Faculty of Science
School of Ecosystem and
Forest Sciences

Next Generation Plantation Investment Research Project

Benchmarking analysis: Part 1 Australia's history of plantation development, policy and incentives.

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Acronyms

ABARE	Australian Bureau of Agricultural and Resource Economics
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ACIAR	Australian Centre for International Agricultural Research ()
AFC	Australian Forestry Council
AFC	Australian Forestry Council (
AFS	Australian Forestry Standard
APM	Australian Paper Manufactures
ASIC	the Australian Securities and Investment Commission.
ATO	the Australian Taxation Office
CGT	Capital Gains Tax
CRRP	Community Rainforest Reforestation Project
DNRE	Department of Natural Resources and Environment
ERF	Emissions Reduction Fund
ESP	eligible service period
FFNAS	Farm Forestry National Action Statement
FFORNE	Farm Forestry North East Project –
FIAC	Forest Industry Advisory Council
FPC	Forest Products Commission
FWPA	Forest and Wood Products Australia
FWPRDC	Forest and Wood Products Research and Development Corporation
GAN	Gippsland AgroForestry Network
GOS	green-off-saw
GST	Goods and Services Tax
IPD	Independent Property Databank, UK
IWC	International Woodland Company
JVAP	Joint Venture Agroforestry R&D Program ()
MIS	managed investment schemes
NAP	National Afforestation Program
NAPSWQ	National Action Plan for Salinity and Water Quality
NCREIF	US National Council of Real Estate Investment Fiduciaries –NCREIF;
NFFP	National Farm Forestry Programme
NFPS	Australia's National Forest Policy Statement
NFPS	National Forest Policy Statement
NGOs	non-governmental organizations
NHT 1	National Heritage Trust 1
NPI	National Plantation Inventory
NTS	New Tax System
PDS	Product Disclosure Statement
R2	second rotation
REIT	Real estate investment trust
RET	Renewable Energy Target scheme.[1]
RPCs	Regional Plantation Committees
RIRDC	Rural Industries Research and Development Corporation
SED	Small end diameter
TIMO	Timber Investment Management Organisations
TIMOs	Timber Investment Management Organisations
VPC	Victorian Plantations Corporation
WA	Western Australia
WAPIS	Wood and Paper Industry Strategy

[1] Commonwealth of Australia (2016: p.13).

Summary

The project

This analysis forms part of the Next Generation Forest Plantation Investment undertaken by the University of Melbourne. The project aim is:

'To bring a combination of actors together to design and test new models of investment in planted forests. This approach presents an opportunity to learn from past experiences in order to design more sustainable and attractive models for planted forest investment that meet the requirements of industry, landowners, capital investors and other stakeholders.'

The key focus is on past Australian experience with actual projects, plantation development and the policy environment.

Key takeaway outcomes

The fundamentals

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-way 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 if defined by the creation of a critical scale 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 defendable (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.

The Australian natural forest and plantation estate

The initial colonist's view of Australia's natural forests was that it was an impediment to progress and required clearing to create arable lands. Subsequently the estate was regarded as a resource and the appetite of the States for timber (either as fuel wood for mining or for construction) resulted in concerns as to resource security. This resource utilisation was not deterred by the difficulties of working with eucalypt wood: the fledgling industries attempted to make paper from the resource but it was not until 1916 that the Conservator of Forests at Dijon (France) during a visit to Western Australia suggested test pulping of immature eucalypt wood as in France research on pulping of young plantation grown *Eucalyptus globulus* (Tasmanian bluegum) wood had proved promising. The exploitation of the natural forests combined with a natural lack of suitable softwood species in temperate Australia (with the exception of Tasmania) led to the establishment of softwood plantations, commencing in 1876 in South Australia. Importantly the history of plantation development has always been on a 'wood+' basis: plus employment, plus landcare, plus utilisation of 'wastelands' (as referred to in the context of the time).

In order to expand the plantation base, a portfolio of options is required and selection of an option must be informed by the current status. To best develop strategies for plantation expansion, it is prudent to classify the state of development of the plantation estate to allow fit-for-purpose approaches: the identified stages are immature; acceleration; maturation; and rationalisation. In assigning a state of development, the different segments of the estate must be assessed independently e.g. while the softwood estate is mature, the farm forestry estate is still in the immature state held back by many false starts and failed projects. The following are the identified phases of development of the Australian plantation estate.

- *Phase 1:* The first phase of the estate development up until the 1960's witnessed a very slow establishment rate;
- *Phase 2:* During phase 2 (early 1960s to early 1980s) saw a significant acceleration in development supported by the Commonwealth Government Softwood Loans Scheme;
- *Phase 3:* During phase 3 (early 1980s to late 1980s) a transition from public softwood to private hardwood investment occurred;
- *Phase 4:* Phase 4 (late 1980's to late 1990's) witnessed the significant expansion in the Tasmanian bluegum estate via managed investment schemes (MIS) vehicles and the rise of the Timber Investment Management Organisations (TIMO);
- *Phase 5:* A shift to northern Australia commenced in phase 5 (2000's to 2007) driven by pressure for land and necessitated the inclusion of a new range of species many of which had not been fully commercialised under Australian conditions. Although not captured by the National Plantation Inventory (NPI), sandalwood and oil mallee projects commenced in WA;

- *Phase 6:* Phase 6 has been a period of reckoning with many plantations established on inappropriate sites harvested and not replanted. It is estimated that over 100,000 ha of harvested hardwood plantations (c.10% of the peak estate) were not replanted from 2005/06 to 2015/16.

Development and ownership of the plantation estate

While MIS and TIMOs are the current dominant investment vehicles, investment forestry in Australia has had a very checked history with many recurring themes of poor projects, questionable promotors and disappointed investors. The past investment vehicles ranged from bonds in the 1920s to 1940s, managed investment company schemes (post 1962) and plantation syndicates.

A major change in the Australian plantation estate commencing in Phase 3 was ownership, in part reflecting the funding mechanisms for tree plantations. Ownership of the Australian plantation estate is divided into Government, industry, retail investors (e.g. via MIS projects), institutional investors (e.g. superannuation funds) and farm-forestry private. The aggregation of farm-forestry private masks the true state of the farm-forestry estate as it includes defaulted MIS lease based plantations. It is important that the true scale of the farm forestry estate is understood as a basis to make informed decisions about its potential. An important insight is the role of MIS in developing greenfield plantations[2] and the ability of institutional investors to purchase such going concerns as brownfield estates. In considering the split between public and private ownership, the scale and significance of the joint venture estate is evident[3]. The NPI classifies and captures joint ventures between State agencies and private interests and this structure constitutes 71,100 ha. The NPI last conducted an inventory of the farm forestry estate in 2000 estimating the estate at 67,021 ha, with 21,849 ha composed of non-current core commercial species (e.g. including 8,190 ha of mixed hardwood species - the commercial viability of mixed hardwood plantings is questionable). The importance of clarity of language and definitions of the elements of the planted forest estate is well recognised. The NPI segments industrial plantations from farm forestry based on scale: any estate greater than 1,000 ha is regarded as an industrial plantation. There remains scope to better capture the farm forestry estate data.

Government loans to support plantation development

In support of a policy objective of self-sufficiency in softwoods, the National Softwood Plantation Development Program (as an aggregate of combined State and Territory efforts) was underpinned by agreements made under the Softwood Forestry Agreements Acts of 1967, 1972 and 1976, which committed the Commonwealth to provide favourable loans to the States to establish and maintain softwood plantations. The Commonwealth loaned $78.1 million under these arrangements with approximately 730,000 ha planted (a mean rate of 45,625 ha/y). State Government agencies initiated farm forestry loan schemes in support of private plantation development (aimed at private parties and farmers). For example, the Victorian Government's Farm Forestry Loan scheme ran from 1966/67 until 1982/83 (8,270 ha) and the NSW Government's Farm Woodlot Loan commenced in 1966 (2,881 ha established over nine years). The terms and conditions of the loans included an inability to transfer the arrangements and limitations on species: Victoria allowed *Pinus radiata* (Radiata pine*)*; Poplars; *E. regnans* (Mountain ash); NSW allowed Radiata pine and *Poplars.*

[2] A greenfield plantation is defined as a plantation that does not have a current market for the main type of logs produced e.g. driven by a lack of a market for the log grown. A brownfield plantation is defined as a plantation with a current market for the main type of logs produced.
[3] A joint venture is an arrangement linking parties for the duration of a finite project where the parties share the inputs and net returns.

Direct investment: planted forest business structure and models

Business structures and arrangements

A direct investment is where the parties invest in a tree project directly rather than via a more sophisticated financial instrument. A range of instruments are available for use in regards to arranging wood fibre supply and each instrument can be used on a fit- for-purpose basis in project and business model development. A wood supply agreement is a current and actual contract between parties regulating wood supply; an off-take agreement is a guarantee of supply into a yet to be developed supply chain and the conditions of that future supply at that time; a forward contract is an agreement to supply at some point in the future; a futures contract is a financial instrument that can only be traded on a futures exchange (all other mechanisms are between the parties). In some cases a party may develop a wood resource independent of an off-take agreement and take a risk that a market will develop. If a project develops a commercially viable species at sufficient scale in a location with access to a market, then a market is more likely to develop. The details of the basis of supply are defined in the instrument and can be on a first right of refusal, take or pay or supply or replace basis, each of which allocate market risk between the parties.

Tree spatial arrangements

Trees can be planted on cleared land in six general spatial arrangements: as individuals, in clumps, as a woodlot, a plantation, with specific fit into agriculture (a subset includes agroforestry) or across 100% of a property. Species selection is critical. A market will generally have a very specific species requirements and only a small number of species have been fully commercialised in Australia (from silviculture through to processing and product supply at a commercial scale and on a commercial basis). Many other species are part-way along the commercialisation process BUT as yet are not commercial, hence the use of such species entails additional risk. A processor (market) will seek a known wood supply (timing, quantity and quality) and once-off plantings may or may not meet such requirements. It is more likely that in the absence of resource aggregation by a cohort of growers, that a continuous planting program is required: there are many examples of where projects have failed to reach critical mass and have become stranded assets.

Generic business models

There are three broad generic business models for tree investment: a lease where trees are planted on land not owned by the grower on an at arm's length basis, where a party owns the land and trees and where multiple parties join into a tree growing arrangement by sharing the risk and returns. The simplest arrangement is where a party owns the land and trees (and the risk and returns). The party could have some form of arm's length wood supply agreement in place with a market but remain 100% independent. A variation observed was where a landowner receives grant funding (a non-repayable gift) towards tree establishment. A number of examples have been observed but the overall outcome in terms of trees in the ground has been poor e.g. the Farm Forestry North East Project (FFORNE) had a goal of 16,000 ha but only managed to attract 70 members who planted a total of 1,700 ha after 10 years.

A range of terms borrowed from agriculture are used by forestry but with some variation to the agricultural understanding (e.g. sharefarming is broadly used to describe all situations where land is accessed from a farmer). The usual definition is more precise and entails the parties 'sharing' the risk and returns. A lease is a simple mechanism where the landowner forgoes all rights to access their land for a period of time in return for a payment independent of the project outcomes. An annuity is

another land access payment mechanism that provides a series of equal payments for land access, but unlike a lease, the value is tied to the crop outcomes (as a pre-payment). A crop-share is a mechanism that allocates the net harvest proceeds based on the share of the inputs by the parties.

A landowner has to be convinced to provide their land to another party. The motivation and decision making will be informed by the context in which the decisions are made: in the 1990s under a depressed farming environment, landowners were eager to enter into tree growing arrangements generating a good income while retaining title to their land, but now with more sophisticated, business like and rationalised farming and the rise of use of advisors (agricultural, accounting and legal) such ventures must be presented as a business proposition generating an acceptable rate of return. Under a lease arrangement, land access can be based on land values (e.g. 3% to 5%) or on a capacity to pay basis (e.g. $/ha). The area of land on offer is critical to the commercial viability of a project and projects generally set a minimum acceptable standard e.g. greater than 10 ha to give harvest economies of scale. Shared direct investments bring together parties to share risk and returns. Under a joint venture parties enter into a project related arrangement but retain their individual identity. They have agreed inputs and an agreed share of the outputs. As with the use of the term sharefarming, the term joint venture is often used outside of its technical definition (e.g. a lease joint venture is an oxymoron). There are two general types of joint ventures used in forestry projects. A marketing joint venture generally involves a first right of refusal provision, which gives the process an out and exposes the grower to market (or lack of) risk. Such agreements were often referred to as farm forestry agreements. A second type is a crop-share joint venture where the parties share the inputs and are allocated a share of the crop outcomes. The use of joint ventures in Australia commenced in the early 1980s and is the third most prominent project agreement mechanism after MIS projects based on the area planted. The attractiveness of joint ventures to all parties underpins their success: there is the ability to design a joint venture on a bespoke basis for each arrangement but the level of variation will increase administrative costs. Based on experience a number of design options are presented to enhance the attractiveness of a joint venture. An important point noted was that the attractiveness of a joint venture can be enhance by drafting from the counter party perspective.

