The Changing Landscape of Australian Forestry

Dr Peter Volker FIFA RPF

Summary

The changing landscape of Australian forestry is happening at economic, social and environmental levels. This paper considers the influence of these on the operating environment for forestry companies in Australia. The globalisation phenomenon has affected forestry as much as any other industry. Australian forestry landscape is influenced not only by global trade but also by international obligations to manage our forests according to principles of Sustainable Forest Management. These principles bring formality and structure to many things we have been doing in the past, but now we must provide evidence that objectives and targets are being achieved. This must be done if we are to gain a license to operate in an extremely competitive global market.

Forestry in Australia has been the subject of political argument for many years. The complexity of government regulation and differences between States makes a challenging operating environment for companies.

The challenge for forest companies will be to apply technology to Australian forestry that makes us competitive with other countries and competing products. The past use of native forest produce is what has made Australia’s produce unique. In the age of increased reliance on plantations and increased reservation of native forests, will Australia be able to maintain a competitive advantage?

The development of adequate human resources to enable the adoption of technological improvements in Australian forestry and forest industries has reached a crisis point. If there is a reduction in forestry expertise there will be subtle but significant changes in the forestry landscape which may be very difficult to retrieve in the future.

Introduction

The landscape for forestry in Australia and neighbouring countries is undergoing very significant changes at a number of levels. Many of these changes are influenced by local, national and international events and some are part of the natural cycle of change.

The challenge for foresters and the forest industry in general is to adapt to these changes to keep Australian forestry at the forefront of practices, maintain a competitive forest industry and keep our forests in a state of good health.

In this presentation I will outline a number of changes in the landscapes of Australian forestry. Rather than use a lot of facts and figures, which are freely available from many sources, I will examine the effects of changes as I see them on the way we work and the way we need to prepare for the future.

Are these changes unprecedented? Forestry is a long term business in an ever changing physical and social environment. Going back to the early part of last century, governments established forestry departments and commissions to specifically manage forests as exploitation increased and in many cases, had become unsustainable. These bodies were always subject to political interference no matter how much autonomy they held in their

1 National President Institute of Foresters of Australia www.forestry.org.au
and
Manager Field Services, Forestry Tasmania PO Box 207, Hobart TAS 7001 Australia
peter.volker@forestrytas.com.au
charter. Despite a move to break up some of these State governance bodies, privatise some of their operations and increasing Commonwealth government intervention, political matters still have a very great influence on the operation of forestry in this country.

The forest industry is also used to change. Over the past three decades there has been a significant structural adjustment occurring in response to changing markets. The hardwood sawmilling industry has seen amalgamations and declining markets. The softwood sawmilling sector has replaced hardwood, but has not significantly led to market expansion for sawn products. There has been significant growth for engineered wood products, panels and packaging. The pulp and paper industry has seen some major developments in the past 20 years, but Australia is still plagued by a $2 billion trade deficit in paper products.

So perhaps I could argue that the more things change, the more they stay the same. However, we all know that Australian forestry faces many challenges to changes in the landscapes, which will influence the way we operate into the future. I will examine each of these landscapes in turn.

**Physical landscape**

The FAO Forest Resource Assessment (Table 1) shows that there has been a decrease of about 4 million hectares in the area of forest in Australia since 1990. Most of this is a result of land clearing for agriculture in what foresters would term, woodlands in Queensland (forest is defined as >2m height with at least 20% ground cover). Conversion of native forest to plantation is not considered as deforestation in these statistics. This “deforestation” has been used in international forums to severely embarrass Australia, especially with respect to forestry activities, for which we criticise our south-east Asian neighbour countries. With respect to high quality forest there has been very little loss since 1990 and most would regard the native forest estate as relatively static and stable.

<table>
<thead>
<tr>
<th>FRA 2005 categories</th>
<th>Area (1000 hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990</td>
</tr>
<tr>
<td>Forest</td>
<td>167,904</td>
</tr>
<tr>
<td>Other wooded land</td>
<td>-</td>
</tr>
<tr>
<td>Forest and other wooded land</td>
<td>167,904</td>
</tr>
<tr>
<td>Other land</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total land area</strong></td>
<td>768,230</td>
</tr>
<tr>
<td>Inland water bodies</td>
<td>5,892</td>
</tr>
<tr>
<td><strong>Total area of country</strong></td>
<td>774,122</td>
</tr>
</tbody>
</table>


Australia’s plantation estate continues to expand at a rate of approximately 5% per annum(source Australia’s Plantations 2007, www.brs.gov.au/plantations) and reached about 1.8 million ha by the end of 2007 which is about 1% of the total forest area. Most of the plantation expansion is of hardwood, which has reached close to half of the total plantation estate from a very low proportion in 1995. The only significant expansion of the softwood estate is in NSW.
Australia has 21.5 million ha in nature conservation reserves, which represents about 13% of total forest.

