

Resources

Next Generation Forest Plantation Investment

Project number: VNC423-1617

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Level 11, 10-16 Queen Street
Melbourne VIC 3000, Australia
T +61 (0)3 9927 3200 E info@fwpa.com.au
W www.fwpa.com.au



**Forest & Wood
Products Australia**



Next Generation Forest Plantation Investment

Prepared for

Forest & Wood Products Australia

by

Lyndall Bull & Rodney Keenan

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Researcher/s:

University of Melbourne: Professor Rod Keenan, Dr Nerida Anderson, Dr Lyndall Bull, Liam Costello, Dr Dean Severino and Dr Jodi York

Swinburne University: Dr Krzysztof (Chris) Dembek

Sylva Systems Pty Ltd: Braden Jenkin

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Forest & Wood Products Australia Limited
Level 11, 10-16 Queen St, Melbourne, Victoria, 3000
T +61 3 9927 3200 F +61 3 9927 3288
E info@fwpa.com.au
W www.fwpa.com.au

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Executive Summary

The Next Generation Forest Plantation Investment Project was driven by the need for increased resources for timber processors in regional Australia and need for more trees in Australian rural landscapes for environmental and social outcomes. It recognised that there are clear economic, social and political limits to the purchase of large areas of agricultural land for plantations.

The principle objective of the Project was to:

‘Develop new approaches to integrating trees for commercial harvest within rural landscapes that deliver on-farm and wider economic, environmental and social benefits while also supporting profitable, resilient, publicly-supported high value regional industries.’

The Project was focussed on two key regions: Colac-Otway and Gippsland and three research streams. The project also aimed to provide a base to develop a National Learning Network (Table 1).

Focus Area	Description	Outputs
Land and Landowner Assessment	Landscape assessment	A GIS based assessment of suitable and potentially available land for commercial trees in target regions Report describing analysis of local and property level constraints on suitable land for commercial trees
	Landowner assessment	Report on surveys of landowners in target areas
Business Model & Partnership Design	Financial Sector Survey	Report on a survey of potential investors in tree growing (in Australia and internationally)
	Business Model Design and Testing	Report from a workshop on business model design. Report providing guidance to industry
National and Global Policy Review and Benchmarking Analysis	Review of past policies and approaches in Australia	Report Summary report
	Global review and analysis	Report
National learning network	Participation in multiple forums to progress new thinking with regard to plantation development	Report from a national workshop, participation in conferences and development of policy recommendations Report describing trends in forest product developments and their implications for commercial tree planting

Table 1 Next Generation Forest Plantation Investment Project research

Industry benefits

Analysis identified that commercial timber plantations operate within a complex system with multiple actors at global, national, regional and local scales. Multiple business partnership models can support plantation production, involving varying inputs of land, labour, capital, technical

capacity or other inputs. Models will vary according to the objectives of the landowner, the investor, the timber processor and the market. Governments and the community have a significant influence on the success of different models, through policies and community support.

The research identified the area of privately owned land in Victoria that is potentially suitable for investment in trees for commercial harvest, based on biophysical and operational constraints.

The ability to access that land will largely be determined by the interest and willingness for private landowners to engage with the sector, and subsequently plant trees on their land. The social research on landowners in this target area identified the characteristics of different types of landowners, their interest in commercial tree growing, and the factors that would determine their willingness to invest partnerships or joint ventures with industry.

Research into the finance sector provides the industry with information on the potential investors in trees, their attitudes to plantation trees as an investment, and what different investors require to support investment.

In a review of past plantation investment approaches in Australia, the project provided the timber industry and potential investors with clear guidance on the key elements for successful private investment in plantations (Figure 1).



Figure 1 Key elements for successful private investment in plantations

A business model design process provided the base for guidance on requirements for successful industry-landowner partnerships.

These partnerships require a change in the mindset of the forest industry regarding plantations. The concept needs to expand from large, single-unit, capital-intensive assets that rely on economies of scale to supply low-cost wood, to include smaller-scale distributed plantings that are integrated with agriculture, share more financial value with landowners and provide multiple benefits to the wider community. In doing so, the industry might achieve a larger-scale estate with lower capital outlay and greater community support. Commercial trees for harvest need to be integrated with agriculture, not seen as a competing use.

This requires a conducive policy and operating environment and long-term company commitment. The project identified the policies and incentives and the broader roles of different levels of government in supporting these partnerships. It also identified tools for further development to support these partnerships. To achieve desired policy outcomes for an increase in the forest

plantation estate, forest plantations need to be included in agricultural policy at Federal and state government level, rather than in separate forest policy. Governments and industry need to engage agricultural and community stakeholders in policy design.

Industry actions

The insights gained through this Project will benefit partner companies, industry as a whole, and government in achieving regional development and environmental policy objectives. Research outputs have been communicated in reports, presentations and workshops.

To realise the potential identified, industry partners need to consider the research findings, the extent that they wish to expand their estate and their capacity to invest in long-term relationships with private landowners and other relevant stakeholders, to increase commercial trees planted on private properties.

Introduction

Project Purpose

Globally there is a growing demand for wood. To meet this future demand, the global area of tree plantations may need to double by 2050. Domestically, an expanding population and increasing use of wood in construction for design and environmental benefits are driving increased demand for wood products. There is a considerable area of farmland in Australia where different types of planted forest would provide agricultural production and environmental benefits. There are strong policy drivers to invest in trees to mitigate climate change and support forest landscape restoration objectives and significant sources of capital for investment in new forest assets.

However, investment in new plantations in Australia is at a standstill. This lack of new investment and relatively flat plantation timber supply are strong constraints on new investment and expansion in the forest processing sector and likely to lead to an increasing reliance on imported timber products.

In short: industry needs more wood, the environment needs more trees, investors need sustainable and reliable sources of return on capital and farmers are increasingly seeking income options that are integrated with their agricultural operations. This presents an opportunity for investment in more trees in rural landscapes.

This project provides industry and policy makers with the information it needs to design more sustainable and effective approaches for working with landholders and establishing new planted forests on private lands. These approaches include greater integration of tree growing with agriculture and partnerships that recognise and provide benefits to a wider range of stakeholders. Realising these opportunities will require industry leadership and investment in industry-landholder relationships.

The research focussed on two key regions in Victoria: Colac-Otway and Gippsland (Figure 2). It aimed to realise the following goals:

1. Understand the land base and the needs and experiences of landowners, industry and the investment community
2. Learn from past experiences to design more sustainable investment models
3. Develop a process to design and test new models for planted forest investment
4. Drive long-term change to position the sector to access new capital and land through partnerships

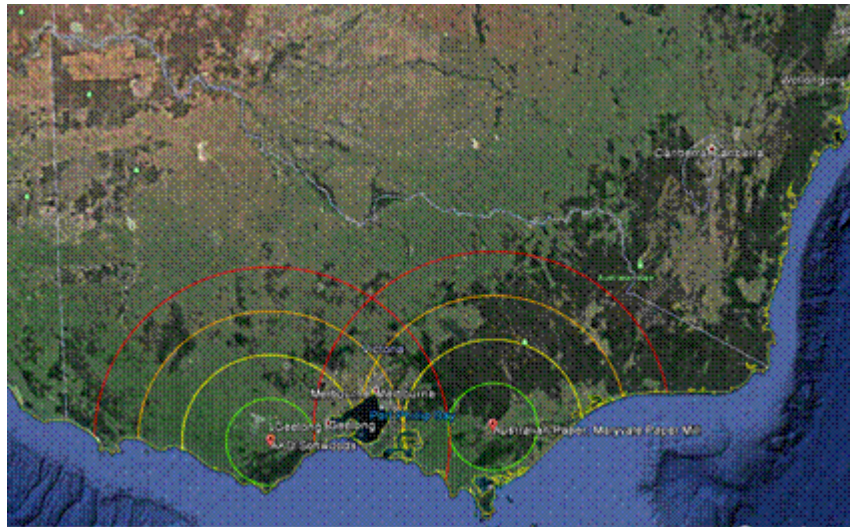


Figure 2 Location of research focus

Project Partners

The Project partners were:

- Midway Limited
- Australian Paper Pty Ltd
- AKD Softwoods Pty Ltd
- Hancock Victoria Plantations Limited
- One Forty One Plantations Ltd
- Australian Forest Products Association

Project Steering Committee Meetings

Project Steering Committee meetings held during the Project are outlined in Table 2.

Meeting number	Date	Accompanying Milestone Report submitted
1.	July 2017	No
2.	October 2017	Yes
3.	December 2017	No
4.	March 2018	Yes
5.	May 2018	Yes
6.	September 2018	Yes
7.	December 2018	Yes
8.	January 2019	No
9.	March 2019	Yes
10.	May 2019	No
11.	July 2019	Yes

Table 2 Project Steering Committee Meetings

Project Budget

Financial contributions

The Project had a cash budget of \$980,000, including a management fee payable to FWPA of 5%. This was sourced from both Project Partners (\$530,000) and FWPA (\$450,000; via the Commonwealth Government's Voluntary Matching Program).