Indirect investment - investment vehicles

An indirect investment in forestry assets is where an intermediary financial product is used rather than by direct owner ship of the trees (and potentially the land). The scale and significance of the impact of indirect investments in the Australian sector is documented with significant greenfield developments during phases 4 and phase 5 via MIS funding and the change of ownership of brownfield plantations from Government and MIS to institutional investors (commencing in phase 3 with the sale of Government assets and in phase 6 with the failure of MIS). This provides an important insight for business model development that there can be sequential owners and that different funding mechanisms and the underlying investors have specific appetites for different stages of development of plantations in a region. Given the significance of the MIS, this mechanisms is defined and in simple terms it is a pooled investment structure that combines the resources of individual investors for management (investment) by an independent third party. An important distinction is required to separate the performance of the financial instrument and the underlying project (e.g. plantations) and the cause of the failure of many MIS arrangements. Institutional investment is in trees has created a new asset class – timberland and the current scale of timberland investment is US$100 billion. Institutional investors will allocate funds to an intermediary party (a Timber Investment Management Organisation - TIMOs) to purchase timberlands and the asset is then managed on behalf of the institution by expert managers. The top 10 TIMOs by funds under management control US$44.4 billion and 10 million ha of land. Inclusion

of Timberland in investment portfolios has been demonstrated to improve overall returns and reduce risk due to the countercyclical nature of the returns (e.g. UniSuper and VicSuper both hold timberland assets. In support of analysis, there are a number of investment indices published for timberlands (e.g. the US National Council of Real Estate Investment Fiduciaries – NCREIF; the UK, Independent Property Databank (IPD) developed and has reported on the IPD UK Forestry Index). The overall total returns performance of timberlands has been more stable that the underlying assets to the S&P 500 Total Returns Index and the NCREIF National Property Index, which was most evident during the impacts of the global financial crisis.

Forest policy in Australia

Policy initiatives have been highly successful in developing the national softwood estate towards self-sufficiency (via The Softwood Forestry Agreement Acts -1960s and 1970s; State-based farm woodlots loans 1960s and 1970s). An adverse outcome of the conversion of many natural forest sites to softwood plantations included a significant loss of social licence. More recent Government policy initiatives have aimed to improve the profitability of private land used for plantations by removing impediments to investment and providing greater certainty to long-term forest investments, rather than by direct facilitation:

- The National Afforestation Program (1987 to 1992);
- The National Forest Policy Statement (1992);
- The Joint Venture Agroforestry R&D Program (1993 to presents);
- The Wood and Paper Industry Strategy (1995 to 1999);
- The National Farm Forestry Programme (1996 to 2001);
- The Plantations for Australia: The 2020 Vision (1997; 2002):
- Action Agenda for the Forest and wood products action agenda (2000):
- The Farm Forestry National Action Statement (2005) ;
- Transforming Australia's forest products industry (2016).

Recognising the need for expanded hardwood plantations, the National Afforestation Program (NAP) sought to increase the knowledge base while providing environmental repair by direct engagement with industry. It also provided direct support to the establishment of 6,000 ha of plantations. The NAP experience provided insights to inform the development of subsequent policy (e.g. a need for an enabling policy environment, the need to match grant structures to policy and how generate commercial outcomes and address environmental goals).

The 1992 National Forest Policy Statement (NFPS) was significant as it created the foundation of plantation development post the previously successful loan schemes. A key intent was the integration of environmental sustainability and commercial production while expanding the estate supported by R&D (e.g. increasing productivity, land capacity assessments and integration of trees into agriculture). As an evolution from natural forest conversion its focus was on cleared agricultural land and the integration of trees into agriculture (with associated benefits). The NFPS recognised the importance of focus on land within economic haul distance of markets. The NFPS initiated taxation reviews (leading to MIS), enabled a range of other mechanisms (e.g. joint ventures and forestry rights), encouraged States to address planning and land rating issues, and sought to promote the wider benefits of trees via Landcare and other community groups.

In support of research, the Forest and Wood Products Research and Development Corporation (FWPRDC) was established in 1994 allowing industry co-contribution towards an internationally competitive, sustainable and environmentally responsible forest and wood products industry. The Wood and Paper Industry Strategy (WAPIS) ran from 1995 to 1999 and aimed to develop the wood and paper industries while protecting forests for future generations. The approach was to enable the industry by among other things, encouraging a significant expansion of Australia's plantation and commercial farm forestry resource and addressing impediments to investment. A critical success of the WAPIS was the establishment of the NPI in 1997. The National Farm Forestry Programme (NFFP: 1996 to 2001) aimed to encourage the incorporation of commercial tree growing and management into farming systems for wood and non-wood production, increasing agricultural productivity and sustainable natural resource management. A key outcome of the NFFP was the establishment of a network of Regional Plantations Committees (RPCs) which operated until 2009. A milestone policy initiative was the establishment of the Plantations for Australia: the 2020 Vision in 1997 with an aim to treble the plantation estate by 2020. The strategy aimed to enhance regional wealth creation and international competitiveness through a sustainable increase in Australia's plantation resources. The Vision was revised in 2002 in response to social disruption caused by rapid expansion of the hardwood estate, to respond to market opportunities and to take account of a swap from public to private ownership of a significant proportion of the national estate. The Action Agenda for Forest and Wood Products initiative in 2000 provided a framework by which industry could pursue sustainable competitive advantages via 12 strategies including the key outcome of developing the Australian Forestry Standard (AFS). Other strategies focussed on markets, investment, innovation and linkages (national and regional). This was the first main forest policy initiatives to not make specific reference to farm forestry nor plantations. A Farm Forestry National Action Statement was launched in 2005 with a vision to increase the adoption of commercial tree growing and management as a widely accepted part of Australian farming and as a component of regional natural resource planning for the production of wood and non-wood products, and natural resource management benefits. A key focus was the coordination of Australian, State and Territory government policies, develop linkages between parties, quantify the benefits of farm forestry and promote markets for farm forestry outputs.

The Forest Industry Advisory Council's (FIAC) statement 'Transforming Australia's forest products industry' 2016 recognised the significant changes in the operating environment (e.g. the rise of bio products) and the resulting opportunities that demand change to the Australian sector in order to realise the potentials. Recognising lessons from previous experience, a caveat is placed on plantation expansion on unsuitable sites (as defined by biophysical and logistics considerations such as distance to market). While previous policy had described an objective of commercial plantings, FIAC's statement defines this important concept. Access to renewable energy opportunities created by renewable energy targets (RETs) and access to the Emissions Reduction Fund (ERF) was regarded an imperative.

Given the importance of taxation issues, past reviews have focused on implications for the forestry sector was analysed and many of the resulting changes have had direct relevance to plantation forestry: a key point is that analysis is required of any proposed and actual changes to the taxation system to identify any subsequent taxation related issues which require addressing. Numerous State Acts address conservation issues with implications for forestry, including Codes of Logging Practice, land-use planning, and flora and fauna protection. Other acts or legislation also cover the establishment and administration of National Parks, and regulate water rights and use. This project did not specifically assess the current state of State policy in regard to the treatment of plantations. A specific point is that State and Territory Governments have more direct opportunities to invest directly in plantations compared to the Australian government.

Government policy as a tool

The intent to invest in establishment and management of plantations for sawlogs requires long time frames and inherent risk (e.g. biological, products, market and a lack of liquidity) and effective policy can assist in risk mitigation. Australia's National Forest Policy Statement (NFPS) should on the one hand be stable but also be made relevant by periodic updates: the use of subsets of special interest policy statement has been an effective tool. The developed (updated) policy should be simple but not simplistic to ensure ease of implementation and transparency. Based on past adverse externalities (e.g. regional social disruptions associated with the MIS sector) associated with past successful policy initiatives (e.g. as defined by the areas developed) the implications of policy should be carefully understood prior to implementation. Past attempts by Government to implement policy tools designed to stimulate plantation development have been variably successful with adverse outcomes associated with a lack of a comprehensive plan, a lack of ongoing funding and failure to secure ongoing third party investment. Successful projects are more generally associated with an existing supply chain. The target land-base for plantation development is cleared agricultural land and consideration should be given to focussing on the farming unit and promoting trees as and into agriculture to assist with the process of alignment of interests. The application of policy as a tool should recognise the differences between industrial plantations and other tree plantings, that there is nil 'silver bullet' and that a portfolio of complementary approaches are required. Plantation investment can also be stimulated where the outputs are a complementary good to another driver supported by a separate policy (e.g. renewable energy targets and biomass supply). As noted, to enable plantation investment, a degree of certainty is required, particularly given the time frames relative to political cycles. While a NFPS framework exists, each State / Territory will have State / Territory specific policy and legal frameworks (e.g. forestry rights legislation). In other cases, changes to specific blocking State legislation has allowed development of a significant resource (e.g. native sandalwood in south west WA). A key point is that a drive to change policy and legislation can be either reactive to identified barriers or in anticipation of impediments. Plantation investment risk can be managed by the development of coordinating plans underpinned by regional plantation productivity assessments (which supports the FIAC hub concept). An outcome of some past policy initiatives (projects) has been the creation of stranded assets. Such outcomes taint the image of plantations as an investment.

Plantation development stimulus incentives

An incentive defined

The term incentive is broad and non-specific and includes any action that seeks a responding action. In a narrow sense and from a plantation forestry perspective, an incentive is any action or strategy that can induce tree planting. There are three broad types of incentives: direct, variable and enabling. Direct incentives pass to the party to be stimulated into action (e.g. costs sharing arrangements), whereas variable and enabling are more in regards to the operating environment (e.g. trade restrictions or land tenure arrangements respectively). Government implementation of incentives is justified where public good results (e.g. amelioration of salinity), and a private party is undertaking the works. In other cases an incentive may be implemented by a party seeking a resource (e.g. resource development on another party's land). In the Australian context it has been suggested that a strong public rationale for government intervention in the plantation forest industry could revolve around: development of the supply of renewable resources; maintaining a stable and economic regional industry; reforestation of degraded landscapes.

Policy-makers and industry have a range of incentive tools available and none has emerged as a 'silver bullet', although some are more effective than others. It is therefore prudent to develop a portfolio strategy on a fit-for-purpose basis, which allows bespoke solutions. A portfolio solution also ensures that impacts are maximised by addressing any impediments (e.g. with enabling incentives). The incentives used must match the stage of development of the specific target sector (immature; acceleration; maturation; rationalisation): it is argued that the industrial plantation estate is mature and requires more enabling incentives, whereas the farm forestry sector is still in the initiation stage after many failures to launch, hence it still requires direct incentives. Although not in the literature, a fourth stage is proposed – rationalisation. Under this stage, development stagnates (e.g. reduced second rotation 'R2' plantings) and more direct incentives may be required.

An assessment of past experience

An assessment of past direct incentive use in projects concluded that the key issue is that the incentive duration is critical. The primary impact of duration is the scale of the estate created: the scale required is on an individual situation basis (e.g. the scale required to support a highly specialised and boutique sawmill could be a 55 to 83 ha estate). Where an incentive aims to develop additional resources into an existing wood supply chain (brownfield development) a short term grant can be used (matching a political cycle) as the scale of the new trees is less critical. If the incentive aims to develop new trees in isolation (a greenfield estate) this requires a long-term commitment to fund over decades to develop a stand-alone estate. Examples of grants applied to greenfield development have naively assumed that an investor could be attracted. This approach created stranded assets. The most successful direct incentives were underpinned by: long-term funding, a highly motivated and empowered delivery group, a motivation to create resources and projects with known species into known markets. Species and intent is critical: there are a small number of fully commercial species regimes in place in Australia (e.g. actually supplying fibre to a processor) and many commercially un-proven cases. Success is most likely with incentives applied to a known species, and if an unknown species is to be planted, a long term commitment is required to create an estate that MAY possibly attract a processor.

Access to robust and commercial information

Information is vital and the Australian plantation forestry sector has a significant library available. Care is required as not all information is robust and commercial. Access to information is driven by a party's tree growing arrangements: a 100% owned project will seek external information whereas under a joint venture, the partner will provide the required information and advice. Extension agents can be a source of advice but great care is required to ensure that the advice is robust and commercial as many philosophical positions can impact that advice. An important point is that the farming sector is now highly sophisticated and reliant on professional advisors (agricultural, accounting/financial and legal) hence any information or prospects presented must pass intense scrutiny, placing pressure on the proponent. When dealing with an individual and a community, company staff can be highly effective if they are part of the local community and are trusted. Development of an incentive structure and an associated offer should first determine the stage of development of the target sector, whether the actual project is greenfield or brownfield, determine the appropriate direct incentive and all complementary and enabling incentives and deploy the offer. A process of monitoring and review is required to ensure that the incentive structure remains effective.