Due to recent changes in regulations and government policy there is now very little clearing of native forest anywhere in Australia. Conversion of native forest to plantation has largely stopped in all States but there is still some activity in Northern Territory. In any case conversion activities represented a very small percentage of the total forest estate even in southeastern Australia where many of the pine and eucalypt plantations were established over the past 50 years.

There is always political pressure in Australia to increase the area of conservation reserves, particularly in the high quality native forests, which are our greatest source of fine quality timbers. Due to the declining nature of the industry, high cost of extraction and relatively low prices returned to governments in terms of stumpage or royalty, there has been a history of political opportunism to win over urban voters over the past few years. We have seen significant areas of native forest removed from production in WA, Victoria, NSW, Queensland and Tasmania. Unfortunately the increase in area of conservation reserves does not match the priorities for conservation, which are most critical in open woodlands and dry forests throughout Australia. Even where political decisions have been made to remove production from these areas, this has made no logical sense as over a hundred years of silviculture has not compromised conservation values (eg cypress pine forests and sub tropical eucalypt forests of NSW).

Environmental landscape

The Australian environment is generally harsh and constantly changing. Climate change has always been a feature of the environmental landscape on this continent. Perhaps the real constant is that most of the production forest in Australia is in relatively dry environments. Even our tall closed forests on the east and southwest coasts of the continent are in rainfall zones of less than 2000mm. There have been many major droughts since European settlement which have had major impacts on farm output and rural economies and these have often combined with major threats to forests through wildfire.

In recent times there have been very significant fires in Victoria and New South Wales of very high intensity and large scale. Victoria suffered major fires in 2003 and again in 2007, where millions of hectares of forest were burnt and reburnt. There is concern that many of the high altitude and highly productive alpine ash forests may disappear due to lack of adequate seed regeneration. In the absence of active management, especially in conservation reserves, this may be a scenario that will limit the options of future Australians.

The prospect of accelerated climate change is receiving increased attention and the consequences are largely unknown. The question for foresters will be how we manage these changes and do we have the resources to implement any desired change. There will also be challenges to achieve the political will to make such changes in the light of predictions such as those below:

“Climate change is expected to adversely affect forestry, along with other agricultural pursuits, as events such as drought or fire can be catastrophic in terms of loss or investment.

Changing climate patterns will also increase biosecurity risks, as it is likely to lead to greater risk of impact from new and existing pests and diseases, which will pose an increased threat to forest health.” (CSIRO 2006)
We have already witnessed the devastation caused by the mountain pine beetle in the inland forests of Canada, which is attributed to a warming climate in that area.

Conservation of biodiversity has become a hot topic for foresters. Australia’s forests are characterised by disturbance – most of our eucalypt forests have life spans of a few hundred years with significant periodic disturbances, which lead to complete or partial replacement. There is increasing pressure to stop any disturbance from harvesting and regeneration activities in native forests, due to perceived negative effects on biodiversity. As we continue to search for species we continue to find more. We have also seen legal attempts to stop legitimate forestry operations, which have been well planned, to cater for biodiversity, on the grounds that harvesting is incompatible with protection of other forest dwellers.

Australian foresters have seen the phenomenon of forests that have been harvested many times, put into conservation reserves due to their high biodiversity status. Surely this is evidence that active silvicultural management is not antagonistic to conservation outcomes.

**International landscape**

We all know that we operate in a global market. The effects of globalisation have been felt in Australian forestry since the first days of European settlement. Timber was shipped around the world as ballast in the first instance and then Australian timbers were highly valued for construction, wharf timbers and shipbuilding. The isolation of the first and second world wars led directly to forest policies that encouraged increased softwood plantation development and encouragement of native forest harvesting with an increased emphasis on regeneration and intensive silviculture.

After the 1970’s the advent of the woodchip export market, principally to Japan, led to opportunities to revitalise forests that had been “high-graded” in the past. Unfortunately, this business in some sense became the tail that wagged the dog in the eyes of many as pulp log production out of native forests far exceeded that of sawlogs. However, this industry established Australia as a significant international player in forest products and has also provided income and cash flow to sustain the native forest sawmilling industry.