In kind contributions

In kind contributions from Project Partners were estimated at circa 107.75 days. This is valued at approximately \$108 181¹. In kind contributions from the University of Melbourne and Swinburne University were estimated as \$104 416 and \$70 280 respectively. Table 3 provides the breakdown of these contributions.

Table 3 In kind contributions

Organisation	Time Contribution (days)	Approximate value of contribution ²
Midway	23.5	\$23 594
Australian Paper Pty Ltd	21.5	\$21 586
AKD Softwoods Pty Ltd	21	\$21 084
Hancock Victoria Plantations Limited	22	\$22 088
One Forty One Plantations Ltd	19.75	\$19 829
University of Melbourne	104	\$104 416
Swinburne University	70	\$70 280
Total	281.75	\$282 877

Project Deliverables

Table 4 provides an outline of the Project outputs. All Final Reports can be found in: <https://www.dropbox.com/sh/fdjdppp80e4s4er/AADN9AXAHAWiQgCaB13q7Ge5a?dl=0>. Public reports can be found at: <https://blogs.unimelb.edu.au/nextgenplantations/#tab187>

¹ Note that this is based on certified contributions as per Milestone Reports with an additional day to cover contributions made in the development of the final deliverables.

² In-kind time calculated based on the following approach agreed with the Project Steering Committee:

- Based on the CRC Project funding approach of using \$250,000 FTE for in-kind staff covering salary, direct salary on-costs, direct and indirect support costs and research
- No differentiation for different levels of staff
- Based on 249 working days per year; \$1004 per day/per person

Table 4 Project Deliverables

Focus Area	Description	Researcher/s	Outputs	Completion date
Land assessment	A GIS based assessment of suitable and potentially available aggregation of land in target regions and analysis of local and farm level constraints	Dr Dean Severino Chathura Hasanka Liam Costello	Two reports: <i>'Next Generation Plantation Investment Land Capability Assessment'</i> And <i>'Next Generation Plantation Investment Research Project Land assessment'</i> A summary of this work can be found in Appendix One of this report.	June 2018 December 2018
Landowner Assessment	Surveys of landowners in target areas to improve understanding of the social and psychological factors underlying landowner attitudes to commercial tree growing	Dr Nerida Anderson	Report on: <i>'Integrating trees in rural landscapes: Landowner Assessment'</i> A summary of this work can be found in Appendix Two of this report.	December 2018
Finance sector	A survey of the finance sector to understand investor motivations, requirements and conditions that would foster greater investment in planted trees.	Dr Krzysztof (Chris) Dembek Dr Jodi York	Report on a survey of potential investors in tree growing: <i>'Finance Sector Report'</i> A summary of this work can be found in Appendix Three of this report.	February 2019
Business Model & Partnership Design	Business Model Design and Testing	Professor Rod Keenan Dr Nerida Anderson Dr Krzysztof (Chris) Dembek	<i>Report from a workshop on business model design:</i> <i>'Next Generation Forest Plantation ThinkCamp Conversation Tracker'</i> Business model development report: <i>'Designing business models for commercial tree growing partnerships on rural land: a guide for the Victorian forest industry'</i>	Conversation Tracker: March 2019 Business model guidance: August

		Dr Lyndall Bull ThinkPlace Pty Ltd	A summary of this work can be found in Appendix Four of this report.	2019
National and Global Policy Review and Benchmarking Analysis	Review of past policies and approaches in Australia	Braden Jenkin Summary report: Professor Rod Keenan and Dr Lyndall Bull	Two Reports <i>'Benchmarking Analysis: Part 1 Australia's history of plantation development, policy and incentives'</i> Summary report <i>'Tree plantation investment and partnerships in Australia: an analysis of past experiences'</i> A summary of this work can be found in Appendix Five of this report.	December 2018
	Global review and benchmarking report	Braden Jenkin	Qualitative and quantitative analysis of key policies to be ranked according to the applicability of the Australia environment: <i>'Benchmarking analysis: Part 2 An international perspective of the history of plantation development, policy and incentives'</i> A summary of this report can be found in Appendix Five of this report.	June 2019
National learning network	Participation in forums to progress new thinking with regard to plantation development	Professor Rod Keenan Dr Lyndall Bull Dr Nerida Anderson Braden Jenkin Andrew Piper	Report from a national workshop, participation in conferences and production of policy documents <i>'National Meeting on Future Plantation Investment Report & Action Plan'</i> <i>Next Generation Forest Plantation Investment Key messages & Insights, February 2019</i> Three presentations to Australian Forest Products Association Presentations to National Timber Councils Association conference, Timber Towns Victoria and Farm Forest Growers Victoria Report on trends in forest product development. A summary can be found in Appendix 6.	National Meeting Report: March 2018 Policy messages: February 2019

In addition to the reports outlined above, a supplementary report was produced that analysed trends in forest product development. That report can also be found at: <https://blogs.unimelb.edu.au/nextgenplantations/#tab187> All project reports will be available at this site from September 2019 onwards.

Establishment of a National Learning Network

The Project team convened a productive national workshop in March 2018, attended by nearly 80 people, to discuss challenges and solutions for future plantation development. Through other activities and presentations, the team engaged with a wide range of stakeholders to consider potential approaches to assist project partners, and the forest sector more generally, in their objectives to increase plantation timber production.

Complementing these activities, the Project team convened discussions between different representatives and actors involved in plantation forestry, investment and other forms of tree growing. The aim was to reflect on, and further develop, the Future Plantation Investment Action Plan. Participants in these discussions were:

Sara Gipton	FSC Australia
Glen Samsa	Midway Limited
Zoe Ryan	Climate Friendly
Ruth Harvey	Forest Products Commission Western Australia
Jeff Swingler	Verdance Group
Howard Parry-Husbands	Pollinate
Peter Stephen	Greening Australia

Events

The Project team convened workshops and a national meeting, and presented and participated in conferences and events by other organisations. Table 5 summarises this activity.

Table 5 Project and external events

Event Name	Timing	Estimated Attendees
PROJECT EVENTS		
Project Design Workshop	8 September 2017	20
Stakeholder Consultation Workshop	15 December 2017	19
National Meeting on Future Plantation Investment	2 March 2018	88
Wood+: Insights and lessons from an analysis of the history of planted trees in Australia	21 May 2018	~50
Institute of Foresters/Australian Forest Growers Conference: Healthy Cities, Farms and People (Project was host of a Conference session)	2 September 2018	~150
A design workshop to develop collaborative business models (ThinkCamp)	27 February 2019	87
EXTERNAL EVENTS		
Institute of Foresters of Australia National Conference (a number of team and PSC members presented and were panellists)	14 August 2017	~100

AFPA members meeting (Keenan , presentation on project activities)	9 November 2017	~50
Institute of Foresters Breakfast forum (Bull, panelist)	November 2017	~50
Institute of Foresters Next Generation Plantations Forum (Keenan, presentation)	1 March 2018	~50
Southern Farming Systems – Farm Trees Workshop, Hamilton (Keenan, Anderson presentations).	22 May 2018	~30
Local Government Forest and Timber Industry Conference (Keenan, presentation)	9 August 2018	~100
Gippsland Agroforestry Network (Keenan presentation)	24 August 2018	~30
AFPA Growers Chamber - (Jenkin presentation Insights & conclusions from an analysis of the history of plantation forestry in Australia)	13 September 2018	~50
Australian Paper - (Jenkin presentation Insights & conclusions from an analysis of the history of plantation forestry in Australia)	21 September 2018	3
4 th International Congress on Planted Forests – presentation on plantation policy	23 October 2018	~100
The Forest Dialogue on Tree Plantations in the Landscape (New Zealand, Bull, Anderson participated)	29 October 2018	NA
AFPA members meeting (Keenan presentation on project outputs)	8 November 2018	~50
AFPA and NFF field trip to Western Victoria (Keenan, presentation on project outputs, Jenkin presentation on insights & conclusions from an analysis of the history of plantation forestry in Australia). –	21-22 March 2019	~50
Timber Towns Victoria Local Government meeting (Keenan, presentation)	9 May 2019	10
Farm Forest Growers Victoria (Keenan presentations and regular meeting attendance)	During 2018 and presentation 13 June 2019	

Media

The Project generated newspaper articles in the Weekly Times and Professor Rod Keenan participated in radio interviews on the ABC.

Project outcomes

Table 6 outlines how the Project met its proposed outcomes and benefits (as outlined in the Project proposal).