Introduction

The project: Next Generation Forest Plantation Investment

There is an increasing demand for wood and wood based products globally. However, although forest plantations are a major source of wood products in Australia there has been an overall decline in Australia's plantation area in the past 5 years, with almost no new plantations established during this period. As well as providing timber and wood plantations can provide a range of benefits to landowners, such as to stabilise soil, as wind breaks, to improve productivity, and/or as a way to diversify income. The aim of the project is to understand the attitudes of landowners to planting trees, with the overall objective to have landowners contribute to developing new models for integrating trees in rural landscapes. This project was conceived and initiated by the University of Melbourne with funding via the Commonwealth Government's Voluntary Matching Program (see Box 1) to address this issue.

Box 1: The project: Next Generation Forest Plantation Investment undertaken by the University of Melbourne.[4]

Project Aim

To bring a combination of actors together to design and test new models of investment in planted forests. This approach presents an opportunity to learn from past experiences in order to design more sustainable and attractive models for planted forest investment that meet the requirements of industry, landowners, capital investors and other stakeholders

The opportunity

There is potentially significant capital available for investment in plantation assets in Australia. This is coupled with a considerable area of farmland in Australia suitable for integrating trees into agricultural systems with potential benefits for production. Further, there are policy drivers to invest in trees to mitigate climate change and support forest landscape restoration objectives. In order to realise this opportunity, the land sector requires of coalition of stakeholders working together to design a best fit solution for all stakeholders.

Outcomes

- *Improved understanding of land available for planted forest investment in target regions*
- *Detailed understanding of land owner attitudes with regard to the forest sector and planted forests and their requirements for plantation investment*
- *Understanding the requirements of different types of investors*
- *New business models for investment in planted forests for a range of objectives, including environmental values*
- *Improved understanding and benchmarking of policies and incentives that have been implemented in Australia and internationally to stimulate plantation investment*
- *Increased trust between, investors, forest industry sector and landowners*
- *New thinking in the forest sector with regard to working with landowners and investors*

Funding

The project is funded by the Commonwealth Government's Voluntary Matching Program, co-funded by Hancock Victorian Plantations Pty Ltd, Midway Ltd., Australian Paper, AKD Softwoods, and One Forty One Plantations Ltd. with research conducted through the University of Melbourne, with additional support from Swinburne University of Technology. Forest and Wood Products Australia administer the project on behalf of the Department of Agriculture and Water.

[4] Next Generation Forest Plantation Investment project overview document.

The nature of a planted forest investment

Investment decisions are driven by the expected returns on investment and associated perceived degree of risk: returns and associated risk are often positively related e.g. higher returns are required to compensate acceptance of a higher risk. An investor must determine in advance whether the returns from an investment compensate for the perceived risk. In the case of an investment in planted trees (a plantation) as the trees age the volume of timber (standing capital) that is recovered (liquidated) at harvest. The risk can be due to potential financial loss as well as the initial investment's opportunity costs (what returns would an alternative investment yield?) and allocation of cleared land (land rent) over the period. Hence, a decision to invest in a plantation will result when an investor considers those risks are acceptable for the expected future return.[5]

An investment in a plantation locks in cleared (arable) land, taking several years from the investment (expenditure) and revenues at harvest. From the perspective of the output logs consumer (e.g. a sawmill), a continuous supply is required. This necessitates continued planting by an investor or investors to establish even aged stands of plantations requiring significant capital. It is possible and likely the investment is spread across a large number of individual investors who may or may not engage individually in continuous planting.[6] This can result in a tension in the alignment of interests: a single investor may not be capable of continuous planting to satisfy the needs of a processor. In a limited number of situations, an investor may be able to sell trees into a spot market provided that the needs of that market are met. An organised (e.g. the same target species, rotation, location etc) cohort of investors in trees may create a resource to satisfy the needs of a processor (e.g. expected and required species, rotation length producing logs of the required size and wood properties and within a financially viable haulage distance).

Plantations financial considerations are driven by their economies of scale e.g. a large scale plantation can reduce unit output costs, and achieve a higher net return for the farm or firm. For example, the average cost of harvesting and haulage over long distances drops significantly with increasing volumes. Thus, investment in forest plantations for (fibre) wood production requires attracting capital from small and large investors away from competing investment alternatives and securing suitable cleared land from alternative farming enterprises.[7]

This analysis and report

It is recognised that history of Australia's plantation development and supporting policy has generated a broad range of benefits. The focus of this analysis has been to consider the core outcome of the area of trees planted and the level of commercial resource as a basis of seeking to understand the mechanisms and components of the mechanisms that have implemented. In this way it will inform the development of business models aim to generate commercial wood fibre resources to supply industry. The results are presented by first exploring the concept of developing a business model, followed by an analysis of the history of the Australian plantation estate, reviewing the parties who developed the estate and the changes of ownership over time and the role of Government loan schemes. The mechanisms used to facilitate the development are explored segmented into direct and indirect investment. Finally the role of Government policy and the use of incentives is documented and analysed.

[5] Low et al. (2010; p.4).
[6] Low et al. (2010; p.4).
[7] Low et al. (2010; p.4).

Part A: Developing a planted forest business model

Summary

This section of the report provides a summary of the key lessons documented in the balance of the report and can read as a stand-alone summary. However, minimal references have been used in this section given that the supporting evidence is documented in the balance of the report.

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 if defined by the creation of a critical scale 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 defendable (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.

Introduction

The structure of a tree development project seeks to triangulate the needs of parties with access to land, requiring wood fibre inputs and with investment (capital) capacity. It is possible that a party may poses all three "needs" or any other combination. A fourth party will hold the required technical knowledge and skills to undertake a project. There is a further cohort of parties external to the core parties, including at the micro level, neighbours to specific unit of land to be planted and at the macro level, policy makers. All parties will contribute to a successful outcome of the drive to increase tree planting on cleared land.[8] Success in a project linking parties can be defined by all party's expectations and whether the needs are met: the processor *'needs to have confidence that there will be a consistent flow of wood of the specified quality over a long time period in sufficient quantities at a competitive price. This confidence cannot be provided by individual farm foresters growing trees on widely dispersed small plots with no regionally cohesive marketing plan.'* [9] For an independent financier, return on investment must match expectations of the risk incurred and for an enabling government, success can be defined in that the outcomes of the project did not generate adverse externalities and possibly generated positive public and environmental good. A first step is that there is willingness by parties developing planted trees and industry to be organised in ways which recognise each other's needs and there are appropriate mechanisms of apportioning and sharing the risks intrinsic to forestry projects into commercial practice.[10] The core of the arrangements between parties is the business model and associated business arrangements. An outcome of the review of the history of Australia's plantation development and policy framework has been to identify a business model framework and the factors that contribute to a successful project. The following chapter documents these summary outcomes.

A planted forest business model defined

Simple and effective definitions of a business model include:

> *"All it really meant was how you planned to make money"* [11]

[8] Note: the term cleared land is used as it includes land with agricultural enterprises or vacant (fallow) land that while cleared of natural vegetation is not managed as agricultural enterprises.
[9] Curtis and Race (1998: p.13) citing Cummine (1996, p.39).
[10] Alexandra and Hall (1998: p.xiv)
[11] Lewis, M. (1999).

'A business model is a company's plan for how it will generate revenues and make a profit. It explains what products or services the business plans to manufacture and market, and how it plans to do so, including what expenses it will incur.'[12]

The development of an approach to investment in trees on cleared agricultural land can be defined as a business model and the elements included are the result of a detailed analysis of the history of tree planting in Australia (see Figure 1).

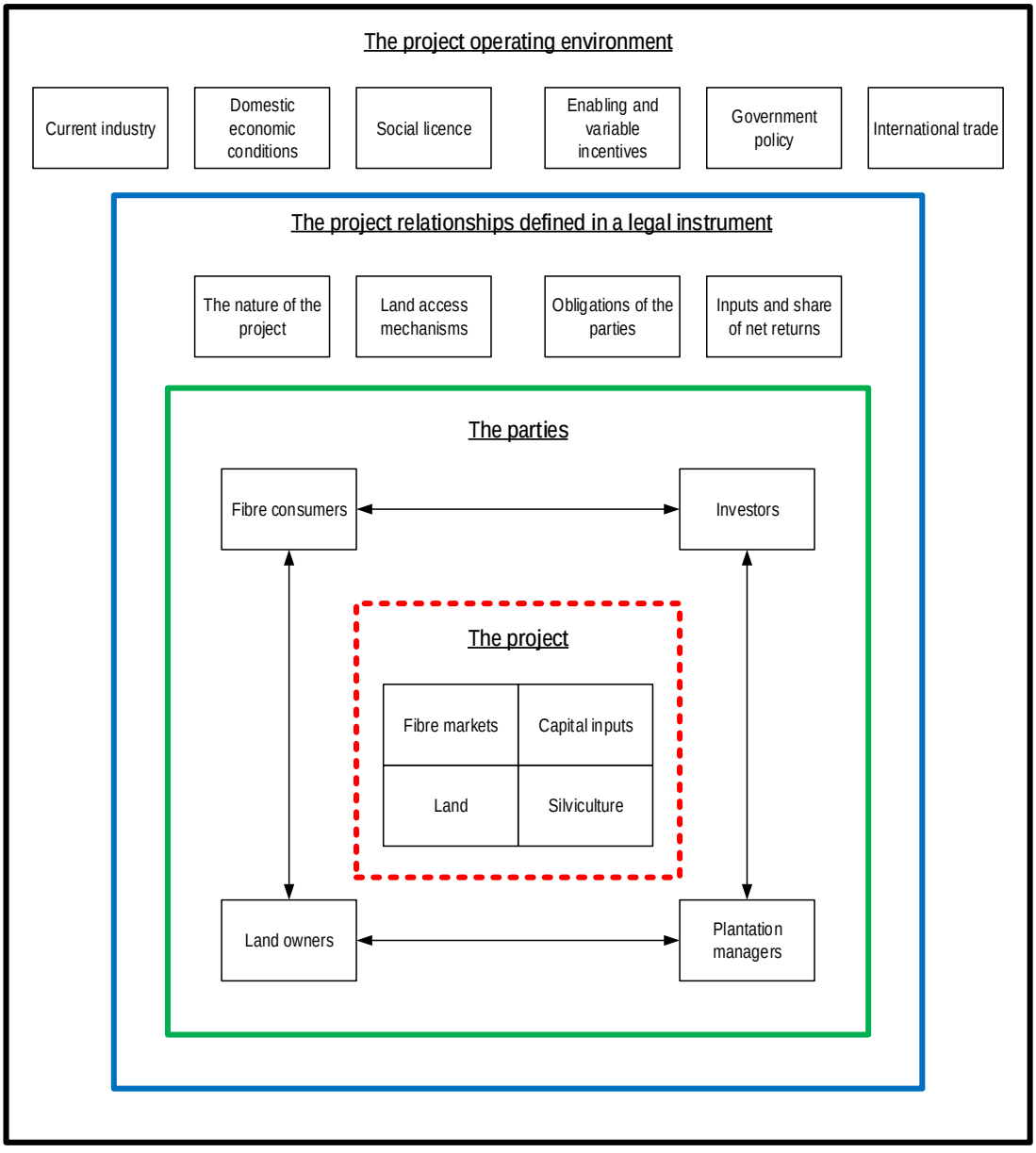


Figure 1 : A planted forest business model consisting of nested elements identified by this analysis.

The literature provides the following insights and cautions in regards to the design and development of structures in support of investment in trees:

'It is not likely that any single strategy could represent the panacea for low investment in forestry. The difficulties faced by the forest industry are varied, and hence a suite of policies designed to foster informed investment

[12] Ovans, (2015).

decisions, on the one hand, and to better manage risk, on the other, is more likely to deliver sustained investment in the sector.'[13]

'Other more complex investment structures for retail investors such as infrastructure bonds and flow through shares were considered as part of the project brief. Issues that were identified with regard to their potential applicability included:[14]

1. *They could potentially disguise the inherent poor profitability of the investment which needs to be addressed;*
2. *The forest industry has a poor history of delivering solid investment returns to the retail investment sector;*
3. *Retail Banks and Institutional investors advised against developing complex investment structures. (The rate of return of these investors also tends to be lower than retail investors).'*

Lessons from past experience: the recurring themes in plantation forestry investments

Analysis of the history of plantation investment reveals the following segments: the parties involved, the investment vehicles, the motivations for investment and the impact of enabling factors (e.g. barriers and incentives). Access to land for plantations is a recurring theme:

In 1915: [15]

'*By 1915, there were about 1,600 hectares of hardwoods (mainly eucalypts), 1,200 hectares of wattles and 2,400 hectares of exotic softwoods, and the forest service said it was having problems finding suitable land.'*

In 1990:[16]

'The third main weakness of forest policy analysis concerns the great questions of where the land and money are to come from to expand the area of Australia's plantations, and what sorts of growers might be involved.'

