Australian Government
Department of Foreign Affairs and Trade

Feeding the Future

A Joint Australia–China Report on Strengthening Investment and Technological Cooperation in Agriculture to Enhance Food Security

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Australia–China Joint Working Group

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Joint Ministerial Foreword

It is a pleasure to present this joint study between Australia and China on how to strengthen investment and technological cooperation in agriculture to enhance food security. We—Australia's Ministers for Trade and Competitiveness and for Agriculture, Fisheries and Forestry and China's Ministers of Commerce and of Agriculture—began discussing this important global issue last year. To see the fruits of this initial discussion is enormously satisfying for us all.

Continuing population growth and limited land and water resources, particularly in the Asia-Pacific region, have made food security a priority for many governments. As the economies in our region grow, and per capita incomes rise, consumers will increasingly demand safe, high-quality, high-protein food.

Australia has earned a global reputation for its expertise in agriculture and the high quality of its produce. It still has large tracts of unused or under-utilised areas in its northern regions. Some of this land could, with investment in new productive capacity and the appropriate application of technologies, produce more food for sale on world markets.

China has its own expertise in agriculture as well as a surplus of investible capital, and has developed great plans for the further development of modern agriculture. After decades of progress and growth, China has developed advanced agricultural technology in areas such as crop breeding; plant disease and insect pest prevention and control technologies; and animal disease prevention and control. Firms also spread these leading technologies internationally, and so make an important contribution to improving food production and enhancing global food security.

In our discussions, we agreed that our two countries could work together to ease growing pressure on global food supplies. In the follow-up, Australia hosted two delegations of Chinese government, business and banking representatives in the agricultural sector. A reciprocal visit to China by Australian business representatives and officials provided further input to the study.

This paper is, first and foremost, about cooperation to raise rural productivity to supply global markets. By bringing land, capital and know-how together our two countries can make a difference. Additionally, both countries hope to develop technological cooperation and investment opportunities to improve the production of agrifood.

At the same time, we recognise that this study makes a limited contribution to the challenge of global food security. But it helps to establish a best-practice approach to Australia–China cooperation on this issue, which could provide a model for improved international cooperation. The principles it identifies are central to long-term success in our bilateral cooperation on agribusiness. Governments need to provide the right policy and regulatory environment so that companies can make sound decisions.

Strengthening agricultural investment and deepening technological cooperation is a focus of international cooperation to address food security, and is also an important measure to promote bilateral cooperation. This is the first time that our two governments have worked together on such a project. It is an excellent example of what can be achieved through cooperation, a model we may wish to emulate in the future. We sincerely thank all those who have contributed to this report.

Craig Emerson

Minister for Trade and Competitiveness and Minister Assisting the Prime Minister on Asian Century Policy

Australia

Chen Deming

Minister of Commerce

People's Republic of China

Joe Ludwig

Minister for Agriculture, Fisheries and Forestry

Australia

Han Changfu

Minister of Agriculture

People's Republic of China

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Glossary

agrifood	In this report, "agrifood" is defined as any food or beverage, or food or beverage material from unprocessed through semi-processed to fully processed (e.g. from wheat grain through flour to bread, biscuits and pasta); and this includes fish and seafood products; it does not include inedible agricultural materials and products like fibre (e.g. wool, cotton and hides) or forestry products.
food security	There are many concepts and definitions of food security, the most widely accepted internationally is that developed by the 191 member states of the Food and Agriculture Organization: "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2009a). Each country has its own detailed perspective on food security. In China, food security means all people, at all times, have access to affordable basic foodstuffs. In this definition, basic foodstuffs refers to the most important grains for maintaining human existence. The internationally accepted definition of food covers grains and other agricultural products including meats, vegetables, fruits and aquatic products. Australia's perspective is that most countries will produce some part of their nation's food supplies; but that it is important for countries to recognise that maximising one's national food security will usually mean the most efficient mix of domestic food production, exports and imports.
grains	The Chinese definition of grains includes cereals, legumes and tubers. In most countries, including Australia, grains generally refers only to cereals.
ha	Hectare; equivalent to 15 mu.
mu	Chinese unit of area measurement; equivalent to 1/15 of a hectare, or 667 square metres.

Technical notes

Unless otherwise specified, all value data are in Australian dollars.

Unless otherwise specified, all data are for calendar years. Some data are only available for Australian financial years, which run from 1 July to 30 June.

Where applicable, the following conversion rates have been used:

Year	Australian dollar (AUD) → US dollars (USD)	Australian dollar (AUD) → Chinese Yuan (CNY)
2008	0.8525	5.9303
2009	0.7927	5.4148
2010	0.9197	6.2224
2011	1.0320	6.6696
2012	1.0343	6.5495

Source: Reserve Bank of Australia
Note that the 2012 figure is the average for the period 1 January–31 August.

List of acronyms and abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
ACACA	Australia–China Agricultural Cooperation Agreement
ACBC	Australia–China Business Council
ACIAR	Australian Centre for International Agricultural Research
ACSRF	Australia–China Science and Research Fund
ANZ	Australian and New Zealand Banking Corporation
AusAID	Australian Agency for International Development
Austrade	Australian Trade Commission
CAS	Chinese Academy of Sciences
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DFAT	Australian Government Department of Foreign Affairs and Trade
DIISTRE	Australian Government Department of Industry, Innovation, Science, Research and Tertiary Education
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
FIRB	Australian Foreign Investment Review Board
JAC	Australia–China Joint Agricultural Commission
JMEC	Australia–China Joint Ministerial Economic Commission
MOA	Ministry of Agriculture of the People's Republic of China
MOFCOM	Ministry of Commerce of the People's Republic of China
NFF	National Farmers' Federation
OECD	Organisation for Economic Cooperation and Development
PMSEIC	Australian Prime Minister's Science, Engineering and Innovation Council
PRC	People's Republic of China
R&D	research and development
RIRDC	Australian Rural Industries Research and Development Corporation
UN	United Nations
WTO	World Trade Organization

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Executive Summary

Food security will remain a global concern for decades to come as demand increases and pressures grow on supply. Australia and China share a common interest in ensuring food security nationally, regionally and globally. Further cooperation between Australia and China can make a significant contribution to improving food security, as well as providing opportunities for commercial benefits to people who farm or fish and to agrifood businesses in both countries.

Australia and China are natural partners for collaboration. Both are major agricultural producers. Both face challenges to maintain and expand food production. Both are at the forefront of agricultural innovation, research and development. Both have expertise in sectors such as dryland agriculture that can be shared with other countries facing similar problems.

China is one of the world's largest producers of grains, most of which is consumed domestically. Improving productive capacity and achieving self-sufficiency of grains for a large population of 1.35 billion is one of the priorities for China's government. China faces challenges of limited water and land resources, and the increasing frequency of natural disasters associated with climate change. The Chinese Government has developed the *12th Five-Year Plan on National Agriculture and Rural Economic Development (2011–2015)* to guide China's agricultural production and development. Foreign investment in agrifood is permitted under an approval system. There is a detailed catalogue which specifies the sectors in which investment is encouraged, permitted and, in some areas, restricted or prohibited (see Appendix 3).

Australia produces much less food than many other countries, including China, but is able to export well over half of its agrifood production. It is a leading supplier to world markets of beef, sheepmeat, wheat, barley, sugar and dairy products. Australia is expected to remain a substantial surplus producer but agricultural production faces challenges including limited land and water resources, adapting to climate change, the need for improved infrastructure and a slowing in the rate of productivity growth. A framework for the Australian Government's response is the forthcoming National Food Plan.

Australia welcomes foreign investment, including in the agrifood sector. Foreign capital has long supplemented domestic savings to help finance the development, improvement and operation of agricultural and food businesses—so making Australians more prosperous. Australia is an attractive destination for foreign investment because of the low level of sovereign risk. The Australian Government's 18 January 2012 "Policy Statement: Foreign Investment in Agriculture" (see Appendix 4) reaffirms the Australian Government's policy framework and provides detailed guidance specific to the sector. The Australian Government is taking steps to ensure the policy is well understood and to strengthen the transparency of foreign ownership of rural land and agrifood production.

Chinese investment in Australia's agrifood sector is in its infancy with investment projects small in number and size. But it is increasing and diversifying in scope, type of investor, mode of investment, and area of investment.

Australia's agrifood investment in China is even smaller. A small number of Australian firms have invested in China, primarily to help sell their products there. A number of firms are providing logistical and rural banking services.

Bilateral investment cooperation should focus on improving productivity and expanding productive capacity sustainably in both countries, with any increase in production in Australia available for sale on world markets. Areas with high potential include: developing water and soil resources in northern Australia; commercialising new technology and new plant and animal varieties; and improvements in food processing and logistics.

China's government has invested much effort and money in improving its level of agricultural and related technology, driven by the domestic demand for food. After decades of progress and growth, China has developed advanced agricultural technology in areas such as crop breeding, and prevention and control technologies for plant diseases, insect pests and animal diseases. It is starting to focus more on issues such as monitoring the environmental effects of food production, raising food safety standards and improving quality assurance systems.

Agricultural innovation has been a necessary response to Australia's particular climatic and environmental conditions. As a result, Australian governments have invested significantly in agricultural research and innovation. Australian researchers have a record of world-class scientific results in fields such as low-carbon farming, sustainable agriculture, genetic resources, and plant and animal health.

Australia and China have a history of productive cooperation in agricultural research and development. Much of this was funded initially by Australia's aid program. Cooperation between the two countries now is increasingly moving towards a commercial basis and is growing deeper.

While Chinese firms' investment in Australia's agrifood sector is growing, some perceive challenges including: risks in obtaining government approval; delayed returns on investment and risks of excessive "green tape"; labour shortages; and difficulties in obtaining all the necessary information. Chinese researchers and farmers also have concerns about the difficulty of achieving good results in China with imported technology, and the absence of an effective platform for technological exchange, cooperation and exhibition.

Some Australian firms also see challenges to investing in China, including: perceived risks associated with the policy environment and regulatory oversight; land ownership and security of tenure; the development of agribusiness logistics; the need for strengthened enforcement of food-quality regulations; and the market for transferring rural land-use rights. Australian researchers generally view collaboration with China favourably but perceive concerns about intellectual property rights; identifying suitable Chinese counterparts; and insufficient language and inter-cultural skills among some Australian researchers.

Notwithstanding these perceived challenges there are opportunities for mutually beneficial investment, especially where this will expand productive capacity. Chinese firms are interested in investing in new irrigation developments in northern Australia (such as the Ord-East Kimberley Expansion Project); in the raising and processing of animals and their output (such as dairy products); tropical agriculture; offshore mariculture; the commercialisation of agrifood-related research; and food processing. There are opportunities for Australian firms to provide specialised services such as distribution, logistics and supply-chain management, land remediation—a growing need in China—and rural banking. There are also opportunities for Australian researchers and firms to develop demonstration farms in China to showcase their expertise and accomplishments.

Furthermore, there are opportunities for cooperation in innovation and technology that can improve productivity and be commercialised. Priority areas include: sustainable agriculture; animal and plant genetic resources; animal disease health; plant biotechnology; agricultural processing; environmental remediation; and remote sensing technologies for agriculture.

Australia and China have concluded that cooperation in the agrifood sector can contribute to improving global food security. This can be achieved through investment that lifts productivity and expands productive capacity, and focused cooperation in innovation, technology and services. As this cooperation between Australia and China begins in earnest, the objective is to establish a best-practice approach based on these guiding principles:

- Australia and China see the development of long-term, mutually beneficial cooperation on agrifood for supply to world markets as an important next step in diversifying a high-quality, complementary economic relationship.
- Australia and China recognise the importance of developing long-term sustainable policy approaches by building cooperation in stages and at a pace suited to the particular national situations, institutions and relative economic advantages of both countries.
- Australia and China recognise the valuable role of joint commercialisation of agricultural technologies to ensure the uptake of food security-related innovation within a framework of protection and management of intellectual property.
- In Australia, the transparency of the scale and nature of investment intentions and a focus on developing large-scale projects on underdeveloped land, particularly in northern Australia, will be important in promoting public understanding of foreign investment in Australia and providing confidence to Chinese investors.
- The demonstration effect is a valuable tool in developing agribusiness, and so Australia and China should work to improve the coordination of agrifood-related research and development priorities between key research organisations.
- Both governments have an important role to play in improving investment certainty by supporting pilot projects and addressing regulatory concerns, but bilateral cooperation on agribusiness will only be successful in the long term if Australian and Chinese companies make sound commercial decisions.
- The initial geographic focus of investment cooperation will be, in Australia, northern Australia (Queensland, Western Australia and the Northern Territory); and, in China, Shanghai Municipality, Shandong Province, Anhui Province and Shaanxi Province. However, cooperation will not be limited to these areas only.
- The initial focus of cooperative investment activities will be large-scale agricultural water and soil resources development in northern Australia; promotion and application of proprietary technologies and new varieties in agricultural product processing (including beef and sheepmeat); aquaculture (including tropical rock lobster farming); and building modern agricultural logistics systems.
- The initial focus of technological cooperation will be sustainable agriculture; plant genetic resources; plant biosecurity; animal disease control and health; plant biotechnology; agricultural processing technologies; animal genetic resources; environmental remediation; remote sensing technologies for agriculture; and supply-chain development and improvement.

Recommendations

(I) Investment

- Both countries should make relevant improvements in providing comprehensive information on the regulatory environment (including environment protection, land and water resource management, quarantine and food safety, tax policies and legal systems). This includes:
  - tailoring the relevant government websites/portals to provide timely information on agribusiness investment opportunities, and detailed procedures on making investments in the two countries, including links to the relevant sections of state, territory and provincial websites of both countries as well as relevant regulators, industry associations and other important stakeholders.
- The Northern Australia Ministerial Forum should consider holding a joint meeting with counterpart Chinese provincial ministers to discuss and review initial results, and explore further opportunities for cooperation and investment.
- Both countries should support annual delegation visits by potential investors in both countries to learn from the results of cooperation on joint pilot projects and other activities in order to develop new investment opportunities.
- Both countries should encourage new entrants to the agribusiness markets to make use of the services provided by the Australia–China Business Council, the Australian National Farmers' Federation, the Australian Food and Grocery Council and equivalent Chinese business groups to assist them to understand better the requirements of good corporate citizenship.
- Australia's national, state and territory governments should strengthen cooperation to reduce regulatory duplication, particularly in environmental protection requirements as agreed by the Council of Australian Governments.
- The Australian Government should continue to make transparency in foreign investment in the agricultural sector a high priority, including through measures such as the refined and ongoing surveys by the Australian Bureau of Statistics and the development of the national foreign ownership register for agricultural land announced by the Prime Minister on 23 October 2012.
- Prospective investors need first to consider the employment of suitably skilled Australian workers in new agricultural developments. If a sufficient number of suitably skilled Australian workers cannot be found, prospective investors should utilise existing migration arrangements to address any labour shortfall. The Australian Government will provide guidance on how the current policies can be used to achieve this outcome.
- Both countries should ensure quarantine and food safety systems are efficient and effective so that new—and existing—agriculture investors in Australia and China are able to sell their products in foreign markets.
- The Australian Government should identify, with relevant Australian state and territory governments, appropriate pilot projects to demonstrate the feasibility of joint development of irrigated broadacre cropping, including the feasibility of mosaic irrigation.

(II) Technological and services cooperation

- Australia and China should further clearly define the organisations undertaking technological cooperation and key research projects, and publish a joint audit of cooperative research in English and Chinese.
- Australia and China should explore the feasibility of establishing a joint research centre with a robust commercialisation capability in order to:
  - fully explore the opportunities for commercialisation in the existing research cooperation between Australian and Chinese researchers;
  - match capital, markets, technology and services;
  - improve intellectual property protection; and
  - coordinate dialogue on successful commercial adaptation of technology between Australian Government organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Commercialisation Australia and Austrade, and relevant Chinese counterparts.
- Australia and China should encourage the use of centres of excellence and demonstration projects in both Australia and China to showcase innovation, explore best-practice management and enhance prospects for commercialisation and licensing of technologies developed through those centres and projects.
- Australia and China should support annual business-focused technology and services delegation visits to learn from the results of cooperation on joint research projects and other activities in order to develop new joint commercialisation opportunities, and to explore opportunities for more effective delivery of services to enhance agrifood productivity, such as logistics and supply-chain management.
- Encourage Australian financial services providers to look at opportunities to expand their rural banking where this would strengthen investment and technological services in China.
- Australia and China should explore the possibility of holding a "China Day" at a future Australian Bureau of Agricultural and Resource Economics and Sciences conference.

(III) Joint consultative mechanisms

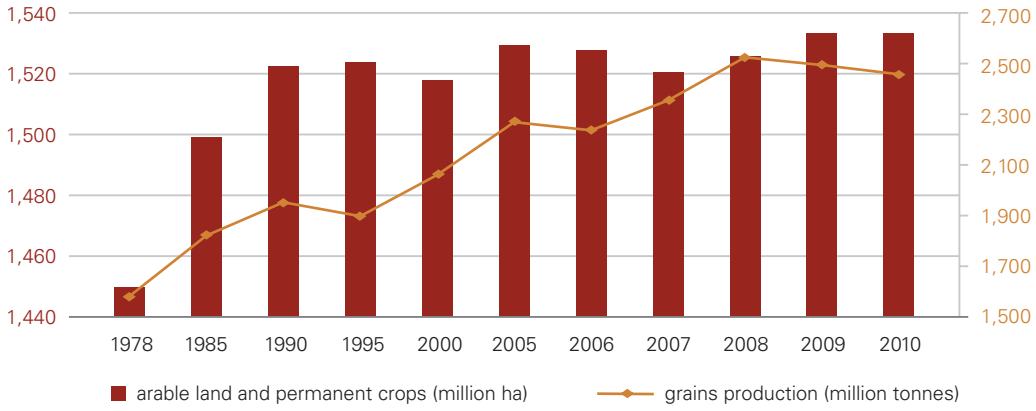
- Both countries should make maximum use of the existing economic, trade and agriculture official consultation mechanisms, including the Joint Ministerial Economic Commission and the Joint Agricultural Commission, to research and promote bilateral cooperation on food security, and hold regular high-level discussions about bilateral cooperation on food security.

Chapter 1: Overview

I. Strengthening agricultural cooperation between Australia and China to deal with global food security challenges

In the 21st century, with continuing global population growth and changes in food consumption patterns, the scale of global food demand will continue to grow significantly. However, the limited available arable land and water resources, and the slowdown in yield growth for grains are tightening the worldwide food supply and demand balance (see Figure 1). Since 2007, food prices and potential shortages, caused by a number of factors, have been of great concern among many countries. International attention has focused once again on global food security. According to World Bank statistics, 925 million people suffered from hunger in 2010.

Figure 1: Global arable land and grain yields, 1978–2010



Note: estimated data for 2010
Source: FAO database, November 2012

According to the Population Division of the United Nations, the world's population is projected to rise to 9.3 billion by 2050 from the current seven billion. The Food and Agriculture Organization of the United Nations (FAO) has estimated that global food demand will increase by around 70 per cent by 2050, and global grains demand could double from the current 2.5 billion tonnes by 2050. Food prices are expected to remain higher on average than pre-2006 levels for at least the coming decade. This will pose challenges for global food security. However, if markets work, higher prices can also act as incentives for farmers to produce more.

