Challenges for Victoria's food and agriculture sector and biodiversity — 2020

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Summary of speech
Land-use change and the implications for biodiversity must be considered in the context of the drivers shaping the food and agriculture sector. By understanding these drivers and how they shape the future, Victoria is better placed to ensure land-use change is aligned to the shared vision and aspirations of the community, industry and government. The challenges faced to realise this vision cannot be ignored. Developing the knowledge and technologies needed for a sustainable future underpins our ability to resolve some of the conflicts driving the sector. This vision will only be achieved through community, industry and stakeholder participation in the development and implementation of sustainability policies.

Keywords
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Introduction
While the future of Victoria's food and agriculture sector is impossible to predict, there is much that we can anticipate. In fact, to the extent that we are dealing with biological and physical systems, it is easier than many realise to develop convincing future scenarios. What is harder to anticipate are the environmental and other impacts we, as a community, will have on our world, and how our attitudes and aspirations will change over the next twenty years. Today more than ever, governments, industries, consumers and the community are demonstrating the values they hold on environmental issues.

In its key policy framework, *Growing Victoria Together*, the Victorian government sets out its vision for Victoria, and the strategic issues that the government will need to focus on to achieve this vision. This vision is based on a fundamentally new approach to thinking, working, and governing that acknowledges that economic growth alone is not sufficient for measuring progress and common prosperity. Rather, *Growing Victoria Together* emphasises the need to value equally economic, environment and social goals if we are to build a fair, sustainable and prosperous future for Victoria.

There are few sectors in which delivering on this 'triple bottom line' is more important than the food and agriculture sector, because of the pervasive influence that this sector has on economic, environmental and (particularly in rural and regional areas) social outcomes. Land use change and the implications for biodiversity must be considered in the context of the drivers shaping the sector and the challenges it faces in meeting the economic, social and environmental aspirations of all Victorians.

An analysis of these drivers shaping the sector and the changes in land use (presented below) can help to identify the challenges, and therefore what government agencies must do to ensure the food and agriculture remains vibrant and at the same time delivers environmental objectives such as effective biodiversity conservation and management.

Economic drivers

The food and agriculture sector makes an important contribution to the Victorian economy. The value of agricultural production is now $6.8 billion, while the food and agriculture sector, from paddock to plate, is responsible for 11% of Victoria's gross state product. The production, processing and marketing of food employs 205 000 people, which is 9.7% of total Victorian employment, not including those employed in a number of related industries, such as restaurants and hotels. In rural and regional Victoria the sector accounts for 21% of all jobs.

Importantly, parts of this sector are growing rapidly. Over the last ten years the value of food and agriculture exports has risen from $3 billion in 1990 to $7.6 billion in 2000, which is an average growth rate of 9.9% per annum. Last year, with the help of favourable exchange rates, Victorian food and agriculture exports jumped a staggering 31%. Exports from this sector are now responsible for 33% of all Victorian exports, with the dairy industry being the Victoria's single biggest export earner.

The growth in the food and agriculture sector in recent years has helped to stimulate growth and employment in a number of Victoria's regional centres.

The key driver of growth in the food and agriculture sector has been a long and impressive record for achieving productivity improvements, largely as a result of the application of new technologies and management practices, and through microeconomic reforms such as deregulation of various marketing arrangements. The annual productivity growth rate for the sector is 2.1%, generating an extra $205 million every year for Victoria. This compares favourably with the productivity growth rate for the whole economy of 1.3%, and has enabled the sector to compete effectively in international markets with relatively little government support.

Much of this growth results from an extensive research and development infrastructure that supports each of the agriculture industries, and the value of this infrastructure is becoming more widely appreciated as we come to understand that new knowledge and innovation is the key to sustained economic growth.

Over the next 20 years the rapidly changing attitude and aspirations of domestic and international consumers in relation to the food they eat will shape the global environment in which the food and agriculture sector operates. As incomes rise and education levels improve, consumers in developed countries are becoming increasingly interested in much more than just the price and quality of the food they eat. In the future, consumers will require evidence that the food they purchase provides a range of nutritional and health benefits, and will pay a premium if this can be demonstrated. In addition, consumption decisions will increasingly be based on 'credence characteristics' — information about the systems that were used to produce the food, including information about the environmental and ethical impacts of the production system.

The opportunities for future growth in Victoria's natural resource industries are exciting, with the rapid urbanisation of many of Asian markets, and the associated demand for quality 'Western' foods, offering enormous potential. It is noteworthy that the urban population in Asia is projected to increase by a staggering 1.7 billion by 2050.