More recently there has been a lot of activity in export of veneer and sawlogs to international markets, particularly in southeast Asia. This has helped establish confidence that Australian timbers can produce high quality products and hopefully may lead to development of on-shore manufacturing.

To quote from the Environment Australia web site,

“Australia can do much to conserve its own biological diversity and contribute to the global conservation and ecologically sustainable use of biological diversity but it is also an issue requiring effective international cooperation. Australia participates in development and implementation of many international agreements dealing with the environmental and biodiversity conservation and sustainable use. These include global and regional conventions and treaties and bilateral agreements.”

Some of these, which directly effect forestry, include:

- Convention on Biological Diversity (CBD) which has global coverage and has as its primary aims the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of genetic resources.
- World Heritage Convention administered by UNESCO.
Australia is a signatory to the International Tropical Timber Agreement and undertakes activities under that agreement towards having trade in tropical timber based on sustainable forest management in tropical regions.

Australia is one of the 12 country members of the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (known as the Montreal Process).

Australia participates in the Valdivia Group of Southern Hemisphere countries on biodiversity issues of common interest.

Convention to Combat Desertification.

Australia has recently signed the Kyoto Protocol to the United Nations Framework Convention on Climate Change and developed a National Greenhouse Strategy when the protocol was first signed, even though Australia was not a signatory at the time.

Many of these international treaties and conventions have a direct effect on forest management in Australia. Since the famous Franklin Dam case in Tasmania, where the Commonwealth government used international treaty obligations (namely the World Heritage Convention) to over-ride State legislation and planning rules, there has been increased Commonwealth involvement in land management, including forestry.

Internationally recognised certification systems are a new feature of the Australian forestry landscape. At present the two internationally recognised schemes operating in Australia are the Forest Stewardship Council (FSC) endorsed by the World Wildlife Fund and Australian Forestry Standard (AFS), endorsed under the Program for the Endorsement of Forest Certification (PEFC) schemes. Both of these schemes seek to encourage participants to adopt Sustainable Forest Management and meet environmental, social and economic targets in management and marketing of forests and products.

Certification schemes described above, and Standards such as ISO 14000, bring about obligations for record keeping and monitoring. Information management technology is required to keep and manage this information in a manner that it can be easily retrieved and audited. In addition, due to the nature of forests the information may be required to be accessible over many decades. Data collection, reporting and storage bring additional cost. The benefits should be achieved in improved forest management outcomes, better management systems and a social and environmental license to operate.

Political landscape

The environmental landscape of Australia is closely tied to the political landscape. Unfortunately, politics seems to over-ride good science. In many cases the political outcome has been to the detriment of the environmental outcome that was desired at the time. The desire to secure votes in capital cities during Federal and State elections has had a direct effect on forest policy. Over the past two decades, the number of hectares taken out of production forestry and dedicated to formal reserves and national parks has been quite staggering. Very little science or logic was applied to many of these decisions and the economic and social consequences were catastrophic for individuals and communities.

There is increasing awareness of the biodiversity, water and carbon values of our forest estate. However, while society places importance on these values it appears that the forest owner is expected to provide these at no charge. We have seen increasing constraints on forest use outside the formal conservation reserve system for both State and private forest owners.
It is interesting to note that governments are now considering charging plantation owners for water use, but there has been no offer of compensation to forest owners who provide clean water out of forested catchments (plantations and native forests) and regulate flows in times of intense rainfall. Are those who have cleared land to be charged for flood damage which may be caused downstream?

The conflict between the use of old forests as a carbon store and young forests as a place to sequester carbon is yet to be resolved. Old forests can be utilised to produce timber and paper products which continue to store carbon, the new replacement forest can then sequester more carbon for storage. Foresters are rightfully sceptical, as the decisions about carbon accounting will be based on political expediency rather than good science as we have experienced many times in the past.

### Regulatory landscape

The evolution of the regulatory environment in Australia has obviously had a significant impact on forestry. Initially the establishment of State Forestry Departments or Commissions in the early part of last century (Table 2) was the result of demand for better forest management. In many States forests had essentially been exploited in an uncontrolled manner until the establishment of these departments. Forestry Departments or Commissions were charged with the responsibility of managing the forests in a sustainable manner so that forest resources would be available to industry in perpetuity. The focus of these bodies was on timber production and other forest products and benefits provided by forests were institutionalised in the concept of multiple use forestry. More recently multiple use forestry has been re-badged as Sustainable Forest Management (SFM).