Food security is a complex and critical global issue, and there is much debate over its causes and solutions. Generally accepted causes include increasing consumption as a result of continued population growth, changing consumption patterns driven by rising incomes and accelerating urbanisation, and limited land and water resources. More controversially, some believe the continued effort to develop biofuels by the USA, European Union, Brazil and others has put strains on food production. Others have raised concerns about the possible contribution of financial speculation to the

significant rise in agricultural commodity prices over the past half-decade, and the impact of severe price volatility on major agricultural commodity importers and exporters.

However, a study published by the Organisation for Economic Cooperation and Development (OECD) and FAO in May 2011 found that supply and demand remained the fundamental drivers of agricultural commodity prices, that speculation played an essential market role in providing liquidity to commodity trade, and that more open and extensive trade was a key way to reduce price volatility.

Improving food security is a major global challenge. Enhancing investment and technological cooperation in agriculture between Australia and China can make a significant contribution to improving global food security, as well as providing opportunities for commercial benefits to people who farm or fish, and agricultural and food businesses in both countries.

II. Cooperation based on common interests and respective advantages

Agriculture holds an important position in the national economy of both Australia and China. Both countries place a high priority on improving the productivity and output of their agriculture and fisheries sectors on an environmentally sustainable basis.

Australia and China are major food exporters and important agricultural trade partners—indeed, a significant trade in wheat began in 1960. In 2011, China's agrifood exports were US$60.1 billion and Australia's $29.6 billion. In 2011, China was the fifth-largest market for Australian agrifood exports, and Australia was the eighth-largest source country for China's imports of agricultural products. China was the third-largest source of agrifood imports into Australia, and Australia was the 11th-largest market for Chinese agrifood exports. Australia's agrifood exports to China were worth $1.9 billion in 2011; the largest items were barley and malt, wheat, milk powder, seafood, sheepmeat, edible offal and wine. China's agrifood exports to Australia were worth $0.8 billion in 2011; the largest items were processed fish and seafood, confectionery, fruit juice, bakery products and other processed foods (see Statistical annex).

The bilateral relationship between Australia and China in relation to agricultural investment and technology has been steadily increasing over the past four decades, in part because of the links to the expanding bilateral agrifood trade. By 2011 over 100 agricultural technology cooperation projects in China had been supported or aided by Australia. China's direct investment in Australia's agriculture and food processing sector in 2011 (flow) was US$19.5 million, with cumulative Chinese investment in the sector (stock) standing at US$47.1 million (MOFCOM 2012). The stock of Chinese direct investment in all sectors in Australia by 2011 was US$11 billion, according to Chinese records (MOFCOM 2012). Australian investment in China's agrifood sector is understood to be much smaller, as the stock of Australian direct investment in China in all sectors was $6.4 billion by 2011 (ABS 2012).

Australia and China have a common interest in steadily improving their capacity to supply agricultural products to satisfy the world's ever-increasing demand for agrifood products. An important part of this will be strengthening bilateral investment in the agrifood sector to increase sustainable production, improve the efficiency of distribution channels and markets, promote employment and the profitability of agricultural enterprises, and contribute to broader economic growth.

III. Opportunities to work together in investment and technological cooperation in agriculture

Against the above background, Australia and China conducted joint research on strengthening investment and technological cooperation in agriculture in order to address the challenges of global food security. This study is committed to providing a clear direction for obtaining mutual benefits from bilateral agricultural cooperation, and working to eliminate impediments to such cooperation. Amid widespread uncertainty about the rapidly changing global agrifood context, strengthening cooperation between Australia and China in the agriculture sector by developing and demonstrating a best-practice model can send a positive signal to the international community.

This joint Australia–China report focuses on:

- the current situation, opportunities and constraints for agriculture in Australia and China;
- the current situation, shared interests and complementarities, and the potential for future cooperation between Australia and China in investment and technological cooperation in agriculture;
- identifying the key fields for this potential future cooperation between Australia and China, and encouraging Australian and Chinese enterprises to explore the opportunities for agricultural investment and for the commercial exchange of new agricultural technologies; and
- working to remove impediments to investment and technological cooperation and improving relevant policies.

Chapter 2: Agriculture in Australia and China

I. Agriculture in China

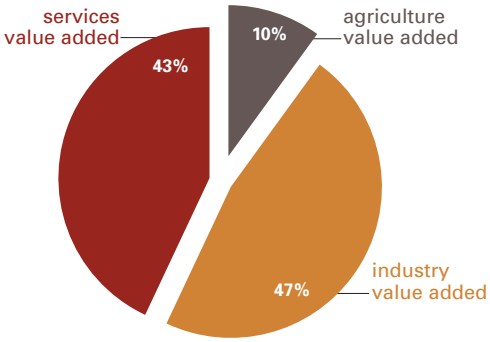
(I) Overview

1. Agriculture has an important position in China's economy

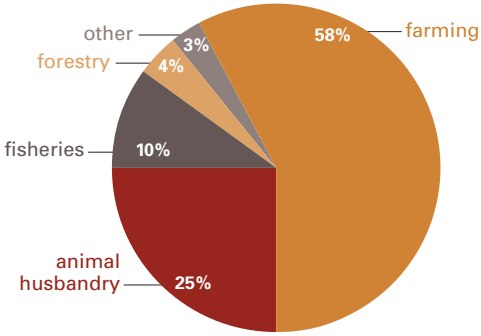
As a developing country with a population of 1.35 billion, China sees resolving its food security problem through its own efforts as a critical task. By the end of 2010, China's rural population was 670 million, just over 50 per cent of the total. In 2010 agricultural value-added reached 4.1 trillion yuan ($659 billion), accounting for 10.1 per cent of GDP, with crop farming comprising 58 per cent, animal husbandry 25 per cent, forestry 4 per cent, fisheries including aquaculture 10 per cent, and other 3 per cent (see Figure 2).

Figure 2: China's agriculture value-added in GDP and its composition in 2010

The composition of Chinese GDP: 2010



The composition of Chinese agriculture value added: 2010



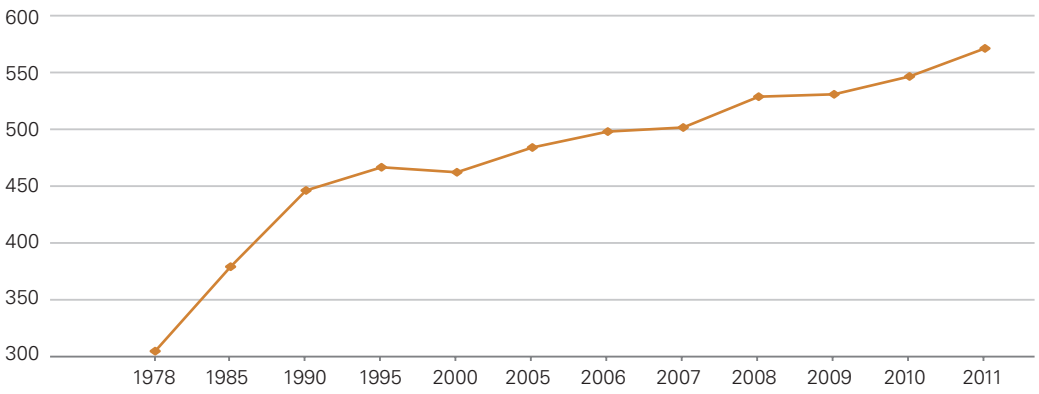
Sources: China Statistical Yearbook 2011; China Rural Area Statistical Yearbook 2011

2. China maintains a high level of self-sufficiency for agricultural products

The Chinese Government successfully feeds 21 per cent of the world's population with just 9 per cent of the world's arable land (China's arable land area is 120 million hectares, equating to less than 0.1 hectares of arable land per capita). This makes an important contribution to global food security. Under the Chinese policy of using domestic resources to achieve self-sufficiency in the supply of grains and other agricultural products, a range of policy incentives have been introduced. Food production increased for eight consecutive years from 2003, with steady growth for major agricultural products. The supply of agricultural produce and products is adequate for China's needs, and the production of meat, dairy products and eggs is growing rapidly to largely meet domestic consumer demand.

China's total grain output exceeded 500 million tonnes for five consecutive years, reaching a record 570 million tonnes in 2011. This was approximately 1.9 times production in 1978, the milestone year for China's economic and agricultural reform and opening-up (see Figure 3). This was equivalent to a per capita grain availability level of 408.7 kg. China maintains significant state grain reserves, and grain imports and exports are mainly for adjustments in bad or good harvest years and adjustments to the supply of different grain types.

Figure 3: China's grain production, 1978–2011
(million tonnes)



Source: China Statistical Yearbook 2011, Statistical Communique of the People's Republic of China on National and Social Development 2011

3. Scientific and technological innovation in agriculture has become the major force to develop modern agriculture

Scientific and technological innovative capacity continues to grow. In the last five years, 2600 new varieties of staple crops have been developed. Up to 95 per cent of the area cultivated with these crops uses these improved varieties. As well, major animal diseases have been controlled by the research, manufacturing, promotion and application of livestock vaccines and medicines. Agricultural science and technology appropriate to China has been actively explored. As a result of improving its capacity for independent agricultural scientific and technological innovation, China has created a modern agriculture system, carried out new variety cultivation projects and scientific research projects in sectors for the public good (agriculture), which have effectively guided scientific and technological innovation in agriculture to concentrate on agricultural production. The contribution of agricultural scientific and technological progress to overall agricultural growth has reached 52 per cent.

Greenhouse crops, Yangling

(II) China's main agricultural development policies

To enhance China's agricultural development, the Chinese Government has implemented a suite of policies relating to agricultural production, the sale of resulting produce and foreign investment in agriculture.

1. Policies to improve domestic agricultural production capacity

- A strict arable land protection system to ensure the arable land area for agriculture is not less than 120 million hectares, and strengthening the arable land protection accountability system.
- Developing a range of policies and measures on increasing agricultural research and development (R&D) input, encouraging innovations in improved varieties and agricultural production technologies and strengthening the promotion of agricultural technology to continuously improve the contribution rate of scientific and technological progress in agriculture.
- Policies on increasing investment in agricultural and rural infrastructure to gradually improve agricultural production conditions through better infrastructure such as irrigation and water conservation, power supply and roads.
- Advancing the transferability of agricultural land and increased scale of production, developing specialised production organisations, and boosting large-scale production, standardisation, and modernisation of agricultural production.
- Encouraging sustainable agricultural resource utilisation and environmental protection, and developing a series of policies and measures on the rational utilisation and effective protection of agricultural resources, agricultural energy saving and emission reductions.

2. Policies on building a good market environment

- Reform of the agricultural product distribution system aimed at marketisation has been generally successful, and the prices for most agricultural products are generally determined by the market.
- China strictly complies with its World Trade Organization (WTO) commitments. In accordance with its Protocol of Accession to the WTO, China's tariff level has dropped significantly. China is committed to advancing fair and free trade in agricultural products, and is actively taking part in international agricultural cooperation.

3. Policies on foreign investment in agriculture

The Chinese Government attaches great importance to the use of foreign investment to promote the country's economic development. Agriculture is a key sector for utilising foreign investment and the use of foreign investment in agriculture maintains stable development. According to the *12th Five-Year Plan for International Agricultural Cooperation* (MOA), during the "11th Five-Year Plan" period (2006–2010), total foreign investment in agriculture is about $4.6 billion, of which foreign direct investment is more than $4.1 billion.

- The Catalogue of Industrial Guidance for Foreign Investment is an important industrial policy for China to guide direct foreign investment. The revised Catalogue came into effect on January 30, 2012, which includes the relevant policies for farming, forestry, animal husbandry and fishery industries. (See Appendix 3 for the full list of encouraged, permitted, restricted and prohibited areas in agriculture.)

- China exercises an approval system for foreign investment (excluding for partnership/joint venture business[1]). The encouraged and permitted projects in the Catalogue for the Guidance of Foreign Investment Industries (production and infrastructure projects) with total investment exceeding US$300 million and the restricted projects with total investment of US$50 million and above must be ratified and approved by the central government of China. The projects with total investment lower than the approval threshold of the central government must be ratified by local government.

(III) Main agricultural planning and prioritised industries and fields

1. Main agricultural planning

The 12th Five-Year Plan for National Economic and Social Development of the People's Republic of China (2011–2015) and the *National Modern Agriculture Development Plan* (2011–2015) define the overall arrangements and requirements of the Chinese Government on the development of agriculture and rural economy. In September 2011, the Chinese Ministry of Agriculture issued *The 12th Five-Year Plan for National Agricultural and Rural Economic Development*. The Plan further clarified the overall goal of agriculture and rural economic development during the 12th Five-Year period: steadily and comprehensively improving productive capacity for grains and other major agricultural products, and making significant progress in modernising agriculture; substantially increasing farmers' income and quality of life; achieving remarkable results in new rural area construction, and coordinating the development of urban and rural areas. On this basis, China further developed specific plans for agriculture and related industries.

2. Prioritised industries and fields

The Chinese Government has prioritised the following areas of agricultural development:

- high yield and ultra-high-yield new varieties and supporting farming technology such as for cotton, rice and wheat;
- production and processing of vegetable, fruit, flowers and edible fungus;
- fresh water aquaculture and coastal aquaculture;
- animal vaccine production and immunisation;
- bio-pesticides and bio-fertilisers;
- molecular breeding technology of animals and plants; and
- deep sea fisheries and aquatic product processing.

[1] According to "the Partnership Enterprise Law of the People's Republic of China", a "partnership" is when a natural person, legal entity and other organisation(s) set up an operating venture with a partnership agreement signed by two or more partners for operating the venture, funding the venture, and sharing the revenue and risks. This includes ordinary partnership and limited partnership companies. "Joint ventures" follow the provisions of "the China-Foreign Joint Ventures Law of the People's Republic of China", by which foreign enterprises and other economic entities or persons in China organise a joint enterprise with Chinese companies or other economic entities.

(IV) Challenges facing agricultural development in China

1. Shortage of arable land and water resources

Currently the per capita arable land of China is less than 0.1 hectare, only about 40 per cent of the world's average. This number is declining due to continuing population growth, urbanisation and increased land usage by industry. The area of reserved arable land is insufficient; and the quality of much of the arable land is not very good, with moderate and lower yield land accounting for 67 per cent of the total. The Chinese level of per capita fresh water resource availability is about 2400 cubic metres, only one quarter of the world's average (for water availability, China is ranked 88th out of 153 countries in World Bank statistics[2]). The distribution of China's water resources is extremely uneven across the country, with severe water resource shortages in northern China.

2. Frequent natural disasters

China faces frequent drought and flood disasters. With the onset of climate change and frequent extreme weather events in recent years, the impact on agricultural production continues to deepen. Since 2004, grain losses caused by disasters exceeded 30 million tonnes per year and reached more than 55 million tonnes in 2009, accounting for 10 per cent of total grain production in that year.[3]

3. Weak agricultural infrastructure and support systems

Agricultural infrastructure is weak, particularly for irrigation and water conservation facilities, and about 60 per cent of cultivated land is affected by drought, salinity and other factors. The market trading system for agricultural products and the cold chain logistics system for fresh agricultural products are underdeveloped. Consequently, the capacity to respond to unexpected events and market fluctuations is limited.

4. Lower level of organisation in agricultural production and operation

China's agricultural production method is based on household units, and is characterised by its small scale and the less developed level of organisation in production and operation. Intermediary organisations such as farmer cooperatives and industrial associations face problems, like the small scale of operation, a limited capacity to drive change and less standardised internal management in some cooperatives.

5. Higher level of post-harvest losses

China's agricultural product storage, preservation, drying and other primary processing methods are simple and the facilities are underdeveloped. The corn post-harvest losses are as high as 8 per cent to 12 per cent. The potatoes post-harvest losses are as high as 15 per cent to 25 per cent. The fruits post-harvest losses are as high as 10 per cent to 15 per cent. The vegetables post-harvest losses are as high as 15 per cent to 20 per cent.[4]

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[2] "The current situation of China's water resources distribution", China Digital Science and Technology Museum.

[3] The total loss of grain caused by natural disaster in 2009 was 55.4 million tonnes, according to the 2010 "Two Sessions" economic report.

[4] "China's agricultural products post-harvest serious loss, should learn from the advanced experience of foreign countries." Xinhua News Agency, May 27, 2011

II. Agriculture in Australia

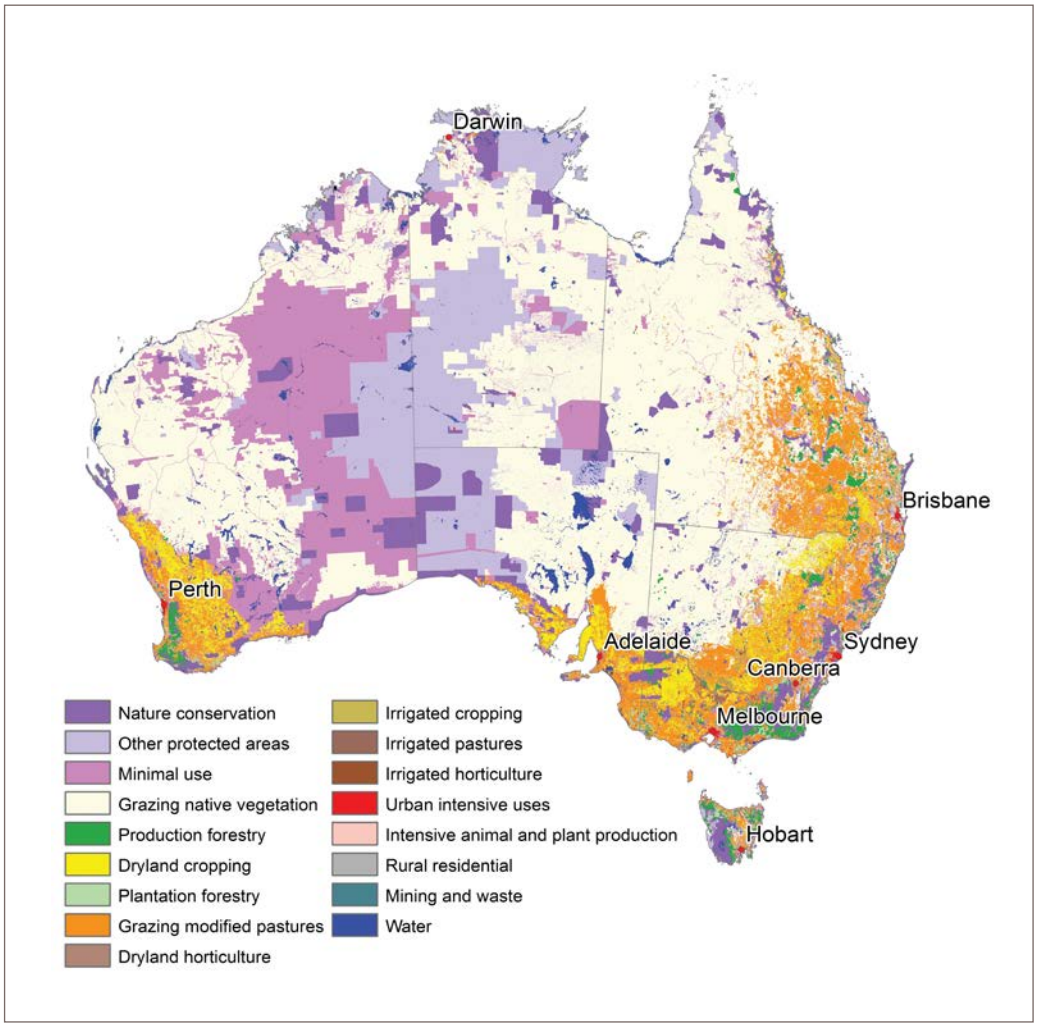
(I) Overview

1. A major global agricultural producer

Australia is a reliable global agricultural producer, though farm and fisheries production accounts for around just 2.4 per cent of Australia's GDP, with a gross production value of $50.3 billion in Australia's financial year 2010–11 (ABARES 2012).

