Australia's response to world food security concerns.

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Objective analysis of world population projections and dietary changes shows that annual global farm output will need to double over the period to 2050, in order to meet projected food demand without substantial increases in food prices.

By any measure, this is a big challenge. The 'green revolution' resulted in annual world agricultural output more than doubling over the period from 1960 to 2000, but that required an extra 200 million hectares of land being used for crops each year, a doubling of average cereal and coarse grain yields per hectare, and a sustained increase in agricultural research and development.

However, many doubt whether there is potential for a further large expansion of cropping areas, the rate of increase in crop yields is slowing in developed nations, and competition for water is reducing the amount available for agriculture. On top of that, areas of higher quality

arable land in high rainfall regions are disappearing due to urbanisation, and the diversion of agricultural capacity to non-food production will also limit the amount of food that can be produced in the future.

In combination, these developments indicate that the era of global food surpluses and declining real food prices may be over, and that the pattern of increasing real food prices observed since the year 2000 may persist for some time. The upward trend in world agricultural commodity prices since the interruption caused by the Global Financial Crisis tends to reaffirm this, as do more recent forecasts of world grain production and stocks.

This is good news for Australian agriculture, despite the fact that higher food prices initially means more people going hungry around the world. However, in the medium to longer term higher food prices are good news for the world's undernourished people. This is because, without a period of higher food prices, solutions to the world's future food needs are not likely to be found.

While this seems counter-intuitive, recent trends in global crop areas and grain prices show the correlation between the two, and highlight that farmers will respond to opportunities for better profits by sowing more crops and investing in increased capacity. In the absence of this

increased profitability, the necessary investment by farmers, agricultural technology companies and governments that is required to expand global agricultural output will not occur.

For Australian agriculture, these global trends appear to present significant new opportunities, and bring with them the potential of a happy co-incidence of outcomes. A period of higher global food prices presents an opportunity for increased farm profitability, growth in agricultural productivity, farm output and regional economic activity, and at the same time creates an opportunity for Australian agriculture to help reduce world hunger.

However, before popping the cork on a bottle of Australian sparkling white wine (now that the French have exclusive use of the term 'champagne'), a quick reality check is necessary. Total Australian agricultural output represents around 1% of global agricultural output, and the total value of Australian agricultural exports amounts to around 3.5% of global agricultural exports, so on those measures Australia is a relatively minor player. This suggests that no matter what we do in Australia, it won't make much difference to world food security.

This is a bit simplistic, because when it comes to nations that are net agricultural exporters, Australia ranks fourth in the world behind Brazil,

Argentina and the Netherlands, and is ranked well above nations such as China and the USA that have enormous agricultural sectors, but in net terms import just as much as they export. As a source of food for hungry nations, the Australian agriculture sector is very important.

That Australian farmers have achieved this under highly variable climatic conditions with virtually the lowest level of subsidies of any farmers globally, and despite persistently high agricultural trade barriers is a magnificent achievement that deserves a lot more recognition.

However, Australian farmers are facing limits to the land and water resources they have available in southern Australia. The area of land used by farmers has been reduced by 15% or 70 million hectares since 1970, due to the creation of national parks and urban expansion around major cities. Irrigation water availability has also been reduced, and the current government policy of water buy-backs is removing large amounts of water from future productive use.

This might lead to the conclusion that Australian agriculture will not be able to help much in meeting increased future global food needs, but I think that conclusion is wrong for three reasons. These are Australia's importance as a net food supplier, Australia's unique low-input

agricultural systems, and Australia's agricultural research and development capability.

First, as one of the major net agricultural exporting nations, the food produced in Australia is a very important source of nutrition for many people in developing nations, and even for people in developed nations such as Japan and Korea that have relatively low levels of food self-sufficiency. Even a small reduction in the availability of surplus food for export can make a dramatic difference to world food prices and hence food availability, especially for lower-income nations, as we have seen over the past two years.

Anyone reading international grain market commentaries over the last two years could not fail to notice how frequently reference was made to crop prospects in Australia as a key factor in future grain price trends.

Second, Australia has quite unique agricultural production systems, which will be ideally suited to a future when energy costs are likely to increase substantially. While much developed world agriculture relies on ever-increasing fertiliser and chemical inputs, Australian agriculture has developed down a low-input pathway.

For example, Australia leads the world in the adoption of minimum and no tillage systems in crop production, and Australian grain farmers are much less reliant on nitrogen fertilisers than their counterparts in North America and Europe. In addition, Australian farmers are able to achieve very high crop yields per millimetre of growing season rainfall, even though overall crop yields per hectare are lower than those achieved elsewhere.

Australia has also developed very low-input, pasture-based animal production systems which are quite different to those in many developed countries. Australian sheep and cattle farms are very efficient at converting low quality plant matter into animal protein, and in utilising marginal agricultural land that would otherwise be unsuitable for farming.

