. The program is delivered by Centrelink on behalf of DAFF.
- The Murray-Darling Basin Irrigation Industries Workshop program provides $7.5 million in funds to five peak industry bodies to deliver information sessions to equip irrigators with specific agronomic and business advice for farm business survival. The focus industries are rice, horticulture, dairy, cotton and wine-grape.

More broadly, there is a need to improve the way water is used in agriculture and to help farmers adapt to reduced water availability in a changing climate. It is important to enhance and build on our ability to farm with less available water, address climate

change challenges and tackle other difficulties. DAFF's irrigation management grants and workshops aim to help irrigators to manage these challenges.

Measuring Sustainability

Measuring sustainability in the farm sector has been a component of a number of the department's sustainable resource management initiatives. The National Land and Water Resources Audit (NLWRA) phase 1 (1997–2002) collected and collated primary data and information related to natural resource management. Assessments were completed and a number of thematic reports were published. Phase 2 of the NLWRA (2002–2008) had a shift of focus to develop consistent indicators to measure resource condition.

Stakeholder focussed programs have improved measurement of sustainability at the industry and farm level. Landholders have been equipped with the tools to improve sustainability and measure their on-farm performance through industry programs that support implementation of best management practices and environmental management systems. At the industry level, *Signposts for Australian Agriculture* was used to monitor and report on the contribution of Australian agricultural to ecologically sustainable development (http://nlwra.gov.au/national-land-and-water-resources-audit/signposts-australian-agriculture). It is a framework that is available to all agricultural industries, and to date six industries have participated in the assessment process.

In partnership with the Australian Bureau of Statistics (ABS), the Agricultural Resource Managers Survey has been developed under Caring for our Country to benchmark existing land management activities. 30 000 land managers from across Australia's 56 natural resource management regions will be surveyed about their land management practices, and results will be available in mid-2009. The Survey builds on previous natural resource management surveys by the ABS and Australian Bureau of Agricultural and Resource Economics (ABARE) which have collected information on topics such as landcare, land-use, weeds and farmer attitudes to resource management.

The department supports an Australian Collaborative Land Use Mapping program which aims to develop nationally consistent land use data and land management practices information (see the example below - Protecting the Great Barrier Reef). Part of this program is the Land Use and Management Information System, which is under development. Data for determining impacts of agricultural industries on water quantity and atmosphere is also expected to improve with recent policy developments associated with the National Water Initiative and the introduction of carbon accounting.

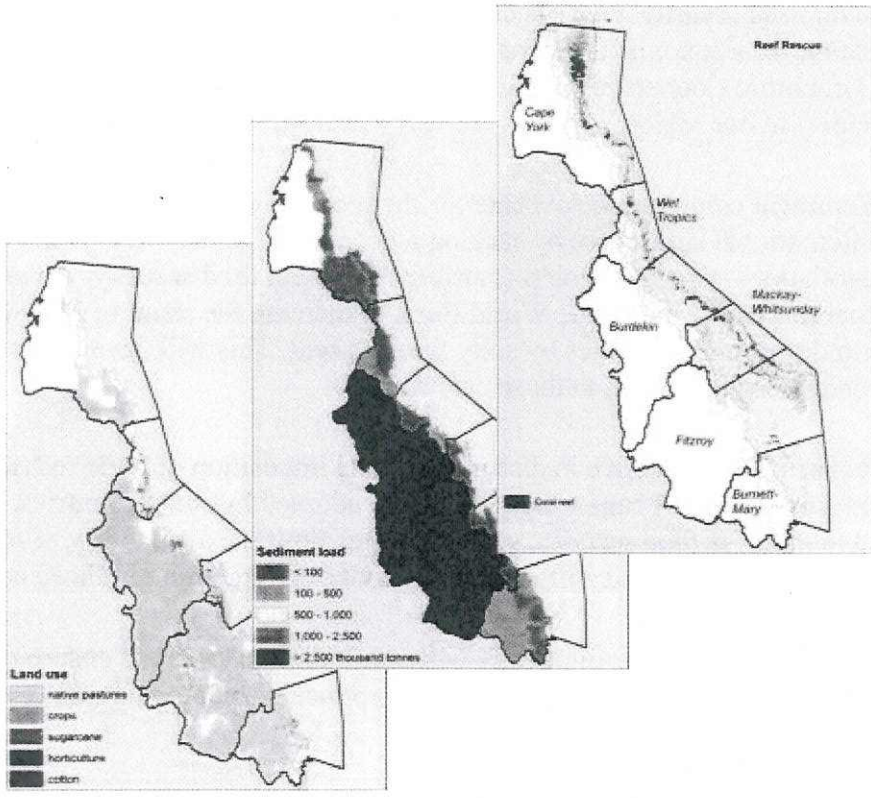
Protecting the Great Barrier Reef

The Great Barrier Reef is one of the natural wonders of the world, and an economic asset of major significance to Australia. Land-based pollution is a threat to the Reef and the Australian Government is addressing this as a national priority through the $200 million Reef Rescue program, part of the Caring for Our Country – Reef Rescue initiative. The initiative aims to improve the water quality of the Great Barrier Reef lagoon by increasing the adoption of land management practices that reduce the run-off of nutrients, pesticides and sediments from agricultural land.