Problems with investment offers and vehicles is also a recurring theme:[17]

'*....during the 1920s and 1930s Australia and New Zealand saw a rash of small investment companies offering interests to the public. The majority of these were dismal failures where the investor received little or no return.'*

A warning into the design of business models and investment structures is that:[18]

'Blunt taxation incentives have been unable to maximise sustainability outcomes.'

The following is a list of recurring themes evident over the history of plantation forestry investment based on the various document reviewed:

1. Negative outcomes:
    a. Failures*:* With uncertainty of species performance and pressure on land availability, a shift to new areas has historically resulted in failures (and some outstanding successes);

[13] Low et al. (2010; p.3).
[14] de Fégely et al. (2011: p. v).
[15] Carron (1990: p.12).
[16] Dargavel (1990: p.438).
[17] McKenzie Smith (1977: p.69).
[18] Alexandra & Campbell (2002: p.87).

   b. Stranded resources*:* Where trees have been biologically successfully grown in new areas, there is a risk that the resource is isolated from a main estate and processors, and does not reach critical mass to attract a processor;
   c. Reputation*:* The rise and fall of many investment vehicles has resulted in significant reputational damage to trees as an investment which is only softened by time and the loss of memory of the outcomes;
2. Projects:
   a. Access to land*:* Which land to plant on a regional scale, which species and how to access "suitable land" underpin much of the tree plantation development dilemma;
   b. Multiple benefits*:* A recurrent theme is that while the action is to plant trees, the motivation and benefits go beyond wood flows to include environmental and social considerations (e.g. wood+);
   c. Rotation length*:* The time till returns is an issue for investors compounded by a delay in the realisation of the actual compared to predicted performance of an investment (and the interim consumption of funds invested by some investment promotors);
   d. Laissez faire*:* Large-scale and successful tree developments have had a specific focus on target and often single species, whereas some farm forestry developments have taken a more *laissez faire* approach to species with a multitude planted species – if the trees are not intended for harvest, then such diversity will enhance the environmental benefits;
3. Financial:
   a. Access to capital*:* Funding the development of planted trees is a well-recognised barrier to participation given the scale of the capital required;
   b. Returns*:* Many comments have been observed where the returns from investment in trees either fail or are driven down by log product (log) prices;
4. The parties:
   a. Focus*:* Facilitation by a party motivated driving the development of planted trees supported by a plan and funds has resulted in development of targeted and successful tree plantings (e.g. scale, species and location);
   b. Adaptability*:* History has shown that parties offering investments in plantations have been highly adaptive to change in the regulatory environment;
5. Regulation:
   a. Legislation and regulation: The nature, structure and operation of investment schemes and options are dictated by the regulatory environment;
   b. Taxation: Taxation can stimulate and stop-dead investment in trees as evidenced by a numerous points in history.

The key success factors

Based on analysis of the literature and past development of and investment in tree planting projects, the following are the critical success factors identified in order of significance. Subsequent sections will consider each factor in a sequential and structured manner. An important point is that the use of direct incentives was either successful or a failure based on the factors listed.

A strategy and plan

A project must have a detailed, factual and fully-costed plan.

Ad hoc and un-planned plantation developments have resulted in stranded assets as they did not reach a critical mass. Successful projects have all elements of the project defined based on evidence, are clearly articulated and quantified, including a funding strategy. A plan can be for a region (e.g. prepared by a regional authority or industry) or for a specific project prepared by a project developer. For example, the development of WA's Tasmanian bluegum estate commenced with a clear strategy and plan. While a critical mass of resource is required to satisfy a market, the route to market and the market was already established for natural forest sourced woodchips and the Tasmanian bluegum resources were to add to this supply. The development by Government of the estate continued from the initial private sector investment with specific 10 year plans (and funding) to develop two nodes of resource for foreign investors.

Critical mass and appropriate funding

A project must seek to develop a resource of appropriate scale and attributes to satisfy a specific market.

There are many examples of projects that have failed to create a critical mass and the trees are stranded assets. A critical mass is defined as the development of adequate resources that can be supplied into a supply chain to a processor or market. The test of a critical mass is conditional on the presence or absence of other plantings in the same location. A greenfield planting is where by way of location (e.g. too far to an existing market), species (e.g. a new species not currently processed locally) or output intent (e.g. sawlogs) a resource must be developed to a commercial scale to attract a new processor or an existing processor to invest to have the capacity to purchase and process the new resources. A brownfield planting is where the trees planted are within economic haul distance of an active processor / market and are the same species and log type as currently supplied to the processor. A brownfield planting does not require development of a same level of critical mass, but it must satisfy all the requirements of the target market (e.g. minimal areas planted and haul distances). A brownfield estate development can be supported by short-term funding arrangements (e.g. a grant direct incentive over three years or a joint venture), whereas a greenfield estate must have adequate funding committed over enough years to create a sustainable resource supply. A greenfield estate could be funded by a sequence of sources such as an initial seed-capital grant followed by securing an investor, but history has shown that in the absence of securing an investor, such will fail. If such a strategy is to be implemented, an investor must be secured from commencement rather than invest grant funds hope to secure an investor at a later stage. While not a true greenfield development (e.g. there was a softwood estates and processors), the Commonwealth Softwood Loan Schemes over 16 years (a direct incentive as a series of loans to States on favourable terms) were extremely successful in developing a significant resource stimulating investment in processing capacity.

Motivated and empowered (funded) parties

A project must have highly motivated parties to drive the project and that the parties are empowered (funded) to make it happen.

A common theme of successful projects was the presence of a motivated and empowered party. The success of the Commonwealth Softwood Loans Scheme was driven by a national motivation for self-sufficiency and the State agencies'

desire to establish plantations. The success of the development of the WA Tasmanian bluegum estate was driven by the motivation of the plantation developers to create three resources bases: two Government sponsored and one private. The staff involved had a mandate and budget to develop the plantations on third party land. An important insight was that the staff involved were part of the local community and had a high degree of trust due to that status (e.g. an implied community perception was that the staff must be promoting a viable project). While many other projects have had highly motivated parties, where such project were to 'encourage' plantation development (e.g. via Farm Forestry Agreements as a direct incentive), they were less successful as they lacked 100% of the funds required to establish the trees.

The underlying project

The underlying project must be commercially proven and viable.

The difference between a greenfield and brownfield project has been discussed. A critical issue is species and the associated regime. Many greenfield projects have failed to reach critical mass due use of a novel species and/or management regime. For example there are numerous cases where a new set of new species have been promoted to be managed to produce sawlogs in the absence of full commercialisation (e.g. where a regime has been implemented through to supply of logs to a processors and the sale of the resulting products). In the absence of full commercialization a project is high risk and it is questionable as to whether it is appropriate to promote investment in such projects: it could be argued that such risk should be taken by Government, but appropriate due diligence is still required from a probity perspective. A process of pilot scale development would be more appropriate. Some projects have assumed a degree of fungibility with natural forest log supply into local processors and this is a high risk strategy as the attributes of the resulting logs and products are likely to be different.

Information provided and management of expectations

The information provided to the parties to a project must present a factually based and defendable expected outcome.

The impressive enthusiasm of extension staff and other parties in promoting tree growing systems must be based on commercial realities (e.g. is the system promoted in operation today buying the type of logs promoted to be grown?). Examples of unproven regimes have been promoted to enthusiastic land owners who have faithfully implemented the regimes (e.g. thinned and pruned Tasmanian blue gums or *E. saligna* - Sydney bluegum only to find that markets have failed to materialise). In some cases industry is 'blamed' as they could not take the resource. Where the objective is to secure access to farm lands, the information provided is an import point give a fundamental change in the farming sector. At the commencement of the WA Tasmanian bluegum industry, farming was depressed due to commodity prices and the structure of many farms (e.g. too small an area and low management skills) hence the opportunity to lease land for trees was welcomed (e.g. retain title plus an annual income for nil effort). Today the farming sector has been rationalised and a more sophisticated and business-like approach is in place. Farmers now rely of technical advisors (e.g. agricultural consultants, accounting / financial advisors and legal advisors) and any proposed tree growing project is highly likely to be subject to intense and highly skilled analysis as part of decision making. Therefore, information in regards to a project must be robust, factual and above all else commercially proven (e.g. viable) in order to attract serious consideration.

Trees as and into agriculture

A project must be framed from the landholder's perspective and complement their agricultural enterprises.

The intent is to plant trees on cleared agricultural land and in the absence of buying large tracts of land, landholders must be convinced to participate. Communications will be critical – as noted above the use of trusted parties is important as will be the content of a proposal. A next consideration is that the proposal should be framed from the landholder's perspective and that it is likely that the landholder's advisors will require convincing. An important step is to develop a mindset of trees as part of and into agriculture; taking this further and to create a marketing strategy, it is strongly suggested that the term farm forestry should not be used. The target of awareness raising should be the technical advisors to landholders (e.g. agricultural consultants, accounting / financial advisors and legal) as this would be more efficient (e.g. an agricultural consultant may provide services to as many as 100 farmers in a location) and effective (e.g. if the advisors are convinced, then they will seek to fit such opportunities into client's farming enterprises). Commercial forestry specialist with an understanding of agriculture should be involved in technical discussions with the farmer advisors, and it is likely that an initial discussion considering a forestry project will be between the landholder and the farmer advisor. Subsequent discussions may include a forestry specialist to address technical issues. In a practical manner the location and arrangement of trees on a property should find a compromise between the landowner's needs and the commercial realities of harvest, haulage and delivered wood costs. Based on full-rotation experience industry fully understands the impacts of different spatial arrangements (e.g. dispersed shelter belts across are undesirable due to cost and the impacts on woodchip quality) and minimum planting unit size.

Transparency

All legal instruments should include full (industry standard?) disclosure and be expressed in language appropriate to the landholders to allow full transparency.

Management of expectations and advisor engagement must be on a transparent basis. In the simplest terms, the language of forestry must be converted into usual agricultural terms and expressions to allow a high degree of understanding and fungibility. Transparency must be further enhanced by full disclosure of the state of the proposed regime and the likelihood of returns (e.g. whether or not a current and active market exists for the proposed outputs). The legal instruments utilised should be robust, in plain language and complete. Historically, many land-lease agreements were silent on the issue of post-harvest stumps and site remediation and this has become significant issue given the costs and liabilities involved. The forestry sector should develop standard templates outlining ALL issues, so that all parties fully comprehend the nature of the enterprise proposed.

Land access – bespoke options

A project should have a degree of ability to create bespoke land-access options to capture the broadest cohort of landowners but be commercially realistic about the administrative cost of such choices.

The literature and discussions indicate a trade-off between bespoke (e.g. landowner specific) and project overhead costs in regards to land access. In some cases a landowner may seek to offer a section of land for trees and in others, 100% of a property may be available. An insight gained was that if a project has a range of species options (e.g. commercially viable and

matched to sites) this can allow some landholders to offer 100% of a property to trees where this is the preferred option. Some projects in the past have used agricultural ventures to occupy the land not suited to trees (e.g. an MIS project running cattle). Apart from ownership, a range of land access mechanisms are possible. The simplest is a lease where the landowner retains tile in exchange for a periodic payment independent of the tree crop outcomes and the use of the land by a tree developer. Lease arrangements are the most popular for BOTH landowners and some tree project developers (e.g. from a tree developer perspective a lease provides close to 100% control but with a commitment to fund the annual access fees). The second option is a joint venture where the parties retain their individual identity and join together for a project (e.g. finite life) and share the risk and returns proportional to their inputs. Joint ventures can be segmented into marketing and crop-share arrangements. Under a marketing arrangement, the landowner in exchange for the counterparty inputs (e.g. seedlings and establishment) is obligated to offer the resulting resources on a first-right-of refusal basis to the counter party. Such arrangements have proven unpopular in the past and resulted in disappointment for some landholder participants where refusal has been exercised. Under a crop-share arrangement the parties share the crop net harvest revenues on an agreed basis (e.g. based on each parties inputs) and such arrangements have proven attractive. Each option has pros and cons and it is situation-specific as to which is the most acceptable.

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 potentially include hybrid arrangements.

Where a tree development project joins with a landholder, a basis of sales mechanism is required. At the point of harvest a landholder resource owner should have a wood sale agreement in place with the purchaser of the resources (e.g. providing all details of the basis of sale and payment structures). Prior to the point of harvest a project agreement between the parties should detail the basis of the obligations in regards to future sales and there are three broad options: take-or-pay; supply-or -replace; first-right-of-refusal. A first-right-of-refusal obliges the landholder to first offer the resource to the counterparty on an agreed basis BUT the counterparty is not obliged to purchase the resource which in the past has been exercised in some cases, hence such arrangements are generally not viewed favourably (e.g. under past Farm Forestry Agreements). A take-or-pay agreement gives power to the landholder and in many cases a take-or-pay agreement will be limited to a set percentage of the agreed woodflows. This is likely to provide the greatest certainly to the landholder and be the most attractive. A supply-or-replace clause dictates that while a landholder has the right to change their mind and retain the planted trees (e.g. for shade and shelter benefits) the counter party must be compensated to be able to purchase replacement resources, potentially from a greater distance. In developing a project it is possible that a hybrid approach could be developed (e.g. 50% as take-or-pay and supply-or-replace; 50% as first right of refusal) and care is required as to the order in which clauses are implemented. Such a strategy can be used to balance power in an arrangements to an equitable basis.