Table 6 Demonstration of Project outcomes

Outcomes	Benefits	Measurement	Demonstration
Improved understanding of land available for planted forest investment in target regions	Identification of potential areas for planted forest investment	Reports on land areas by suitability and availability classes	Analysis demonstrated the plantation production potential of land in the research focus areas.
Detailed understanding of land owner attitudes with regard to the forest sector and planted forests and their requirements for plantation investment	An improved basis for developing appropriate business models to support the development of different types of plantations	Reports on landowner needs and attitudes of landowners that support the development of new business models	Based on the outcomes of the research a typology of landowners was developed. The Project enabled an improved understanding of the needs of landowners when considering the planting of trees on farms. This knowledge was integrated into the business model development component of the project.
Understanding the requirements of different types of investors	Better forest industry and landowner understanding of requirements of finance sector that can inform new business model development	Reports on finance sector requirements	The research developed an understanding of the trends in the finance sector and the needs and benefits that the forest sector might gain from developing capacity to report against investment impact criteria.
New business models for investment in planted forests for a range of objectives, including environmental values	New investment in plantations in the target region	Participation of landowners, investors and industry in business model development and testing	<p>The Project delivered a report: Designing business models for commercial tree growing partnerships on rural land: a guide for the Victorian forest industry.</p> <p>This report was developed using the research and insights from the Project, the outputs from the ThinkCamp (incorporating participation from landowners, the investment community and industry) and inputs from Project Steering Committee members.</p> <p>It is anticipated that the report will be used to guide future plantation development that incorporates the findings of this Project.</p>
Improved understanding and benchmarking of policies and incentives that have been implemented in Australia and internationally to increase plantation investment	To learn from and build on current and past plantation development policy approaches	Development of plantation development policies and incentives that are economically, socially and environmentally appealing	Learnings from policy and incentive mechanisms both in Australia and globally have been communicated to project partners and to a broader audience. Effective implementation of these will take place outside the life of the project.
Increased trust between, investors,	Opportunities for mutually	Level of participation in new	New planted forest partnerships will necessarily take place

forest industry sector and landowners	beneficial investment options for forest industry, investors, landowners and other stakeholders	planted forest investment partnerships	outside the life of this project. To do this effectively will be a long journey for all parties involved. The project was successful in its efforts to increase the opportunities for dialogue and improved understanding between the forest sector and landowners.
New thinking in the forest sector with regard to working with landowners and investors	New opportunities for planted forest investment	New plantation development that differs from traditional approaches	<p>The Project was successful in generating significant discussion in the sector about how it might work with landowners and investors into the future.</p> <p>The guidance material that the project generated offers relevant stakeholders with the basis for new approaches to plantation development. The application of those new approaches is necessarily outside the life of this Project.</p>

Plan for National roll out

The National Workshop held in March 2018 in Melbourne identified a suite of actions for increasing investment in plantations in Australia. The full report can be found at: <https://cpb-ap-se2.wpmucdn.com/blogs.unimelb.edu.au/dist/d/279/files/2017/10/National-Plantation-Investment-Meeting-Report-Action-Plan-237iezc.pdf>

The Action Plan and strategy from that report are presented here (Table 7 and Figure 3).

Table 7 Proposed Action Plan for increasing investment in plantations in Australia.

Governments	Forest industry	Finance Sector	Landowners
Setting better policy			
<ul style="list-style-type: none"> • Clear goal and consistent bipartisan long-term policies • Consistent and logical regulatory policy for plantations at the Federal, State and Local government levels • Invest in infrastructure to support plantation timber production • Invest in R&D to identify innovative and sustainable approaches to plantation investment • Natural capital accounting models that recognise plantations 	<ul style="list-style-type: none"> • Engage constructively with governments and landowners to develop new policy that supports sustainable development of new plantations that are complementary to existing agriculture 	<ul style="list-style-type: none"> • Develop clear and transparent governance frameworks to guide and encourage investment in plantations 	<ul style="list-style-type: none"> • Work collectively with government, forest industry and finance sectors to support investment in trees to improve and diversify incomes and environmental outcomes
Stimulating investment			
<ul style="list-style-type: none"> • Funding for new research and the effective communication of findings from existing studies on the economic and on-farm benefits of plantations • Explore and commit to the most appropriate financial support mechanisms e.g. underwriting plantation investment, a 'bank for wood fund' etc • Establish long term markets for environmental benefits provided by trees • Financial support to develop an 'honest broker' agency to facilitate relationships between capital, the forest industry and landowners 	<ul style="list-style-type: none"> • Implement transparent pricing for different products from plantations • Invest in value-adding to lift potential returns • Establish an agency to work as an 'honest broker' to facilitate trust between the industry, growers, farmers and the general public, and to stimulate the emergence and expansion of markets for timber products • Invest in value adding and use of all forest outputs to increase potential returns 	<ul style="list-style-type: none"> • Develop simple investment and financial products & instruments that incentivise value chains • Develop instruments that strengthen the value and recognition of the currently non-monetised value of plantations • Provide financial guidance to the 'Broker agency' • Develop simple investment and financial products and instruments focused on plantations 	<ul style="list-style-type: none"> • Provide landowner relevant guidance to the 'Broker agency'
Quantifying and monetising co-benefits			
<ul style="list-style-type: none"> • Establish a policy framework that facilitates investments in planted forests for timber production, carbon and other environment 	<ul style="list-style-type: none"> • Encourage and promote studies that quantify co-benefits of tree plantations, including other on farm production, income diversification, 	<ul style="list-style-type: none"> • Develop new financial instruments supporting innovative and sustainable approaches to plantation development 	<ul style="list-style-type: none"> • Work with the forestry and finance sectors to design and implement instruments that support innovative and sustainable approaches to

services	<p>carbon and biodiversity</p> <ul style="list-style-type: none"> • Work with the finance sector and landowners to design and implement innovative instruments that support sustainable and profitable approaches to plantation development 		plantation development
Communicating and building capacity			
<ul style="list-style-type: none"> • Develop a national communication strategy promoting the benefits of forestry and trees in rural landscapes • Increase in-school adoption of the curriculum developed as part of forestlearning.edu.au 	<ul style="list-style-type: none"> • Build better and enduring relationships with landowners • Develop and support new plantation forestry models that better integrate with existing on-farm activities and production • Provide long term community support where plantations are present 	<ul style="list-style-type: none"> • Develop simple communication strategies outlining investment opportunities 	<ul style="list-style-type: none"> • Promote champion landowners who have successfully integrated trees on farms • Work with government, industry and the finance sector to implement new tree planting approaches

Next Generation Forest Plantation Investment STRATEGY MAP

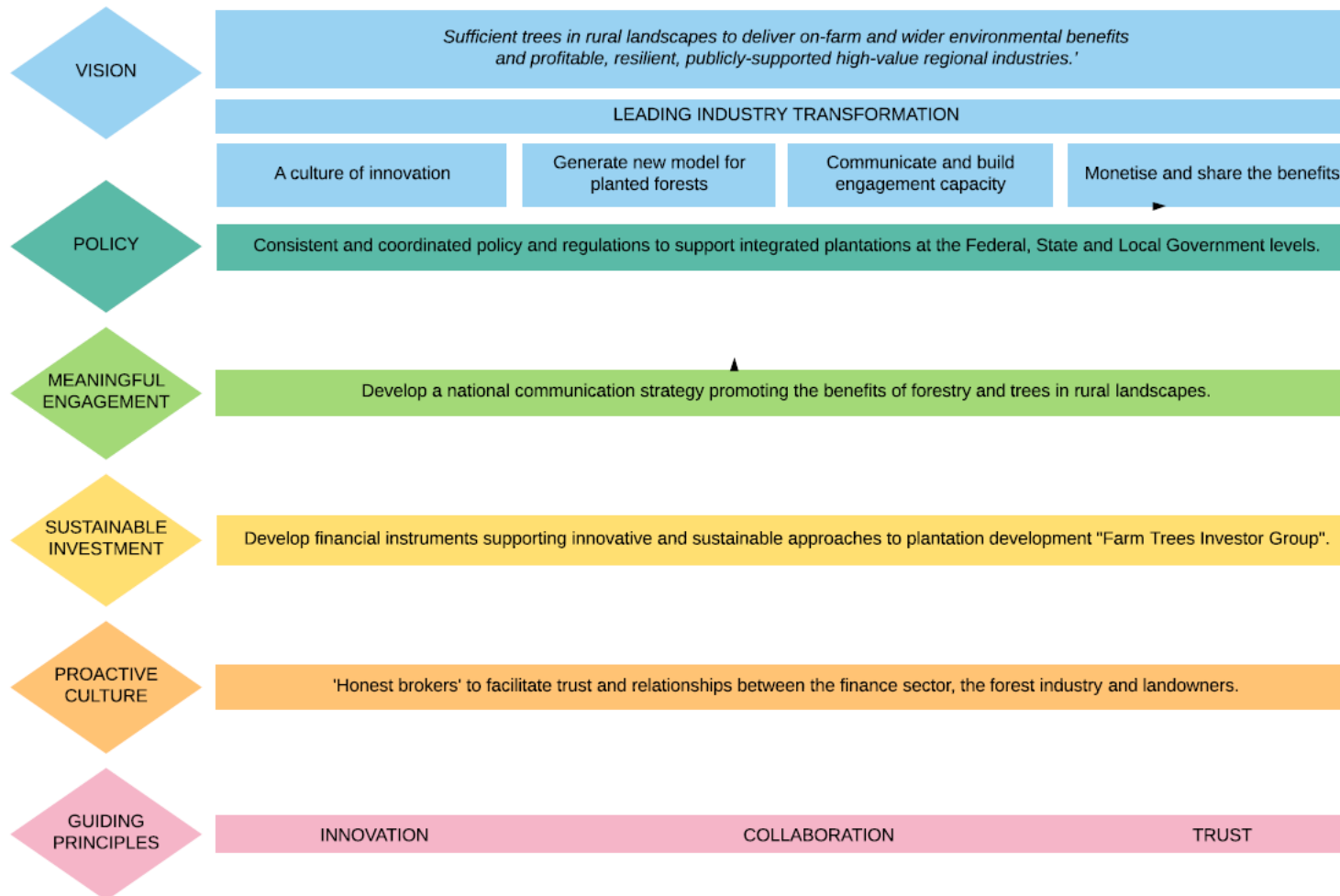


Figure 3 Next Generation Forest Plantation Investment Strategy Map

Future research and training

As part of the design workshop on collaborative business models held in February 2019, stakeholders identified a range of tools and activities that would assist to develop industry-landowner relationships (Figure 4).