Land use information is making a critical contribution to effective targeting of this investment. The level of sediment, nutrient and pesticide run-off is determined largely by land use and management practices in the Reef catchment. For example, since European settlement, extensive rangelands grazing has greatly increased sediment loads and intensive coastal agriculture has greatly increased nutrient loads.

As part of the Australian Collaborative Land Use Management Program (ACLUMP), the Queensland Department of Natural Resources and Water has produced land use maps for reef catchments. Those maps are making critical contributions to:

- assessing the threat to reef assets from sediment, nutrient and pesticide outflows
- efficient targeting of the promotion of improved land management practices
- understanding social and economic capacity for land management practice change
- monitoring trends in resource condition and the effectiveness of investment
- monitoring land use change



ACLUMP Land use mapping for catchments adjacent to the Great Barrier Reef produced by the Queensland Department of Natural Resources and Water has been critical to modelling sediment, nutrient and pesticide risks to reef waters and to devising appropriate management responses

International Food Security

A systematic and sustained response to high world food prices is needed to address the immediate and long term needs of both developed and developing countries, through three key actions:

- increased development assistance and humanitarian aid to the world's most vulnerable;
- constructive participation in multilateral processes, such as the World Trade Organization's (WTO) Doha Round of multilateral trade negotiations and the Food and Agriculture Organization (FAO) of the United Nations; and
- advocacy for international trade policy reform.

To address immediate needs, on 13 July 2008, the government announced that it will provide $50 million, through AusAID, to a new World Bank trust fund to stimulate agricultural production in developing countries adversely affected by rising food prices. This funding is in addition to the $30 million Australia contributed in response to the emergency appeal of the World Food Program (WFP) to assist in food aid operations (through AusAID). Australia provided over $77 million to the WFP in 2007-2008, and additional contributions to improve food security in Indonesia, Ethiopia, Afghanistan, North Korea, India, Iraq, Zimbabwe and Sri Lanka.

In addition to these financial contributions, the government has supported the development of the United Nations Comprehensive Framework of Action, and played an active role in the FAO High Level Conference on World Food Security. Australia is also working to expedite the process of reform of the FAO, to ensure it can fulfil its mandate on food security most effectively. Further, Australia is also working with the Organisation for Economic Cooperation and Development (OECD) and within the Asia Pacific Economic Cooperation (APEC) forums to explore other initiatives to improve food security in our region.

The government continues to advocate for the removal or reduction of the distortions facing international agriculture by seeking a conclusion to the WTO Doha Round of trade negotiations, which will help contribute to global food security. An ambitious Doha Round is estimated by the World Bank to increase the share of global agriculture exports to developing countries by sixty five per cent. This will have a significant impact on poverty reduction in those countries.

Australia has also been active in discouraging the imposition of trade restrictive measures such as export bans which have been adopted by some countries. Although intended to increase food security, such measures limit the availability of food on world markets, increase prices and stifle the productivity of agriculture in those countries.

The government is working bilaterally with our trading partners to ensure that access to existing international markets for Australian produce is maintained and new markets are identified.

Climate change poses significant challenges for agriculture. These include direct challenges through heat stress in animals and crops, decreasing water availability and increasing occurrences of pests and diseases as well as indirect challenges through the

impact of government sector measures to mitigate anthropogenic pressures on our environment. Actions to address climate change pressures should, where appropriate, recognise any inter-dependencies with the challenges of meeting the food needs of a growing global population. Care needs to be taken to avoid introducing unanticipated perverse incentives to land use decisions through climate change policies which may impact food production and food security.

International Treaty for Plant Genetic Resources for Food and Agriculture

As a signatory to the International Treaty for Plant Genetic Resources for Food and Agriculture, Australia is committed to the conservation and sustainable use of plant genetic resources for food and agriculture.

Since 2006, the Australian Government has committed $200,000 to building capacity for conservation of plant genetic resources in the South West Pacific region. The department jointly organised and delivered two Pacific Regional Workshops as part of the South West Pacific regional consultations on the International Treaty for Plant Genetic Resources for Food and Agriculture and the Secretariat of Pacific Community. These workshops were run in 2006 and 2007. Papua New Guinea, along with numerous other South Pacific countries and territories participated in both these workshops.

The aim of the workshops was to:

- discuss developments on plant genetic resources in the United Nations Food and Agriculture Organization (FAO) and other international forums
- increase cooperation within the Pacific region on policy issues affecting the conservation, management and use of plant and animal genetic resources for food and agriculture
- seek to identify resources that can be used to put priorities into action

These are crucial issues in assisting the maintenance of productive and sustainable agricultural development, food integrity and food security in the region. Australia has worked closely with the Secretariat of Pacific Community on these initiatives.

Global Crop Diversity Trust

The Australian Government is a key donor to the Global Crop Diversity Trust, having committed $16.5 million to date. The Grains Research and Development Corporation is also a major contributor. The Trust invests its capital and uses the interest to ensure the long-term conservation and availability of plant genetic resources for food and agriculture with a view to achieving global food security and sustainable agriculture.

In addition to supporting the Trust's endowment fund, AusAID funds a three year seconded position to the Secretariat of the Trust (filled by Ms Melissa Wood, in the role of Director of Program Development). The secondment is due to end in January 2010.

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