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.

A range of direct incentives are available in support of plantation development, however a ‘silver bullet’ does not exists hence there is a need to develop an incentive strategy. Experience has demonstrated that the use of an incentive must match the

nature of the situation. The first step is to determine the stage of development of the sector of interest. Caution is required as not all sub-sectors are likely to be at the same level of development. For example the Australian industrial plantation sector is mature whereas 'farm-forestry' remains immature in many cases after numerous false starts (as noted above) or be regionally focussed (e.g. Gippsland is very different to northeast Victoria). Once the sector status has been determined, development stage specific incentives can commence. A point of caution is that a proposed project should be guided by robust plans and a regional or industry plan should document the incentives strategy. The plan should recognise that with time and experience, a sub-sector or region will evolve and mature, hence a 'set-and-forget' incentive strategy is inappropriate. The strategy should include provision for monitoring of milestones that signal the need to adjust or change the incentives used. Individual incentives do not operate in isolation of the operating environment, therefore each incentive will have complementary direct, variable and enabling incentives which in combination will generate the most robust outcomes. It is critical to ensure that the incentive strategy determines the state of required complementary and enabling incentives.

Addressing impediments by deploying 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.

Where a thorough due diligence is undertaken as part of project development, specific impediments and the ability of variable and/or enabling incentives to address such impediments can be determined. Addressing enabling incentives has mostly been reactive to identified issues (e.g. the WA native sandalwood plantation industry developed once legislation vesting all sandalwood in the State was changed). Creating an enabling incentive can result from changes to policy and legislation, stabilizing policy and legislation or provision of the certainly of the role of Government at all levels (e.g. at the Local Government level provision of a right to harvest and road use are critical to project confidence).

Social licence

Not all successful projects (e.g. as 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 negative impacts and maximise the net outcomes.

The Commonwealth Government Softwood Loans Schemes and MIS while developing significant resources, generated unintended social licence issues: conversion of natural forest and regional social disruption respectively. There are inherent difficulties in predicting social licence issues and while forest science may focus on facts and figures, public responses are likely to be based on perceptions and individually important matters. A classic point of divergence is that from a species perspective the koala population in the western Victorian Tasmanian bluegum estate is a positive outcome, but this is negated by the death of individual animals on the roads around the plantations. A project plan should never the less include an assessment of likely social licence issues which are likely to be very regionally specific.

Part B: Australia's forest resources

The Australian natural forest and plantation estate

Summary

The initial European colonist's view of Australia's natural forests was that it was an impediment to progress and required clearing to create arable lands. Subsequently the estate was regarded as a resource and the appetite of the States for timber (either as fuel wood for mining or for construction) resulted in concerns as to resource security. This resource utilisation was not deterred by the difficulties of working with eucalypt wood: the fledgling industries attempted to make paper from the resource but it was not until 1916 that the Conservator of Forests at Dijon (France) during a visit to WA suggested test pulping of immature eucalypt wood as in France, research on pulping of young plantation grown Tasmanian bluegum wood had proved promising. The exploitation of the natural forests combined with a natural lack of suitable softwood species in temperate Australia (with the exception of Tasmania) led to the establishment of softwood plantations, commencing in 1876 in South Australia. Importantly the history of plantation development has always been on a 'wood+' basis: plus employment, plus landcare, plus utilisation of 'wastelands' (as referred to in the context of the time). In order to expand the current plantation base, a portfolio of options is required. To best develop strategies for plantation expansion, it is prudent to classify the state of development of the plantation estate to allow fit-for-purpose approaches: the identified stages are immature; acceleration; maturation; and rationalisation. In assigning a state of development, the different segments of the estate must be assessed independently (e.g. while the softwood estate is mature, the farm forestry estate is still in the immature state held back by many false starts and failed projects).

The following are the identified phases of development of the Australian plantation estate.

- *Phase 1:* The first phase of the estate development up until the 1960's witnessed a very slow establishment rate;
- *Phase 2:* During phase 2 (early 1960s to early 1980s) saw a significant acceleration in development supported by the Commonwealth Government Softwood Loans Scheme;
- *Phase 3:* During phase 3 (early 1980s to late 1980s) a transition from public softwood to private hardwood investment occurred;
- *Phase 4:* Phase 4 (late 1980's to late 1990's) witnessed the significant expansion in the Tasmanian bluegum estate via managed investment schemes (MIS) vehicles and the rise of the Timber Investment Management Organisations (TIMO);
- *Phase 5:* A shift to northern Australia commenced in phase 5 (2000's to 2007) driven by pressure for land and necessitated the inclusion of a new range of species many of which had not been fully commercialised under Australian conditions. Although not captured by the National Plantation Inventory (NPI), sandalwood and oil mallee projects commenced in WA;
- *Phase 6:* Phase 6 has been a period of reckoning with many plantations established on inappropriate sites harvested and not replanted. It is estimated that over 100,000 ha of harvested hardwood plantations (c.10% of the peak estate) were not replanted from 2005/06 to 2015/16.

Introduction

The development of trees on cleared agricultural land will involve motivation of parties to participate, hence the underlying drive of this project to develop novel business models. It is highly likely that clues to the elements of and examples of 'novel' business models have already been implemented in Australia and that we can learn from past experience. To underpin this development it is important to document past experience as a first step to identifying the motivators and tactics that can be incorporated into any new model. This section of the report documents the history of the development of Australia's from European colonisation through to plantation development initiation and the different phases of the estate evolution.

The European colonists view

On British settlement of Australia, the development of agricultural land converted natural vegetation to other land-uses and *"Forest clearance, in contrast to forest exploitation as such, remained the primary objective for many decades...."*.[19] The strategic importance of the forest resource was noted by the English Government: *".....His Majesty's instructions to Governor Phillip required that, in allotting lands to emancipated convicts, he should reserve "to use such timber as may be growing or to grow hereafter upon said land which may be fit for naval purposes."*[20] However, the difficulty of utilisation of the eucalypt resource was documented by Governor Phillip[21]:

> *"The timber of the site is well described by Captain Cook's voyage but unfortunately it has one very bad quality which puts use to very great inconvenience: I mean the large gum-tree which splits and warps in such a manner when used green, to which necessity obliged us, that a storehouse boarded with this wood is rendered useless. The timber which in its growth resembles the fir tree warps less but we are obliged to fetch it from some distance and it will not float."*

From an initial degree of ambivalence to the native forest species, the Australian forest product sector developed.

Realising the potential of the resource base

The difficulty of exploitation of the eucalypt resource noted by Governor Phillip[22] did not deter the exploration of the utilisation of the natural forest resources of Australia (see Box 2). In 1914 Mr H. E. Surface (an eminent American expert papermaker) was brought to Tasmania in an attempt to manufacture paper from Australian natural forest eucalypts and his research resulted in a poor yield (30%), poor quality and difficult to be bleach pulp and he reported adversely on the prospects. Later during a 1916 visit to WA, the Conservator of Forests at Dijon (France) suggested test pulping of immature eucalypt wood as in France research on pulping of young plantation grown *Eucalyptus globulus* (it is unknown which sub-species) wood had proved promising.[23]

[19] Rule (1967: p.45) and See Dargavel (1995) for an account of the development of the Australian landscape and Williams and Woinarski (1997) for details of the ecology of the eucalypts.
[20] Carron (1985: p.1).
[21] Carron (1985: p.1&2).
[22] Carron (1985: p.1&2).
[23] Boas (1947: p.106).

Box 2: A statement in the Official Year Book of the Commonwealth of Australia, for the period 1901 to 1914.[24]

'1. Objects.—Economic forestry, aiming at the conservation of forestal wealth by safeguarding forests against inconsiderate destruction, and by the suitable re-afforestation of denuded areas, is essential to the preservation of industries dependent upon an adequate supply of timber, and to the perpetuation of a necessary form of national wealth. Though in Australia large areas of virgin forests still remain, the inroads made by timber-getters, by agriculturists, and by pastoralists—who have destroyed large areas by " ring-barking"—are considerable ; and it is not unlikely that climatological changes are caused thereby. It is stated that beneficial consequences follow on the planting of trees on denuded lands, or along eroding coasts, and that a forest covering tends to beneficially regulate the effects of rainfall.

Successful planting of exotics in various parts of the Commonwealth has demonstrated that the Australian climate is suitable for the cultivation of a large number of the most valuable and beautiful of the world's timber trees.'

Research into the commercial utilisation of Australian timbers commenced very early and the 1915 Official Year Book of the Commonwealth of Australia noted such endeavours (see Box 3). Research continued documenting the properties of the natural resource (e.g. a 1924 publication documented the fibre properties of a range of natural forest resource eucalypts[25].) In 1947 it was noted[26] in reference to the development of the Australian pulp and paper industry and the processing of natural forest eucalypts that:

> *"The growth of this industry is a most interesting example of what can be done by properly directed research in this country, and the fallacy of using imported experts in place of carrying out investigations with Australian trained men. Experts of all sorts originally condemned the proposals. Some who remained in Australia became in time the most enthusiastic supporters of them. The problem was solved by Australian chemists who began with no knowledge of papermaking and so were free from the prejudices of the expert mind.....It took twenty years to overcome the objections listed above, one at a time, and about £250,000 was spent on research at that time."*

Since that time a number of pivotal references have been prepare on eucalypts as a source of wood products.[27]

Box 3: A statement in the Official Year Book of the Commonwealth of Australia, for the period 1901 to 1914. [28]

§ 3. Commercial Uses of Principal Australian Timbers.

'The uses of the more important of Australian timbers are many and various, and are indicated in previous issues of this work (see Official Year Book No. 6, pp. 454-6). As aids in the development of Commonwealth industries, the Government is experimenting with Australian woods for rifle stocks, telephone switch boards, etc. It has also made available a sum of money for the seasoning and storing of Australian timber. Timber seasoning depots have also been established by States Governments at the principal centres, and from these contractors may obtain timber at scheduled rates. Other timber seasoning works have been established by private enterprise.'

The 1910, Australian forest products trade included significant imports of dressed and undressed timbers balance by exports including sandalwood (see Box 4).

[24] Knibbs (1915: p.379).
[25] Baker & Smith (1924).
[26] Boas (1947: p.111).
[27] Hillis and Brown (1984); Bootle (1996) provide a comprehensive overview of the utilisation of eucalypt wood.
[28] Knibbs (1915: p.382).

Box 4: Timber products trade statistics for 1910 in the Official Year Book of the Commonwealth of Australia, for the period 1901 to 1914.

Imported timbers for 1910: [29]

- Dressed timber = 64,147,155 super feet (151,387 m^3) with a value of £466,754;
- Undressed timber and logs = 278,674,754 super feet (657,672 m^3) with a value of £1,542,178.

Exported timbers for 1910:

- All grades = 142,834,000 super feet (337,088 m^3) with a value of £976,355;[30]
- Sandalwood = 183,646 cwt (9,330 t) with a value of £88,624.[31]

The development of Australia's plantation estate

The stages of the estate

Plantation estate development can be divided into a series stages: initiation, acceleration and maturation[32], and in some cases including rationalisation.

- *Initiation:* Strategic investment in plantations to ensure wood resource security threatened by exploitation of natural forests;
- *Acceleration:* The use to plantation incentives to achieve self-sufficiency;
- *Maturation:* A broader focus including strategic goals of creating an internationally competitive plantation-growing and processing industry by developing a long-term and environmentally sustainable plantation resource through major private sector investments;
- *Rationalisation:* A reduction in the estate as poor sites are exited at harvest or by conversion.

A snap shot of the development of Australia's plantation estate

The development of Australia's plantation estate focused on addressing a general lack of native coniferous wood[33] and the first documented importation of *P. radiata* planting materials occurred in 1857 when a single specimen was received for planting in the Sydney Botanic Gardens.[34] The first plantation developments of *P. radiata* occurred in 1876 in South Australia[35] with the first log processed in 1903 into 28 apple cases.[36] In NSW with a focus was on tannin bark production, the first experimental plantings by the Forestry Branch were of acacia species in 1882 along a railway reserve with *P. radiata* first planted between 1883 and 1885.[37] Private companies also developed plantation resources: for example APM Forestry Pty Ltd was created in 1951, however Australian Paper Manufactures' (APM's) first plantings occurred in NSW in 1948 with the

[29] Knibbs (1915: p.382).
[30] Knibbs (1915: p.382).
[31] Knibbs (1915: p.385).
[32] Enters et al. (2004).
[33] Rule (1967: p.106).
[34] Rule (1967: p.116).
[35] Rule (1967: p.118).
[36] Lewis (1975: p.24).
[37] Grant (1989: p.147 to 150).

