Tropical Forestry in Australia: The New Frontier

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Biography

Mark Parsons and Phil Pritchard are senior scientists in the Bureau of Rural Sciences. The Bureau manages the National Plantation Inventory and private forest inventory projects that include forest inventory and resource assessment.

Abstract

The forest debate in Australia has mainly focussed on biodiversity issues, with large areas of remnant native forest now set aside from timber production. However Australia’s tropical forests, both native and plantation areas, have been somewhat overlooked in this debate. Can development of our tropical resource offer a long-term future to private growers and the community?

Growing interest in the capacity of forests to act as a carbon store has triggered a change in how our forests are perceived — from a wood production resource to delivering a broad range of goods and services, including carbon sequestration. This change in perception is presenting opportunities to promote forestry as a sustainable production system. But this is not without challenges, as much depends on better collective understanding of the resource and more sophisticated management. Reliable and robust information is essential to build a portfolio of forest management arrangements that better suit the tropical context.

Recent work by the Bureau of Rural Sciences in Northern NSW will be used to illustrate the challenges and opportunities for developing Australia’s tropical forests.

The Tropical Timber Resource

Introduction

Growing interest in the capacity of forests to act as a carbon store typifies a change in how our forests are perceived. While the issues of forest protection and market access have contributed to a difficult operating environment for private forestry managers, recent developments, particularly the prominence of carbon management, will be important scene-setters for forest management and are contributing to a reassessment of the role of forests in delivering public benefits to the community.

While much of the forest debate of recent decades has centred on the impacts of harvesting on biodiversity, we now see a stronger recognition that private forest management delivers a broad range of goods and services, including wood products and biodiversity conservation. This is important in the positioning of the private forest grower as a major contributor to sustainable forest management. It is also part of a renewed national impetus to reward good land and resource management.

While perhaps not realistic in the past, there now appear to be concrete opportunities for the sector to work with Governments in meeting community needs while delivering benefits to growers. Whether through conventional markets, market based incentives or stewardship payments, these opportunities are looking more achievable as long term drivers sustainable and productive forest management. In practice, the limits of economic wood production in much of northern Australia will necessitate consideration of forest management that provides good and services as timber production may not be sufficient by itself.

But this is not without challenges, as much depends on better collective understanding of the resource and more sophisticated management and accounting arrangements. Reliable and robust information is therefore essential to understanding of forest management arrangements that better suit the tropical context and new and emerging markets for environmental services. Irrespective of the developments in the carbon and other markets, wood harvesting remains the most immediate option for growers, particularly in the north coast of NSW and southern Queensland. Productivity and capability will also be important in assessing carbon market opportunities.

Resource information is often a major limiting factor; little is known about productive potential for a large part of Australia’s sub-tropical and tropical native forests, especially private native forests. The cost and difficulty of obtaining better resource information for such extensive, variable and remote forests may seem insurmountable. Private native forest inventories undertaken in northern NSW and southern Queensland may provide a solution. In key regions we also need to understand better the timber opportunities if market development is to prosper. This will also be important in plantation developments. There appear to be significantly improved prospects for plantations, with evidence that plantings in tropical regions is expanding, albeit from a low base. The added impetus that may come from a possible carbon pollution reduction scheme suggests cause for optimism, although the realisation of benefits is still some way off.
This paper aims to provide a broad overview and lessons for the future. Inevitably the focus is limited by data availability and the fact that the plantation resource information provides a more concrete basis for discussion. It is necessarily the case that when we discuss the tropics we are talking of a significant part of Australia. We focus on key regions to illustrate the paper.

Native Forests in Northern Australia

When defined using the national forest definition, around half of Australia’s forests lie in the north. This includes large areas of woodland, *Melaleuca* and *Acacia* forests. This is potentially a large timber resource, but development of markets is difficult without resource and market information and infrastructure and when regulatory uncertainty is considered (MIG 2008). Overall, much of the forest and woodland area contributes little to timber supply because it comprises leasehold land predominantly used for grazing, merchantable yields are low, it is too far from markets or too dispersed. While rainforests are prominent in tourism advertising they do not constitute a significant timber resource as timber harvesting is generally not permitted. In the past the availability of a range of native hardwoods, including tropical species, was significant. Successive reductions in allowable yield and cessation of harvesting in parts of Queensland have permanently reduced the harvest. Moreover, the Queensland Government has signalled a significant phase-out of native forest harvesting on public land in favour of hardwood plantations in areas where they can be developed (MIG 2008).