Agricultural production and yields vary widely across Australia, reflecting the different geographical and climatic conditions (see Map 1).

Map 1: Land use in Australia, 2005–06



Australia is a major producer of broadacre crops (see the Statistical Annex). Between 2006 and 2010, Australia's sowing area for winter crops ranged between 20 and 23 million hectares, and for summer crops between 9 and 13 million hectares. Wheat production is highly dependent on rainfall between April and November. Under favourable seasonal conditions, production is generally between 24 and 25 million tonnes. An average of around 13 million hectares is planted annually. The main coarse grain grown in Australia is barley, used principally for livestock feed and malting. Production of barley was around 8.1 million tonnes in 2010–11. An average of around 4.5 million hectares is planted annually. Grain sorghum, which is used for livestock feed, is the second-highest produced coarse grain in Australia. Production of sorghum was around 2.1 million tonnes in 2010–11 (DAFF 2012b).

Around 95 per cent of Australia's sugar comes from Queensland and the remainder from northern New South Wales. Harvested areas of sugar cane in Australia have declined since 2002–03 because of a range of factors, including relatively low world prices, drought, cyclones, urban encroachment and higher returns from alternative land uses, particularly forestry. In 2010–11, 334,000 hectares was planted, producing 3.6 million tonnes of sugar (DAFF 2012b).

Australia is also a major livestock producer, notwithstanding the low rate of stocking in much of the country. Beef production is widespread across Australia, with an average of 27.5 million head of cattle and a production of 2.1 million tonnes of beef. Australia's dairy herd of 1.6 million cows produces 93.1 billion litres of milk, with a yield of over 5,650 litres per cow. The Australian pig herd was around 2.3 million head in 2010–11 and pork production was 342,000 tonnes. Australia's 73 million sheep are reared for both wool and meat, producing over 620,000 tonnes of meat (DAFF 2012b).

Key factors underlying Australian agrifood production are:

An open and competitive economy

Tariffs are low and agricultural producers receive government funding support for just 3 per cent of their income, the second-lowest in the OECD. These factors, along with competitive markets, have broadened the sources of food for Australians and expanded consumer choice. Australia's imports of food, beverages and fishery products have grown. In 2011 imports totalled $11.6 billion compared to exports of $29.6 billion.

An emphasis on food safety and biosecurity

Australia is free of many pests and diseases found in other countries, including major livestock diseases such as bovine spongiform encephalopathy (BSE) and foot and mouth disease (FMD). Maintaining this largely disease-free status is a priority. So too is maintaining high levels of food safety, both for exports and domestic consumption. According to the OECD, Australia ranked equal first with Denmark and the UK for food safety performance in 2010.

A strong R&D base

Australia's agrifood productivity growth is driven, in part, by the strong agricultural R&D base, including networks linking universities, government and specialist research centres. Sectoral R&D is funded equally by both government and producers.

Efficient supply management

Australia's agricultural supply-chain management functions well, though constant effort is needed to improve efficiency and cost-competitiveness. The expertise and infrastructure to transport agrifood products reliably, safely and in a timely manner helps to make Australia one of the world's leading agricultural exporters. It is also important in ensuring high levels of quality and safety for domestic and international consumers.

2. ... with strengths in many fields ...

Australia has developed many strengths, including:

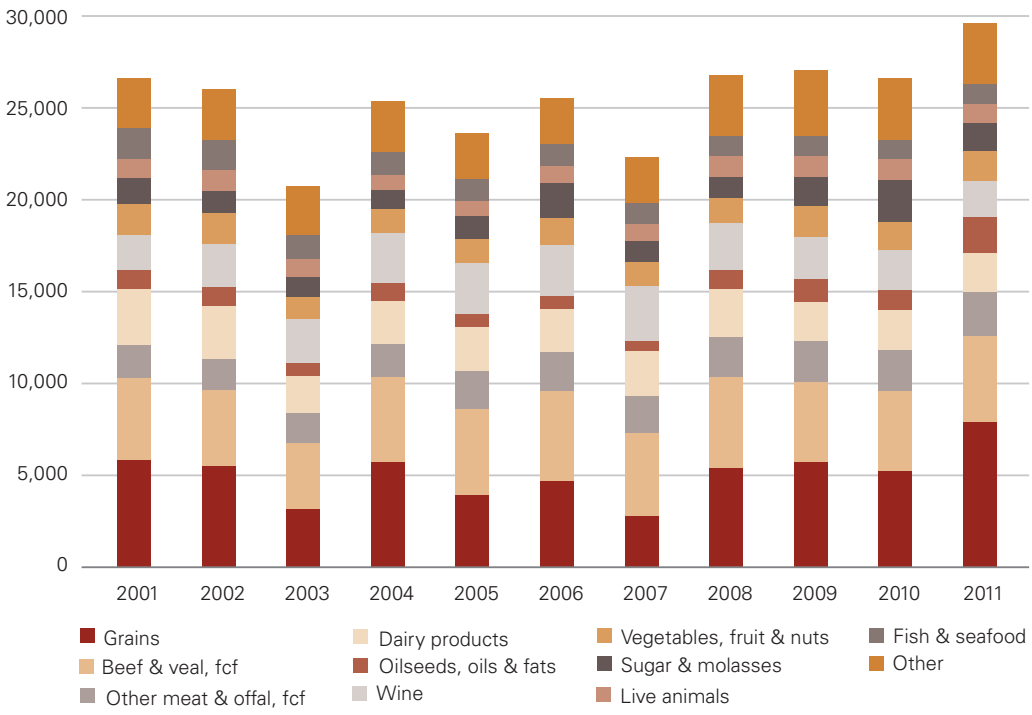
- animal, plant and environment biosecurity;
- livestock genetics (cattle, sheep, goats) and live animal exports (cattle, sheep, goats);
- fodder and livestock management;
- broadacre cropping (wheat, canola, barley, sorghum);
- dry land farming and some areas of horticulture;
- sustainable management in both agriculture and fisheries (including aquaculture);
- high quality fish and seafood production, both wild and farmed;
- probiotics, nutraceuticals and other dairy product diversification;
- food and livestock traceability;
- agricultural inputs and services; and
- farm management and extension training.

3. ... and a net contributor to global agrifood supplies

Australia currently produces sufficient food to feed up to 60 million people but has a population of less than 23 million. The export of surplus agricultural products increases global food supplies. This, when combined with accessible and efficient global agricultural and food markets and supply channels, helps reduce market and price volatility and thereby helps improve global food security.

Notwithstanding this considerable surplus, Australia's share of total global agrifood production is quite small overall (around 3 per cent), much less than China's. For some important agrifood products, however, particularly beef, sheepmeat, wheat, barley, sugar, dairy, canola and pulses, Australia is a significant global exporter. In 2011 Australia ranked 17th among food exporting countries, with 2 per cent of total global exports. (WTO 2012; see also Figures 7 and 8 below, and Appendix 1).

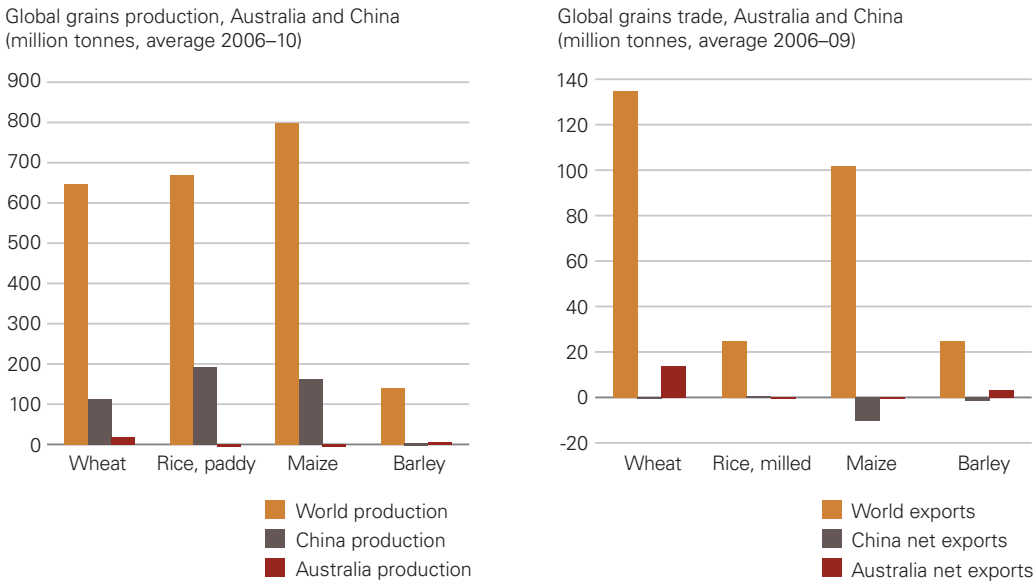
Figure 4: Australian agrifood exports by main category, 2001–11
($ million)



Note: fcf = fresh, chilled or frozen
Source: DFAT STARS database, based on ABS data

Australia is expected to continue to produce a surplus even as domestic demand grows (Linehan et al. 2012). This growth in Australian demand will flow primarily from an increase in population: the Australian Bureau of Statistics (ABS) estimates Australia's population will be more than 35 million by 2056, on current trends (ABS 2010). Current trends in Australia's consumption profile are expected to continue: consumers are likely to continue to favour high-protein, highly processed, convenience-oriented food, with an emphasis on quality, safety and traceability. As demand grows, Australia's imports of food—mainly out-of-season produce and highly processed foods and beverages—are also expected to increase (DAFF 2011). However, the increase in domestic food demand in Australia will be insignificant compared to the major expansion in food demand in other parts of the world, especially Asia.

Figure 5: Global grains production and trade – Australia's and China's shares



Source: FAO Database, April 2012

(II) Foreign investment in Australia's agricultural sector

1. Foreign investment is beneficial

Australia welcomes foreign investment. Foreign capital has always supplemented domestic savings to drive employment and prosperity, including in agriculture. It can help farmers, agricultural enterprises and food processors and manufacturers diversify, become more competitive and boost incomes. It helps sustain Australia's agricultural productivity and economic prosperity more broadly.

Foreign investment has often been associated with the introduction of new technologies or improvements in existing technologies, and improved access to markets. Direct investment in cattle raising, the use of feed-lots and processing in Australia in the 1970s and 1980s onwards contributed to the significant expansion of Australia's beef exports to Japan and later the United States. Japanese and US companies' investments in the development and growth of Australia's cattle industry lifted its export competitiveness not only for the Japanese and US markets but also for other high-value markets. Similarly, significant international investment in the Australian wine industry helped improve wine production and distribution systems, and helped drive growth in wine exports to European and other markets.

The RIRDC/ABARES report *Foreign Investment and Australian Agriculture* (Moir 2011) concluded that foreign investment in the agricultural sector enhances Australia's food security by increasing efficiency and productive capacity. It adds to incomes, infrastructure and employment, often in regional areas.

2. Australia is an attractive destination for foreign investment

Australia is a globally competitive location in which to do business: home to rich and abundant natural resources, a highly skilled workforce, a culture of innovation, a robust legal system and political stability. The certainty provided by Australia's legal and political systems makes sovereign risk low. The Australian food industry enjoys a reputation as one of the world's best for food safety and food quality. This is attracting the world's leading food production companies to invest in the Australian market.

One factor that affects foreign investment in Australia is the barriers to imports that exist in foreign markets. These affect exports not only from Australian-owned companies, but also foreign companies that have invested in Australia. As Chinese investment in Australian agriculture increases, Chinese companies will similarly face barriers in export markets.

3. Australia's policy on foreign investment

The *Foreign Acquisitions and Takeovers Act 1975* and Australia's Foreign Investment Policy provide the framework for the Government to review foreign investment proposals. The Government, through the Foreign Investment Review Board (FIRB), reviews foreign investment proposals against the national interest on a case-by-case basis. Elements of the national interest typically taken into account include: national security; competition; other Australian Government policies such as taxation; the impact on the economy and community; and the character of the investor. Generally, private sector investment above $244 million (as at 1 Jan 2012; indexed annually) is subject to review.

All proposals by foreign governments and their related entities for making a direct investment, starting a business or acquiring land are subject to review. In the case of proposals by foreign governments and their related entities, the Government also considers if the investment is commercial in nature or if the investor may be pursuing broader political or strategic objectives.

The Treasurer can block proposals that are contrary to the national interest or apply conditions to a proposal to address national interest concerns. Only two business cases have been blocked in the past ten years, one in the resources sector and one in the financial services sector. Between 2007–08 and 2010–11, no Chinese investment proposals were rejected, and around 270 were approved.

4. Foreign investment policy in the agricultural sector

The Australian Government recognises the benefits that foreign investment in the agricultural sector can bring, consistent with protecting Australia's national interest. The Government's 18 January 2012 Policy Statement on Foreign Investment in Agriculture provides detailed guidance on specific factors typically considered in relation to proposed acquisitions in the agricultural sector. These include the impact on:

- the quality and availability of Australia's agricultural resources (including water);
- land access and use;
- agricultural production and productivity;
- Australia's capacity to remain a reliable supplier of agricultural products to both the Australian community and trading partners;
- biodiversity; and
- employment and prosperity in Australia's local and regional communities.

There are concerns in some parts of the Australian community about the sale of rural land and agricultural businesses to foreign investors. Consequently, the Government has taken steps aimed at ensuring that its policy is well understood and to strengthen the transparency of foreign ownership of rural land and agricultural food production. These steps include funding the Australian Bureau of Statistics' ongoing Agricultural Land and Water Ownership Survey and establishing a register for foreign-owned agricultural land. Transparency in foreign investment in the agriculture sector is important in providing reassurance to Australian citizens and foreign investors alike.

(III) A policy framework

The Australian Government is finalising Australia's first-ever National Food Plan. This will be a framework that guides on-going activities within the Australian food system to ensure that Australia has a sustainable, globally competitive, resilient food supply which supports access to nutritious and affordable food. The Plan also seeks to ensure that Australia continues to be a reliable surplus food supplier to international markets as part of its contribution to global food security.

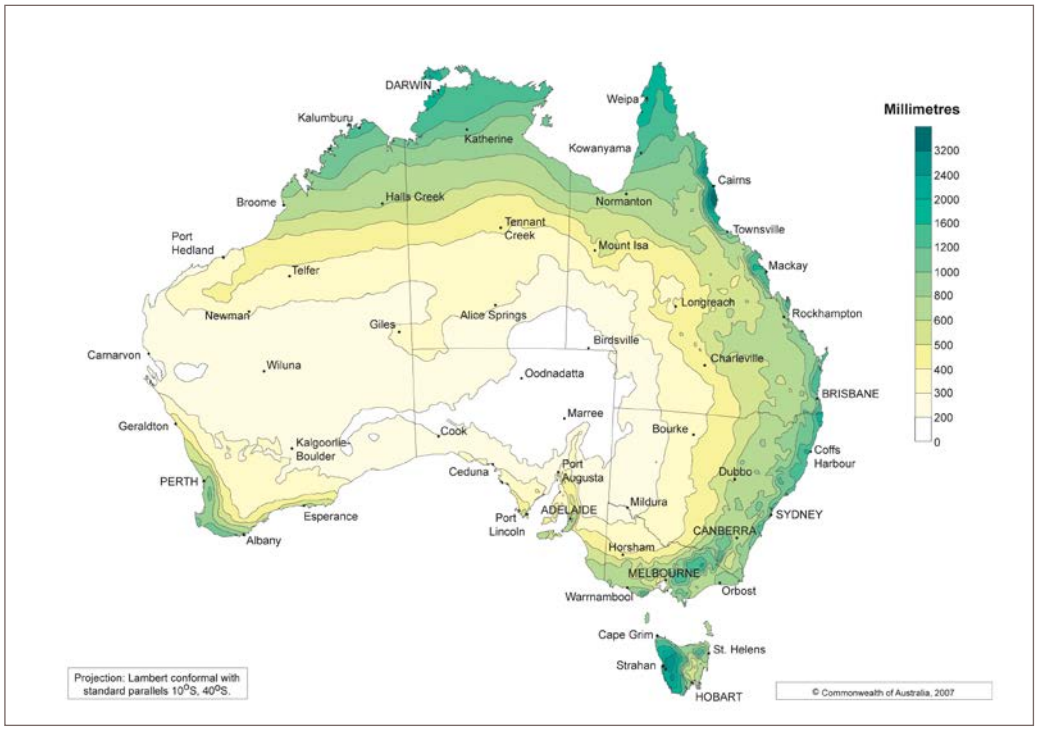
(IV) Challenges to Australia's food supply

1. Restricted land and water resources

Although a large country, Australia's agricultural productive base is limited and the often poor soil quality affects production. Compared with soils in the northern hemisphere, Australian soils have less organic matter, low levels of phosphorous and other nutrients, and poorer structure that results in reduced nutrient storage and water-holding capacity.

Excluding Antarctica, Australia is the driest continent, and agricultural productive capacity is affected by rainfall distribution. Long-term average annual rainfall varies from less than 300mm per year in central Australia to more than 3000mm in northern Queensland (see Map 2). Runoff into rivers is low—on average, only a tenth of this rainfall is captured in rivers or subterranean aquifers (National Water Commission 2012)—compared with a world average of 65 per cent. Substantial use of irrigation in parts of the country has placed pressure on ecosystems that also rely on the nation's water.

Map 2: Annual average rainfall across Australia



Note: based on a standard 30-year climatology record (1976–2005)
Source: Bureau of Meteorology

2. Adverse effects of climate change on agricultural production

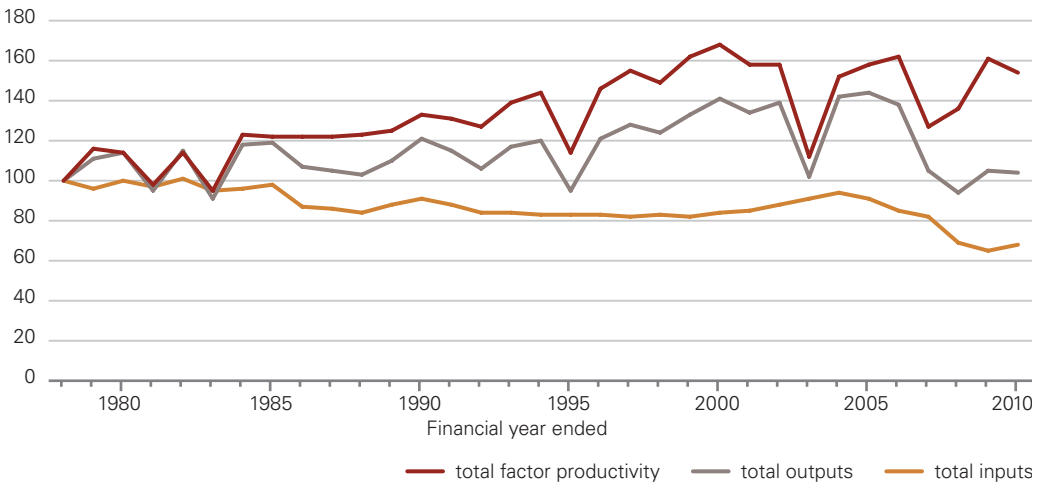
Climate change has the potential to change agricultural productivity at a regional level. For example, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Bureau of Meteorology estimate that southern Australia will experience a decline in average rainfall in coming decades. Significant weather events such as drought, fires, floods and cyclones may increase in frequency and/or strength, with effects on annual yields. This is a major policy focus for the Australian Government. Research and development programs which can reduce greenhouse gas emissions from agricultural activity while increasing productivity and responding to the impacts of climate change are a priority.