Australian irrigation systems, especially in the rice, cotton and horticulture sectors are also highly efficient in terms of output per litre of water used. The Australian cotton and rice industries achieve yields per hectare and per litre that are equal to the best in the world.

Australia's unique, low-input production systems appear ideally suited for use in many developing nations in Asia, the Middle East and Africa, which have similar agronomic and climatic conditions. The adoption of

Australian production systems and technologies by farmers in those nations will be very important in boosting their food self-sufficiency.

Third, and related to the second, is the importance of Australia's agricultural research and development capacity. Decades of past investment by government and industry in agricultural research and development in Australia has been a major factor in the sustained high productivity growth rates of Australian farm businesses over the last four decades.

Australian Farm Institute research in 2007 identified that agriculture had achieved the second highest productivity growth rate of any sector of the economy over the last three decades, and Australian agricultural productivity growth rates were amongst the highest internationally. While this productivity performance cannot be attributed entirely to past R&D investment, it is noteworthy that Australian agricultural R&D investment levels (approximately 3% of agricultural GDP per annum) have been higher than the average of 2.6% for developed nations.

This past investment in agricultural R&D has been important not just in delivering agricultural innovations and productivity growth, but has also developed the infrastructure and personnel to enable that R&D effort to continue in the future, and to tackle new challenges as they emerge. This

is quite important, because many developing nations simply can't afford to develop and support their own agricultural R&D capacity, and rely heavily on technology 'spillovers' from developed nations like Australia.

This is not just a one-way street, though, as issues such as avian influenza and swine flu reminds us. Plant and animal diseases can very quickly have a global impact irrespective of where they originate, so developed nations don't have the luxury of being able to ignore them just because they came from a poor country. Once problems like this spread internationally, they affect farmers in developed and developing nations alike, unless quick solutions are found. Developed nation farmers can therefore benefit greatly from the efforts of their researchers to solve agricultural threats in poor countries.

This highlights that the agricultural R&D capacity of developed nations such as Australia is doubly important, not just to sustain the productivity growth and competitiveness of their domestic agricultural sector, but also to provide R&D capacity and spillovers that assist the growth of agriculture in developing nations.

Some might argue that providing agricultural R&D capacity to developing nations is shooting ourselves in the foot, because that will

help developing nations to grow their own food rather than buy ours. There is evidence the reverse is true – that agricultural development results in an increase in consumer wealth and therefore food demand in developing nations, and increases the number of consumers who can afford the higher quality food produced by nations such as Australia.

These three factors – Australia's role as a net food exporter; Australia's expertise in low-input agricultural systems; and Australia's agricultural R&D capacity – highlight that Australia has a major role to play in the future as the world faces an increasing challenge to provide affordable food for a growing population.

The obvious question is "How can Australian agriculture do better? What things need to change so that Australian farmers can be even more successful in helping to meet future global food demand?"

I'm sure most people in this room could very quickly come up with a wish list of things that could be changed. Some of them would be actions by governments, some would be actions by service providers and marketers, and some would be things that individual farm business managers can change.

I certainly have a list of things I think need tackling, but it strikes me in thinking about them that at their core lies a fundamental issue, which is the attitude of the wider Australian community towards agriculture.

Living in a major city, as I do, and seeing community attitudes towards agriculture reflected in everything from school syllabus material to national electronic and print media, I am constantly reminded of the lack of connection between Australian food consumers and the producers of their food.

This lack of connection enables critics of agriculture to make what are often unsubstantiated and sometimes outrageous claims about the irreparable damage agriculture does to the land, or how wasteful farmers are in using water, or how cruel farmers are to their animals; without consumers making any connection between these issues and their abundant access to inexpensive and high quality supplies of locally produced food.

Perhaps this lack of connection has developed because of the intense urbanisation of the Australian population. Perhaps it has developed because Australia's highly efficient agricultural sector relies on less and less people, and there are therefore less people with direct connections to

farming. Perhaps it has developed due to Australia's growing migrant population, which has little contact with rural Australia.

Whatever the reason, this lack of connection lies at the heart of many of the policy and economic decisions that unnecessarily limit the potential of Australian agriculture. These problems won't really be resolved until there is a change in the attitude of the broader community towards agriculture, and this may well take a generation to occur. I say this because I see the information that Australian school students are taught, and very little of it has anything positive to say about agriculture. Negative perceptions of agriculture are ingrained from a very early age.

I believe we need to find effective ways to highlight that, on average, every Australian farm business is responsible for providing food for around 600 people every year - 150 of them here in Australia and another 450 people overseas. It is not individual farmers who are using the land or the water, but it is those 600 people. The Australian community needs to understand that policy decisions that reduce the availability of land and water resources, or that increase farm input costs or limit farm production affect not just the farmer, but also the 600 people who rely on that farmer for their food.

Achieving a change in Australian community attitudes towards agriculture is essential, but will require a sustained effort over an extended period of time. In the meanwhile, there are a range of issues that need tackling more immediately to enable Australian farmers to better meet the food requirements of their 600 dependents.