A large proportion of private native forests in northern Australia is owned by Indigenous people, many of whom would consider commercial development opportunities for their forests (Annandale 2008). These opportunities are constrained by the same factors listed above.

Nonetheless, the forests of Queensland, Northern Territory and northern Western Australia are extensive (Table 1). A total of 57% of Australia’s native forests (66% of the private native forests, which includes Indigenous-owned forests) are in Queensland and the Northern Territory. Sub-tropical and tropical forests in Western Australia and northern NSW add to those proportions. This means that the forests of the north, including the taller commercial forests in and around the tropical coast and the vast woodlands, are delivering large carbon sequestration benefits to the land use change sector. Importantly, it is also in relatively good condition to deliver multiple benefits, including biodiversity conservation.

Table 1: Area of native forest by tenure and jurisdiction ('000 hectares)

<table>
<thead>
<tr>
<th>Tenure</th>
<th>ACT</th>
<th>NSW</th>
<th>NT</th>
<th>Qld</th>
<th>SA</th>
<th>Tas</th>
<th>Vic</th>
<th>WA</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leasehold land</td>
<td>8</td>
<td>9 891</td>
<td>13 920</td>
<td>34 304</td>
<td>3 083</td>
<td>0</td>
<td>35</td>
<td>3 891</td>
<td>65 132</td>
</tr>
<tr>
<td>Multiple-use forests</td>
<td>0</td>
<td>1 980</td>
<td>0</td>
<td>1 991</td>
<td>0</td>
<td>1 026</td>
<td>3 163</td>
<td>1 248</td>
<td>9 408</td>
</tr>
<tr>
<td>Nature conservation</td>
<td>108</td>
<td>5 148</td>
<td>16</td>
<td>4 576</td>
<td>4 029</td>
<td>1 121</td>
<td>3 505</td>
<td>3 868</td>
<td>22 371</td>
</tr>
<tr>
<td>preserves</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other crown land</td>
<td>7</td>
<td>943</td>
<td>674</td>
<td>1 598</td>
<td>277</td>
<td>85</td>
<td>109</td>
<td>7 169</td>
<td>10 862</td>
</tr>
<tr>
<td>Private land (incl.</td>
<td>0</td>
<td>8 076</td>
<td>16 317</td>
<td>8 908</td>
<td>277</td>
<td>85</td>
<td>1 025</td>
<td>1 489</td>
<td>38 099</td>
</tr>
<tr>
<td>Indigenous)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unresolved tenure</td>
<td>0</td>
<td>170</td>
<td>83</td>
<td>1 204</td>
<td>67</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1 524</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>26 208</td>
<td>31 010</td>
<td>52 581</td>
<td>8 885</td>
<td>3 116</td>
<td>7 837</td>
<td>17 665</td>
<td>147 397</td>
</tr>
</tbody>
</table>

Source: MIG (2008)
were also planted on Melville Island, Northern Territory, from the 1960s to the 1990s. While growth of exotic pines was satisfactory, it proved impractical to develop a viable processing industry; the sites are now being replanted with *Acacia mangium*.

Initial attempts at hardwood tropical plantation forestry were not so successful. A range of hardwoods – including Flindersias, *Toona ciliata*, *Cardwellia sublimis* and several eucalypts – were tried in wet tropical parts of Queensland by the 1920s. Remnants of those survive today on the Atherton Tableland. A trickle of hardwood planting continued, an average of about 50 hectares per year until 1990. Farm forestry initiatives in the 1990s accelerated the rate to about 500 hectares per year. When the managed investment schemes joined in in the late 1990s, the rate increased to an average of about 6000 hectares per year (National Plantation Inventory data).

Hardwoods, including *Khaya* species, have been tried in the seasonally-dry tropics of Queensland since the 1950s (Dickinson and Kelly 2006) and in the Northern Territory from 1972 (Reilly 2006). *Khaya* species, mainly *K. senegalensis* (African mahogany), has been planted for ornamental purposes for many years and 160 hectares were established by Comalco for mine site rehabilitation from the 1960s to 1985 (Dickinson and Kelly 2006). Planting of *K. senegalensis* is now soaring. In the past five years the number of corporate *Khaya* growers has increased from one to at least six. As well, more than 60 private landowners are growing areas from a few hectares to 30 hectares each (Dickinson and Kelly 2006).

The first forestry managed investment schemes in tropical Australia planted eucalypts and *Acacia mangium* (mangium), the vast majority aiming for pulpwood production. More recently there has been a surge of investment – managed investment schemes and other private investors. As well as *K. senegalensis*, these schemes are growing *Tectona grandis* (teak) and *Eucalyptus pelita* (red mahogany). At least six managed investment schemes have planted one or more of those speciality sawlog species now operate in northern Western Australia, Northern Territory and North Queensland (Figure 1). Another private investment scheme started in the Northern Territory in 2006.