<table>
<thead>
<tr>
<th>State</th>
<th>Forestry Act</th>
<th>Forest Practices Act or Code</th>
<th>GBE established</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>1916</td>
<td>2005</td>
<td>2004</td>
</tr>
<tr>
<td>Vic</td>
<td>1908</td>
<td>1996</td>
<td>2004</td>
</tr>
<tr>
<td>WA</td>
<td>1918</td>
<td>-</td>
<td>2000</td>
</tr>
<tr>
<td>SA</td>
<td>1882</td>
<td>-</td>
<td>2001</td>
</tr>
<tr>
<td>Qld</td>
<td>1959</td>
<td>2007</td>
<td>2006</td>
</tr>
<tr>
<td>Tas</td>
<td>1920</td>
<td>1985</td>
<td>1997</td>
</tr>
</tbody>
</table>

The most significant Commonwealth legislation affecting forests is *the Environment Protection and Conservation of Biodiversity Act 1999*. This Act has significant implications for land managers on public and private land. It has been used to by the Commonwealth and private individuals to significantly hinder or curtail forestry activities and other land development.

There is a number of other Commonwealth Acts, which directly and indirectly affect forestry in the States. The Regional Forest Agreements were established to achieve 20-year agreements on forest management between the States and the Commonwealth. As part of this process there has been a rigorous assessment of a Comprehensive and Adequate Reserve (CAR) system, which has resulted in many forests on public land being put into formal reserves. Mechanisms have also been established to establish reserves on private land through the use of covenants and voluntary agreements.

Tasmania was the first State to introduce a Forest Practices Act in 1985. This Act provides for the development of a Forest Practices Code and the establishment of the Forest Practices Authority to implement and enforce the Code. Other States have followed with the production of Codes of Practice, but only in Queensland has a specific Act been implemented in 2007, to support these. In Victoria and NSW the Codes are implemented through bodies
such as the EPA or Soil Conservation Service. The Tasmanian system has the advantage of being a “one stop shop” for those engaging in forestry activities, whereas in other States there can be a complex web of local and State planning requirements to undertake forestry activity. The other feature of the Tasmanian system is it adopts a “carrot and stick” approach aimed at co-operative effort to bring about continuous improvement. This has advantages over an enforcement approach through “policing” type regulation, which tends to lead to adherence to the minimum standard only.

The establishment of Government Business Enterprises (GBEs) out of the existing government agencies has muddied the waters for the regulatory environment in Australia. In some cases, these GBEs are expected to behave like private companies and at the same time regulate activities in State forests and develop forest policy, which benefits the whole of industry. Significant conflicts of interest have the potential to arise in this situation. In addition these GBEs are also expected to provide significant dividends to their government shareholder. Criticism is often levelled as the return on assets is quite low compared to other enterprises, but then again not many businesses have assets that can only be liquidated at a rate of less than 1% per year and need to provide community services out of their operating funds. I am not sure that the most appropriate model has been reached, as evidenced by the differences in approach between States. Certainly in many States, key personnel and capabilities have been lost or severely reduced (eg experienced fire management capability).

One thing is clear, that a nationwide company operating in forestry must be abreast of a number of different operating practices, regulations, planning authorities and other constraints before they can start a saw, turn a sod, plant a tree or commit to a supply contract.

The advent of carbon trading and prospect of water regulation in relation to forests will add more complexity to this situation. Despite the implementation of RFAs, which hoped to bring 20 years of certainty in the forests, the regulatory landscape is constantly changing.

Industry landscape

The forest industry is one of Australia’s largest manufacturing industries, contributing about 1% of GDP, employing 83,000 people with exports of $2 billion and imports of $4 billion. Our major export destinations are Japan (47%), China (24%) and New Zealand (21%). The products exported include wood chips ($839M), paper and paper products ($593M), panel products ($151M) and sawn timber ($118M) (BRS figures for 2005-06). Most of our imports are in the form of paper and paper products from major producers such as Finland, Germany, Indonesia, USA and New Zealand. New Zealand, Canada and Malaysia are the main suppliers of sawn timber.

Australia’s forest product consumption is increasing due to population growth with 150,000 new houses and 4 million tonnes of paper consumed per year, but consumption per person is decreasing slightly overall (from 1.2 to 1.0m³ per year).