Gippsland plantation program commencing in the 1950's with both softwoods and eucalypts planted as potential resource for the company's pulp and paper operations.[38]

The 6 phases of development

The development of Australia's plantation estate has gone through a series of phases over the past 110 plus years (see Figure 2).[39] Phase 1 (up until the early 1960s) was characterised by strategic public investment aimed to replace softwood imports, however the development of the plantation estate commenced with hardwoods. During this period the States formed various Government agencies to administer the natural forest estate, primarily driven by concerns of over-exploitation (e.g. to supply wood resources to the mining sector), to provide building materials and for social and environmental benefits (see Box 5). An import replacement motivation was dominant post the Second World War, and the development of the softwood estate had a very specific focus on Radiata pine, *P. pinasta* (Maritime pine) and southern pines (*P. caribaea* - Caribbean pine and *P. elliottii* - Slash pine).

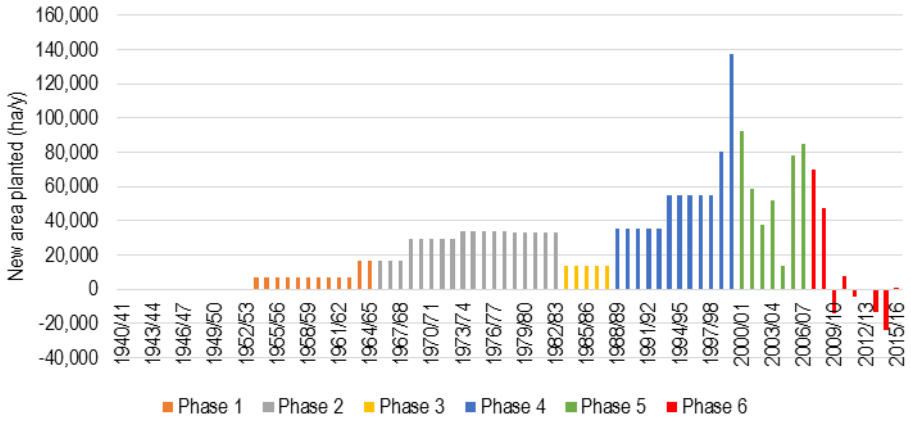


Figure 2 : The development of the Australian plantation estate adding Phase 5 & 6 to Phases 1 – 4.

[38] Sinclair (1990: p.95 &171).
[39] Building on Ferguson *et al*, (2002) Phase 1 to 4, with Phases 5 & 6 based on NPI data analysis.

Box 5: The commencement of Australia's plantation estate on a State by State basis.

Victoria: the first plantations in 1872 - 3.

'The first stimulus to the establishment of plantations in Australia arose from the discovery and mining of gold in Victoria in the 1850s. The large-scale destructive cutting of forests to meet the voracious demands of a rapidly expanding population and a frenetic mining industry prompted an otherwise unlikely troika of the Surveyor General, the Assistant Commissioner of Lands and Survey and the Secretary for Mines to strongly recommend in 1865 that the Government establish plantations of indigenous and exotic species. .....Twenty years after the first nursery was established at Mount Macedon in 1872, there were 1,000 hectares of plantations fed by nurseries at Creswick, Havelock, Gunbower Island and the You Yangs, mainly of hardwoods but with increasing use of radiata pine which had shown sufficient promise for commercial planting to begin in the Macedon area in 1880.' [40]

South Australia: the first plantations in 1876.

'Within thirty years of first settlement in 1836, people both within and outside government began to express concern at the rate at which the limited native forest resource was being used up and the apparent lack of any planning for future supplies of timber. G.W. Goyder (Surveyor General) and F. E. Krichauff (a member of the House of Assembly) pooled their influence to have the Government legislate to preserve the remaining forest cover, to south-east) and at Wirrabara and Bundaleer (north of Adelaide) where the first plantation, of native hardwoods, exotic hardwoods and softwoods, was established in 1876.' [41] *'.....South Australia's policy was supported by the United Kingdom in 1926 by a grant of migration funds toward 2000 hectares per year for ten years to assist migrant employment.'* [42]

NSW: the first plantations in 1912.

'The establishment of nurseries and plantations of timber trees was near the top of the list of duties of the Forest Conservancy Branch of the Mines Department of 1882, which is taken as the origin of today's Forestry Commission. John Duff, successor to the poet, Henry Kendall, who was the first Inspector, made an attempt to respond to this with some arboretal trials. These were extended considerably by his successor, J.E. Brown (erstwhile first Conservator in South Australia), who was still eager to demonstrate that 'forests attract rain clouds'. But the first plantation of any size was established at Tuncurry (on the north coast near Taree) around 1912.' [43]

WA: the first plantations in 1897.

The increasing rate of exploitation of the native forest in the 1870s prompted citizens, members of Parliament and even the Colonial Office to pressure the Government into some thoughts of a policy of conservation and replacement. However it was nearly another thirty years before J. E. Brown, erstwhile first Conservator in South Australia and Inspector in New South Wales, was engaged to report on the situation. As a result of Brown's report, the Government appointed him in 1896 to head what he named the Woods and Forests Department to develop the 'woods' of conifers, which the Colony lacked, as support for the 'forests' of eucalypts, which it had in abundance, the Government's instructions being 'to form plantations of some of the softwoods of commerce and thus to a certain extent make the Colony independent of outside supplies which are daily increasing'. [44] *Brown began planting -particularly maritime pine (Pinus pinaster) and wattle on 'the seaside commonage' near Bunbury in 1897. His successor, in his annual report for 1899, was of the view that 'it is well known that the pine timber supplies of the world are reaching a visible termination and that in the future there will be certain market for colonial pine wood'. If similar plantations were established at intervals amongst the barren sandhills of the coastline from Geraldton to Albanly 'the pines would self-sow themselves ...and in years to come would form on continuous stretch of forest as in the...French Landes... representing untold wealth to the State'.* [45]

Tasmania: the first plantations in 1920s.

Though a Conservator was appointed as early as 1886, and even by that time rate of depletion of the magnificent Huon pine (Dacrydium franklinii) resource were prompting numerous people, official and private, to press the Government on the matter of softwood afforestation, there was too much to do in trying to exert some sort of control over the profligate use of what looked like an unlimited natural hardwood resource for the successive forestry authorities to consider anything but simple arboretal trials until well into the 1920s. [46].... *Though, in the event, results were to fall short of aspirations, Tasmania brought a novel and imaginative response to the enthusiasm of the interstate conference for expansive coniferous planting. In 1921, the newly formed Tasmanian Forestry Association proposed 'the planting of the great waste areas of Tasmania with exotic conifers...the establishment of forest plantations, (and) homes or colleges in which destitute and waif boys of the Empire may find their place, their manhood and their citizenship in planting the waste and in leaving a heritage of enormous value to those who come after'. The sixth conference (Brisbane, 1922) applauded this 'bringing into a forestry partnership of practical usefulness the waste lands of Tasmania and the waste childhood of the Empire'.* [47]

Queensland: the first plantations in c1911.

As well as a great range of constructional hardwoods and some of the fine cabinet timbers in the world, Queensland was also blessed with a group of the best utility coniferous timbers in hoop (Araucaria cunninghamii), bunya (Araucararia bidwillii) and kauri (Agathis robusla) pines. But, growing as they did on the scrub soils most sought after for settlement, forest conservators from the first appointment in 1905 saw the major replacement for the supply of these soft timbers, which was rapidly being depleted, in '...exotic varieties of inferior quality, secured by importation in a manufactured state or from local plantations on land not capable of producing the indigenous varieties'. So, from N. W. Jolly's appointment as head of the forest service in 1911, the softwood plantation policy became two-pronged: maintain as much rainforest as possible for clearfelling and hoop pine replacement; and carry out extensive trials of exotic conifers over the State, particularly on sites where large areas might be ceded to forestry for the purpose. [48]

ACT: the first plantations in c1925.

The success of radiata pine in reducing the effects of erosion on Mount Stromlo caused by grazing and rabbits, and in enhancing the environs of the infant capital, allied with Lane-Poole's strong recommendations (as Commonwealth Forestry Adviser) that the Territory should have its own industrial plantation program, prompted the Federal Capital Commission to appoint G. J. Rodger as Chief Forester in 1925 and approve an annual planting program of 200 hectares. By 1938, the annual rate had been lifted to 400 hectares and visiting hydrologists were commenting favourably on the reduction of erosion in the city's water catchment as a result of the planting there. [49]

[40] Carron (1990: p.12).
[41] Carron (1990: p.12&13).
[42] Carron (1990: p.15&16).
[43] Carron (1990: p.13).
[44] Carron (1990: p.14).
[45] Carron (1990: p.14).
[46] Carron (1990: p.14).
[47] Carron (1990: p.16).
[48] Carron (1990: p.14&15).
[49] Carron (1990: p.17).

A policy of self-sufficiency during phase 2 (the early 1960s to the early 1980s) again focussed on development of softwood plantations supported by the Commonwealth Government Softwood Loans Scheme. While the bulk of the loans funded development was by the state agencies, Governments developed various farm forestry loan agreements to assist private non-corporation investment in plantations. The bulk of the areas planted were Radiata pine, but farm forestry loans could be used for poplars (NSW and Victoria) or eucalypts (Victoria). A transition from public softwood to private hardwood investment in new plantations occurred in phase 3 (mid to late 1980's). Phase 4 (late 1980's to late 1990's) witnessed the greatest expansion rates, a shift from Radiata pine to Tasmanian blue gum plantation development (for export pulpwood) in south west Western Australia and south west Victoria and a commencement of a shift in ownership from public to private. The driver of the expansion rate was investment via managed investment schemes (MIS) and private ownership of State developed plantation assets via institutional funds facilitated by specialist intermediaries known as Timber Investment Management Organisations (TIMOs). This was not new, as private investment in plantations in Australia has occurred since the start of last century via a range of vehicles and instruments (e.g. the last wave of MIS was not the first). It has been reported that "*during the 1920s and 1930s Australia and New Zealand saw a rash of small investment companies offering interests to the public. The majority of these were dismal failures where the investor received little or no return".*[50]

Building on the previous analysis,[51] phase 5 (2000's to 2007) involved moving north with new species and the embryonic start of new industries. New species were established for sawn timber production: endemic species such as *E. pellita* (Red mahogany), *E. dunnii* (Dunn's white gum) and Corymbia species were planted in northern Australia, along with exotic species such as *Tectona grandis* (teak) and *Khaya senegalensis* (African mahogany). Biomass species such as *E. polybractea* (blue mallee) and *E. kochii subsp plenissima* (oil mallee) were developed in dryer areas. *Santalum spicatum* (Australian sandalwood) and *S. album* (Indian sandalwood) were new species managed for aromatic oil production, in the southwest and far north of WA respectively.[52] During this period planting rates fluctuated greatly (e.g. in some cases due to change to the taxation system).

Phase 6 has been a period of reckoning for many projects where poor species performance compared to expectations has resulted in exit and establishment of pasture, compounded by the collapse of the main MIS companies.[53] The actual loss of hardwood plantation area from 2009/10 to 2015/16 is under-stated when simply looking at the gross area change, because new planting areas mask the impact of areas that were not replanted after harvest. Over the period from 2005/06 to 2015/16, 100,620 ha (10.2% of the peak estate) were not re-planted after harvest and over the same period the softwood estate expanded by a modest 35,648 ha, with limited new plantings over the most recent two financial years. Analysis of change in the area of plantations highlights events that had significant impact on the plantation estate: for example the 2003 Canberra wildfires reduced the area of Radiata pine estate recorded in 2004/05 (Figure 3) and write-off of MIS hardwood projects in southern Queensland reduced the area of hardwoods in 2009/10 (Figure 4).

[50] McKenzie Smith (1977: p.69).
[51] Ferguson et al. (2002).
[52] Note: The NPI excludes Oil Mallee and Sandalwood - ABARES (2016: p. 44).
[53] de Fégely et al. (2011: p.iii).

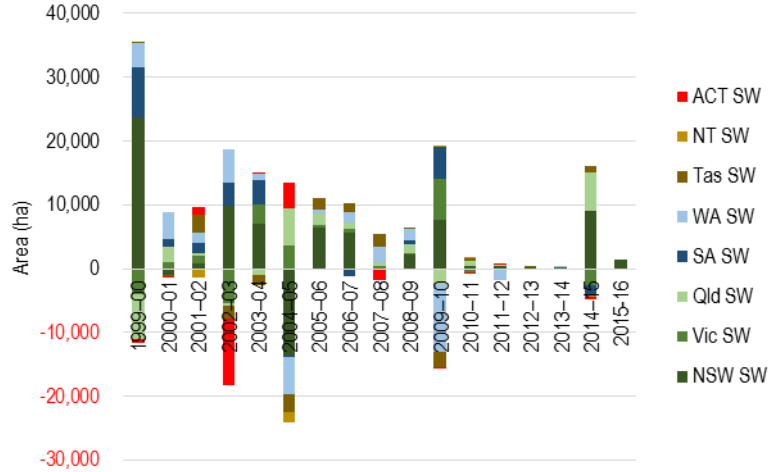


Figure 3: A detailed breakdown in the change in the softwood estate.[54] Specific events are evident: the loss of ACT's pine estate due to fire in 2002/03.