The development of the region is based on the market opportunities for increased hardwood sawlogs and pulpwood from plantations. For example, planting teak, mahogany and mangium reflects in part the need for fast growing species with a quicker return than tropical pines and the increased understanding of market opportunities for hardwoods. It can also be linked to potential export opportunities and the recent developments in species for plantation development. Existing infrastructure and processing capacity remains limited in many parts of the north. NSW Northern Tablelands and North Coast, North Queensland and Northern Territory do not have existing processing capacity to support any significant plantation resource, although logs can be exported from several ports.

![Figure 1: Cumulative area of specialty MIS sawlog plantations, northern Australia](image)

Source: National Plantation Inventory data.

**Case Studies Of Native Forest Resource Inventory In Northern Australia**

In 2003, the Queensland Timber Board and the Australian Government jointly commissioned assessments of timber and some non-timber values for private native forests in south-east and central-western Queensland. These provided timber resource estimates for private native forests in those regions. The work also provided assessment methods that can be applied to private native forests in other regions. These methods use attributes derived from remotely-sensed data combined with strategically-placed sample plots. Similar methods have now been applied to the southern tablelands and north coast regions of NSW (Roberts 2007; Roberts et al. in press). These methods provide valid estimates at a regional level, rather than at the individual property level.

Private native forests tend to be dispersed, fragmented in ownership and highly variable in type and condition. These features present difficulties not faced by public forest managers for regional resource inventories. The south east Queensland private native forest inventory addressed these difficulties by using a combination of remote sensing and ground sample plots based on a statistical method that allowed for the wide range of type and condition of private native forests. The forestry schools of the Australian National University and the University of Melbourne were instrumental in the development of these methods (Brack et al. 2004).

Private native forests cover nearly 1.4 million hectares (22%) of total land area in south-east Queensland. After discounting non-commercial forest types, inaccessible areas and environmental buffers, the net area where timber products may be harvested was found to be 750 000 hectares. The total volume of potentially harvestable timber products on that net area was estimated to average about 60 m³/ha, including sawlogs, poles, residual logs, small roundwood and fencing timbers (MBAC Consulting and BRS 2003a).

The inventory method developed for south-east Queensland was then applied in Queensland’s Western Hardwoods region, which extends from the New South Wales – Queensland border to near Charters Tower in the north, Charleville in the west and Toowoomba and Gladstone in the east. The total area is 31.5 million ha, of which private native forests cover just 1.54 million hectares (4.4%). When allowing for slope and...
environmental restrictions, the assumed net available area was less than 1.4 million hectares. Access to sites for sample plot measurement was a major constraint. Sampling sites were selected to target canopy densities, rather than forest types. The result was an estimated average of about 35 m²/ha, including sawlogs, poles, piles, small roundwood and fencing timbers (MBAC Consulting and BRS 2003b).

These inventories show that, despite the practical difficulties, it is feasible to develop resource estimates for dispersed, variable forests in northern Australia. Furthermore, the sampling procedures are not restricted to the usual timber products. Non-timber products and environmental attributes can also be included. This could be of considerable use, for example, to people pursuing business opportunities for Indigenous forests.

In 2008, the Australian National University and the Bureau of Rural Sciences commenced an inventory of private native forests in the Upper North East NSW regional forest agreement region. That project will be completed later in 2008.

Scope for Other Markets

While existing forests may not be counted for credits, the scope for benefits to growers may increase through additional plantings on previously cleared agricultural land, aided and abetted by the Australian Government’s ‘green paper’ (AG 2008), which states that:

‘Tree planting is one the few cost-effective abatement opportunities currently available in the agriculture sector. The Government proposes to credit increases in forest carbon (that are counted towards Australia’s Kyoto target) by allowing forests, including environmental and landcare plantings, to be included in the scheme on a voluntary basis.

This would be an opportunity not previously available, though the extent to which this can occur and the speed with which it could be adopted is still very much unknown. Nonetheless, it signals a major potential shift in the relationship of the farming community to forestry and commercial tree growing. However, there are many examples where agricultural communities have expressed concern at reforestation of farmland, even on a modest scale.

References


MBAC Consulting and BRS 2003b. Western hardwoods region Queensland private native forest inventory. MBAC Consulting Pty. Ltd. and Bureau of Rural Sciences, Canberra.