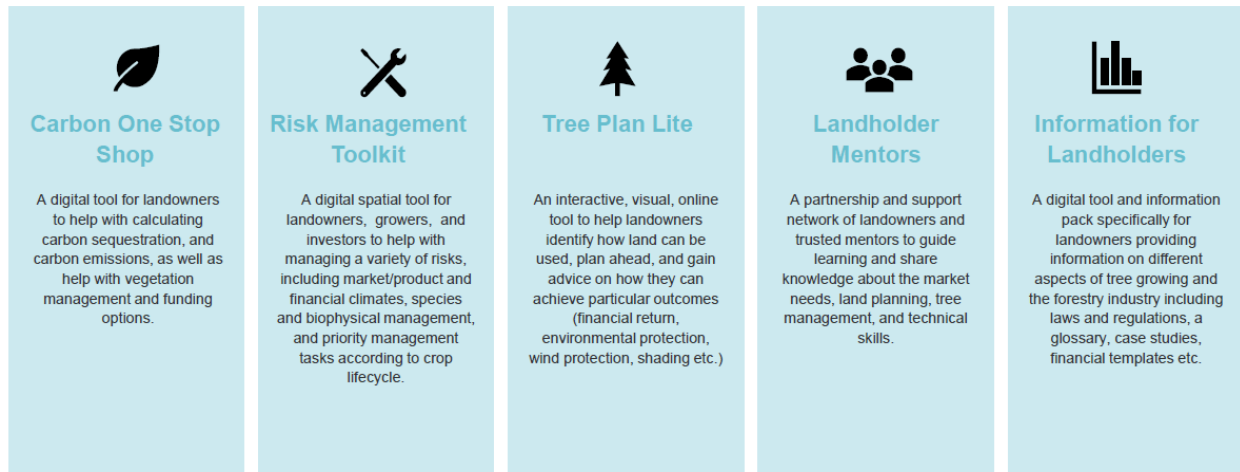


Figure 4 Options for future research, training and support

Appendix One: Landscape assessment (Dean Severino, Chathura Hasanka, Liam Costello)

Key findings

1. There are approximately 6.21 million ha of private rural land above 600 mm annual rainfall in Victoria with no existing native vegetation or plantation, or other zoning restrictions.
2. Of this, between 1.9 M ha and 2.6 M ha meets commercial criteria for forest productivity, transport and harvest costs within 200 km of the processing centres of the four project industry partners.
3. For each centre there is between 460,000 and 925,000 ha of land that meets broad investment criteria. There is overlap between these areas.
4. Local level planning and operational constraints could reduce these areas by 10-20%.
5. Suitability does not indicate availability of land. This will depend on the decisions of individual landowners and their willingness to participate in partnerships with industry or investors.
6. The extent and location of existing plantation was difficult to determine. The Victorian plantation layer from the NFI identified 87% of project partners' estates. The Victorian Land Use layer identified only 59 to 67 % of the partners' estates.
7. The average property length of internal fence per ha is a potentially useful measure to assess opportunities for integrating tree plantings into existing land uses. This varied between 46 to 92 m/ha.
8. Replacing or extending existing shelter belts on properties could potentially incorporate trees on 9 to 17% of properties (8 to 18 ha per property). Fencing costs for shelter belts would need to be negotiated with farmers and could add to establishment costs.
9. Engaging landowners in partnerships will require intensive investment in relationship building through trusted intermediaries, such as an agricultural adviser.

Recommendations for assessing land suitability and availability

1. For broad planning purposes, assess land suitability for tree plantations using a combination of modelled tree growth, roading, transport costs and slope class.
2. Model tree growth and slope at the highest possible resolutions to identify smaller and more fragmented land parcels than traditionally considered commercially viable by large plantation operators.
3. Use verified spatial data for presence of existing plantations. Don't assume public domain data is accurate.
4. Land availability is constrained by landholder willingness to participate in tree planting. Therefore, to model availability there must be a clear focus on quantifying landholders' existing land uses and how much and what classes of land they are prepared to utilise for commercial tree planting, and under what business partnership conditions.
5. Identify volunteer landholders to provide design input through:
 - o Building relationships with trusted advisors such as agricultural consultants
6. Using a communication message that focusses on landholders' needs
7. Being physically present and available at rural events to answer questions and build rapport.
8. Be ready for questions about potential partnership models that indicate "how much and when I might get paid", as the answers will determine potential land availability.

Appendix Two: Landowner assessment (Nerida Anderson)

There is a growing demand for wood and wood-based products both globally and in Australia, driven principally by increased population growth (O'Grady & Mitchell, 2017). Planted forests are a major source of commercial wood products in Australia. However, although the integration of commercial forest plantations within the rural landscape can provide multiple social, environmental and economic benefits as well as providing timber and fibre resources, there has been an overall decline in Australia's commercial plantation area over the past 5 years, with almost no investment in new plantations during this period. To increase the area of forest plantations on privately owned land it is necessary to develop new models for establishing plantings that align with the goals and objectives of private landowners.

While there has been significant research investigating trees on farms in Australia and overseas over the past two decades, the focus of much of this research has been on the environmental, social and economic benefits of farm trees, opportunities for agroforestry products, markets, and investment and socio-economic and public policy issues including identifying training and extension needs (Powell, 2009). There has been relatively little qualitative or quantitative research seeking to understand the social and psychological factors underlying landowner attitudes and motivations to participate in commercial forestry in Australia.

Research objectives

The objectives of this research were to: identify the perceived benefits and barriers private landholders associate with integrating plantation forestry with existing land uses; examine how these beliefs relate to intentions to participate in forestry; and identify how perceived benefits and barriers relate to the acceptability of different investment models. The outputs from this research will contribute to developing new types of partnership models for investment in commercial forestry on privately owned land in ways that more closely align with the goals and objectives of landowners.

Research approach

The research approach draws on the social psychology theory of reasoned action (Fishbein & Ajzen, 2010) as a conceptual framework. The research was undertaken in two-stages. In the first stage, qualitative data was collected during 34 semi-structured interviews conducted with land owners in the study region in October – December 2017. In the second stage quantitative data was collected in a postal survey of 183 landowners and land managers in the study region in September – October 2018. The objective of the postal survey was to quantify and expand on key themes identified in the interviews.

Key findings and implications

Key findings and implications relating to the social psychological factors underlying landholder beliefs and motivations to integrate plantations for commercial harvest are:

- **Key finding 1:** Three broad categories or types of beliefs about planting trees for commercial harvest are related to intentions to engage in forestry: beliefs that commercial forestry can provide multiple environmental, social and economic benefits; beliefs about the importance of maximising income and returns from the land; and beliefs about the

compatibility of commercial forestry with current land uses. Actively considering planting trees for commercial harvest is more likely to be associated with beliefs that commercial forestry can provide multiple benefits, while beliefs that commercial forestry is incompatible with current land uses is more likely to be associated with having no intention or interest in participating in commercial forestry.

Implications: To encourage participation establishment and management models should clearly demonstrate the ‘relative advantage’ of forestry to landowners from a social, environmental and economic perspective. This can be done by designing tree plantings to enhance the on-farm and environmental benefits of commercial plantings, and by structuring financial returns in terms of both cash flow and overall returns to align with the requirements of the landholder and that are commensurate with current land uses.

- **Key finding 2:** Landholders vary in the degree to which they agree with or subscribe to different beliefs about commercial forestry. Five ‘types’ or groupings of landowners sharing similar beliefs are identified and labelled to reflect the dominant beliefs in each group: Incompatible; Beneficial; Financial; Ambivalent and Lifestyle. Intentions to engage in plantation forestry vary between landowner ‘types’, essentially reflecting the relative importance of each belief category within the group.

Implications: Identifying the dominant beliefs and motivations of landholders can be used to tailor establishment and management models that align with the underlying objectives and motivations of the landholder.

- **Key finding 3:** Landowner ‘types’ as defined by shared beliefs about commercial forestry are not readily distinguished by sociodemographic or land use characteristics alone.