However, this 'prize' will be highly sought after. In an increasingly globalised economy, competitive pressures are intensifying, putting continuous pressure on the terms of trade for agricultural commodities. To capture a share of these growing markets, the challenge for natural resource industries is to continue to innovate, to develop new products, to find niches in the market that command premium prices, and to adapt to the forever-changing requirements of markets while sustaining and, where required, improve the natural capital, such as biodiversity.

Environmental drivers

The food and agriculture sector will play a pivotal role in achieving the sustainable use of our natural resources. In fact, because around 85% of the state's private land is used for agricultural production, farmers are effectively the custodians of Victoria's private land-based resources. The sector also uses 77% of the state's water resources, and is increasingly the centre of efforts to protect Victoria's biodiversity. More than 60% of native vegetation on private land represents threatened ecological communities.

It is now clear that the rate at which natural resources can be consumed has limits, and that with an expanding population and changing consumption patterns we are now fast approaching these limits of use for many of our natural resources. In other words, the demand for natural resources is beginning to exceed supply.

The limits to which water, for example, can be sustainably harvested has been reached already in many of Victoria's river systems (46% of surface water management areas are fully developed or over developed), and the limit will be reached very soon in many others. Most of this water (77%) is used for irrigation; urban and industrial uses account for another 17%. As the limits of use are reached, conflicts over water allocation and use will clearly increase as an inevitable consequence of population and economic growth, and increasing community expectations for diversion to other uses, such as environmental flows. This will ultimately reduce the amount of water available for irrigated agriculture, which is currently responsible for a third of the value of agricultural production.

Land clearing for agriculture, and its impact on the water cycle, has been a major cause of many of our environmental problems. Replacing deep-rooted native vegetation with shallow-rooted introduced crops and pastures that are only active for part of the year has resulted in excess water in the landscape. Put simply, our agricultural systems are more leaky than native vegetation. The water that filters through the soil causes groundwater levels to rise, bringing dissolved salts close to the surface, cause salinisation of the land. This reduces the productive capacity of land and also damages built assets such as towns, roads and railways. Around 260 000 hectares of land is affected by salinisation in Victoria, with a direct cost of around $50 million per annum. Projections indicate that, without effective intervention, 1.85 million hectares will be affected by 2050.

It is also now increasingly clear that, in many instances, we are exceeding the capacity of our ecosystems to absorb the off-site impacts of food and agricultural production, resulting in subtle but ultimately profound changes to our natural environment in the form of increased salinity, declining river health and the loss of biodiversity. In the case of biodiversity, around 63% of the ecological vegetation classes that occur on private land in Victoria are threatened with extinction; that is, more than 70% of their former extent has been lost. Others have noted that the destruction and modification of habitat, particularly through the clearance of native vegetation, is the most significant cause of biodiversity decline.

About 30% of the populations of threatened species are found on private rural lands; and some species are almost entirely dependent on habitat on private land. In-stream biodiversity is significantly affected by water quality; only 5% of streams are in good or excellent condition, and 65% are poor or very poor. The loss of biodiversity is widely recognised as one of the most significant environmental problems facing Australia.

In the future, biodiversity conservation needs to be incorporated into all planning and project development processes. The role of plants, animals and other organisms in maintaining beneficial natural processes, such as nutrient recycling, is universally understood. Intensive studies on our threatened species and communities over many years will lead to the increased protection and recovery of many of these species and communities.

There will be many visual changes over the next 20 years, one of the most notable being that native vegetation will be restored along almost 90% of the rivers and streams. This is expected to dramatically extend riparian and in-stream wildlife habitats, while the water quality of most of our rivers and streams will markedly improved. We now recognise the quality and quantity of our freshwater resources as one of the primary limiting factors in the Victorian environment, and in some sectors of the economy. In 20 years time these resources will be very carefully managed to maximise biodiversity outcomes for catchments and for the bays and estuaries into which they flow.

In the rural landscape, a variety of programs that incorporate biodiversity conservation, like the current Landcare and Land for Wildlife programs, will have taken deep root in the community, where most people will view the conservation of biodiversity as part of their everyday lives. Conservation custodianship will be internalised as a result of this ground-breaking work. Over this period, urban Victorians will take a greater interest in their local areas

and in the rural landscape of Victoria. This generation of rural and urban Victorians are expected to have a deeper appreciation and empathy for the landscape, its biodiversity, and its place in their quality of life than did the previous generation.

The quality of native vegetation and habitat will improve as natural resource management regimes shift to ecological sustainability. The development of key biodiversity monitoring methods will promote accelerated change, allowing landholders and management agencies to assess the quality of ecological communities and measure changes over time. This will be an important breakthrough, as it gives people practical tools for working out how to modify their production and conservation management practices so that they have zero or positive impacts on biodiversity. Monitoring undertaken across the state will provide information that enhances Victoria's 'clean and green' reputation, assisting all Victorian export industries and attracting international tourism. New research and development proposals will be subject to risk assessment so that we can be confident that the environmental, economic and social impacts are understood and addressed.