3. Slower productivity growth

Similar to the problems experienced in other countries, a fundamental challenge for Australia is the need to respond to the recent slowing in the rate of growth of agricultural productivity.

Research by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES 2012) found that Australian farms achieved average total factor productivity growth of 1.2 per cent per annum between 1977–78 and 2009–10 (see Figure 6). This rate of productivity growth is higher than most other Australian industries. However, while the long-term trend is positive, the average growth rate has declined in the last 10 years. This decline can be partly attributed to reductions in R&D investment in the sector. Future increases in production will require positive productivity growth rates, which, in turn, will require ongoing investment in research and development (Linehan et al. 2012).

Figure 6: Trends in Australian broadacre total factor productivity, total inputs and total outputs, 1977–78 to 2009–10
(index, 1977–78 = 100)



Source: ABARES 2012

4. Further investment is required in logistics and other agricultural infrastructure

Transport costs are a significant proportion of total farming costs; up to 21 per cent of the value of grains produced in Australia is spent on transport (Tulloh and Pearce 2011). Many Australian farms are located considerable distances from ports or other transport hubs and from processing plants. Weather also imposes logistical constraints: monsoonal rains mean that some roads in northern Australia are inaccessible for months each year.

5. Younger, better-skilled workers are needed

Australia faces challenges with its agricultural workforce. The average age of workers in the sector is increasing. The current mining and resources boom has exacerbated agricultural workforce pressures. It is also estimated that the number of agricultural graduates produced every year in Australia may only be one-fifth of total demand (Office of the Chief Scientist 2012). This trend is partly countered by the increase in the average size of agricultural holdings, increasing mechanisation and other technological advances. For example, a farm of approximately 1000 hectares in the Ord region of Western Australia would only need between three and six permanent staff, depending on the crops produced and farming methods. The Australian Government is examining ways to address these challenges and to encourage younger Australians into agriculture.

6. Post-harvest losses

Estimates of post-harvest losses range from 10 to 40 per cent (Keating and Carberry, cited in Moir and Morris 2011), so even a small reduction in wastage would have a positive effect on productivity. Additional government and private investment in infrastructure will be required, especially if there are shifts in where food is grown or processed as a result of changes in climate or the introduction of new technology.

Chapter 3: Investment and technological cooperation in agriculture

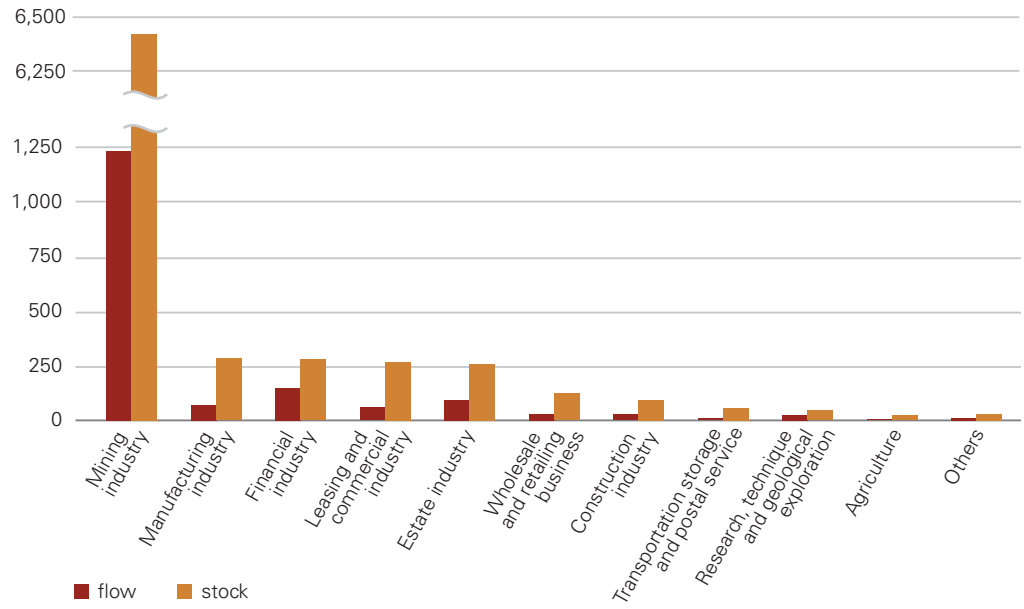
I. Investment in agriculture in Australia and China: the current situation and future prospects

(I) Chinese agricultural investment in Australia

1. Chinese investment in Australian agriculture is in its infancy ...

Chinese investment in Australian agriculture is in its infancy, with investment projects small in number and size. According to China's Ministry of Commerce, investment in Australian agriculture accounts for a small proportion of Chinese investment in Australia (see Figure 7). Chinese investment accounts for a small proportion of total foreign investment in Australian agriculture. According to Australian statistics, which do not provide a breakdown by sector for each country, China ranks 10th in terms of the stock of total foreign direct investment in Australia, and the stock of its investment constitutes 2.6 per cent of the total stock of foreign direct investment in Australia.

Figure 7: Chinese direct investment in Australia by sector, 2010
(US$ million)

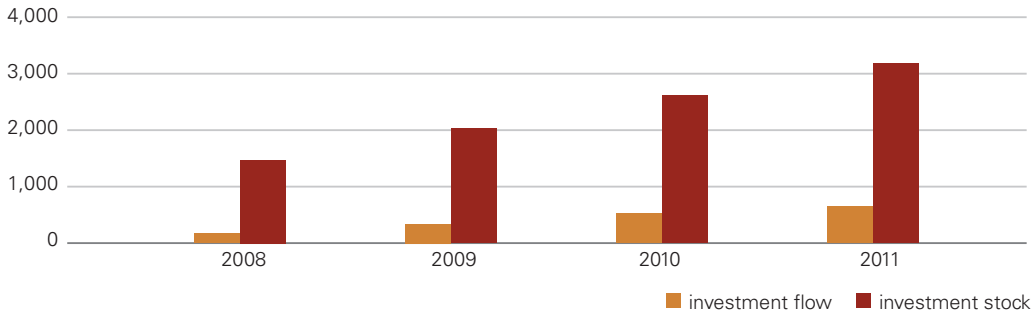


Source: 2010 Statistical Bulletin of China's Outward Foreign Direct Investment, China's Ministry of Commerce, National Bureau of Statistics, the State Administration of Foreign Exchange of the People's Republic of China

2. ... but is growing ...

In recent years, Chinese enterprises have had increasing interest in investing in overseas agriculture, and China's outward investment flows to the agricultural sector have increased from US$170 million in 2008 to US$650 million in 2011 (see Figure 8).

Figure 8: Chinese foreign direct investment in agriculture, all countries, 2008–11
(US$ million)



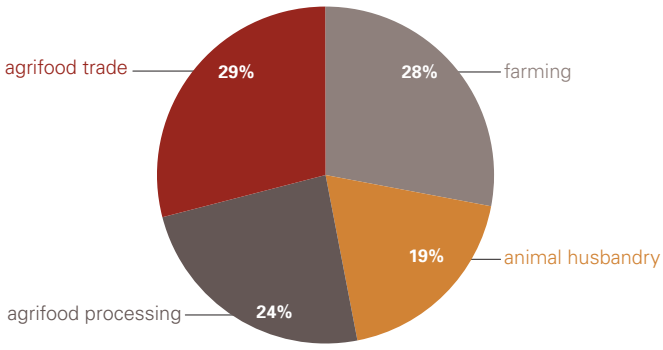
Note: the figure for 2011 is an estimate
Source: 2008–2010 statistical bulletins of China's Outward Foreign Direct Investment, China's Ministry of Commerce, National Bureau of Statistics, and the State Administration of Foreign Exchange of the People's Republic of China

The scale of Chinese investment in Australian agriculture and food processing is increasing. Chinese direct investment in agrifood in Australia in 2010 was US$3.23 million, with cumulative FDI (stock) of US$22.5 million (MOFCOM 2011). This increased in 2011 to US$19.5 million, with a stock of US$47.1 million (MOFCOM 2012). According to an annual survey of investment intentions, existing or planned Chinese investment in Australia amounted to about US$700 million by the end of 2011, a relatively large increase compared with 2010.

3. ... and becoming more diverse

The scope of investment is expanding to cover planting, breeding, farming, and food processors and traders (see Figure 9). As well, the range of investors is more diverse. In addition to state-owned enterprises, publicly listed and private companies have gradually become the main Chinese investors in Australia. The mode of investment is also more diverse. In addition to greenfield investment, the level of Chinese involvement in agriculture-related commercial transactions including mergers and acquisitions has increased rapidly. Finally, the location of investments is gradually expanding. Promising new areas for investment include the relatively underdeveloped areas of northern and northwest Australia.

Figure 9: Sectoral distribution of Chinese direct investment in Australian agriculture



Note: Direct investment projects according to market research data for statistical analysis, 2011
Source: Market research data provided to MOFCOM

(II) Australia's current agricultural investment in China

Australia's total stock of FDI across all sectors in China was $6.4 billion in 2011. Although neither Australian nor Chinese data record Australian agrifood investment in China, anecdotal evidence suggests it is growing, albeit from a very small base. Increasing food demand in China has given rise to significant commercial opportunities. Agrifood investment is believed to constitute only a small fraction of Australia's total FDI in China. Currently, Australian agrifood investment in China is developing around two main industry subsectors:

Sales of agrifood products

A number of Australian companies have invested in China in order to expand their sales of agrifood products in the Chinese market, including Murray Goulburn Co-operative Co. Ltd and Goodman Fielder.

Agribusiness services

Other companies such as Nufarm, Elders and Toll Group are providing logistical and other agribusiness services, all aimed at the Chinese market. As well, a number of Australian financial sector firms, including the Australian and New Zealand Banking Corporation (ANZ) and the National Australia Bank are providing banking services to Chinese agribusiness firms. As China's rural areas are currently underserviced in terms of financial services, ANZ established the Chongqing Liangping ANZ Rural Bank in September 2009. The rural bank, which focuses on agricultural-related business in the local area, is now profitable with a solid customer base, providing the company with experience in China's rural business sector and allowing it to tap into the many business opportunities arising from the region's rapid growth.

Australian investment in China is not limited to Australian-owned companies. Some Australian subsidiaries of foreign firms have already invested in different parts of China's agricultural and food sector.

There are many reasons for the relatively limited levels of investment by Australian firms in China's agrifood sector. In general, few Australian agrifood businesses invest offshore, reflecting the structure of the sector with its predominance of smaller, family-owned farms and the increasing prominence of foreign-owned food processors.

(III) Prospects for strengthening agricultural investment

The sustainability of agriculture is significant for Australia, China and the world. Both Australia and China have issues that need to be addressed in order to improve sustainability.

Cooperation between Australia and China will benefit both Australian and Chinese producers. Continued investment will help them remain competitive and sustainable food producers. Success in resolving these problems, especially in sectors such as dryland farming, can be shared with other countries, enabling Australia and China to contribute to global food security.

There are a number of areas where increased investment could deliver potential benefits by expanding production or improving productivity.

1. Developing water and soil resources in northern Australia

Australia's main traditional agricultural zone (the south-east of the continent) is relatively well-developed. Agricultural production here can be increased by improving efficiency. Northern Australia, with its tropical climate and significant land and water resources, has significant potential for productive large-scale development. It may become a new growth area in Australian agriculture, although considerable further research and commercial-scale demonstration is required.

2. Commercialising proprietary technology and new varieties

Successfully commercialising potential proprietary technologies and new varieties of crops and breeds of animals of both countries, with appropriate intellectual property protection, would deliver considerable economic benefits. Potential projects include the artificial propagation of aquaculture products like Australian lobsters, cultivation of quality embryos, and soil reclamation. China's equipment and agriculture technology also have good prospects for application in Australia.

3. Processing agrifood products

Many of Australia's agricultural products are exported with no or limited processing. With improved infrastructure in logistics and processing, there will be more opportunities for further processing of agricultural products. China's agricultural production mainly comes from small-scale operations, which have a lower level of business organisation, and are less able to process food. Considering the domestic requirements in both countries for processing, convenience, food safety and traceability, as well as international requirements, it is also necessary to increase investment and cooperation in agricultural processing and further promote the production and processing ability of both countries.

4. Modern supply-chain logistics

As the movement of agricultural products increases, both countries would benefit from increased investment in cold chain, warehouse and logistics infrastructure, including ports, related infrastructure, and transport and distribution networks. Increased bilateral trade would increase logistical efficiency and lower logistics costs for the movement of food between Australia and China.

II. Current cooperation between Australia and China in agricultural technology and future opportunities

(I) China's agricultural technology level

1. Recent achievements and current levels of agricultural technology

The continuing development of agricultural technology is fundamental to ensuring national food security. In terms of agricultural scientific and technological research, the Chinese Government has carried out a series of programs that adapt such research to China's mode of intensive cultivation. They aim to increase output, centering on the basic goal of meeting the food demand of a huge population with limited agricultural resources. Such programs include, for example, research projects on breeding various crops and associated agricultural skills and machinery; livestock and poultry breeding programs and associated animal nutrition; and environmental control of plant growth, disease control and research. This has produced some strong results, for example, lifting the yield per hectare of several of China's staple crops, namely wheat (4.7 tonnes per hectare), corn (5.5 tonnes per hectare), rice (6.6 tonnes per hectare) and seed cotton (2.1 tonnes per hectare), accounting for 158 per cent, 105 per cent, 150 per cent and 174 per cent of the world average.

China has made breakthroughs in many research fields, which have contributed to world food security. For example:

- China created the world's first ideal tool for wheat colony improvement: dwarf male-sterile wheat which can continuously cultivate new varieties of wheat in a large batch and improve the breeding efficiency manyfold.

Hydroponic cultivation, Yangling

- Hybrid rice research, led by Professor Yuan Longping, who was awarded the World Food Prize in 2004, changed the traditional understanding that rice is self-pollinating with no hybrid advantage, and created a new breeding method. In 2011, China's super hybrid rice target yield of 900 kg per mu was achieved successfully, and Chinese super high yield hybrid rice research continues to maintain a leading position in the world.

On the application of agricultural technologies, China closely follows world agricultural technological developments, and has made outstanding achievements in many fields:

- In crop breeding, China has adopted hybrid breeding, mutation breeding, polyploidy breeding, molecular marker breeding, transgenic breeding and other technologies, and China takes a leading role in the hybrid advantage utilisation and transgenic breeding of some crops in the field.

The Australian delegation visiting an agricultural research facility in Anhui

- In livestock and poultry breeding, the technologies of molecular marker-assisted breeding, transgenic animal breeding, artificial insemination, embryo transplantation, and gender control technology have been applied in production and practice, and China has reached an internationally advanced level especially in animal bioreactor and animal somatic cell cloning technology.
- China has taken a leading role in plant disease and insect pest prevention and control technologies, and made rapid progress especially in botanical pesticides, microbial pesticides, and the use of animal natural enemies for biological control.
- China has made significant achievements in animal disease prevention and control, especially in developing the attenuated disease (bacteria) vaccine, and has taken a leading role in bird flu vaccine development.

2. New requirements in agricultural technology development

Though China has rapidly developed agricultural technologies and made outstanding achievements in many fields, there are still some gaps, mainly reflected in the following aspects:

- China has carried out extensive research in staple crops such as rice, corn and wheat, but started late in the development of vegetable, fruit and flowers. Similarly, China has done extensive research in pig breeding but started late in dairy cow breeding and other fields. Generally speaking, research and development among different agricultural sectors has not been even.
- Though China has abundant animal and plant genetic resources, it has not done sufficient basic research on the genetic functions, and its advantage in genetic resources has not been transferred to production and practice.
- China has focused on breeding to increase yields, and placed insufficient emphasis on developing crop quality and stress-resistant varieties. The excessive dependence on chemical fertiliser and pesticide has led to less technical research in environmental improvement measures; and there has been insufficient research into measures and instruments to speed up quality inspection of food and disease diagnosis.
- China has focused its research on producing agricultural technologies, but neglected research on processing equipment, veterinary drugs, pesticides, and production-line equipment for agricultural processing, and is not yet able to satisfy production needs.

(II) Australia's agricultural technology level

Australian governments have long invested in agricultural research and innovation, and Australian researchers have a record of world-class scientific results. A recent report by the Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE) found that Australia's agricultural and biological sciences are its most specialised area of research relative to the rest of the world. Australian research in this field also has a citation rate above the world average (DIISRTE 2012).

Australia's agricultural expertise mainly includes the following areas:

Sustainable agriculture

This includes techniques and technology that improve soil condition, water quality and biodiversity outcomes and reduce the impacts of invasive species. The sustainable practices promoted include controlled traffic farming (confining the impact of machinery wheels to permanent intra-crop lanes), systems to increase perennial vegetation in pastures and conserving native vegetation. Precision agriculture technologies can be used in both dryland and irrigated agriculture.

Low-carbon farming

Australia's Carbon Farming Initiative (CFI) is the first federally legislated agriculture and forestry offset market in the world. It covers a broad range of eligible offset activities for sequestering carbon in vegetation and soils and reducing agricultural emissions of methane and nitrous oxide.

Plant genetic resources

Australia's major seed banks, which in total comprise 184,000 documented samples, hold unique genetic resource collections. The germplasm from the seedbanks is available to international researchers and breeders as well as Australian users. In April 2012 Australia consolidated its grains genetic resources to maintain access to, and preserve, the resources.

Biotechnology

Plant biotechnologies, including genetic modification (GM), have been widely applied in Australia. GM cotton has been grown in Australia since 1996 and now makes up virtually all cotton plantings. Commercial plantings of GM canola commenced in some states in 2008.

Genetic research

Australia's genomic technologies and tools of livestock industries are advanced. Drawing on its expertise in multi-chromosome technology, Australia developed and now uses a modern genetic evaluation system (BREEDPLAN) for beef cattle.

Biosecurity research

Plant and animal disease control and capacity building, including the strengthening of plant health and veterinary services, can have major benefits to health and food security, as well as to productivity at the farm level. Australian scientists have provided assistance to improve the response to pandemics and emerging infectious diseases (EIDs) in the Southeast Asian region, including through the development of national pandemic preparedness plans, strengthening of systems of early detection, surveillance, prevention and control of EIDs including transboundary animal diseases (e.g. foot and mouth disease) and zoonoses.

Australia has established and implements stringent pest and disease control programs that accommodate the changing biosecurity and agricultural environment. For example, advanced technology is used to monitor and control novel production pests and diseases affecting Australian eucalypts and acacia trees.