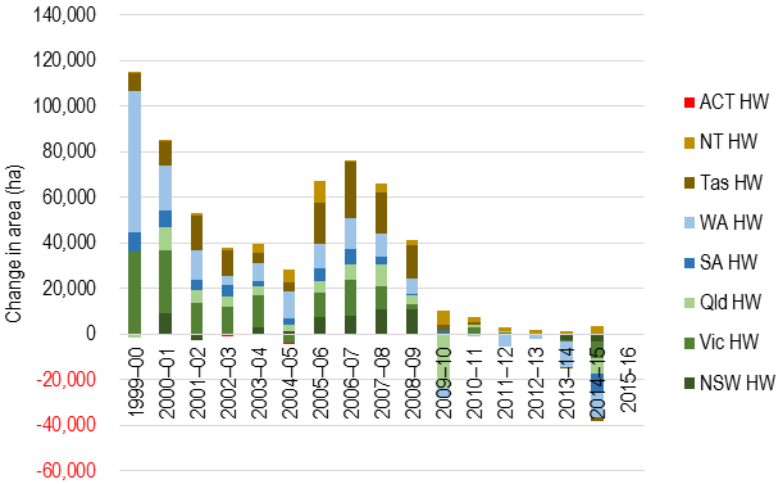


Figure 4: A detailed breakdown in the change in the hardwood estate.[55] Specific events are evident: the failure of some Queensland hardwood plantations in 2009/10.

New plantation investment in Australia has effectively 'stalled' for long-rotation plantations. A new set of public policy drivers has emerged (e.g. carbon economy, integrated land management) that may justify targeted direct incentives in conjunction with an enabling environment to stimulate such investment.[56] In many respects, a new phase of targeted 'acceleration' is required to secure and grow the plantation sector as a whole, taking into account key factors underlying long-term industry competitiveness.

Reporting on the national plantation estate

The NPI reports on the Australian planted forest estate and applies the following definitions – see Box 6.

[54] Analysis based on NPI data.
[55] Analysis based on NPI data.
[56] de Fégely et al. (2011: p.iii).

Box 6: The NPI definitions applied to the Australian plantation estate.

Plantation: Intensively managed stands of trees of native or introduced species established by the regular placement of seedlings or seeds, usually to produce timber. Plantations established primarily to produce eucalyptus oil, sandalwood oil, bioenergy, carbon or other non-timber products are not currently recorded by the National Plantation Inventory.[57]

Industrial plantations: The term 'industrial plantations' has been introduced into this report to differentiate between traditional large plantation growers reported in previous NPI reports, and farm forestry growers that are now also being reported. The collection and reporting of industrial plantation data is the province of the NPI. Information collected on industrial plantations focuses on growers who manage a combined total estate of greater than 1,000 hectares. This may include joint ventures where one partner is a large grower. However, industrial companies with plantation estates smaller than 1,000 hectares are also included.[58]

Farm forestry: The term 'farm forestry', as used in this report, applies to plantations that are owned outright by individuals with total plantation estates less than 1,000 hectares. This is generally considered the small grower sector and is consistent with the operating guidelines for data collection and reporting under the NFFI. This definition does not include other recognised elements of farm forestry such as private native forest management, and joint ventures and annuity schemes. A broader assessment of farm forestry, including the extent of plantations established through joint ventures or leasehold arrangements, is reported at the national level. [59]

Plantation species

Motivated by a need for softwood timber and import replacement, Radiata pine was the species of choice for the early plantations in temperate eastern Australia and in Western Australia Maritime pine was also planted, demonstrating a pragmatic approach to species selection. In northern east coast Australia more suitable species of softwood were planted including *A. cunninghamii* (Hoop pine - a local species), Caribbean pine and Slash pine. There was less motivation to develop hardwood species plantations given the available natural forest resources. The current species composition of the national plantation estate is presented in Figure 5 and by State and Territory in Figure 6 for hardwoods and in Figure 7 for softwoods. In summary, the current estate is 47.3% hardwoods and 52.7% softwoods by area, with 77.9% of the hardwood estate composed of Tasmanian bluegum (52.7%) and *E. nitens* (Shining gum - 25.2%). The softwood estate is dominated by Radiata pine occupying 89.5% by area and Caribbean Pine and Slash Pine & hybrids occupying 15.1% by area. For the hardwood estate, 10.7% by area is described as other species which includes 22,300 ha in WA and 25,100 ha in north coast NSW and for the softwood estate 2.0% is noted as other pines and other softwoods.

Plantations established primarily to produce eucalyptus oil, sandalwood oil, bioenergy, carbon or other non-timber products are not currently recorded by the NPI.[60] In 2001 it was reported that the farm forestry estate of 66,980 ha included 8,190 ha of mixed hardwoods.[61] The NPI defines mixed plantations as:[62]

> *'…..for industrial plantations, mixed plantations refers to mixed hardwood and softwood species. For farm forestry, mixed refers to plantings that contain predominantly mixed hardwood species, and, at the regional level, these are included in the hardwood totals.'*

[57] ABARES (2016: p.44).
[58] Wood et al. (2001: p.6).
[59] Wood et al. (2001: p.6).
[60] ABARES (2016: p.44).
[61] Wood et al. (2001: p.19).
[62] Wood et al. (2001: p.169).

In some cases projects have included a very large number of species[63] e.g. the Community Rainforest Reforestation Project (CRRP) was a Government-landowner projects operating in the wet tropics areas of north Queensland which commenced in 1992/93[64] and included over 100 species: the main species based on numbers planted were Red mahogany, Hoop pine, *E cloeziana* (Gympie messmate) and *Flindersia brayleyana* (Queensland maple) and by number of blocks planted, Queensland maple, *Elaeocarpus angustifolius (Quandong)*, *Agathis robusta* (Kauri pine) and Red mahogany.[65]

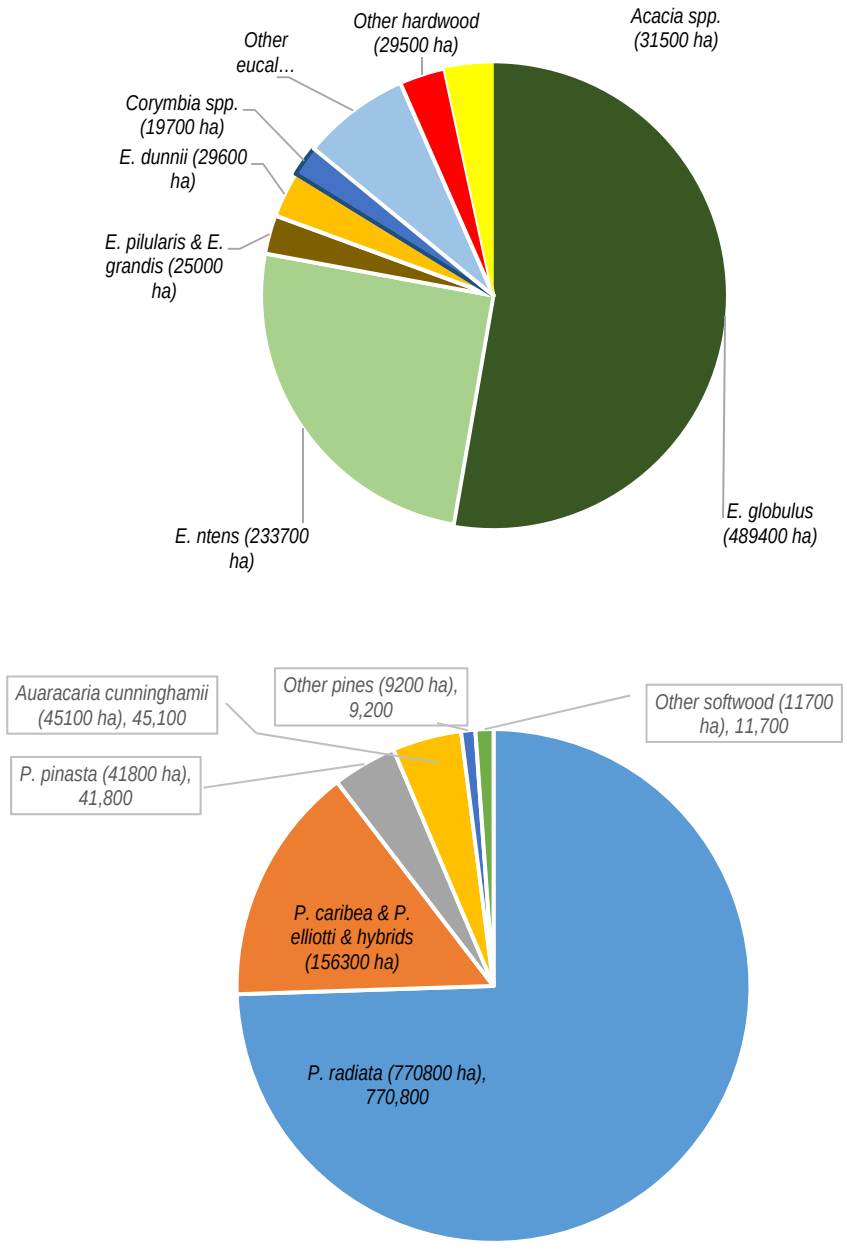


Figure 5: A detailed breakdown species composition of the total Australian hardwood (top) and softwood (bottom) estate.[66]

[63] Most species had not been fully commercialised through to a current log market and product output based on planted trees.
[64] Skelton & Sexton (2003: p. 7).
[65] Skelton & Sexton (2003: p. 7, 16 & 21).
[66] Analysis based on ABARES (2016: Tables 4 & 5).

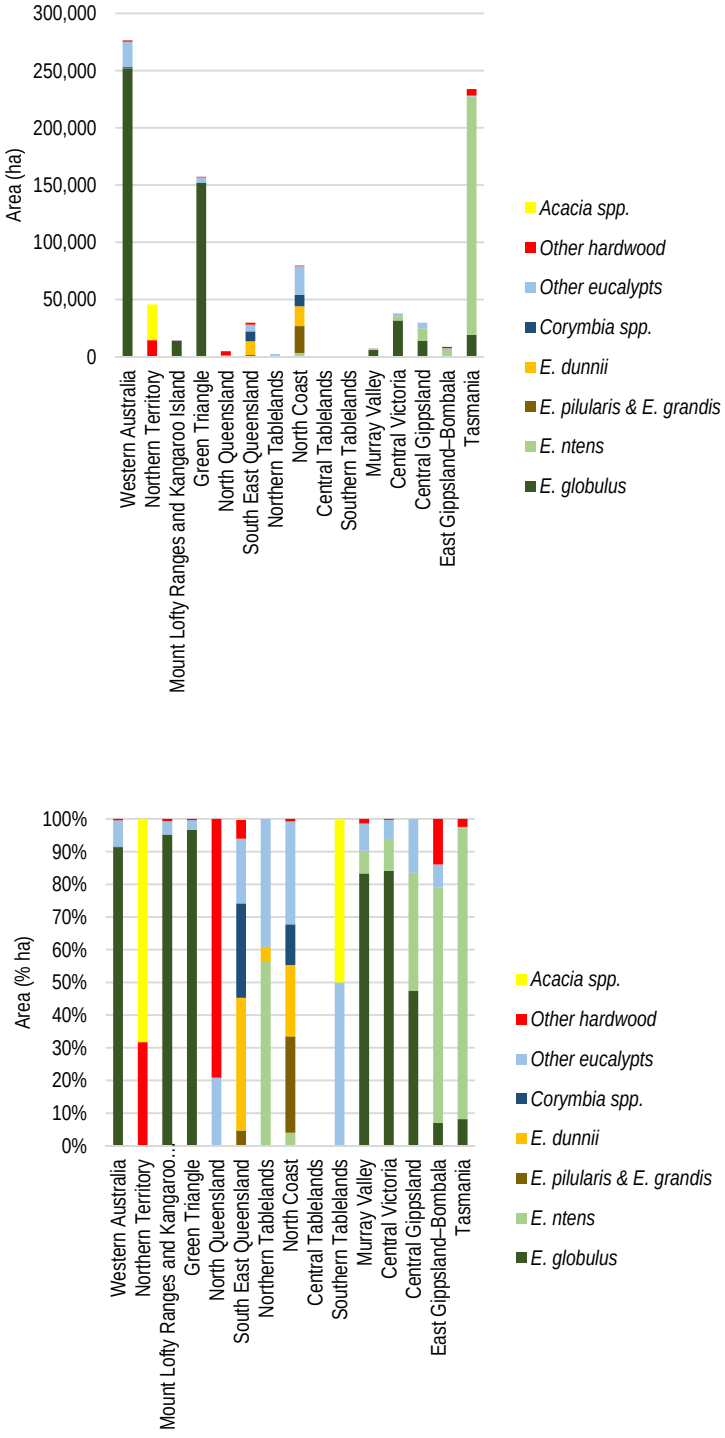
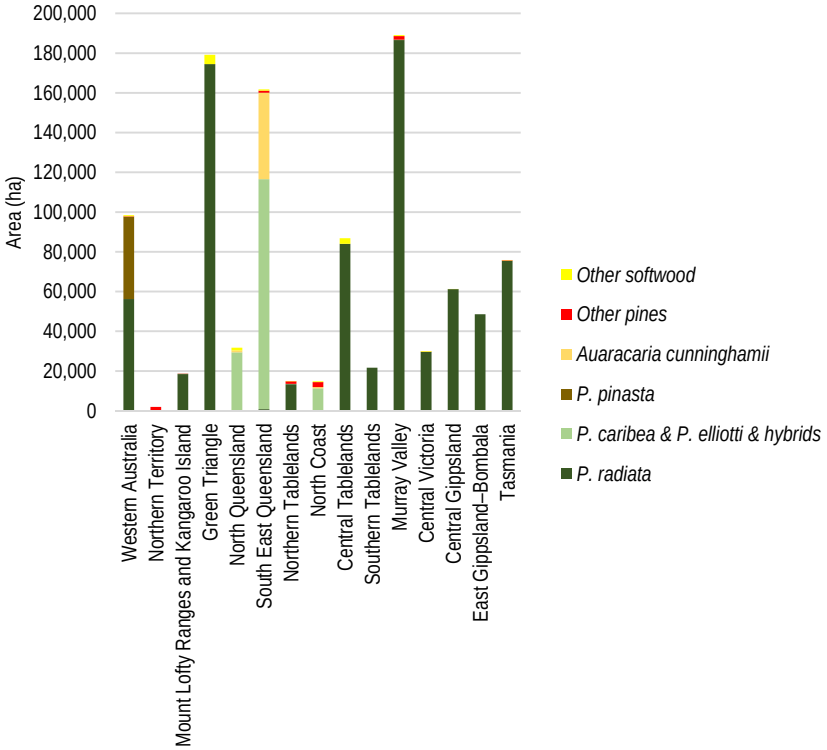