In response to consumer demands and changing community values, leaders in all types of businesses are expected to become genuinely committed to conservation goals and will ameliorate impacts on biodiversity. 'Biodiversity friendly' will become a shared part of our quality of life.

Social and structural drivers

The most challenging driver for change over the next twenty years is the community's increasing demand that natural resources be managed to achieve a range of environmental outcomes.

Meeting these expectations will increase the competition for resources. Competition for water resources, in particular, will intensify, as society places greater importance on the use of water for environmental stream flows, human consumption and recreation. This will reduce the amount of water available for irrigated agriculture, which is currently responsible for a third of the value of production. Over the next ten years the Snowy River will be returned to 21% of its average natural flow (212 GL), at a cost of $375 million.

There is nothing to gain from delaying our response to these issues, as a number of overseas examples illustrate. Last year for example, the US Bureau of Reclamation cut off water to 1400 Oregon farmers in order to protect the endangered Coho Salmon and Sucker Fish. The resulting loss in production was estimated to be $250 million, and was responsible for a 10% increase in the unemployment rate in a population of 69 000 people.

We must find a clever ways to manage the range of environment problems. Failure to do so may result in the community progressively withdrawing its 'permission' for some industries to operate.

At the farm sector level, the increasing competition associated with globalisation is continuing to put pressure on commodity prices. This is driving the rationalisation and consolidation of agricultural production as farm businesses strive to remain internationally competitive.

This process is creating a polarised sector, with two discrete groups of producers beginning to emerge: large and often family-owned enterprises (corporations, cooperatives and joint ventures) serving the global market, and small niche players serving local markets. As in many industries, the medium-size enterprises that are 'stuck in the middle' are in decline.

This, of course, is the continuation of a long-term trend. Recent ABARE statistics confirm that the number of farms in Australia — around 110 000 — has halved over the last 40 years, and that medium-size enterprises have had the greatest decline. If this trend continues, it seems likely that within two decades only a handful of powerful global retailers will have emerged from a phase of acquisitions and mergers, each sourcing food from fewer and larger suppliers. These suppliers, in turn, will continue to drive the rationalisation and consolidation of agriculture production as farm businesses strive to achieve the necessary economies of scale to remain competitive. Employing best management practices, these businesses will account for the vast majority of agricultural production.

At the other extreme, small producers will concentrate on niche products, such as luxury or alternative health products, for local markets. Typically, these people will work only part-time on food production, supplementing their income by working in related industries, such as tourism centred on food and wine consumption. While not contributing much to the state's gross value of production, the importance of these businesses to regional economies is not often appreciated. Every once in a while, they can also develop a niche product that spawns a whole new industry.

The rationalisation and consolidation of the sector is having profound impacts on the demography of Victoria. Regional centres such as Mildura, Swan Hill, Shepparton and Horsham have grown rapidly in recent years as a result of large-scale, cost-competitive farm production and the associated investment in regional food processing and related industries. Coastal centres have also grown significantly, capitalising on their lifestyle benefits. In sharp contrast, though, many small towns are in decline.

Of course, communities and industries are always changing. In fact, this process of change, or structural adjustment, improves productivity as resources move to their most productive use. However, when the pace of structural adjustment exceeds the capacity of communities to adapt, enormous pressure results.

In the small-farm landscapes that are emerging within commuting distance of major centres, maintaining viability without significant off-farm income is a significant challenge. Farm businesses are constrained by both rising land prices and changing community expectations as people seeking the lifestyle benefits associated with rural landscapes become less tolerant of intensive agriculture industries, and their associated impacts.

However, agriculture production will continue to be important in these landscapes. The importance of these businesses to regional economies and to the achievement of environmental outcomes is often not fully appreciated. In particular, farmers in these landscapes can provide many non-agricultural community benefits, such as open spaces or green wedges contributing to landscape amenity and as land managers contributing community benefits, such as biodiversity conservation. Understanding the benefit of such ecosystem services to the community and to the farm business will assist in good policy development.

Governments have a role in addressing these issues through providing people with information on farming, land management and environmental management so that they have a realistic expectation of life on the land and by putting in place appropriate regulatory and planning arrangements to support the desired activities. Scientific knowledge and technology will be important in supporting these outcomes.