Australian farmers and agrifood producers have also been successful in improving the way farms and agribusinesses organise, manage, operate, and market their products. But in the agrifood sector, Australia has not been as successful as it might be in commercialising innovation, both research and in the way farms and firms operate.

(III) Australia–China technological cooperation in agriculture

Agricultural cooperation is already an important part of the Australia–China bilateral relationship. The partnership in agriculture is built on common interests as well as growing commercial agrifood links. Agricultural cooperation pre-dates the formal bilateral relationship, which commenced in 1972, having started in 1960 with trade in wheat.

Goats in Yunnan bred from Australian breeding stock

Current and past cooperation in agricultural technology has enhanced technological progress in China's agriculture and improved the environment. Poverty alleviation projects have played an active part in alleviating the poverty of central and western China. Dialogues and exchanges have allowed governments, technological institutions and businesses to deepen their communication and broaden their strategic vision. Research cooperation has led to improvements in both Australia's and China's standard of agricultural research. In addition, government-to-government cooperation has played a significant role in promoting bilateral trade in agricultural products.

Since the 1980s, Australia and China have signed a number of key agreements to establish formal agricultural cooperation mechanisms.

- In 1981, the Agreement on Enhancing Development and Technical Cooperation between Australia and China was signed by the Australian International Development Assistance Bureau (now AusAID) and the Ministry of Agriculture of the People's Republic of China (MOA) which carried out cooperation in the fields of agricultural aircraft, animal quarantine, fruit production and processing, dairy cattle breeding and milk production, agricultural sustainability services, and watershed management. Under the Agreement, China's Ministry of Agriculture has completed 12 agricultural assistance projects with total input reaching $37.5 million.
- In 1984, the Protocol on Promoting Cooperation in Agricultural Research for Development was signed by the Australian Centre for International Agricultural Research (ACIAR) and the Ministry of Agriculture of the People's Republic of China. Under this agreement, cooperation has been carried out in the areas of animal and plant breeding, exchange of germplasm resources, animal and plant quarantine, rangeland management, water and soil resources management, agro-processing, storage and transport to improve agricultural productivity and support poverty alleviation. Since the protocol was signed, Australia and China have carried out 108 bilateral cooperative research programs with funding support of $86 million. The agricultural research institutes and agricultural departments of nearly 30 Chinese provinces and municipalities have participated in these programs. Now, the focus of ACIAR's work has moved away from development assistance to a more collaborative relationship. ACIAR's program focus is on western China, which shares many of the environmental constraints of Australian agriculture. ACIAR's work in water management and dryland agriculture has helped China to increase farmers' incomes and better manage scarce natural resources.

- In 1984, the Australian Department of Agriculture, Fisheries and Forestry (DAFF) and the Ministry of Agriculture of the People's Republic of China convened the first meeting of the Australia–China Joint Committee and officially signed the Australia–China Agricultural Cooperation Agreement. The Agreement established a Joint Agricultural Commission (JAC), which provides a mechanism for regular high-level dialogue on agriculture between DAFF and the MOA. Priorities under the Agreement are agricultural cooperation projects and reciprocal visits designed to increase each country's knowledge of the other's level of agricultural innovation. Since the Agreement was signed in 1984, both countries have held 10 ministerial and vice-ministerial joint committees for agriculture, and organised more than 200 exchange delegations involving nearly 1,000 people.
- In 2004, the Memorandum of Understanding on Dialogue about the Dairy Industry was signed by the Australian Department of Agriculture, Fisheries and Forestry and the Ministry of Agriculture of the People's Republic of China. Since 2004, four meetings of both countries' dairy industries have been held, which provides a useful platform for exchange of ideas between both countries' enterprises, and technology and management personnel in the dairy industry.
- In 2006, the Letter of Intent for Technical Cooperation Programs in Agriculture was signed by the Australian Department of Agriculture, Fisheries and Forestry and the Ministry of Agriculture of the People's Republic of China. During the four-year implementation, both sides carried out a series of technical training programs to promote the development of the livestock industry, including dairy cattle management technical training, the construction of a fine-wool marketing system, the construction of livestock improvement and pasture management system, and the planning study for major animal disease prevention, control and elimination. Since the Letter was signed, Australia and China have carried out a series of technical training programs for the livestock and animal husbandry industry.

Cattle in Yunnan bred from Australian breeding stock

Under their agricultural technological cooperation framework, Australia and China have moved away from the agricultural assistance projects of the past towards mutually beneficial cooperation in advanced agricultural technology. Scientific agricultural research cooperation with China delivers direct benefits to Australian agriculture (ACIAR 2011). Australia–China co-authorship of publications in the agricultural sciences grew about eightfold between 2002 and 2010, making China now Australia's second-highest national source of collaboration in agricultural science (Office of the Chief Scientist 2012).

CSIRO and the Chinese Academy of Sciences (CAS) undertake a significant amount of collaboration across all fields of science. Through an agreement with the Chinese Ministry of Education's China Scholarships Council, CSIRO hosts between 20 and 40 Chinese PhD and postdoctoral students, many conducting research in the agricultural area. CSIRO also has a number of active Memorandums of Understanding with various universities and research organisations conducting research activities in the agricultural area. These include the China Agricultural University, the Chinese Academy of Agricultural Science and the State Bureau of Mapping and Surveying.

Australia and China currently collaborate on agricultural R&D through the Australian Government's Cooperative Research Centres (CRC) program. The CRC program supports medium- to long-term end-user-driven research collaborations, many of which are world-leading. Chinese institutions and businesses are currently working with CRCs in diverse areas including agriculture, biosecurity and the environment. In 2010–11, eleven CRCs reported 28 separate collaborative alliances in China.

The priority areas of CSIRO and CAS

Under the Joint Steering Committee's "Agriculture and Crop Breeding Technology" stream, one of four priority areas for collaboration, CSIRO and CAS are co-funding two joint projects: one on parental gene memories and their role in regulating rice endosperm development and grain size, and the other on "genome-wide sequence strategies for gene discovery in wheat". Since their commencement in 2010 these joint projects are already demonstrating significant results. In the longer term, this research could lead to an improvement in agricultural productive capacity in both Australia and China.

Developing more effective water use by rain-fed wheat in Australia and China

Wheat is a major food staple in Australia and China. In both Australia and north-western China, conservation farming practices are being promoted as an important component of more-sustainable farming systems. CSIRO has been achieving considerable breeding success for dry land wheat in Australia by targeting specific traits that make more effective use of available water. Some of these traits have also been shown to improve adaptation of wheat to conservation farming practices. This project, led by CSIRO and ACIAR on the Australian side, aims to extend this breeding success to north-western China by working with leading breeding programs for dry land wheat in north-western China, based at Northwest Agriculture and Forestry University, Yangling, Shaanxi province, and Ningxia Academy of Agriculture and Forestry Science, Yinchuan, Ningxia province.

The new varieties being developed by the breeding program need to be commercialised and their use promoted. Agronomic services (soil health, plant nutrition, and pest and weed management) could be promoted at the same time.

(IV) Future opportunities

- Australia has a comparative advantage in breeding disease-resistant and stress-resistant crops, while China has a comparative advantage in breeding high-yielding varieties of crops. The exchange of germplasm resources is conducive to the cultivation of crop varieties with high environmental adaptability.
- Australia and China can build on existing expertise in breeding, animal husbandry and disease control, prevention and management. Cooperation in the production of quality varieties of animal breeding stock, embryos and frozen sperm, and research and development in high-protein feed for beef cattle and dairy cows can help improve the overall production capacity and quality of livestock of the two countries.
- Australia has a comparative advantage in mine rehabilitation, land remediation and ecologically restoring grassland, while China has a comparative advantage in land-use efficiency and saline-alkali land management. Cooperation in the development and application of technology in this area will assist the ecological restoration and improvement in land yield in both Australia and China.
- Australia has a comparative advantage in agricultural and food quality and safety management, plant and animal biosecurity research including epidemic prevention and disease control, and agro-ecological environment protection technology while China has a comparative advantage in the biopesticide and biofertiliser sectors. Opportunities exist for cooperation in agricultural product quality control, quick detection of pesticide residues, and rapid diagnosis technologies for animal and plant diseases.
- The Australia–China Science and Research Fund (ACSRF) provides opportunities for agricultural cooperation. The ACSRF was announced in 2011 and is jointly administered by DIISRTE and the Ministry of Science and Technology of the People's Republic of China. Each government has committed $9 million over three years to the ACSRF. The Fund will support joint research centres in agreed priority areas including agricultural and biological sciences. It will also support group missions to achieve specific purposes related to research and research-driven innovation and a more prominent role for government in knowledge brokering and communication.

Tropical Rock Lobster Hatchery Project

Strong demand for rock lobsters (or spiny lobsters) globally cannot be met in the long term by capture in the wild. Australian research is at the leading edge in rearing rock lobsters in an artificial environment. Queensland researchers are assisting south-east Asian countries (notably Vietnam and Indonesia) to improve their grow-out capability with support from ACIAR.

The Queensland Government is seeking investment to establish commercial production of juvenile rock lobster in Queensland for grow-out and supply to the Chinese food market.

Strengthening research cooperation to respond to the problem of grassland degradation

Globally, grasslands are undergoing considerable change with steep rises in human and livestock populations resulting in degradation that threatens the livelihoods of millions of poor people. Addressing grasslands problems is now a priority of the Chinese Government, as reflected in dramatically increased policy attention, funding and research related to grasslands.

An ACIAR project in Inner Mongolia has shown that stocking rates can be reduced sustainably by 45 to 65 per cent while at the same time enabling an average 50 per cent gain in net household income. This research—which draws on experiences in Australia—is being replicated by partner Chinese research agencies in multiple locations with similar results emerging.

Building on these results, the research will now attempt to develop market-based mechanisms that would provide incentives for millions of herders to make the transition to lower stocking rates and improved livelihoods. If successful, Australia and China could collaborate in sharing the results of the research with other countries.

Chapter 4: Challenges in Australia–China investment and technological cooperation in agriculture

Potential investors and researchers from both Australia and China have identified concerns about government policies and other factors that affect their willingness to invest and collaborate. These concerns may be unwarranted, but still need to be taken into account by governments in both countries in order to improve the two-way flow of capital and creativity, increase understanding and mutual trust, and remove perceived obstacles to investment and to collaboration in agricultural technology.

I. Challenges encountered by Chinese companies in investment and technological cooperation in Australia

(I) Challenges in agricultural investment

Chinese investors are highly enthusiastic about investing in Australia, but they have concerns about the following impediments that they perceive regarding investment in Australian agriculture.

1. Perceived risks in obtaining government approval for foreign investment

In *Australia's Foreign Investment Policy* (released in January 2012), the Australian Government stated that foreign investment should be in line with Australian national interests and should be transparent and made on a commercial basis. Some Chinese investors perceive that this policy is not sufficiently clear and gives the Australian Government extremely high discretion in approving investment projects. Although the investment volume from China is far below that from countries such as Japan and the USA, there is an impression that mergers and acquisitions involving capital from China often encounter opposition and obstruction from some social organisations and the media. This perception of unfair treatment affects the confidence and enthusiasm of some Chinese enterprises that are considering investing in Australia.

2. Delayed return on investment and risks of excessive 'green tape'

Some Chinese investors believe that the poor level of infrastructure in remote areas of Australia means that any agricultural investment projects involving water and land resource development in those areas would require significant capital investment, such as in irrigation systems and roads. They conclude that Australian production methods in some sectors may result in lower agricultural productivity than in China, which could result in a lower return on investment—and over a longer period—than that of a comparable investment in China. This may dampen the enthusiasm of investors. In addition, for agricultural land and water resources development projects, they believe the complexity surrounding Australian federal and state governments' environmental protection regulations can delay or hamper potential investment.

3. Concern about labour force restrictions

Some Chinese investors note that the Australian agricultural zone is sparsely populated and lacks a sufficient local labour force, which results in high labour costs. They are concerned that this makes it hard for enterprises to employ suitable labour and technicians in the early production and operational stages of a venture; and about Australia's migration policy, under which it is difficult to obtain work visas for overseas labour. Some Chinese investors consider that this could have a negative impact on investment projects.

4. Perceived lack of effective ways to obtain information about investment in Australia

Some Chinese investors worry that Chinese entities generally have a limited understanding about Australia's investment environment and legal system, especially with regard to: the regulatory framework; market access; agricultural land policy; water resource management; and environment protection. This incomplete understanding can result in difficulties in carrying out investment projects. This in turn affects the decision-making of entities intending to invest in Australia.

(II) Challenges in technological cooperation in agriculture

Because Australia and China practice different farming and livestock management techniques, the two countries have different targets for developing breeding and cultivation technologies. Owing to a lack of adaptive improvement and follow-up services, direct imports of technology or varieties from Australia often do not result in the outcomes that are expected by Chinese researchers. This problem has been experienced in recent years with the import of high-quality animal and plant varieties, including those intended to improve Chinese livestock breeding stock.

II. Challenges encountered by Australian companies in investment and technological cooperation in China

(I) Challenges in agricultural investment

Australian firms are cautious about direct investment in agriculture in China, and they have concerns about the following impediments.

1. Perceived risks of the policy environment and regulatory oversight

Some Australian investors have concerns about perceived risks associated with China's policy environment and regulatory oversight when making direct investments in China, including: China's restrictions on foreign investment in some areas; insufficient protection of intellectual property (IP); the transparency of China's law enforcement if disputes need to be resolved; and the approvals processes required for repatriating profits.

2. Land ownership and security of tenure

Some Australian investors have concerns about access to land. China's agricultural land is collectively owned, and investors can only have land-use rights rather than ownership. At present, China's agricultural land can only be leased and sub-leased in most cases, so land-use terms may be changed as required by the owners, some of whom do not have a strong concept of legal restraints to lease termination or transfer.

3. The development of agribusiness logistics

Some Australian firms are concerned that agribusiness logistics are still at an early stage of development in China, and they consider that the logistics of agricultural enterprises are imperfect and so increase the cost of logistics.

4. Enforcement of food quality regulations needs to be strengthened

Some Australian firms are concerned that consumers, both local and in many overseas markets, lack confidence in the labels of locally produced food, affecting export opportunities as well as local sales.

5. Concerns about the market for transferring rural land-use rights

Some Australian investors are concerned about the complexity of China's system of rural land contracting and managing rights, and the transfer of rural land-use rights (noting, however, that the *ownership* of the land cannot be transferred). They feel that the market for transferring rural land-use rights is underdeveloped.

(II) Challenges in technological cooperation in agriculture

Researchers in Australia generally view China as a favourable country for technical cooperation, particularly in agriculture, due to the country's rising science investment and capacity, and the increasing number of international cooperation schemes and frameworks. Opportunities for collaboration are likely to increase through the use of new technologies. Despite this, some research organisations and firms and their researchers within Australia's innovation system continue to perceive concerns about collaboration with China. These include:

- appropriate protection of intellectual property;
- identification of the most suitable research counterparts given the scale of the Chinese system; and
- uncertainty among some researchers that they are adequately equipped with the cultural and linguistic skills required to deal effectively with China.

III. Addressing these challenges

The perceptions outlined above indicate that the main barrier to greater Australian and Chinese cooperation in agriculture is a mutual lack of understanding of each country's legal and regulatory frameworks, technical capacities and cultural norms. This barrier will take time, patience and determination to break down. Governments on both sides can play their part by enhancing the transparency of investment decisions and by facilitating deeper networks among the commercial and research sectors. A number of the recommendations in Chapter 6 address these perceptions.

Chapter 5: Priorities for Australia–China investment and technological cooperation in agriculture

Investment in either Australia or China that leads to new agrifood productive capacity or enhances productivity will contribute to meeting both countries' domestic demand and, as importantly, demand in third countries, thus helping address global food security challenges. Similarly, technological cooperation can expand the opportunities for productivity-enhancing innovation that can be commercialised. Australia and China have identified a number of opportunities for cooperation that could improve productivity and expand production.

I. Investment

(I) Opportunities for Chinese investment in Australia

Chinese enterprises have good opportunities for investment in agriculture, including:

- Development of land resources and efficient crop production:
  - development of irrigation infrastructure to increase the area of land available for agricultural production in the Ord River basin and north Kimberley region, Carnarvon and the Pilbara;
  - further research and commercial demonstration to determine the extent to which irrigation infrastructure in northern Queensland, such as the Gulf and Gilbert river basins, can improve water use efficiency, expand the irrigation area and enlarge crop output; and
  - production of field crops, such as wheat and barley, and primary processing, warehousing and logistics of agricultural products.
- Animal husbandry production and processing:
  - construction of beef cattle farms, slaughter and packaging houses, beef by-product deep-processing plants and cold-chain logistics;
  - construction of facilities for fine breeding stock (including beef and dairy cattle) cultivation and export, and facilities for the production of animal embryos and frozen semen;
  - construction of cultivated pasture lands and the production of supplementary feeds for cattle; and
  - development of dairy farms and development of formula milk powder, cheese, butter, whey and other dairy products.
- Development of efficient tropical agricultural products:
  - construction of tropical fruit (including mango, avocado, mangosteen and banana) and vegetable production facilities that would include post-harvest processing and cold-chain logistics; and
  - construction of facilities to grow and process sugar and cassava, including the development of ethanol fuel.
- Offshore mariculture and fisheries:
  - offshore mariculture, such as lobsters, prawns and barramundi; and
  - cooperation under international and regional fisheries and marine living resources management agreements and bodies to ensure the sustainable management and conservation of fishery and other marine living resources.

- Processing of agricultural products with special characteristics:
  - grape planting and wine processing; and
  - processing of honey, mutton fat and fish oil.

Northern Australia: A promising region for agrifood development

Northern Australia is a promising region for agrifood investment. It is a relatively underdeveloped area of Australia that is located close to Asia and near important trade hubs. There is considerable scope to use land in northern Australia more efficiently and sustainably. Investment—in R&D, infrastructure, and agrifood production, processing and distribution—has the potential to deliver considerable productivity increases for cattle, sugar and other crops. This would expand production in Australia for local and overseas markets. Some potentially sensitive issues will need managing, such as indigenous land-use rights and environmental management. Investors may need to introduce agricultural techniques and technology that are new to the region.

Map 3: The Ord, Flinders and Gilbert Rivers of northern Australia

To be successful in northern Australia, a number of challenges need to be overcome. These include adequate access to water and productive soil, the large size of many rangeland cattle properties, the long distances between farms and ports, and, in some places, insufficient infrastructure.

Additional investment could lead to changes in the cattle industry, a mainstay in the region. This is currently based on the export of live animals that have been reared using natural feed. Expanding cattle numbers will require an increase in the supply of feed. Researchers are examining whether mosaic irrigation—small, dispersed areas of irrigated land intended to incorporate pastures and crops onto existing cattle farms—can be an effective "alternative to traditional large-scale, contiguous irrigation systems" (Paydar et. al. 2007). With additional investment in infrastructure, including one or more abattoirs in northern Australia, the region could export chilled beef. This would require export accreditation by authorities in both Australia and importing countries.