Australia’s forest industry is going through a period of rapid change. There are major industrial developments, which have recently been commissioned or are well advanced. Examples include major softwood sawmill processing facilities in NSW, Qld and Tas., hardwood sawmills for regrowth and plantation logs in Victoria, WA, NSW and Tas and pulp mills in NSW and Tasmania. There has also been significant expansion in manufacturing of veneers for engineered wood products such as plywood and LVL as well as increase in production of panel products such as MDF and particleboard.

The hardwood sawmilling sector based on large diameter timber including old growth has been in decline for the past two decades. Statistics reveal that their markets have largely been replaced by softwood. It will be interesting to see if high throughput hardwood mills using
regrowth and plantation logs can compete in these markets. However, at present there is only scant interest in managing eucalypt plantations for solid wood products, led by Forestry Tasmania and some private interests in NSW, Victoria and Queensland.

The ownership structure of the forests has changed substantially in the past decade. State owned plantations in Tasmania (pines) and Victoria (pine and eucalypts) have been wholly or partly privatised. In the 70’s and 80’s the major eucalypt plantation developments were carried out by pulp and paper companies in Victoria and Tasmania or woodchip export oriented companies in Western Australia and Tasmania, with some smaller activity by forestry agencies governments in all States. The advent of Managed Investment Schemes in the mid 90’s along with the Vision 2020 policy announcement by the Commonwealth was the catalyst for huge investment in eucalypt plantation development by a number of new companies utilising funds provided by small investors. The rigorous rules for forest management has taken away the traditional flexibility in silviculture that was applied to State owned or large industrial plantation estates.

Despite much encouragement the farm forestry plantation sector is only a minor player when compared to the scale of the above operations. The native forests under private ownership in Australia are substantial, and make a significant contribution to the forest economy.

The rapid increase in the eucalypt plantation estate over the past decade provides opportunities for further value-added processing in Australia. At present much of the resource is being exported to paper manufacturers in Asia. There are proposals for pulp mill developments in Australia and the use of this material for biofuel is also gaining increased attention. It is predicted that pulpwood production will increase from 3 to 14 million m³ per year. Sawlogs from hardwood plantations could reach 1.8 million m³, or more, per year by 2030, but this depends on appropriate silvicultural regimes being adopted.

The softwood sector is maturing and is relatively stable with sawlog output at 9 to 12 million m³ and pulpwood at 5 million m³ per year.

The increasing use of engineered and reconstituted wood products presents many opportunities for foresters and forest industries. Most of these products require high throughput manufacturing processes with relatively uniform resources as feedstock. This will increase the attractiveness of plantation and young regrowth resources. The advantage of these products over traditional sawn timber is the consistency of performance in structural and engineering uses that compete favourably with alternative products such as steel, concrete and aluminium. The added bonus of a carbon storing capacity should not be overlooked in the new carbon constrained economy.

The use of increased use of plantations brings with it the opportunity to substantially increase productivity in the forest, greater efficiencies in harvest and transport and more streamlined industrial processing.

Plantation productivity can be improved through propagation methods, tree breeding and silvicultural inputs including site preparation, weed control and nutrient management. Other technological improvements are discussed elsewhere.

Social landscape

Australia’s social landscape has been undergoing change for some time. There is significant reform and adjustment in rural economies which is resulting in farm amalgamation and decline in small rural towns and moves towards larger “urban” centres. This is counter-balanced to a small extent by “tree-changers” and sea-changers” who move back into these areas, but don’t rely on the land as their primary source of income.
The forestry sector is closely linked to the social landscape. Certainly, the social consequences of these decisions were barely considered and where they were, many governments thought that financial compensation and structural adjustment packages would solve the problem.

Forest management organisations are easy targets in the political landscape, generally because there are so few of them and they control large tracts of land. There has been much unwarranted criticism of the effects of forestry activities on the social landscape such as purchase of farms, where similar cause and effect circumstances prevail in agricultural industries.

There is increased recognition among forestry organisations that the social context in which they operate is important to ensure their business can proceed smoothly. Active engagement with local communities, neighbours, indigenous communities and NGOs is becoming more a feature of the social and political landscape for forestry. FSC and AFS certification schemes, place very strong emphasis on adopting adequate social engagement policies to ensure forestry organisation communicate with stakeholders and all affected parties in the communities in which they operate.