Implications: It is necessary to find ways to identify the dominant beliefs and motivations of individual landholders that are independent of, or in addition to, sociodemographic or land use characteristics.

- **Key finding 4:** Landowner beliefs about their ability to control or achieve the desired social, environmental and economic outcomes from commercial forestry can be a barrier to participation. Beliefs contributing to a perceived ability to control outcomes included beliefs about the uncertainty arising from knowledge deficits, evident in the clear distinctions made between being a farmer or a forester, and the associated lack of skills or interest to successfully engage in forestry. Beliefs about the uncertainty and risk inherent in natural systems, such as from fire, insect attack, drought, or changing climate, or the commercial and sovereign risks associated with the relative long-time frames involved in commercial forestry, were also a barrier to participation.

Implications: Partnership models should align with the individual landholder’s beliefs about their skills, interest, time available, and preparedness to undertake some of the work themselves. Beliefs about the capacity to achieve the desired outcomes can be built with experience.

- **Key finding 5:** Being actively involved in the initial planning and decision making is important for all landholder types, while financial outcomes and the provision of additional environmental and on-farm benefits are important for most landholders.

Implications: These findings highlight the importance of having landowner or land manager involvement in decision making relating to the establishment of commercial plantings,

including where trees are established, planting configuration, species planted and having access to the land once the trees are established. Having active landholder input will require more flexible establishment and management models to allow alignment with the different goals and objectives of individual landholders.

- **Key finding 6:** The area landowners are willing to consider for commercial forestry as a proportion of property size is relatively small, with just over half (55%) of landholders surveyed willing to plant trees for commercial harvest on up to 10% of their land. Only 17% of surveyed landowners were willing to consider planting on more than 20% of their land. *Implications:* Depending on the size of the property and the proximity to existing forest plantations, achieving economies of scale in timber production may require management of smaller areas of trees on multiple properties.
- **Key finding 7:** There is support for three broad investment models: Independent – where the landholder is responsible for establishing and managing the trees, pays all associated costs and receives all of or a share of the net proceeds at the time of sale; Third party – where a commercial partner is responsible for, and pays all associated costs with establishing and managing trees, with the landholder receiving an annual payment or a share of the net sales proceeds at the time of sale; and Shares – where responsibility for establishment and management is shared between the landowner and a third party. Payment arrangements vary depending on the arrangements and agreement with the third party. The three models essentially differ in the degree of risk borne by landholder. *Implications:* All three models are acceptable to a greater or lesser degree, highlighting the need to match business models to the tolerance for risk as well as to the goals and objectives of individual landholders.
- **Key finding 8:** Receiving additional financial benefits such as tax concessions or carbon credits can increase landholder willingness to consider planting trees for commercial harvest. *Implications:* The perceived ‘relative advantage’ of plantation forestry in economic terms can be enhanced by incorporating additional payments for ecosystem services, such as a carbon price, and quantifying the on-farm benefits associated with increasing trees in the rural landscape.

Recommendations

Drawing on the key findings from the research, six recommendations are made for developing business models that align with landholder goals and objectives:

- **Recommendation 1:** Beliefs are an important determinant of intention to engage in a behaviour. Consider how beliefs are shaped and formed to actively promote beliefs that are more amenable to integrating commercial plantings on privately owned land (Key finding 1 and 2).
- **Recommendation 2:** Develop a means to identify the goals and objectives of individual landholders that are not dependent on sociodemographic or land use characteristics alone (Key finding 3). This could be done by developing decision tools such as questionnaires incorporating decision trees to systematically identify landholder values, including key objectives, goals and preferences for establishment models (Key finding 7).

- **Recommendation 3:** Develop flexible tree planting designs that complement existing land uses. This is necessary to account for the different beliefs underlying willingness to engage in commercial forestry (Key finding 2) as well as differences in the perceived acceptability of different establishment and management models (Key finding 7). Key to developing more flexible models is recognition of the importance of landholder input and preference for autonomy in the design of tree plantings (Key finding 5).
- **Recommendation 4:** Develop some simple rules and approaches to aggregate smaller areas to achieve required economies of scale (Key finding 6) (see Section 4: Limitations and future research needs).
- **Recommendation 5:** Reduce uncertainty and enhance beliefs about abilities to achieve or control outcomes (Key finding 4) by aligning establishment models with landowner skills, interest, and preparedness to participate in the management of commercial plantings. Develop forestry advisory systems or integrate with existing agricultural advisory services to meet the information and support needs of landowners: enlist advisors, create open and transparent markets, foster landowner autonomy in decision making (Key finding 5), while also incorporating contingency planning and provisions structured to reduce commercial risk and uncertainty for the landowner.
- **Recommendation 6:** Facilitate and broker payments to landowners for the ecosystem services that forestry plantations may provide or generate rules for sharing this income (Key finding 8).

Appendix Three: Financial Sector Survey (Krys Dembeck and Jody York)

New investments leading to new plantations in Australia have been at a standstill for nearly a decade. The establishment rate decreased from 86,600 hectares in 2006–07 to 200 hectares in 2016–17, the lowest ever recorded under the National Plantation Inventory (ABARES 2018). While very few new plantations were planted during the last decade, the relative mix of non-government plantation owners has shifted substantially. The biggest movements have been the redistribution of MIS assets (33% of the plantation estate in 2006-7 and 5% in 2016-7) to institutional ownership, which increased from 12% in 2006-7 to 49% in 2016-7 (ABARES 2018). Because of the market opportunity created by the collapse of the MIS companies during the global financial crisis, these assets were purchased by institutional investors at very favourable prices that are no longer available in the current market.

Our research has identified that there are constraints for both private investors and professional managers (of collective or private funds) at the awareness, interest, willingness and ability stages that reduce their likelihood of investing in forestry. Awareness does not translate into interest for many investors. In the absence of direct experience, negative stories contribute to a generalised perception of higher risk and difficulty than other investments generating comparable return that dissuades investors when there are 'easier' options available. Even when investors are aware and interested in forestry investment, it is difficult to make an investment case for new investment in forestry with land prices at their current levels. Additionally, at this time, the level of investment required in forestry in its current form is too high for most of private investors. There are very few retail opportunities for private investors to gain exposure to forestry in the Australian market. A premise of this project is that integrating trees with existing land uses is a key avenue for increasing the planted forest estate. Professional fund managers are generally interested in optimising the use of capital, rather than optimising use of land. Hence, most are not receptive to mixing forestry with other land uses, expressing strong preferences for specialised managers and specialised investment products. They hold the belief that specialisation is critical for optimising financial results, and that lack of specialisation is a breach of fiduciary responsibility. Thus, they diversify across portfolio but keep products and land parcels separate. By contrast, smaller investors and specialised agricultural funds are more receptive to mixing land use, and more likely to be motivated by diversification opportunity offered by integrating forestry into agricultural land use. Private investors are likewise less focused on specialisation than professional investors and, more open to trying new ideas including mixed uses of land.

Similarly, a longer-term perspective is required to achieve results in agriculture and forestry, which are subject to weather patterns and other fluctuations. Currently most institutional investors and lenders approach financial outcomes of their portfolios with a short-term perspective. Private investors and private fund managers are more able to adopt a long-term perspective to their investment returns.

Research findings

We have found that while *financial return on investment* is a key motivator for investors, many are seeking opportunities that also have *measurable social or environmental impact to be realised* by the investor in addition to financial return.

These findings reflect a global trend of large investors rapidly adopting responsible and ethical principles to inform their decision making processes. This adoption of ethical principles in financial investment decision making in turn increases the availability and amount of capital available, and seeking, to create socio-environmental impact. We

have also found that despite its potential forestry sector is not currently perceived and considered as ethical or impact investment. Given its potential to deliver socio-environmental impact, planted trees have the potential to attract socio-environmentally informed capital. In turn, forestry has an opportunity to position itself strategically for the impact-oriented investment landscape.

Opportunities

Based on the findings, we identified the following opportunities to attract new sources of capital for investment in tree planting for harvest:

1. As there is increasing interest from the finance and investment sector in achieving socio-environmental impact from investment, previously unavailable sources of equity and debt capital have potential to be unlocked for forestry investments. These sources include significant pools of private capital concentrated in the accounts of wholesale private investors such as high net worth individuals (HNWIs), 'mass affluent' individuals investing \$100,000 to \$500,000 by way of self-managed superannuation funds (SMSF), and specialist investment funds.
2. Most large investors, and their sources of capital, are considering the social and environmental impact of investment alongside financial returns. Currently, apart from one forest company, planted tree investments are not generally regarded by the finance and investment sector as meeting the requirements of this investment class. This represents a new opportunity for attracting an impact-informed pool of capital into trees for timber production.
3. Respondents indicated that integrating trees in rural landscapes and optimising the use of land can increase investment returns. This is achieved through the flow-on effects of tree planting which can improve soil, reduce pesticide usage and increase water quality within the areas surrounding the planted trees. Where investors have a diversified portfolio of interests across the forestry and agricultural sectors, they can achieve increases in value beyond that invested in the trees themselves. Some leading financial institutions have started recognising the value of these effects and are looking to provide incentives- for example by exploring how to discount the cost of capital for farmers who successfully improve the soil quality and productivity.
4. It is clear that the finance and investment sector, along with the broader community, feel that there is little reason to trust the intent, actions and processes of the forestry industry. There are low levels of trust towards the sector's ambitions for tree planting, and this negatively impacts on risk-return assessments made by investors. There is a need to overcome negative past experiences and negative perceptions, through strengthening of ties between the forestry industry, landowners, local communities and investors. This can be done by positioning the industry as a key partner in building local communities' resilience.