Kununurra diversion dam, Ord River Irrigation Area

Within northern Australia, a number of regional development projects are already underway or under consideration. The **Ord-East Kimberley Expansion Project** is a $506 million expansion (taking into account federal and state government funding) of the Ord River irrigation scheme. So far, 15,200 hectares of future agricultural land has been released, more than doubling the area of irrigated land. (On 20 November 2012, the Western Australian Government announced a Chinese company as the preferred proponent to lease and develop 13,400 hectares under the Ord-East Kimberley Expansion Project, with an estimated 1,700 hectares available to other producers.) Further expansion of the irrigation area, potentially by as much as 22,000 hectares, is under consideration.

Irrigation channel, Ord-East Kimberley Expansion Project

Elsewhere in Western Australia, the state government is expanding irrigation in the **Carnarvon** area. This will increase the area of irrigated land by up to 600 hectares. It is also working on a pilot project in the **Pilbara** to use for irrigation the groundwater that has been extracted during the process of open-cut mining (a process called 'mine dewatering'). The Pilbara pilot project will provide much needed information on the potential for irrigated agriculture opportunities in the Pilbara region. If results are favourable there is the potential for further joint State, Commonwealth and Chinese investment in development expansion. As well, Rio Tinto is looking to use groundwater from mine dewatering to cultivate hay on a 1,600 hectare area near one of its iron ore mines.

The **North Queensland Irrigated Agriculture Strategy** is a joint federal–state project assessing the potential for new irrigated agriculture. It is focused on an assessment of the potential for new irrigated agriculture in the Flinders and Gilbert basins in north-west Queensland. Under the project, CSIRO will test the long-term commercial viability and sustainability of a range of irrigated agriculture opportunities, including cotton, and assess potential environmental, economic and cultural impacts and risks under different climate and development scenarios. This work commenced in January 2012 and will conclude in December 2013.

Federal, state and territory governments have recognised the need for close coordination to manage the sustainable development of northern Australia. The **Northern Australia Ministerial Forum**, established in December 2010, is chaired by the Commonwealth Minister for Regional Australia, Regional Development and Local Government, and includes ministers from Queensland, Western Australia and the Northern Territory responsible for regional development in northern Australia.

(II) Opportunities for Australian investment in China

A major opportunity exists for Australian firms to provide services that will be in growing demand in connection with China's rapidly changing agrifood sector and which can improve productivity or expand agricultural production.

1. Distribution, logistics and supply-chain management

The demand in China for modern distribution services and more effectively managed supply chains, especially for refrigerated products, is growing. As the change in food shopping and consumption patterns accelerates toward a greater use of modern supermarkets and hypermarkets, the volume of food that is transported in China will grow markedly. This will require a high emphasis on timeliness, safety and high quality in food logistics.

2. Rural banking

In relation to the financing difficulty of smaller Chinese agribusiness firms and individual farmers, Australian financial service providers may be able to fill the gap. Some are already doing so in some regions in China.

3. Land remediation

The encroachment of cities and industrial zones onto farmland is a challenge for the Chinese Government. To maintain the amount of arable land, local governments at all levels will need to reclaim land previously used for activities such as dumping waste or mining—and this land will need to be remediated before it can be reclaimed for agricultural production. There would appear to be an opportunity for Australian firms who can provide these land remediation services to China. Australian firms have considerable expertise in the remediation of land used for mining land. New technologies make land remediation possible in two to three years.

4. Construction of Australian demonstration projects

Australian investors may find it advantageous to develop demonstration projects in China, either alone or with Chinese collaborators, to highlight Australian expertise in one or more of the following areas:

- an organic agricultural products demonstration plant;
- an Australian agricultural product exhibition and agricultural technique demonstration centre; and
- fish breeding and poultry raising demonstration projects focusing on transfer of Australian specialised techniques.

5. Direct investment projects to meet requirements of Chinese customers

To respond to changing consumer preferences in China, Australian companies could explore opportunities to develop enterprises to raise dairy cattle and process dairy products, especially whey and cheese.

Current status and investment opportunities for the industrial development of agriculture in Shanghai, Shandong, Anhui and Shaanxi

The Shanghai Municipal area is located in the Yangtze River estuary in the middle section of the coastline of the Chinese mainland. It has a total area of 6,340 square kilometres. The city vigorously develops urban modern agriculture integrating multiple functions such as production, ecology and lifestyle. In 2010, the value of output from agriculture, forestry and fisheries in Shanghai was 28.7 billion yuan ($4.4 billion). Shanghai made outstanding achievements in full-process control and supervision of the quality and safety of agricultural products. Shanghai will promote biological products, industrial-scale planting, intensive processing of agricultural products, greater use of information and other new technology in agriculture; develop a cyclic agricultural economy, popularise precision seeding and adopt combined planting and breeding, sustained resource utilisation and other ecological planting and breeding models; and actively promote an agricultural product processing industry, a modern seed industry, a circulation service industry and leisure agriculture.

Shandong Province is located on the eastern coast of China and in the lower reaches of the Yellow River. It has a total area of 156,700 square kilometres. It is one of China's most important grain production provinces and is also one of the main production areas of cotton, peanuts, vegetables, fruit and aquatic products. In 2010, the value of output from agriculture, forestry and fisheries in the province was 665.1 billion yuan ($101 billion). Shandong gives enormous support to scientific research and innovation for grains, breeding fine varieties, popularising

agricultural technologies, mechanising agriculture, and establishing a disaster prevention and reduction system and an agricultural eco-environment protection system. It actively promotes the construction of modern agriculture demonstration parks and accelerates the development of efficient, ecological high-end, high-quality agriculture, and ecological and recycling agriculture.

Anhui Province is located in the southeast of China. It has a total area of about 139,000 square kilometres. It is one of China's most important grain production provinces. In 2010, the value of output from agriculture, forestry and fisheries in the province was 295.5 billion yuan ($45.1 billion). Anhui actively promotes the development of its seed industry, cultivating and strengthening animal husbandry, aquatic products, vegetable and other leading industries; is vigorously developing corn and japonica rice production, processing of coarse food grain, fine processing and feed processing; and accelerates the development of urban efficient agriculture and actively develops dryland farming and water-saving agriculture, facility agriculture and ecological agriculture.

Shaanxi Province is located in the hinterland of China and the middle reaches of the Yellow River. It has a total area of 205,600 square kilometres. The province has four large agricultural areas: Guanzhong Plain, where dryland farming is dominant; the north Shaanxi area, where extensive cultivation, extensive dryland farming and animal husbandry prevail; Hanzhong Basin in south Shaanxi, enjoying a lasting reputation of "a land flowing with milk and honey"; and the Qinling Mountain area. In 2010, the value of output from agriculture, forestry and fisheries for the province was 166.6 billion yuan ($25.4 billion). Shaanxi supports the role of the Yangling Agricultural Hi-tech Industries Demonstration Zone, focuses on four major sectors including grain, fruit, livestock and vegetable, attaches importance to promoting the development of selection and breeding of fine agricultural varieties, water-saving irrigation, new-type planting, popularisation of science and technology, machine application, and meteorological disaster monitoring and early warning systems, steadily develops vegetable facilities, improves the modern agricultural industrial system and strengthens the development of agricultural product processing, storage and transport systems.

Demonstrating how to utilise agricultural resources efficiently: the Shouguang model for agricultural development

Shouguang, located in the centre of Shandong Peninsula, has an area of 2,180 square kilometres, and a permanent population of more than one million. In 2011, the gross output value of farming, forestry, animal husbandry and fishery of Shouguang reached almost 7.3 billion yuan ($1.1 billion). Shougang has a crop planting area of 1.4 million *mu* (about 93,333 hectares) and a total output of 663,000 tonnes; and a vegetable and fruit planting area of 856,000 *mu* (more than 57,000 hectares) and total output of 4.4 million tonnes. It has introduced 57 investment projects with a total investment of 1.1 billion yuan ($168 million). Shouguang has become one of China's major vegetable distribution centres with a total annual transaction volume of more than 5.2 million tonnes and a transaction value of more than 10 billion yuan ($1.5 billion).

Fruit trees being cultivated in greenhouses in Shouguang

By developing greenhouses, three-dimensional planting and counter-seasonal production, Shouguang has effectively conserved arable land, while improving the land utilisation and output rate. Agricultural technologies, efficient cultivation, and water and fertiliser control have played an important role in Shouguang's vegetable production, with the result that unit production has increased by five to ten times, significantly increasing the land output rate. Today Shouguang has promoted more than 300 kinds of new technologies such as greenhouse drip irrigation, more than 1,000 new varieties and more than 30 new planting techniques, with about 95 per cent of farms using advanced technology and 98 per cent using improved varieties. The contribution of technical progress to agricultural growth reached 67 per cent.

II. Technological cooperation

Priority areas where further bilateral cooperation would be desirable include:

- Sustainable agricultural technologies:
  - agricultural resource use efficiency;
  - soil improvement;
  - dryland farming and water-saving irrigation agriculture;
  - climate change impacts on agricultural productivity;
  - biopesticides and biofertilisers; and
  - land development and application of efficient land use technologies.
- Plant genetic resources:
  - breeding high yield, good quality, drought- and disease-resistant crop strains; and
  - exchanging plant genetic material, including the key crops of wheat, rice, sugarcane and cotton.
- Biosecurity risk mitigation and food safety:
  - rapid diagnosis and drug residues analysis of plant and animal diseases and pests; and
  - research and development into biosecurity threat management, veterinary drugs, vaccines and forage additives.
- Key technology and facilities for agricultural product processing:
  - technology and equipment development and application.
- Animal genetic resources:
  - transfer of fine genetic breeding stock and embryos of breeding stock as well as frozen semen production, focusing on dairy cows and beef cattle.
- Environmental remediation technologies:
  - water treatment; and
  - land remediation.
- Remote sensing technologies for agriculture:
  - software for remote sensing and satellite positioning and monitoring;
  - livestock identification and tracing systems, including virtual fencing; and
  - precision agriculture.
- Intellectual property commercialisation and licensing:
  - commercialisation of intellectual property (including patented and proprietary technologies) such as artificial reproductive technology for lobsters.

Research and commercialisation of sorghum gene varieties

The Queensland Government is looking at ways to partner with China to identify the most resilient gene varieties of sorghum for growth in marginal climatic/land conditions and for mainstream food production. Sorghum is a gluten-free grain. Due to its drought tolerance and adaptation attributes, sorghum can be grown in those areas where agricultural and environmental conditions are unfavourable for the production of other crops.

Major components of this research could include:

- identifying suitable quality sorghum, then milling and testing sorghum flour as an appropriate input for Australian/Chinese bakery/food industry requirements;
- isolating and identifying health components in sorghum so as to improve sorghum quality;
- studying the structure and functional relationship of sorghum's major constituents (e.g. protein and starch) to establish ingredient and processing interactions for sorghum's optimal use in food;
- working on product development solutions that industry can easily adapt to current and future production; and
- undertaking digestibility studies to assess how best to utilise the health benefits available in sorghum.

Establish a platform for Australia–China joint study on agriculture in arid and semi-arid areas

Yangling Agricultural Industries Demonstration Zone (Yangling Demonstration Zone) is located in the centre of Guanzhong Plain, Shaanxi Province, covering an area of 135 square kilometres in total. It is a state-level agricultural high-tech demonstration zone, crowned as China's Agricultural Science City. Relying on the academic forces of the Northwest Agriculture and Forestry University and other scientific institutions, Yangling Demonstration Zone has made great achievements in dry land crop cultivation, animal and plant genetic breeding, soil and water preservation and ecological restoration, plant protection, prevention and cure of important animal epidemic diseases, and other fields.

In 2011 the gross output value of farming, forestry, animal husbandry and fishery in Yangling Demonstration Zone reached 877 million yuan ($134 million). In the past five years, Yangling Demonstration Zone has: delivered more than 2,400 technical results and patent applications; introduced 15.7 billion yuan ($2.4 billion) of investment in total; set up more than 260 demonstration and promotion bases covering an area of 45 million *mu* (3 million hectares) and created demonstration and promotional benefits of more than 12 billion yuan ($1.8 billion); and promoted more than 1,000 practical technologies and new breeds, allowing for the development of industries of improved varieties of crops, vegetables, seedlings, breeding of improved varieties of pig and meat cattle, flowers, edible fungus, commercial forests and orchards and a batch of industrial chains.

Joint High-Technology Display Centre, Yangling

In addition, Yangling has successfully held 18 sessions of agricultural high-tech fairs. At the 18th Agricultural High-tech Fair, a total of 1,750 exhibition booths were set up, displaying more than 7,500 high-tech results, attracting about 1.6 million people from 30 countries and regions. At the fair, a total of 56.6 billion yuan ($8.6 billion) of investment and commercial transactions were concluded.

Chapter 6: Conclusions and recommendations to ministers

I. Conclusions

In undertaking this study, Australia and China have been guided by the overarching principle of cooperation for mutual advantage. It is our conclusion that Australia–China cooperation in agriculture has a sound foundation and bright future prospects. Further enhancing bilateral cooperation in investment, agricultural resources development, technological innovation and agrifood services will improve agricultural productivity in both countries and contribute to improving global food security.

Our overall objective is to establish a best-practice approach to Australia–China cooperation in:

- investing in new agricultural productive capacity, or agricultural investments that enhance productivity, in both Australia and China, with the resulting produce to be available for sale on world markets; and
- promoting the commercialisation of Australian and Chinese agricultural technology and services to raise productivity in both countries and the world.

A number of factors make it important to agree on clear guiding principles at the outset of this new cooperative partnership between Australia and China. Investment in agribusiness is an inherently long-term venture with few opportunities for large short-term gains. Success requires complex policy coordination at various levels of government in both countries, as well as enhancing public awareness and understanding of the benefits of foreign investment.

These guiding principles can be summarised as follows:

- Australia and China see the development of long-term, mutually beneficial cooperation on agrifood for supply to world markets as an important next step in diversifying a high-quality, complementary economic relationship.
- Australia and China recognise the importance of developing long-term sustainable policy approaches by building cooperation in stages and at a pace suited to the particular national situations, institutions and relative economic advantages of both countries.
- Australia and China recognise the valuable role of joint commercialisation of agricultural technologies to ensure the uptake of food security-related innovation within a framework of protection and management of intellectual property.
- In Australia, the transparency of the scale and nature of investment intentions and a focus on developing large-scale projects on underdeveloped land, particularly in northern Australia, will be important in promoting public understanding of foreign investment in Australia and providing confidence to Chinese investors.
- The demonstration effect is a valuable tool in developing agribusiness, and so Australia and China should work to improve the coordination of agrifood-related research and development priorities between key research organisations.
- Both governments have an important role to play in improving investment certainty by supporting pilot projects and addressing regulatory concerns, but bilateral cooperation on agribusiness will only be successful in the long term if Australian and Chinese companies make sound commercial decisions.

- The initial geographic focus of investment cooperation will be, in Australia, northern Australia (Queensland, Western Australia and the Northern Territory); and, in China, Shanghai Municipality, Shandong Province, Anhui Province and Shaanxi Province. However, cooperation will not be limited to these areas only.
- The initial focus of cooperative investment activities will be large-scale agricultural water and soil resources development in northern Australia; promotion and application of proprietary technologies and new varieties in agricultural product processing (including beef and sheep meat); aquaculture (including tropical rock lobster farming); and building modern agricultural logistics systems.
- The initial focus of technological cooperation will be sustainable agriculture; plant genetic resources; plant biosecurity; animal disease control and health; plant biotechnology; agricultural processing technologies; animal genetic resources; environmental remediation; remote sensing technologies for agriculture; and supply-chain development and improvement.

II. Recommendations

(I) Investment

- Both countries should make relevant improvements in providing comprehensive information on the regulatory environment (including environment protection, land and water resource management, quarantine and food safety, tax policies and legal systems). This includes:
  - tailoring the relevant government websites/portals to provide timely information on agribusiness investment opportunities, and detailed procedures on making investment in the two countries, including links to the relevant sections of state, territory and provincial websites of both countries as well as relevant regulators, industry associations and other important stakeholders.
- The Northern Australia Ministerial Forum should consider holding a joint meeting with counterpart Chinese provincial ministers to discuss and review initial results, and explore further opportunities for cooperation and investment.
- Both countries should support annual delegation visits by potential investors in both countries to learn from the results of cooperation on joint pilot projects and other activities in order to develop new investment opportunities.
- Both countries should encourage new entrants to the agribusiness markets to make use of the services provided by the Australia–China Business Council, the Australian National Farmers' Federation, the Australian Food and Grocery Council and equivalent Chinese business groups to assist them to understand better the requirements of good corporate citizenship.
- Australia's national, state and territory governments should strengthen cooperation to reduce regulatory duplication, particularly in environmental protection requirements as agreed by the Council of Australian Governments.
- The Australian Government should continue to make transparency in foreign investment in the agricultural sector a high priority, including through measures such as the refined and ongoing surveys by the Australian Bureau of Statistics and the development of the national foreign ownership register for agricultural land announced by the Prime Minister on 23 October 2012.

- Prospective investors need first to consider the employment of suitably skilled Australian workers in new agricultural developments. If a sufficient number of suitably skilled Australian workers cannot be found, prospective investors should utilise existing migration arrangements to address any labour shortfall. The Australian Government will provide guidance on how the current policies can be used to achieve this outcome.
- Both countries should ensure quarantine and food safety systems are efficient and effective so that new—and existing—agriculture investors in Australia and China are able to sell their products in foreign markets.
- The Australian Government should identify, with relevant Australian state and territory governments, appropriate pilot projects to demonstrate the feasibility of joint development of irrigated broadacre cropping, including the feasibility of mosaic irrigation.

(II) Technological and services cooperation

- Australia and China should further clearly define the organisations undertaking technological cooperation and key research projects and publish a joint audit of cooperative research in English and Chinese.
- Australia and China should explore the feasibility of establishing a joint research centre with a robust commercialisation capability in order to:
  - fully explore the opportunities for commercialisation in the existing research cooperation between Australian and Chinese researchers;
  - match capital, markets, technology and services;
  - improve intellectual property protection; and
  - coordinate dialogue on successful commercial adaptation of technology between Australian Government organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Commercialisation Australia and Austrade, and relevant Chinese counterparts.
- Australia and China should encourage the use of centres of excellence and demonstration projects in both Australia and China to showcase innovation, explore best-practice management and enhance prospects for commercialisation and licensing of technologies developed through those centres and projects.
- Australia and China should support annual business-focused technology and services delegation visits to learn from the results of cooperation on joint research projects and other activities in order to develop new joint commercialisation opportunities, and to explore opportunities for more effective delivery of services to enhance agrifood productivity, such as logistics and supply-chain management.
- Encourage Australian financial services providers to look at opportunities to expand their rural banking where this would strengthen investment and technological services in China.
- Australia and China should explore the possibility of holding a 'China Day' at a future Australian Bureau of Agricultural and Resource Economics and Sciences conference.

(III) Joint consultative mechanisms

- Both countries should make maximum use of the existing economic, trade and agriculture official consultation mechanisms, including the Joint Ministerial Economic Commission and the Joint Agricultural Commission, to research and promote bilateral cooperation on food security, and hold regular high-level discussions about bilateral cooperation on food security.

Statistical annex

1. Agriculture in China*

(1) Basic overview

Total land area (10,000 km²)	960
Cultivated land (10,000 hectares)	12,172
Grass land (10,000 hectares)	33,100
Area of sea (10,000 km²)	473
Length of coastline (km)	32,000
Water resources (100 million m³)	30,906
Population (10,000 people)	134,735
Agrifood enterprises	378,711

Note: China has no official statistics for arable land; the international and Chinese definitions of arable land are basically the same.