Tourism and forest recreation is an integral part of our social landscape. Most of this is concentrated in our managed native forests as well as in National Parks and and other formal and informal reserves. The challenge for forestry is how to cater for these social needs and at the same time extract some value for doing so through the provision of infrastructure to support such activities. The willingness to pay for these services was a topic of intellectual discussion when I was a student 30 years ago, but there are very few examples of forest land-managers achieving satisfactory returns from tourism and recreational infrastructure.

**Technology landscape**

Technological change in forestry has been slow in the past. Perhaps the biggest revolution in the last century on the harvesting side was the introduction of the bulldozer and the chainsaw as a means of extracting larger volumes of timber and opening up new areas for exploitation. On the planning side, the use of aerial photography also brought about major changes.

In the past two decades there has been a rapid change in technology applied to forestry operations at a number of levels.

An example of technological change being slow initially, and then moving rapidly, is in the area of tree breeding. Breeding of radiata pine commenced in Australia in a serious way in the 1950s. It took another 30 years to move to the 2nd generation of breeding. Increased computing power, combined with better analytical techniques and data storage (eg TREEPLAN® and Data Management System operated by the Southern Tree Breeding Association) as well as documented planning strategies has enabled a move to third and fourth generation material being made available in the past ten years. This demonstrates that technology can often be useless without good planning and people to implement it.

Increased computing power, communication and information availability has revolutionised the forestry industry in many ways, but there is still much work to be done. Often the work is not in developing the tools, but adapting them to the forestry situation or solving the operational problems to achieve adequate implementation.

Harvesting and transport account for a third to one-half of the delivered price of logs to a mill. Technological change in machinery, harvesting heads and truck design have brought efficiencies, however one area that has been neglected is data capture and communication. Improved communication networks, measurement and monitoring equipment can be applied
to transfer of data in real time. This is especially applicable to meet requirements for Chain of Custody certification under FSC and AFS schemes. These communication tools can be combined with sophisticated harvesting equipment to optimise merchandising of logs in the bush and to track the distribution of forest products to customers.

Forest management and planning tools are evolving quickly. The use of GIS and remote sensing (satellite and aerial imagery) to assist in these areas is gaining increased acceptance. However, the level of uptake is perhaps slow compared to other industries such as mining and more advanced agricultural enterprises.

**Labour supply landscape**

Integral to the adoption of new technology in forestry is the availability of a highly skilled workforce. Forestry has evolved from the days where most of the workforce in the bush consisted of unskilled labourers. Operators of harvesting equipment must be highly skilled in machine operation and have sufficient knowledge of environmental management rules to perform their jobs. There are few jobs where some skill level is not required. Even rudimentary silvicultural operations such as planting trees or pruning require some degree of training.

The challenge for forestry in Australia is to recruit and retain a workforce to service the needs of the industry. Demand for skilled workers at all levels from machine operators to professional foresters outstrips supply. In the case of machine operators, competing industry demand is a reason for lack of availability. In other cases, such as professional foresters, there are insufficient numbers of people taking up the profession through university or technical training. Allied professions that are required in the forest sector such as science, engineering and surveying are also suffering from lack of graduates. Others have studied the cause of this situation, suffice to say there is a crisis facing forestry at all levels.

**Conclusion**

The Australian forestry landscape is ever-changing. The change in balance between supply of logs from native forest to plantations is well underway. The emphasis on plantations as the major source of wood products in some ways makes Australian forestry less unique and exposes us to international competition because our products won’t be that much different from anyone else.

The challenge for Australia is to adapt to this change and perhaps to extract more value out of our native forest resource, because these forests provide unique wood and non-timber products.

There are new opportunities for forests through carbon trading, environmental services and tourism. However, while there may be demand, the willingness to pay is open to question. In terms of carbon trading we must be careful that any trading mechanism does not lead to perverse outcomes for forests.

A key limiting factor to forestry development in Australia is the availability of human resources with adequate training and knowledge to perform unique tasks. The focus on improved forest management during the last century rode on the back of having sufficient numbers of adequately trained professional and technical foresters well resourced with specialised technology, skills and information that could be applied to forest management. If these skills are lost there is no doubt that forest management practices will undergo gradual change over time. There is evidence that the loss of fire management skills has already had a profound effect on forest management in many parts of Australia.
The technology of forestry is constantly changing and improving. The challenge is often not in acquiring the technology, but how to use it wisely and efficiently to improve operations, reduce costs and increase productivity.

Australia must face up to key decisions about the forestry landscape at economic, social and environmental levels. The technological landscape and the human resources which go with it is the key to making many of these decisions and managing these changes for the better.