The first is the weighting given to agriculture in decisions that are made about competing demands for resources such as land and water. In many cases, it seems that agriculture is the default user of land and water resources until any other competing use emerges. As a consequence, agriculture invariably loses access to resources as soon as an alternative such as mining, conservation, or urban development emerge. This also leads to the persistence of the 'lock up and exclude' mentality whereby instead of valuing agriculture and looking for ways that agricultural and other objectives can be jointly achieved, the reflex approach of Australian governments is to exclude agriculture.

We see this in decisions to buy-back water entitlements, rather than investing in ways to secure water savings that could benefit both agriculture and the environment.

We see this in decisions to declare blanket bans on any agricultural activities, through wilderness, national park and wild river declarations,

rather than the adoption of policies that provide incentives for innovative farmers to find ways to achieve both economic and environmental outcomes.

We see this in the use of blunt regulatory instruments, such as bans on vegetation clearing or grazing livestock in national parks, rather than policies that provide farmers with options to flexibly manage areas to improve environmental outcomes.

We see the risk of this in proposals such as the Carbon Pollution Reduction Scheme, which has the potential to greatly disadvantage Australia's efficient livestock sector, and result in the conversion of productive agricultural land into permanent carbon sink forests.

This approach, whereby agricultural activities are allocated very low value, stands in stark contrast to the attitudes that prevail in Europe and North America, where agricultural capacity is highly valued, and policies are developed that enable agricultural and other objectives to be simultaneously achieved.

It is not surprising that in its 2007 review of farm policy measures in Australia, the OECD was very positive about most things, but identified

the lack of policies that simultaneously encourage farming and conservation as a major weakness.

The second area that needs urgent attention is the level of agricultural research and development that is occurring in Australia. While it is very difficult to obtain definite numbers, there is no doubt that agricultural R&D funding has declined over recent years, as State governments in particular reduce departmental funding. And even when funding has not been cut, there has been a very large diversion of available funds away from production research, and instead devoted to issues such as greenhouse emission mitigation. That is not to say that greenhouse emission mitigation research is unimportant, but funding that by diverting money from production research is like robbing Peter to pay Paul, and will leave agriculture worse off in the future.

This approach to greenhouse research in agriculture stands in stark contrast to the massive amounts of public money that has been allocated to greenhouse research in the electricity generation sector. If governments really want to find ways to reduce greenhouse emissions and maintain agricultural productivity, then an urgent increase in total R&D funds for agriculture is required.

A third area where considerable effort is required is agricultural trade barriers. One of the unfortunate side-effects of the spike in agricultural commodity prices in 2008 was that while 18 countries responded by reducing import tariffs on grains, 37 responded by either restricting food exports, imposing food price controls, or increasing food subsidies – all responses that further restrict agricultural trade. Most notably, both the USA and the EU have re-introduced dairy export subsidies, which have the potential to have a serious negative impact on global dairy markets and signal a return to the protectionist policies of past decades.

Trade Minister Simon Crean and Agriculture Minister Tony Burke have been highly critical of these measures, and have vowed to redouble their efforts to free up agricultural trade and to get an agreement out of the WTO Doha round. This is clearly a very important issue for farmers in Australia, who rely so much on international markets. It is equally important for the welfare of the 450 people overseas that each Australian farmer provides food for each year. The Australian government should be strongly encouraged to work even harder to get some positive results on this issue.

Finally, I think it is very important that areas of rural Australia have adequate services and infrastructure, both to enable farm produce to be efficiently delivered to export markets, but also to ensure that farming

regions can continue to attract the skilled and educated people that are such an essential part of modern agriculture.

Even the best on-farm technology in the world will be of little benefit if there is no-one with the skills to operate it, and if the costs and delays post the farm gate make agricultural production uneconomical.

For example, in recent years there has been a significant deterioration in rail infrastructure, and there doesn't appear to be any solutions in sight, despite governments looking for opportunities to spend money to upgrade national infrastructure. Surely in a period of heightened concern about greenhouse emissions and future energy supplies, upgrading the rail infrastructure servicing key agricultural production areas would be a pretty obvious option that could deliver multiple environmental and economic benefits, as well as generating significant regional employment.

In conclusion, none of these issues are new, and I'm sure there are many others that could be added to this list that would help Australian farmers in their task of providing food and fibre for the world's consumers.

The fact that these haven't been adequately addressed highlights to me the importance of the first issue I mentioned – that being the attitude of the broader Australian community towards agriculture.

It is only when we achieve a change in community attitudes towards agriculture that politicians will start to see it as being electorally important to increase the resources allocated to rural Australia, or to implement policies that encourage increased agricultural output.

It is only when a change occurs in community attitudes that Governments will recognise the importance of finding ways to achieve improved environmental outcomes without unnecessarily restricting agricultural capacity.

And it is only when those changes occur that Australian farmers will be able to feed not just the 600 people they currently do, but the 800 or even 1,000 people that they will be called on to feed in the not too distant future.

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