Sources: *China Statistical Yearbook, 2011* and *China Basic Statistical Units Yearbook, 2011*

(2) Total output and composition of farming, forestry, animal husbandry and fisheries

(100 million yuan)

Year	Gross output value				
	Total	Farming	Forestry	Animal husbandry	Fisheries
2002	27,390.8	14,931.5	1,033.5	8,454.6	2,971.1
2003	29,691.8	14,870.1	1,239.9	9,538.8	3,137.6
2004	36,239.0	18,138.4	1,327.1	12,173.8	3,605.6
2005	39,450.9	19,613.4	1,425.5	13,310.8	4,016.1
2006	40,810.8	21,522.3	1,610.8	12,083.9	3,970.5
2007	48,893.0	24,658.1	1,861.6	16,124.9	4,457.5
2008	58,002.2	28,044.2	2,152.9	20,583.6	5,203.4
2009	60,361.0	30,777.5	2,193.0	19,468.4	5,626.4
2010	69,319.8	36,941.1	2,595.5	20,825.7	6,422.4
2011	81,303.9	41,988.6	3,120.7	25,770.7	7,568.0

Sources: *China Statistical Yearbook, 2011* and the outline of *China Statistical Yearbook, 2012*

* Note that China uses ten thousand (10^4) and one hundred million (10^8) as standard quantities whereas Australia uses one thousand (10^3), one million (10^6) and one billion (10^9).

(3) Number of agrifood enterprises, 2010

Agriculture, forestry and fishery	**185,917**
Agriculture	64,756
Forestry	18,843
Animal husbandry	65,989
Fishery	13,983
Service activities for agriculture, forestry, animal husbandry and fishery	22,346
Manufacturing	**192,764**
Processing of food from agricultural products	108,825
Manufacture of foods	46,556
Manufacture of beverages	37,383

Source: *China Basic Statistical Units Yearbook, 2011*

(4) Output of major farm products

(10,000 tonnes)

Year	Grain							Sugarcane	Fruits
	Total grain	Cereal				Beans	Tubers		
		Total cereal	Rice	Wheat	Corn				
2002	45,705.8	39,798.7	17,453.9	9,029.0	12,130.8	2,241.2	3,665.9	9,010.7	6,952.0
2003	43,069.5	37,428.7	16,065.6	8,648.8	11,583.0	2,127.5	3,513.3	9,023.5	14,517.4
2004	46,946.9	41,157.2	17,908.8	9,195.2	13,028.7	2,232.1	3,557.7	8,984.9	15,340.9
2005	48,402.2	42,776.0	18,058.8	9,744.5	13,936.5	2,157.7	3,468.5	8,663.8	16,120.1
2006	49,804.2	45,099.2	18,171.8	10,846.6	15,160.3	2,003.7	2,701.3	9,709.2	17,102.0
2007	50,160.3	45,632.4	18,603.4	10,929.8	15,230.0	1,720.1	2,807.8	11,295.1	18,136.3
2008	52,870.9	47,847.4	19,189.6	11,246.4	16,591.4	2,043.3	2,980.2	12,415.2	19,220.2
2009	53,082.1	48,156.3	19,510.3	11,511.5	16,397.4	1,930.3	2,995.5	11,558.7	20,395.5
2010	54,647.7	49,637.1	19,576.1	11,518.1	17,724.5	1,896.5	3,114.1	11,078.9	21,401.4
2011	57,120.8	51,939.4	20,100.1	11,740.1	19,278.1	1,908.4	3,273.0	12,516.5	22,768.2

Sources: *China Statistical Yearbook, 2011* and the outline of *China Statistical Yearbook, 2012*

(5) Output of major livestock products

(10,000 tonnes)

Year	Meat					Milk		Poultry/ eggs	Honey
	Total	Pork/beef/ mutton	Pork	Beef	Mutton	Total	Cows' milk		
2002	6,234.3	4,928.4	4,123.1	521.9	283.5	1,400.4	1,299.8	2,265.7	26.5
2003	6,443.3	5,089.8	4,238.6	542.5	308.7	1,848.6	1,746.3	2,333.1	28.9
2004	6,608.7	5,234.3	4,341.0	560.4	332.9	2,368.4	2,260.6	2,370.6	29.3
2005	6,938.9	5,473.5	4,555.3	568.1	350.1	2,864.8	2,753.4	2,438.1	29.3
2006	7,089.0	5,591.0	4,650.5	576.7	363.8	3,302.5	3,193.4	2,424.0	33.3
2007	6,865.7	5,283.8	4,287.8	613.4	382.6	3,633.4	3,525.2	2,529.0	35.4
2008	7,278.7	5,614.0	4,620.5	613.2	380.3	3,781.5	3,555.8	2,702.2	40.0
2009	7,649.7	5,915.7	4,890.8	635.5	389.4	3,677.7	3,518.8	2,742.5	40.2
2010	7,925.8	6,123.1	5,071.2	653.1	398.9	3,748.0	3,575.6	2,762.7	40.1
2011	7,957.8	6,093.7	5,053.1	647.5	393.1	3,810.7	3,657.8	2,811.4	43.1

Sources: *China Statistical Yearbook, 2011* and the outline of *China Statistical Yearbook, 2012*

(6) Output of major aquatic products

(10,000 tonnes)

Year	Total	Saltwater aquatic products			Fresh water aquatic products		
		Total	Wildcatch	Farmed	Total	Wildcatch	Farmed
2002	3,954.9	2,298.5	1,238.0	1,060.5	1,656.4	194.7	1,461.7
2003	4,077.0	2,332.8	1,237.0	1,095.9	1,744.2	213.3	1,530.9
2004	4,246.6	2,404.5	1,253.2	1,151.3	1,842.1	209.6	1,632.5
2005	4,419.9	2,465.9	1,255.1	1,210.8	1,954.0	221.0	1,733.0
2006	4,583.6	2,509.6	1,245.4	1,264.2	2,074.0	220.4	1,853.6
2007	4,747.5	2,550.9	1,243.6	1,307.3	2,196.6	225.6	1,971.0
2008	4,895.6	2,598.3	1,258.0	1,340.3	2,297.3	224.8	2,072.5
2009	5,116.4	2,681.6	1,276.3	1,405.2	2,434.8	218.4	2,216.5
2010	5,373.0	2,797.5	1,315.2	1,482.3	2,575.5	228.9	2,346.5
2011	5,603.2	2,908.1	1,356.7	1,551.3	2,695.2	223.2	2,471.9

Sources: *China Statistical Yearbook, 2011* and the outline of *China Statistical Yearbook, 2012*

(7) Overview of China's agricultural trade
(US$100 million)

	2005	2006	2007	2008	2009	2010	2011
Total	558.3	630.2	775.9	985.1	913.6	1,208.0	1,540.4
Exports	271.8	310.3	366.2	401.9	391.9	488.8	601.3
Imports	286.5	319.9	409.7	583.2	521.7	719.2	939.1

Source: *China monthly statistical report on agricultural products trade, 2005–11*

(8) China's agricultural exports by region
(US$100 million)

	2005	2006	2007	2008	2009	2010	2011
Asia	1,794,558	1,910,021	2,203,658	2,252,845	2,325,475	2,923,627	3,630,740
Africa	66,051	88,829	113,660	154,807	157,706	178,785	243,022
Europe	449,680	552,499	701,350	829,937	724,013	879,059	1,053,838
Latin America	52,162	80,834	89,287	131,410	107,671	162,635	210,098
North America	322,086	422,718	494,117	577,569	536,302	658,080	761,168
Oceania	33,861	47,687	59,867	75,698	70,198	86,134	111,962

Source: *China monthly statistical report on agricultural products trade, 2005–11*

(9) China's agricultural imports by region
(US$100 million)

	2005	2006	2007	2008	2009	2010	2011
Asia	564,619	792,264	1,009,321	1,243,143	1,119,515	1,621,185	2,117,067
Africa	107,178	120,092	93,458	92,985	116,186	154,833	224,979
Europe	338,263	367,452	450,060	532,347	504,470	682,909	943,320
Latin America	753,104	768,222	1,153,468	1,948,462	1,421,581	1,948,547	2,512,170
North America	789,491	842,408	1,040,848	1,619,633	1,669,144	2,166,862	2,644,927
Oceania	312,059	308,324	349,519	397,495	386,647	615,909	946,298
Other countries	49	6	77	10	2	126	10

Source: *China monthly statistical report on agricultural products trade, 2005–11*

(10) China's agricultural trade with Australia

(US$10,000)

	2005	2006	2007	2008	2009	2010	2011
Exports	27,719	36,291	45,036	58,280	56,696	68,299	89,850
Imports	240,621	232,323	261,228	293,391	249,038	393,045	644,102

Source: *China monthly statistical report on agricultural products trade, 2005–11*

(11) Chinese direct investment in Australia

(US$10,000)

	2005	2006	2007	2008	2009	2010	2011
Flow	19,307	8,760	53,159	189,215	243,643	170,170	316,529
Stock	58,746	79,435	144,401	335,529	586,310	786,775	1,104,125

Source: *Statistical bulletin of China's outward foreign direct investment, 2009–11*

2. Agriculture in Australia

(1) Basic data

Population, 2011 ('000)	**22,485**
Population share aged 0–14, 2010–11 (%)	19
Population share aged 65+, 2010–11 (%)	14
Urban population, 2011 (%)	89.2
Rural population, 2011 ('000)	2,441
GDP, 2011–12 ($ billion)	**1,441**
GDP average growth rate, 2007–11 (%)	2.6
GDP per capita, 2011–12 ($)	64,088
Agriculture share of GDP, 2011 (%)	2.4
Total land area ('000 ha)	**768,230**
Arable land area, total ('000 ha)	47,161
Arable land area, per capita (ha)	2.1
Pastoral land area ('000 ha)	361,518
Length of coastline (km) (including islands)	**59, 736**
Marine area, including EEZ (km²)	10,000,000
Number of farming enterprises (2009–10)	**134,553**
Grazing*	104,867 (78%)
Cropping*	69,058 (51%)
Horticulture*	22,345 (16%)
Average holding size of farming enterprises (ha)	
(Mainly) Grazing**	3,341
(Mainly) Cropping***	482

Notes:

* A number of Australian farming enterprises engage in both grazing and cropping, so appear in both categories in this data.

** Average size of grazing properties varies significantly by location within Australia depending on different pasture stock carrying capacity – from average 8,662 ha in Western Australia (within which there are also regional variations) to average 1,298 ha in New South Wales.

*** The average size of cropping properties also varies significantly, depending on location within Australia (for example, different in WA compared to Tasmania), crop type and local agronomic conditions, ranging from small horticultural operations (such as wine grapes) to large broadacre cropping (such as for wheat, barley, sorghum, and oilseeds).

Sources:

UN, *World Urbanization Prospects: The 2011 Revision*

ABS, *Year Book of Australia 2012*, 1301.0, May 2012

FAO, FAOSTAT database, May 2012

ABS, *Agricultural Commodities* 2009–10, 7121.0, April 2011

ABS, *Land Management and Farming in Australia*, 2009–10, 46270DO001, June 2011 (Table 1)

(2) Agricultural and fisheries production and composition, 2010–11
(1,000 tonnes)

Grains	Wheat	27,891
	Rice	726
	Maize	351
	Barley	8,145
Oilseeds & pulses	Soybeans	47
	Canola	2,382
	Cottonseed	1,269
	Pulses	2,303
Sugar cane (cut for crushing)		27,443
Sugar, raw (after crushing)		4,472
Horticulture	Potatoes	1,217
	Grapes (for wine)	1,563
	Apples	234
	Oranges	277
Meat	Pork	342
	Poultry meat	1056
	Beef & veal	2,133
	Sheepmeat (mutton & lamb)	514
Dairy products	Cow milk, liquid	9,102
	Whole milk powder	151
	Skim milk powder	222
	Butter	122
	Cheese	338
Fisheries*	Wild catch	172
	Aquaculture production	74
Livestock slaughtered ('000 head)	Pigs	4,643
	Cattle & calves	8,097
	Sheep & lambs	23,221
	Poultry	550,000

*Fisheries data for 2009–10

Sources:
DAFF, *Australian Food Statistics 2010–11* (Canberra, 2012), Tables 1.1, 2.3 and 2.4
ABARES, *Australian Fisheries Statistics 2010* (Canberra, 2011), Tables 2, 7–13

(3) Australia's agrifood trade with the world, 2011
($ million)

Key imports	Value
Fish & seafood	1,304
Alcoholic spirits (e.g. whisky)	560
Wine (of grapes)	514
Pork, fcf	417
Coffee	410
Bakery goods (bread, biscuits etc.)	436
Cheese	394
Chocolate & cocoa preps	391
Sauces, condiments	262
Waters, natural, mineral, aerated etc.	250
Nuts, fresh or dried	239
Fruit & vegetable juices	211
Beer	189
Sugar confectionery (w/o cocoa)	177
Rice	159

Key exports	Value
Wheat	6,076
Beef & veal, fcf	4,684
Wine (of grapes)	1,922
Sheepmeat, fcf	1,645
Barley	1,378
Rapeseed/ canola seed	1,106
Live animals	1,071
Fish & seafood	1,062
Milk powder	960
Pulses	786
Cheese	754
Sugar, bulk raw	1,322
Edible offal (bovine, ovine)	545
Fats, bovine/ovine, raw/rendered	389
Malt, barley	317

Notes: fcf = fresh, chilled or frozen; preps = preparations
Source: DFAT STARS Database, based on ABS data June 2012

(4) Australia's key agrifood trading partners, 2011

($ million)

Trading partner	Exports	Principal items	Imports	Principal items
Japan	4,530	beef & veal, fcf (1,656); wheat (463); cheese (398); lucerne & other feed (334); barley (270)	74	sauces & condiments (17); molluscs fcf/dried (9); fish, noodles (3); beer (3)
New Zealand	1,407	wheat (154); chocolate/ cocoa preps (106); raw sugar (99); bakery prods (87); wine (71)	2,100	wine (279); cheese (201); bakery prods (99); chocolate (84)
United States	2,152	beef & veal, fcf (743); wine (504); sheepmeat fcf (451); wheat gluten (137)	1,204	pork fcf (173); alcoholic beverages (129); grapes fresh/dried (61)
China	1,940	barley (367); wheat (215); wine (196); bovine/ovine fat (190); malt extract (126); M&C, fcf/dried (120)	823	M&C, fcf/dried (133); sugar confectionery (64); bakery prods (60); fruit juices (58)
Indonesia	2,269	wheat (1,117); raw sugar (304); live cattle (275); beef & veal, fcf (171); milk powder (121)	191	coffee (28); bakery prods (20); cocoa butter (20); pasta (17)
Republic of Korea	2,336	beef & veal, fcf (773); wheat (573); raw sugar (433); malt (75)	70	pasta (12); extracts of coffee/tea (10); bakery prods (6); waters, sugared (5)
Singapore	888	milk powder (125); bovine/ ovine fat (106); raw sugar (93); beef & veal fcf (71); pork fcf (52)	733	food preps for making non-alcoholic beverages (489); cocoa paste, butter & powder (101);
Thailand	572	wheat (220); malt (63); milk powder (45); malt extract (40); beef & veal fcf (25)	821	fish, M&C prep/pres (287); rice (90); sugar (79)
Malaysia	833	wheat (303); beef & veal fcf (60); sheepmeat fcf (48); raw sugar (67); malt extract (47)	492	palm oil (112); cocoa paste, butter & powder (44); margarine (34)
Vietnam	886	wheat (695); malt (47); crustaceans, fcf/dried (30); milk powder (17)	316	cashews (94); fish fillets fcf (61); fish, M&C prep/ pres (58)
Netherlands	792	rape/canola seeds (635); wine (66)	251	coffee/tea extracts (71); beer (13)
Hong Kong (SAR of China)	1,000	M&C, fcf/dried (372); bovine/ovine offal (74); wine (72); beef & veal fcf (71)	40	sauces & condiments (18); sugar confectionery (4); bakery prods (4)

Notes: M&C = molluscs and crustaceans, fc = fresh or chilled; fcf = fresh, chilled or frozen; prep/pres = prepared or preserved

Source: DFAT STARS Database, based on ABS data June 2012

(5) Foreign direct investment in Australia by industry division

($ million)

Industry	2007	2008	2009	2010
Agriculture, forestry and fishing	697	740	691	669
Mining	105,109	122,683	141,234	151,065
Manufacturing	69,014	71,506	83,314	88,481
Electricity, gas and water	9,292	7,581	9,060	9,587
Construction	21,765	14,561	15,679	16,886
Wholesale and retail trade	30,126	31,826	38,259	44,500
Accommodation, cafes and restaurants	4,951	5,082	5,390	5,855
Transport and communication	56,743	48,106	46,738	43,331
Finance and insurance	54,728	53,104	60,196	67,653
Property and business services	18,197	19,693	21,469	25,174
Other services	787	1,543	1,572	1,627
Unallocated	25,442	20,090	17,037	18,845
Total	**396,852**	**396,515**	**440,641**	**473,673**

Source: ABS, 53520 – *International Investment Position, Australia: Supplementary Statistics, 2010*, Table 15a, Canberra, July 2011

(6) Total foreign investment in Australia by level of investment, 2005–11 (major countries)
($ million)

	2005	2006	2007	2008	2009	2010	2011	% share 2011
United States	333,987	383,053	441,121	443,416	516,914	548,194	555,868	27.4
United Kingdom	299,740	359,632	411,702	440,700	496,561	475,473	470,846	23.2
Japan	51,023	51,679	63,380	89,033	102,910	119,071	123,410	6.1
Singapore	19,665	27,436	39,168	43,259	41,071	41,965	48,709	2.4
Netherlands	28,704	31,045	34,365	28,526	42,156	41,518	43,706	2.2
Switzerland	19,945	28,748	30,395	37,248	32,318	41,601	42,281	2.1
Hong Kong (SAR of China)	31,571	38,873	45,933	55,671	41,504	39,565	39,416	1.9
New Zealand	27,248	35,711	42,861	28,546	31,591	34,299	29,707	1.5
Canada	13,372	12,489	10,776	15,070	19,148	18,717	25,048	1.2
Luxembourg	4,502	5,722	6,397	8,471	14,411	17,523	23,542	1.2
Germany	21,061	24,670	34,414	38,849	39,550	41,583	22,491	1.1
France	16,331	23,197	25,267	29,723	23,593	24,721	20,036	1.0
China	2,274	3,508	6,187	8,417	16,487	19,467	19,047	0.9
Malaysia	5,514	5,523	6,767	10,058	8,786	8,410	13,987	0.7
Thailand	207	294	338	882	1,268	4,962	13,408	0.7
Republic of Korea	900	4,959	7,796	7,178	9,206	9,250	12,772	0.6
Belgium	23,090	24,200	11,686	11,954	13,242	14,336	12,672	0.6
India	322	609	np	np	np	np	10,954	0.5
Bermuda	5,362	6,506	9,634	9,148	12,169	10,074	8,743	0.4
Austria	np	np	np	np	3,759	4,011	5,746	0.3

Notes: Due to the high degree of confidentiality in Australian investment statistics, the above table omits countries where confidentiality prevents the release of figures.

np not published.