Recommendations

In light of the research findings, understandings of the current problem domain and the various opportunities presented, we recommend the following five actions to attract new capital in planted trees:

1. **Implement impact measurement and reporting for tree planting.** This has potential to unlock all opportunities identified in this research. Impact measurement is the basis of new financial instruments such as climate and social impact and bonds, and of emerging valuation processes that recognise the value of environmental services provided by trees. Impact measurement activities may also provide information and tools for building new relationships- for example with responsible and ethical investors who expect solid evidence of the way in which their money makes a difference. Impact measurement is also required

by financial institutions that seek to introduce new valuation methods and can therefore open possibilities for lower-cost capital. Finally, impact measurement and reporting are an excellent tool for managing performance and risk, and can help improve the image of the industry and position it strategically in the new investment landscape. As such, it is also a useful tool for current investors in forestry who are increasingly expected to demonstrate the socio-environmental impact of their investments.

2. **Increase awareness of forestry as an investment class**, especially among financial intermediaries such as financial advisors and the managers of responsible, ethical and impact funds. These gatekeepers of financial opportunities provide access to this new class of investors, and our research suggests that the current awareness of forestry among these groups is low and based on unfounded assumptions.
3. **Build the case for optimising land utilisation** by integrating trees with existing land uses. Many current institutional investors are disinterested in optimising land output through integrating forestry with other land uses, and have risk management approaches that require individual investment pools in defined asset classes. Integrating tree planting with existing land uses increases the size of the investment pie. Creating smaller scale pilot projects with HNWI's, smaller impact investors, and other groups open to the idea, can help build new relationships and show the broader investor community the potential of this approach. Impact measurement can be used to document the benefits created.
4. **Collaborate with those entities that are pioneering the inclusion of natural capital** into the valuation and risk assessment activities of land-based enterprises. A number of investors and non-investing finance professionals indicated that current mainstream valuation methods are focused on the direct relationship between forest growth and financial returns and provide no path to include broader benefits such as environmental services. As a result, landowners may see a reduction in the capital value of their land when trees are planted, which impairs their access to capital for other activities. There are currently efforts in the financial community to change the ways valuation is conducted. Supporting the implementation and promotion of these efforts is in the best interest of the forest sector, and can build valuable relationships as well as open access to new capital.
5. **Bridge different scales of investment in trees planted for harvest**. The study has shown there is a scale mismatch in the investing market, in which institutional and impact capital struggles to find 'investable' deals of appropriate scale, and small scale forestry opportunities struggle to find capital and market. New investment products and arrangements developed with finance and investment community should help bridge this gap. Doing so will help unlock both new land and capital.

Appendix Four: Business Model Design (Rod Keenan, Nerida Anderson, Lyndall Bull, Krys Dembeck, Laura Kostanski, Sarah Patterson)

This report provides an overview of guidance on collaborative business models between the timber industry and rural landowners. It draws on experience with past plantation investments, research on the attitudes and needs of rural landowners, analysis of suitable land areas, and the requirements of different types of investors.

To expand plantation timber production, the plantation sector has three options:

1. Increase the productivity of the current estate,
2. Buy rural land for new plantations, or
3. Engage in partnerships with landowners and investors.

Plantation companies can make their own decisions about the relative merits of these options. Financially, there may not be a large difference between land purchase and forming landowner partnerships. The decision will likely depend on other factors, such as land and capital availability and a desire to share more benefits with the community.

If done well, partnerships with landowners can enable greater access to land with lower initial capital outlay, diversify sources of timber supply, and share the benefits of the investment more widely. These models involve a shift from transactional negotiations, focused around minimising costs for industry, to relationship building, explicitly revealing preferences and interests, and working toward a shared long-term vision.

Collaborative business models

A business model represents how a company structures its resources, partnerships and customer relationships to create and capture value, i.e. to generate income. Business models are collaborative when they involve close working partnerships and share value (that is create value for both the company and partners involved), for example, with local landholders and suppliers. The flow of benefits in the model needs to be transparent and distributed fairly. Risks need to be clear and managed. Successful models are those in which the benefits outweigh opportunity costs for all partners.

All partnership models should be based on sound financial analysis, good technical information, and transparent agreements that clearly assign the ownership of different assets (land or trees) and indicate the rights and responsibilities, and risks and rewards, for each party. Developing tree-growing partnerships is a social learning process involving sharing knowledge, taking action, assessment, reflection and review in a process of continuous improvement. Models will develop and evolve over time as companies engage and learn, and as landowners build knowledge and confidence in the benefits of commercial trees and in working with the sector.

What kinds of business models might attract and engage investors and landowners? An effective business model involves all people in the value chain, with benefits outweighing costs for all actors. If financial returns for farmers are modest, trees will need to provide on-farms benefits as well as timber industry needs. Tree crops require longer timeframes to generate returns than most other forms of agriculture, with different risks and uncertainties. Model design needs to identify and manage these.

The following factors are required to make these models work:

1. Regional planning to ensure that the right tree species are planted in the right places to generate desired benefits.
2. A commitment to purchase wood, with prices high enough to generate required rates of return for investors.
3. Income through carbon or other payments for environmental services as the trees are growing.
4. An investment vehicle to generate sufficient scale for investors and underwrite investment risks.
5. Mutual understanding, trust, and long-term commitment.

Three types of business models are recommended: land lease, joint venture and outgrower models. Offering alternative models will enable the industry to engage landowners with different scales of suitable land, different interests in growing trees, varying need for immediate income, and risk appetites. The models allow for landowners with varying needs for permanent plantings, subject to industry constraints. Companies have used all three successfully in Australia and internationally. These are a part of a broader spectrum of tree growing business models, extending from large-scale plantation ownership by growers to small-scale farm forestry focused on producing on-farm benefits or specialty timber for niche markets.

Models that meet different landowner needs will be more likely to interest a wider group of landowners and see more take-up of commercial tree growing. Flexibility includes payment arrangements, landowner co-investment, tree location and design on farms (including permanent plantings for shade, shelter, aesthetics or biodiversity benefits).

Realising opportunities from investing in more timber trees on rural land will require the Australian timber industry to change the way it interacts with rural landowners. Working together, the sector can promote a consistent message that producing timber is a farm activity that complements other forms of agriculture, and that it is willing to work with farmers to achieve common goals.

Business models have five elements

1. **Land** needs to be capable of growing the desired tree species at an acceptable rate, within an economic distance of a mill or port, be accessible by harvesting machinery and transport, and be a large enough in area to ensure a viable harvest volume.
2. **Capital** pays for land costs and to establish and maintain the trees until harvest. It is provided by a company, a landowner or third party investors. In some cases, governments may contribute funds through grants or payments for tree growing. Grants or payments linked to benefits such as carbon sequestration or water quality can improve the overall return on investment and make investments more attractive by providing income while trees are growing. They should be geographically targeted and performance-based, as well as consider all negative and positive impacts.
3. **Labour** is the human input to plant and manage the trees. It can be provided, or paid for, by the company, the landowner, or a third-party contractor.
4. **A technical package** includes the tree species and its site and management requirements. Commercial tree species generally have improved growth, form and wood properties resulting from breeding and improvement. A science-based package

reduces risks of adverse site selection or poor tree growth, and underpins value by producing wood with known market properties.

5. **A market** guarantee is generally provided through an agreement with a wood buyer to purchase wood. This is called an offtake agreement. This gives confidence in the future market for landowners and investors. The buyer could be a timber processor, or a third party. The purchase agreement can be based on a set future price, or linked to a market index, for example, export prices. It can be 'take-or-pay' or 'first right of refusal'. The latter allows tree owners to sell to another buyer offering a higher price but the party to the agreement has the opportunity to buy at the higher price.

In each of the recommended models, a landowner provides the land. A timber purchasing or forest management company provides the technical package (required tree species and management). The models are not definitive and can be tailored to meet the needs of different parties. Variable elements in the models are the source of capital (company, an independent investor, or the landowner), the nature and timing of payments to landowners, inputs by landowners, ownership of the trees, who receives payments for services such as carbon sequestration, and the landowner exposure to market risks.

The models can apply to short rotation or longer rotation softwood or hardwood plantations. Flexible configurations of trees on the land (wider windbreaks, strips, areas around irrigators or in larger blocks) are possible.

Models are underpinned by agreements that indicate: the timeframe; any interest on the property title; lease payment and cost or profit-sharing arrangements; responsibility for rates, taxes, or insurance; condition of land at the end of the agreement (e.g. who is responsible for the stumps and site clean-up); transfer rights, treatment of carbon or other obligations; consultation and grievance arrangements; termination, review and renewal; and compliance with relevant legislation, planning or forest certification requirements.