While structural adjustment pressures occur in many parts of the economy, governments have a particular interest in the impact on rural and regional communities, for two reasons. First, many rural and regional communities have fewer adjustment options. Second, government is particularly interested in changing land use patterns because of the important impact alternative land uses can have on the environment.

The challenge

In the past, separate, and often conflicting, responses may have been developed for each of these challenges. However, this approach is increasingly untenable, because in natural resource management the economic, environmental and social outcomes are clearly intertwined. This is increasingly acknowledged through new interest in achieving the 'triple bottom line'.

The food and agriculture sector provides a unique opportunity to address this challenge. The Department of Agriculture and the Department of Sustainability and Environment have already started to address some of these challenges through programs such as the Ecologically Sustainable Agriculture Initiative (ESAI), which commenced in July 2001 and aims to encourage productive and sustainable agricultural development. ESAI is addressing issues facing agriculture such as biodiversity, greenhouse, environmental management systems, and resource management such as recycling.

The Department of Primary Industries (DPI) and the Department of Sustainability and Environment (DSE) are also pioneering more innovative market-based instruments that promise

to solve some of the previously intractable environmental and natural resource management problems. For example, we have just piloted our first auction of biodiversity conservation contracts under the Bush Tender scheme. This tool for land use change could be extended to deliver other high value environmental benefits.

Victoria needs to develop natural resource industries that simultaneously deliver on economic and environmental outcomes. The government recognises this by identifying the priority action of improving the productivity and sustainability of natural resource industries such as fisheries, farming, forestry and mining.

This essentially means achieving more value from fewer natural resources, thus freeing up some of these resources for other uses such an environmental flows and biodiversity conservation. We need to maintain sector performance while reducing the demand on our natural resources. At the same time, we need to minimise the impacts on the environment, in the form of declining water quality or loss of biodiversity associated with natural resource based industries. This includes significant investment in protection and restoring our natural capital.

This is challenging, but achievable. New and emerging technologies and policy tools currently under development offer the prospect of helping the food and agriculture industry turn the threats to sustainable development into opportunities.

Victoria has the opportunity to lead the development of these technologies and policy tools, and thus capture the benefits that may follow from increasing demand for expertise in natural resource management.

DPI and DSE have a world-class science and technology infrastructure that generates the new knowledge and technologies required to support productive and sustainable natural resource industries. A greater scientific effort is required to overcome the key gaps in our understanding of how to deliver environmental benefits. This includes investment in new knowledge about the resilience of ecosystem functions, and in understanding the long-term and multiple impacts of changes in resource use. There are emerging technologies and systems that are demonstrating a capacity to deliver radical improvements in resource productivity. Some areas for further research may include:

- environmentally balanced *intensive* production systems that achieve dramatic improvements in resource use efficiency through the use of technologies that dramatically improve productivity while minimising off-site impacts of natural resource-based industries, e.g. precision agriculture or closed production systems
- *extensive* production systems based on perennial species, which better match ecosystem processes by mimicking the natural ecosystems, provide production systems for degraded environments, and improve our understanding of ecosystem function
- viable *systems* for small-farm landscapes valued for both agricultural production and environmental products and services such as landscape amenity and biodiversity
- new *monitoring* technologies at both farm and catchment level that provide ‘real time’ information on the impacts of land use change or new farming practices on biodiversity, e.g. microtechnologies such as biosensors or naturally occurring indicators such as insects. (To ensure that we are conserving biodiversity in the most effective way, we must continually seek out, and make use of, new information. Monitoring is an integral part of conserving biodiversity.)

Developing the knowledge and technologies needed for a sustainable future underpins our ability to resolve some of the conflicts driving the food and agriculture sector. However, just as vital is the need to increase community and stakeholder participation in the development and implementation of sustainability policies. DPI and DSE have extensive industry and community networks in rural and regional Victoria, so they are well placed to help rural communities develop the capacity to anticipate, respond to, and drive change — which is the key to ensuring that change in the food and agriculture sector also produces positive social outcomes.

Conclusion

The land use change taking place across Victoria is in response to the drivers mentioned above. The government's role is to ensure that the farming systems of the future are economically viable and add to the environmental and biodiversity assets of the state while meeting the attitudes and aspirations of our society.

Land use change will continue to occur, but we have the opportunity to steer this change toward a shared vision, through which:

- the environment and biodiversity are recognised as core considerations in the day-to-day running of food and agriculture enterprise
- industry is focused on the global and domestic opportunities where we can have a competitive advantage
- the community and industry are engaged in understanding and implementing the changes required, especially in natural resource management and production systems
- we have the technologies and farming systems that address the apparently contradictory task of achieving greater returns from fewer natural resources.

DPI and DSE will work with other public and private sector organisations to realise such a future for Victoria.