Source: ABS, 53520 – *International Investment Position, Australia: Supplementary Statistics, 2011*, Table 2, Canberra, May 2012

(7) Foreign direct investment (FDI) in Australia by level of investment, 2005–11 (major countries)
($ million)

	2005	2006	2007	2008	2009	2010	2011	% share 2011
United States	75,554	86,599	100,891	100,400	100,271	116,947	122,379	24.1
United Kingdom	52,501	55,822	62,409	59,565	61,468	54,402	69,747	13.7
Japan	21,403	23,819	31,100	36,677	45,643	51,103	52,334	10.3
Netherlands	21,365	24,633	24,833	19,188	32,433	30,199	32,870	6.5
Switzerland	11,821	16,646	16,366	19,521	17,772	20,903	23,005	4.5
Singapore	4,201	5,590	14,189	10,415	16,512	18,791	19,966	3.9
Canada	6,070	7,661	7,232	7,287	11,646	12,811	17,326	3.4
Virgin Islands, British	np	np	np	np	np	np	np	—
Germany	9,754	10,558	19,778	15,503	18,113	16,818	14,333	2.8
China	np	550	np	3,643	9,058	12,947	13,354	2.6
Bermuda	846	1,229	5,550	5,814	9,654	8,463	7,791	1.5
France	9,468	11,743	12,620	12,905	13,020	12,996	6,777	1.3
Hong Kong (SAR of China)	np	4,758	7,211	9,093	5,440	6,631	6,714	1.3
New Zealand	6,981	9,566	7,785	5,606	6,180	6,363	5,980	1.2
Belgium	np	2,286	2,887	5,227	5,614	6,189	5,622	1.1
Luxembourg	np	np	np	np	3,239	1,459	2,344	0.5
South Africa	np	np	992	1,273	1,466	1,643	1,729	0.3
Sweden	1,249	1,470	1,661	1,696	1,341	1,750	1,524	0.3
Ireland	1,112	np	np	np	894	348	104	0.0
Vietnam	-1	np	np	np	np	1	1	0.0

Notes: Due to the high degree of confidentiality in Australian investment statistics, this table omits countries where confidentiality prevents the release of figures.

np Not published.

Source: ABS, 53520 – *International Investment Position, Australia: Supplementary Statistics, 2011*, Table 2, Canberra, May 2012

(8) Australian total investment abroad by level of investment, 2005–11 (major countries)
($ million)

	2005	2006	2007	2008	2009	2010	2011	% share 2011
United States	303,118	352,765	412,459	399,743	397,801	403,554	410,612	34.9
United Kingdom	88,625	130,427	137,958	163,337	178,799	193,030	192,944	16.4
New Zealand	61,512	69,420	72,045	68,313	79,915	75,139	74,267	6.3
Canada	11,856	26,856	31,463	39,491	36,047	37,396	43,476	3.7
Germany	18,051	25,653	38,475	26,737	38,385	37,808	36,260	3.1
Japan	31,752	41,633	37,256	31,912	33,643	30,924	34,595	2.9
France	np	23,035	33,907	37,566	28,784	30,118	27,245	2.3
Netherlands	26,121	32,115	35,866	31,040	26,436	24,230	26,875	2.3
Singapore	9,049	15,102	18,493	23,010	22,090	26,041	21,350	1.8
Hong Kong (SAR of China)	10,398	16,492	17,451	20,773	30,301	29,434	20,386	1.7
Switzerland	4,522	9,999	17,232	15,446	16,300	20,006	18,777	1.6
China	2,034	3,043	5,993	7,141	6,547	12,024	16,994	1.4
Brazil	878	1,209	2,223	2,441	19,064	22,588	16,449	1.4
Papua New Guinea	2,061	3,278	3,436	3,569	5,209	15,689	16,202	1.4
Luxembourg	1,773	1,869	2,670	6,056	8,726	11,499	13,279	1.1
Bermuda	4,127	5,710	7,491	7,879	10,308	11,796	11,117	0.9
Denmark	1,083	1,107	1,259	875	12,092	13,931	8,781	0.7
Republic of Korea	4,728	6,898	9,212	7,575	6,587	7,275	7,633	0.6
Malaysia	809	900	3,397	2,940	4,118	5,021	5,692	0.5
Belgium	1,344	1,598	3,009	2,608	6,423	6,274	5,479	0.5

Notes: Due to the high degree of confidentiality in Australian investment statistics, the above table omits countries where confidentiality prevents the release of figures.

np Not published.

Source: ABS, 53520 – *International Investment Position, Australia: Supplementary Statistics, 2011*, Table 5, Canberra, May 2012

(9) Australian foreign direct investment abroad by level of investment, 2005–11 (major countries)
($ million)

	2005	2006	2007	2008	2009	2010	2011	% share 2011
United States	114,814	131,628	165,134	135,641	99,464	94,330	97,854	28.9
United Kingdom	33,597	45,567	31,907	24,917	63,960	71,266	52,105	15.4
New Zealand	38,854	42,629	46,933	34,235	42,029	39,783	40,159	11.8
Canada	4,375	np	np	np	21,494	21,339	23,295	6.9
Papua New Guinea	1,548	2,744	2,782	3,011	4,312	np	np	—
Brazil	np	np	np	np	np	np	12,901	3.8
Germany	3,735	6,131	11,053	8,698	9,711	9,193	7,394	2.2
Singapore	2,906	5,037	8,980	6,559	7,509	7,140	7,061	2.1
China	847	np	2,289	np	2,347	6,705	6,355	1.9
Switzerland	np	np	np	4,499	np	7,397	6,220	1.8
Netherlands	7,933	7,864	np	np	4,181	4,467	4,598	1.4
Hong Kong (SAR of China)	4,620	6,728	6,444	5,928	13,513	11,038	3,865	1.1
Indonesia	926	1,396	1,875	2,089	3,068	3,320	3,654	1.1
Chile	90	np	np	1,095	np	np	1,325	0.4
Fiji	459	638	799	618	759	742	1,127	0.3
Argentina	np	np	np	np	536	1,035	914	0.3
Vietnam	660	np	np	278	461	425	580	0.2
France	np	np	np	341	311	np	491	0.1
South Africa	125	np	np	498	404	564	473	0.1
Thailand	np	493	446	390	216	370	431	0.1

Notes: Due to the high degree of confidentiality in Australian investment statistics, the above table omits countries where confidentiality prevents the release of figures.

np Not published.

Source: ABS, 53520 – *International Investment Position, Australia: Supplementary Statistics, 2011*, Table 5, Canberra, May 2012

Appendix 1: Official visits associated with the joint study

Chinese delegation visits to Australia

China's Ministry of Commerce organised a commercial delegation to undertake a visit to Australia's north for the purpose of agricultural cooperation from 7–14 December 2011. The delegation, including experts from the area of agricultural investment and technical cooperation, and agricultural entrepreneurs from Shanghai and Tianjin, and Shaanxi, Liaoning and Shandong Province, visited Sydney, Canberra, Cairns and Perth and inspected potential agricultural investment projects.

From 8–18 April 2012, the Ministry of Commerce organised a joint report working group to inspect the agricultural investment environment and projects of the Northern Territory and Western Australia. The working group was composed of experts from the Ministry of Agriculture, China Development Bank, China International Engineering Consulting Corporation, and Foreign Economic Cooperation Centre of the Ministry of Agriculture.

The delegation was made up of representatives from the following organisations:

Government organisations
Ministry of Commerce
Ministry of Agriculture
Department of Commerce of Shandong Province
Shanghai Municipal Commission of Commerce
Foreign Economic Cooperation Centre, Ministry of Agriculture
China State Farm Economic Development Centre, Ministry of Agriculture
Shanghai Association of International Economic and Technological Cooperation

Finance and investment consulting corporations
China Development Bank
China International Engineering Consulting Corporation

Agricultural enterprises
Bright Food (Group) Co., Ltd
Shanghai CRED Real Estate Stock Co., Ltd
Shanghai Xiangfu Real Estate Investment Co., Ltd
Shanghai New Dragon Base (Group) Company
Shanxi Kingbull Livestock Co., Ltd
Tianjin Aolv Agricultural and Sideline Product Group
Liaoning Huishan Holding Co., Ltd
Jining Ruyi Technology Group Co., Ltd
Yantai Nanshan Group Co.(Australia), Ltd
Laiwu Taifeng Textile Co., Ltd
Pengli (Australia) Co. of COFCO

Australian delegation visit to China

A multidisciplinary Australian delegation undertook an official visit to China for the purpose of the joint study from 6–16 March 2012.

The delegation initially visited Beijing for government-level discussions concerning the joint report, before undertaking a series of field visits to: Jinan, Weifang and Qingdao in Shandong Province; Xi'an in Shaanxi Province; Hefei in Anhui Province; and Shanghai Municipality.

The Australian delegation visiting the Anhui Academy of Sciences

The delegation comprised representatives from the following organisations who participated in at least part of the visit program:

Commonwealth Government
Department of Foreign Affairs and Trade (DFAT)
Australian Trade Commission (Austrade)
Department of Agriculture, Fisheries and Forestry (DAFF)
Australian Centre for International Agricultural Research (ACIAR)

State Governments
Department of Employment, Economic Development and Innovation (DEEDI), Queensland
Queensland Government Trade & Investment Office, Shanghai
Department of Regional Development and Lands, Western Australia
Department of Agriculture and Food, Western Australia
Department of State Development, Western Australia
New South Wales Business Office in Shanghai

Private Sector
Minter Ellison
KPMG
PriceWaterhouseCoopers
Asian Agribusiness Consulting
Wine Australia
China BlueSky Ventures
National Australia Bank
Harvest Capital

Appendix 2: Websites

China

Ministry of Commerce	http://www.mofcom.gov.cn/
Ministry of Agriculture	http:// www.moa.gov.cn/
Department of Commerce of Shandong Province	http://www.shandongbusiness.gov.cn/
Department of Agriculture of Shandong Province	http://www.sdny.gov.cn/
Shanghai Municipal Commission of Commerce	http://www.scofcom.gov.cn/
Shanghai Municipal Commission of Agriculture	http://e-nw.shac.gov.cn
Department of Commerce of Anhui Province	http://www.ahbofcom.gov.cn/
Anhui Provincial Commission of Agriculture	http://www.ahny.gov.cn/sites/MainSite/
Department of Commerce of Shaanxi Province	http://www.sxdofcom.gov.cn/
Department of Agriculture of Shaanxi Province	http://www.sxny.gov.cn/sites/MainSite/
China International Engineering Consulting Corporation	http://www.ciecc.com.cn/
Foreign Economic Cooperation Center (MOA)	http://www.fecc.moa.gov.cn/
China Development Bank	www.cdb.com.cn
Chinese Academy of Agricultural Sciences	http://www.caas.net.cn/caasnew/
Chinese Academy of Sciences	http://www.cas.cn/
Shandong Academy of Agricultural Sciences	http://www.saas.ac.cn/saas/
Shanghai Academy of Agricultural Sciences	http://www.saas.sh.cn/index.asp
Northwest A&F University	http://www.nwsuaf.edu.cn/
Anhui Academy of Agricultural Sciences	http://www.ahas.org.cn/
China Agricultural University	http://www.cau.edu.cn/
Anhui Agricultural University	http://www.ahau.edu.cn/
Shandong Agricultural University	http://www.sdau.edu.cn/

Australia

Commonwealth Government

Foreign Investment Review Board	http://www.firb.gov.au/
Australian Trade Commission (Austrade)—information for investors	http://www.austrade.gov.au/invest
Department of Foreign Affairs and Trade	http://www.dfat.gov.au
North Queensland Irrigated Agriculture Strategy	http://www.regional.gov.au/regional/ona/nqis.aspx
Department of Industry, Innovation, Science, Research and Tertiary Education	http://www.innovation.gov.au
Commonwealth Scientific and Industrial Research Organisation (CSIRO)—information for partners	http://www.csiro.au/Portals/Partner.aspx
Australian Department of Agriculture, Fisheries and Forestry	http://www.daff.gov.au/
Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)	http://www.daff.gov.au/abares

State Governments

New South Wales	
NSW Government—Department of Primary Industries (Agriculture)	http://www.dpi.nsw.gov.au/agriculture
NSW Government—Trade and Investment (Doing Business in NSW)	www.business.nsw.gov.au
NSW Government—Doing Business in Sydney and NSW (in Mandarin)	http://www.sydneyaustralia.com/cn/home
Queensland	
Queensland Government—Business and Industry	www.business.qld.gov.au/
Queensland Government—Trade and Investment	http://www.business.qld.gov.au/trade-and-investment.html
Queensland Government—Department of Agriculture, Fisheries and Forestry	http://www.daff.qld.gov.au/home.htm
Queensland Government—Investing in Queensland's food and agribusiness industry	http://www.business.qld.gov.au/trade/investing-queenslands-industries/investing-food-agribusiness-industry
South Australia	
SA Government—Department for Manufacturing, Innovation, Trade, Resources and Energy—Invest in SA	http://www.dmitre.sa.gov.au/invest_in_south_australia
SA Government—Department of Primary Industries and Regions	www.pir.sa.gov.au/home
South Australian Food Centre	http://www.safoodcentre.com.au/

Tasmania	
Tasmanian Government—Department of Infrastructure, Energy and Resources	http://www.dier.tas.gov.au/homepage
Tasmanian Government Farm Point	www.farmpoint.tas.gov.au
Tasmanian Government—Department of Primary Industries, Parks, Water and Environment	http://www.dpiw.tas.gov.au/inter.nsf/Home/1?Open
Victoria	
Invest Victoria	www.invest.vic.gov.au
Victorian Government—Department of Primary Industries	www.dpi.vic.gov.au
Western Australia	
Western Australian Trade and Investment Office (Mandarin)	www.westernaustralia.cn
WA Department of Agriculture and Food	www.agric.wa.gov.au
WA Department of Regional Development and Lands	www.rdl.wa.gov.au
WA Department of State Development	www.dsd.wa.gov.au
WA Department of Environment and Conservation	www.dec.wa.gov.au
WA Department of Water	www.water.wa.gov.au
Water Corporation	www.watercorporation.com.au

Territory Governments

Australian Capital Territory	
ACT Business Development	www.business.act.gov.au
Northern Territory	
InvestNT	http://investnt.com.au/
NT Department of Resources—Primary Industry, Fisheries and Resources	www.nt.gov.au/d/
Information for Prospective Investors in Agricultural Enterprises in the Northern Territory	http://www.nt.gov.au/d/Content/File/p/pi/Agribro.pdf

Other Institutions

University of Sydney—E.J. Holtsbaum Agricultural Research Station	http://sydney.edu.au/agriculture/about_us/facilities_ locations/holtsbaum_agricultural_research_institute.shtml
University of Western Australia—WA Future Farm 2050	http://www.animals.uwa.edu.au/research/future-farm
National Farmers' Federation	http://www.nff.org.au/
Australian Food and Grocery Council	http://www.afgc.org.au/
Australia–China Business Council	http://www.acbc.com.au/
Australian Local Government Association	http://www.alga.asn.au/

Appendix 3: China's foreign investment policy for the agricultural sector

According to the *Catalogue of Industries for Guiding Foreign Investment* (2011 amendment), the relevant policies for investment in agriculture, forestry, animal husbandry and fisheries are:

(1) Encouraged areas

- Planting, development and production of woody plants that contain edible oils or that can be used as seasonings or industrial raw materials.
- Technological development in the cultivation of organic vegetables (including edible fungi and melons), dried and fresh fruit, and tea, and the relevant production.
- Technological development in the cultivation of sugar crops, fruit trees, pasture, etc., and the relevant production.
- Production of flowers, and construction and operation of nurseries.
- Planting of rubber trees, oil palm, sisal and coffee.
- Planting and cultivation of traditional Chinese medicine herbs (limited to Sino-foreign equity/cooperative joint venture operations).
- Returning of crop straw to farmland and the comprehensive utilisation thereof; development and production of organic fertiliser resources.
- Planting of trees or bamboos, and development of improved varieties, and development of new varieties of polyploidy trees.
- Breeding of aquatic larvae (exclusive of China's rare and endemic species).
- Construction and operation of such ecological environment protection projects as the planting of trees and grasses to combat desertification and soil erosion.
- Aqua farming open ocean cage aquaculture, industrial aquaculture and ecological mariculture.

(2) Restricted areas

- Selection and cultivation of new varieties of crops, and production of seeds (with Chinese parties as the controlling shareholders).
- Processing of the lumber of precious varieties of trees (limited to Sino-foreign equity/cooperative joint venture operations).
- Processing of cotton (seed cotton).

(3) Prohibited areas

- Research and development, breeding and planting of China's rare and special varieties, and production of relevant breeding materials (including quality genes in planting industry, husbandry and aquaculture).
- Research and development of transgenic organisms, and production of transgenic crop seeds, breeding livestock and poultry, and aquatic fingerlings.
- Fishing in the sea area and inland waters under China's jurisdiction.

Appendix 4: Australian Policy Statement: Foreign Investment in Agriculture

The Australian Government released the following policy statement on 18 January 2012:

Australia is a capital-hungry country that has always relied on foreign investment as a driver of employment and prosperity, including in our agricultural sector. Foreign investment plays an important role in maximising food production and supporting Australia's position as a major net exporter of agricultural produce, by financing investment, and delivering productivity gains and technological innovations.

Without foreign capital inflows, investment in Australia would be limited, resulting in lower food production with potentially higher food prices, as well as lower employment, lower incomes in the sector and lower government revenue. Foreign investment in agriculture supports agricultural production, job creation and contributes to the prosperity of rural communities and the broader Australian economy.

Australia's foreign investment policy strikes the right balance between attracting foreign investment into Australia to support our economy, and ensuring that investments are not contrary to the national interest. This applies to investments in all sectors of the economy, including agriculture.

Under the Government's foreign investment screening arrangements, all proposed investments by foreign government related entities, including in agriculture, must be examined.

Proposed investments by private investors in agribusinesses (including those involving agricultural land) are subject to the same thresholds that apply to other foreign acquisitions of Australian companies or business assets.

In assessing any application under the Government's foreign investment screening arrangements, the Government applies a rigorous national interest test. National interest considerations include the effect of investments on national security, competition, the economy, the community and other government policies. The Government also considers the type of investor and the extent to which an investor operates independently of foreign governments.

Consistent with these principles, the Government is committed to ensuring on a case-by-case basis that investments do not adversely affect the sustainability of Australia's national agricultural resources, including their economic, social and environmental contribution to Australia.

In assessing foreign investment applications in agriculture, the Government typically considers the effect of the proposal on:

- the quality and availability of Australia's agricultural resources, including water;
- land access and use;
- agricultural production and productivity;
- Australia's capacity to remain a reliable supplier of agricultural production, both to the Australian community and our trading partners;
- biodiversity; and
- employment and prosperity in Australia's local and regional communities.

In addition, all investors—both foreign and domestic—must comply with Australian law, irrespective of the value of the investment. An important example of this is the requirement for all investments to be consistent with Australia's national competition policy. The Australian Competition and Consumer Commission rigorously assesses all proposals that have the potential to raise competition concerns, including any potential competitive effects of agribusiness supply chain acquisitions by foreign investors. All potential investors must also obtain any other approvals, such as environmental approvals, that are required under Australian laws.

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China

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