Agreements also need to cover risks such as bankruptcy of either party, plant closures, or major changes in market conditions. Government can provide underwriting or insurance arrangements, as it does in other sectors, such as construction. Management activities and responsibilities can be attached to these agreements.

Key messages

The following actions are recommended from industry, governments and rural landowners to support increased commercial tree investment on rural land.

Timber and plantation industry

- Set clear goals and targets to inform stakeholders of company plans to increase the area of commercial trees. Frame targets and goals in terms of the benefits, desired outputs and outcomes - increased wood supply, regional investment, jobs, improved water quality, conservation, or other community benefits.
- Develop plans for regional investment hubs through collaboration across the forest sector and through inclusive consultation with stakeholders along the value chain, in local government and in the broader community. These plans require industry leadership and regional platforms for dialogue.
- Understand the stakeholder landscape to identify key decision makers, collaborators and influencers who are important for the success of the program.
- Collaborate across the sector to develop and present common messages for consistent policies, the opportunities for investors, and the potential co-benefits (such as farm production, carbon or water quality), and to build public support for the sector.

- Increase investor awareness and engagement with commercial trees by breaking down stereotypes, demonstrating social and environmental benefits, lowering the investment threshold and demonstrating potential for competitive returns. Work with investors and governments on suitable investment vehicles.
- Increase landowner awareness of commercial tree opportunities through broad-based communication and engagement, and targeted campaigns relevant to farmers with different values, beliefs and goals, and varying personal, social, cultural and economic circumstances.
- Work with rural advisors to engage farmers in collaborative business models.
- Clearly communicate company needs for commercial trees, including species and minimum areas for viable planting, management and harvest and the costs. Indicate the poor financial viability of small, isolated plantings or those on steep slopes.
- Work with landowners to develop collaborative business models to integrate trees into farm plans, providing benefits for the farm operation and supporting rural business development plans. Build trust in business negotiations by listening to farmers, understanding their need and sharing a greater portion of the benefit from the investment.
- Plan for increasing climate risks when selecting locations for tree growing, including risks to infrastructure and other components of the value chain.
- Invest in research for alternative species and products to open a wider area of land for commercially attractive trees species and wood products at a commercially viable scale.

Government actions

Australia's three levels of government can support commercial tree investment by adopting a consistent approach to trees on farms, including integrating commercial tree-growing into federal and state agricultural policies.

Government policy can support collaborative business models by improving landowner negotiating power through access to information and supporting cooperative tree-grower organisations. Information needs include market trends, product prices, calculation of returns, and risk assessments. Governments can also develop standard legal agreements, provide concessional finance, co-invest in public good values of trees with direct grants, or underwrite investment risks.

Federal Government

1. Eliminate the 600 mm maximum rainfall restriction on plantation forestry, simplify plantation forestry methodologies, and reduce the uncertainty for commercial tree investors to receive carbon payments through the Emissions Reduction Fund. Growing commercial trees for harvest on cleared land increases landscape carbon stocks. Carbon payments can provide short-term cash flow and increase commercial tree investment.
2. Develop a coordinated long-term national plan for trees in rural landscapes with state, territory and local governments. Define desired public good environmental outcomes, and communicate information on synergies between agriculture and commercial tree-growing options.
3. Develop a planning framework for regional tree investment hubs in conjunction with industry, state governments and other stakeholders, using spatial information on land suitability to better integrate with agriculture, and specifying infrastructure for industry development.
4. Develop incentives linked to regional plans. Design grants or loan programs to target specific locations for afforestation, tree species and other desired project attributes.

- Work with State Governments to align incentives. Consider underwriting market or biophysical risks to provide assurances to investors and landowners.
- 5. Ensure taxation policies for investors in commercial trees are consistent with those for other agricultural land uses.
- 6. Increase research and development in commercial trees on farms for different regions and support education and training to build professional capacity in the industry, farm advisors and rural landowners.
- 7. Provide technical and financial support for commercial farm tree information - inventories, timber prices, harvest projections, and other planning tools to provide a clear picture of the current plantation industry and market status in each state and territory.

Victorian Government

- 1. Work with the sector to promote the benefits of trees on rural land for climate change and the circular economy, including use of wood in construction, packaging and paper products and the need for more trees to create a new cycle of sustainability.
- 2. Planting trees requires a package of policy actions similar to the Victoria Solar rebate scheme. Develop plans and targets for investment in commercial trees in regional hubs in conjunction with industry, state governments and other stakeholders, based on spatial information on land suitability to integrate with agriculture, and specifying infrastructure for industry development. Use these plans to progress investment of the \$110 million committed to plantations, including by underwriting market or biophysical risks to provide assurances to investors and landowners.
- 3. Support CMAs and government agencies to develop information for tree planting - including suitable locations and integrating commercial tree-growing with catchment management and farm productivity objectives.
- 4. Develop incentives linked to regional plans to ensure they increase investment, not distort the market or delay investment. Design long-term grants or loan programs to target specific locations for afforestation, tree species and other project attributes. Work with the Federal Government to align carbon-related incentives. Ensure incentives are promoted and are accessible to rural landowners and investors.
- 5. Develop investment vehicles for public and private investment in trees in rural landscapes at sufficient scale to make a difference. These could include payments for environmental services for trees in rural landscapes.
- 6. Provide support for collaborative business models between industry and landowners, including development of standard legal agreements, offtake agreements, and other relevant administrative documents. Provide support services to prepare and submit planning applications.
- 7. Ensure coordinated planning for plantations across local governments. Provide information on the potential benefits of commercial trees. Relevant local governments need trained staff, information and resources to implement state policies and plans. Provide guidance on planning scheme arrangements that support integration of commercial trees with agriculture.
- 8. Increase research and development in commercial trees on farms for different regions and support education and training to build professional capacity in the industry, local governments, farm advisors and rural landowners.
- 9. Provide information and planning tools for trees on farms, carbon calculators, risk management, and information for rural landowners. Provide technical and financial support for commercial farm tree inventories in Victoria, and information on timber prices, harvest projections, and other planning tools.

Local Government

Local governments play a critical role in planning, regulating and approving commercial tree-growing on private land. Local governments also provide and maintain local infrastructure such as roads and bridges that is critical to the success of planted forest investments. If convinced of the local economic and environmental benefits, local governments can also be strong champions and supporters of investment in commercial tree plantations on rural land.

1. Provide clear right to harvest for commercial planted trees
2. Ensure that commercial trees are incorporated into planning schemes.
3. Exclude planted commercial trees from environmental planning overlays.
4. Participate in the development of plans for regional hubs for commercial trees.
5. Ensure that council has appropriately trained and informed staff to manage Codes of Practice for commercial trees and other legislative and policy requirements.

Rural landowner

1. Consider incorporating trees on farms for income diversification and on-farm benefits.
2. Seek information on investment options, companies as potential partners, tree species site and management requirements, and timber market prospects.
3. Explore opportunities for trees to offset greenhouse gas emissions from farming.

Appendix Five: Review of past policies and approaches in Australia (Braden Jenkin)

Successful projects leading to commercial wood resources have had adequate funding to develop the required scale of the right species managed in the right way and in the right location relative to an actual market. Failed projects have generally had short-term grant funding (with an ‘expectation’ of attracting an investor), to plant new species managed on a commercially un-proven basis in a new area devoid of a current active market.

It has been suggested that this project is reinventing the wheel, however the facts are that an outcome of this analysis has been to identify a cycle of failed projects resulting in wasted capital, stranded resources and disappointed growers and investors. The *status quo* approach to trees on farms has generally failed to deliver significant plantation development into farming enterprises.

In many ways an element of Australia’s farm forestry has been a grand experiment promoting commercially un-proven species to be planted and managed in a commercially un-proven manner in areas lacking a market for the target log outcomes.

Assessment of the past performance

The benefits and achievements of Landcare are well understood and acknowledged, and if a clear understanding of business models for tree planting is the objective, analysis must remove consideration of the positive externalities of any project or arrangement and focus on the area outcomes and any negative externalities.

Reports on projects that have failed to deliver the target area have generally glossed over this fact and highlighted the other benefits. This analysis has focussed on the basics and stripped away the noise around plantation expansion and focussed on the core issues in regards to the development of commercial trees.

Support of the plantation sector

Information does not plant trees, people do.

While research outcomes create potential for resource development, a ‘potential resource’ does not support an actual processing facility.

Australia has developed and implemented an almost continuous string of policy, action statements and strategies with underlying themes of plantation expansion on cleared agricultural land, promotion of farm forestry and integration of trees into agriculture for wood production, benefits to the farming enterprises and environmental services. Policy implementation has included a comprehensive series of reviews and revisions of Australia’s taxation regimes to address impediments to plantations and trees on farms.

While large scale plantation development has responded to such enabling initiatives, farm forestry has failed to initiate, evolve or expand.

Linkages to industry as a market

While we must defend the right of individuals to plant whatever species they want and in any area, the corollary is that industry has the right to only purchase commercially viable resources that are fit-for-purpose to their needs: industry did not plant the wrong trees. A significant number of projects analysed have lacked transparency as to the commercial realities of the silviculture and markets, and that some farm forestry advisors continue to promulgate regimes devoid of scientific evidence nor any consideration of commercial realities.

Formal linkages between industry / processors have been developed with joint venture models as a useful framework to align the interests of the parties. However a number of examples of un-balanced relationships between industry and landholder growers have been identified with wood

supply on a first right of refusal by industry, being in fact refused leaving the growers without a market. Similarly it is possible for growers to decide that the benefits of trees on their land out-weigh the expected financial returns from harvest. A mechanism to balance the interests and power is required.

Linkages to agriculture

The development of plantation business models must focus on the needs of agriculture while taking full account of the commercial realities of plantations: the trees should be regarded as part of agriculture and not be referred to as farm forestry.

Current farming is business focussed and relies heavily of professional advisors (e.g. agricultural consultants, accounting / financial advisors and legal counsel), hence any tree based business proposal must withstand intense assessment of the credibility of the information provided.

It is suggested that highly skilled commercial foresters should design projects and prepare the information (with appropriate technical advice) and present the outcomes to the professional advisors rather than marketing to the farmers. One agricultural consultant could have c.100 farmer clients and if they are fully informed on how to fit trees into agriculture, then they can set the vision for each client's farming enterprises including trees.

Developing a planted forest business model

A planted forest business model has been defined commencing with a core project (defined by markets, capital, silviculture and land) surrounded by the parties to the project (fibre consumers, investors plantation managers and landholders). The parties are linked by a legal instrument (defining the nature of the project, land access mechanisms, obligations and inputs/returns). The project is then defined to operate in an external environment (considering the current industry, domestic economic circumstances, social license, enabling and variable incentives and international trade). Significant insights have been gained by analysing past experience with many positive and negative recurring themes (e.g. concerns about access to land was noted in 1915 and 1990) which remain at the core of issued documented by this research project. History (as noted in other sections) is littered with the flotsam and jetsam of failed investment projects and failed past government initiatives, as well as significantly successful outcomes. Success is defined by the creation of a critical mass of resources of the species and log type required by a market that is within economic haulage distance. A negative outcome has been the creation of many stranded resources (e.g. a non-commercial tree planting, either due to scale, location and/or species) Taking the insights from the lessons learnt, the following is a list of key success factors in developing a tree planting project with an objective to harvest and sell the resources created:

- **A strategy and plan:** A project must have a detailed, factual and fully costed plan;
- **Critical mass and appropriate funding:** A project must seek to develop a resource of appropriate scale and attributes to satisfy a market;
- **Motivated and empowered parties:** A project must have highly motivated parties to drive the project and that the parties are empowered (e.g. they have adequate budget) to make it happen;
- **The underlying project:** The underlying project silviculture and management must be commercially proven and viable;
- **Critical mass and appropriate funding:** A project must seek to develop a resource of appropriate scale and attributes to satisfy a market;

- **Information provided and management of expectations:** The information provided to the parties in a project must present a factually based and defensible (e.g. evidence based) expected outcome;
- **Forestry as agriculture:** A project must be framed from the landholder's perspective and complement their agricultural enterprises – trees into farming;
- **Transparency:** All legal instruments should include full (industry standard?) disclosure and be expressed in language appropriate for the landholders to allow full transparency;
- **Land access – bespoke options:** A project should have a degree of ability to create bespoke (e.g. tailored and individual) land access options to capture the broadest cohort of landowners but be commercially realistic about the administrative costs;
- **Basis of sales:** Stimulus of uptake of a forward supply arrangement as part of a project agreement between a landholder and a resource consumer should find a trade-off between the interests of the parties and include hybrid arrangements;
- **An incentives strategy:** A successful project will have an incentive strategy that is fit for purpose and flexible to change with the evolution of the target recipient/project;
- **Addressing impediments by variable and enabling incentives:** During project plan development and due diligence a check should be undertaken of variable and enabling incentives or the lack thereof and a strategy should be developed to either by-pass such road blocks or to seek to rectify the impediment;
- **Social licence:** Not all successful projects (defined by area established) have been free from adverse externalities and impacts on social licence: a critical success factor is to carefully assess and weigh-up project externalities and attempt to mitigate the impacts while seeking an overall increase in community acceptance and social licence.

Appendix 6: Global review and benchmarking report (Braden Jenkin)

The aim of this analysis and report is to provide insights and guidance to the development of robust and evidence based mechanisms to support the expansion of the Australian plantation estate. While it is possible to present a simple list and limited narrative around incentives, it is only by a thorough analysis of a mechanism, consideration of the enabling and other factors in the operating environment and the outcomes, that it is possible to fully understand the purpose and utility of a tool. The analysis considered the United States of America and the European Union (taking The Republic of Ireland as an exemplar Member State) to understand the intent and mechanisms used: the intent was manipulation of agricultural production by semi and permanent land-use change by afforestation. A detailed analysis was undertaken of New Zealand and *República Oriental del Uruguay* (Uruguay). New Zealand was selected because their history and system of Government is similar to that of Australia, with a key difference in the level of involvement of the Government in the plantation estate by the use of a range of incentives. The New Zealand estate was initially based on the conversion of native forests to plantations and later focusing of cleared agricultural land. Uruguay was selected based on the experience of developing a world-scale plantation estate in close to 30 years. The land-base was natural grasslands used for agriculture and the Government's role was as facilitator. The Government developed and effectively implemented a series of incentive mechanism to stimulate afforestation.

Conclusions and recommendations

The following are the key conclusions of the analysis

1. A single 'magic lever' incentive does not exist to stimulate afforestation.
2. Effective incentives involve a broad range of considerations synchronized and in alignment.
3. Land-owners are key and their involvement will require compelling reasons to plant trees. A continued dialogue between AFPA and NFF is critical to reinforcing a link to have trees regarded as an option within agriculture. Trusted advisors must be convinced that planting trees is a 'wise and prudent' use of land.
4. Regional plans are required to align the interests of parties, focus tree regime design (species + silviculture + markets) and to assist with the fit of trees into agriculture. Plans must take account of the current status of trees within a region.
5. Mechanisms are required to join parties and it is suggested that well designed joint-ventures offer a robust mechanism to share the risks and returns in the absence of funds to support a lease arrangement. A motivated party is required to drive the process.
6. An intelligent and fit-for-purpose incentive package is required to help implement regional plans. The incentive used can help reduce the risk of adverse social and environmental outcomes by providing some influence over implementation (e.g. target land).

Appendix 7: Trends in Forest Product Development. (Andrew Piper)

This report provides an overview of trends in wood product development and the way that these may impact on plantation forestry in Australia. It is intended for the information of project partners and in the design and testing of new business models for the integration of tree growing with agriculture. An overview of Australia's forest products is provided, followed by the identification of key trends influencing the use and development of forest products. Following this, some relatively "new" or emerging products are described and their implications for plantation development are considered:

- Cross Laminated Timber (CLT) for tall buildings;
- Bioenergy from wood pellets;
- Plywood from spindle-less lathes;
- Bio-plastics using wood residues;
- Wood Plastic Composites (WPC) as building materials; and
- Native foods as non-timber forest products.

These are only some of the products and innovations that could impact on plantation development. It is also recognized that there are a range of factors that influence decision making on the establishment of, management and marketing of plantation products.

The product examples described in this report show that there are innovations that have the potential to make some plantations more viable or more valuable than they once were by creating more value for lower quality logs and processing residues, or by increasing demand for existing timber products.

CLT for tall buildings

Wide adoption of CLT will increase overall demand for lower quality and smaller dimension softwood structural timber and potentially also for hardwood plantation timber. CLT could be a significant driver of future demand and price for plantation wood.

Bioenergy and wood pellet production

The use of wood residues for bioenergy can increase the value and demand for waste or low value products. In the context of Australia's plantations, this could help to make what would otherwise be uneconomic scenarios potentially economic.

Plywood from spindle-less lathes

Demand for plywood production and spindle-less lathe technology are already impacting on the demand for and value of Australia's hardwood plantation resource. Logs from plantations established for pulp production and thinnings from sawlog plantations are being diverted into higher value products such as plywoods and veneer based engineered wood products.

Bio-plastics using wood residues

Bioplastics could create new or higher value markets for residues from wood and pulp and paper processing. This could increase the overall value of plantation logs where there are nearby markets. They represent an opportunity for the forest industry to contribute to the reduction of fossil fuels in plastic production.

Wood plastic composites as building materials

Wood plastic composites (WPC's) could create new or higher value markets for residues from wood and pulp and paper processing. This could increase the overall value of plantation logs where there are nearby markets. In some applications, WPC can also compete with timber.

Native foods as non-timber forest products

Development of natural foods and related products could make tree growing attractive to a wider group of landowners than traditional plantations. There is scope for mixtures and diversification of planting types at farm level that could generate a range of products, both timber and non-timber.