Figure 6: A detailed breakdown species composition of the hardwood estate by NPI region.[67]

[67] Analysis based on ABARES (2016: Tables 4 & 5).



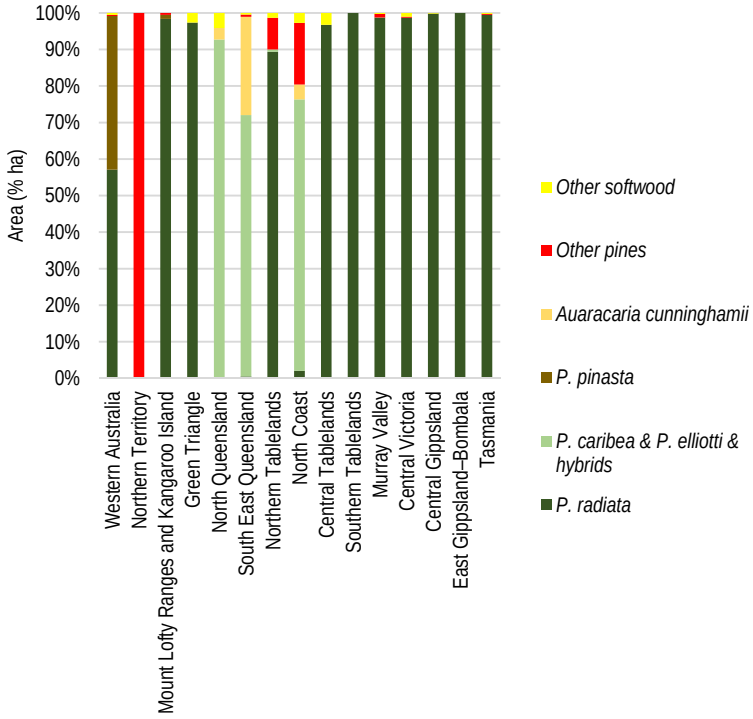


Figure 7: A detailed breakdown species composition of the softwood estate by NPI region.[68]

[68] Analysis based on ABARES (2016: Tables 4 & 5).

Development and ownership of the plantation estate

Summary

While MIS and TIMOs are the current dominant investment vehicles, investment forestry in Australia has had a very checked history with many recurring themes of poor projects, questionable promotors and disappointed investors. The past investment vehicles ranged from bonds in the 1920s to 1940s, managed investment company schemes (post 1962) and plantation syndicates. A major change in the Australian plantation estate commencing in Phase 3 was ownership, in part reflecting the funding mechanisms for tree plantations. Ownership of the Australian plantation estate is divided into Government, industry, retail investors (e.g. via MIS projects), institutional investors (e.g. superannuation funds) and farm-forestry private. The aggregation of farm-forestry private masks the true state of the farm-forestry estate as it includes defaulted MIS lease based plantations. It is important that the true scale of the farm forestry estate is understood as a basis to make informed decisions about its potential. An important insight is the role of MIS in developing greenfield plantations[69] and the ability of institutional investors to purchase such going concerns as brownfield estates. In considering the split between public and private ownership, the scale and significance of the joint venture estate is evident[70]. The NPI last conducted an inventory of the farm forestry estate in 2000 estimating the estate at 67,021 ha, with 21,849 ha composed of non-current core commercial species (e.g. including 8,190 ha of mixed hardwood species - the commercial viability of mixed hardwood plantings is questionable). The importance of clarity of language and definitions of the elements of the planted forest estate is well recognised. The NPI segments industrial plantations from farm forestry based on scale: any estate greater than 1,000 ha is regarded as an industrial plantation. There remains scope to better capture the farm forestry estate data.

Introduction

Building on an understating of the history of the development of Australia's plantation estate requires a more in-depth analysis of the initial funding mechanisms and ownership. Analysis can also build on the stages of development concepts explored as they relate to both initial development and ownership. To maximise utility of the resulting information, the analysis undertaken was objective and factually based: while the outcomes may not please all readers, this is fundamental to progress in the design and implementation of new investment models for trees on cleared land. The following presents the outcomes of this analysis.

A history of forestry investment

The bond-sellers (1920s to 1940s)

A bond is a form of debt security, usually with a fixed rate of interest, issued by a corporate or public body as a financial product; the principal is repaid on maturity with interest paid.[71] Bonds were first used to fund plantation development in 1926.[72] Investors bought the rights to use a specific area of land ("acre lots" of pine plantations) and benefited from the proceeds of timber sales from that land. The principal problem was a requirement to identify the individual areas held by the bondholders

[69] A greenfield plantation is defined as a plantation that does not have a current market for the main type of logs produced e.g. driven by a lack of a market for the log grown. A brownfield plantation is defined as a plantation with a current market for the main type of logs produced.
[70] A joint venture is an arrangement linking parties for the duration of a finite project where the parties share the inputs and net returns.
[71] CSI (2013); Downloaded from http://www.investopedia.com/terms/g/government-bond.asp on 21/01/2015; ASIC (2009: p.6); Downloaded from http://www.investopedia.com/terms/m/mortgage.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/h/hybridsecurity.asp on 21/01/2015.
[72] McKenzie Smith (1977: p.68).

and the logs and produce from each specific area for payments. The system was modified to include pooling of the resource (usually by planting year) and the holders of covenants or 'pool certificates' receive a *pro rata* payment. The nature of such investments concealed poor performance due to site and management, and it was observed that: '*the poor sites meant delayed growth so that their money was tied up for a longer time than originally was promised and the management, more often than not, was either unable or unwilling to take corrective steps to improve this situation, because they knew not how to do so technically, or were disinterested'*.[73] The problems experienced by most such companies led to them falling into disrepute and gave private afforestation a bad reputation in the late 1930s and 1940s.[74]

The management / investment company schemes (post 1962)

As noted, during the 1920s and 1930s in Australia and New Zealand, small investment companies offered interests (bonds) to the public and the majority were "*dismal failures where the investor received little or no return"*. [75] Management / investment company structures and investment method replaced the bond sellers as a result of changes to the Companies Act in several States, and they were first offered in 1962 in NSW in response to changes which prevented a specific entity from continuing selling bonds. A scheme company offered shares to the public via a prospectus after approval by the Registrar of Companies, and the prospectus was "*examined by the Registrar, assisted by the Forest Service, to assess the future viability of the enterprise"*.[76] The scheme's promoters formed a management company and the public subscribed capital to specific investment companies that owned, or leased land. The management company (on a fee for service basis) handled the sale of the shares and the administration of their group of investment companies. They were also paid to establish, maintain and harvest the crop which remained the property of the investment company shareholders.[77] Commentary from 1977 noted that "*the principal of the company receives a handsome salary throughout and the continuing administration expenses are heavy as annual reports must be sent out and correspondence dealt with*":[78] in a case examined only 13% of the investor capital was expensed on actual works. Another issue noted was that: *some companies appear to be using the proceeds from 1977 sales to complete the development of the 1976 commitments and the maintenance of earlier thinnings.*[79] As with any sector there were participants who undertook their responsibilities well and examples were noted in the review.[80] This was an early form of MIS.

Plantation syndicates (1970's)

Plantation syndicates as investment vehicles commenced in Western Australia. A syndicate of individual investors was formed, to own and operate an area of land, usually of at least 10 ha to gain primary producer status for tax purposes. The schemes could be arranged by a lead entity and variations include junior partnerships and tenants in common arrangements.[81]

[73] Peaty (1977: p.73).
[74] McKenzie Smith (1977: p.68).
[75] McKenzie Smith (1977: p.69).
[76] McKenzie Smith (1977: p.69).
[77] McKenzie Smith (1977: p.68)
[78] McKenzie Smith (1977: p.71)
[79] McKenzie Smith (1977: p.71)
[80] McKenzie Smith (1977: p.71)
[81] McKenzie Smith (1977: p.68).

Direct investment

A direct investment is where a party makes an investment free of intermediaries, and some or all of the works are undertaken by the investor. Historically several companies have offered land sale deals with "stapled" contractor services available following a significant initial investment: only larger investors seeking taxation relief were attracted to such options.[82] During the mid-1960s to mid-1980s, private investment was assisted by State Government loans: for example the Farm Forestry Loan Scheme of the Forests Commission, Victoria[83] and the NSW Forestry Commission's Farm Woodlot Loan Scheme[84]. The farm forestry incentive schemes aimed to increase the State's timber reserves and diversify the income of farmers.[85]

Definitions of the planted forest estate

The importance of clarity of language and definitions of the elements of the planted forest estate is well recognised: '*detailed definitions of plantation 'types' are required, not for pedantic reasons but because by accurately recognising the differences, policies and programs can be targeted accurately..... It is important for both government and industry bodies to recognise these differences in clear and well-articulated ways.*'[86] A past practice has been to lump all plantations into the farm forestry category,[87] and the NPI sought to provide clarity by adopting the NFP definition of a timber plantation and farm forestry (see Box 6). The NPI then segments the definition into:

- *Industrial plantation:* Plantations owned by growers who have a combined total estate usually greater than 1,000 hectares, which may include joint ventures where one partner is a large grower; [88]
- *Farm forestry:* Plantations out-rightly-owned by individuals with a total plantation estate of usually less than 1,000 hectares'. [89] This definition does not include other recognised elements of farm forestry such as private native forest management, and joint ventures and annuity schemes. A broader assessment of farm forestry, including the extent of plantations established through joint ventures or leasehold arrangements, is reported at the national level.[90]

Ownership of the estate

A major change in the Australian plantation estate over the last decade has been in ownership, in part reflecting the funding mechanisms, but also transaction (e.g. the estate area is constant and ownership changes). Ownership of the Australian plantation estate can be divided into Government, industry, retail investors (e.g. via MIS projects), institutional investors (e.g. superannuation funds) and farm-forestry private (see Figure 8). The 254,400 ha increase in the farm forestry / private estate between 2014 and 2015 was not the result of a massive burst of enthusiasm and investment, but rather tree ownership converting from MIS projects to the land owners due to default on lease arrangements. Institutional investors now own many former MIS projects and some timber processor's estates. This has implications for the national estate and resulting wood-fibre-flows due to differences in the attitudes and intent of the new owners. Institutional investors assess investment risks and

[82] McKenzie Smith (1977: p.68).
[83] Semmens (1977: p.185).
[84] Hawkes (1977: p.188).
[85] Semmens (1977: p.185).
[86] Alexandra & Hall (1998: p.27).
[87] Alexandra & Hall (1998: p.27).
[88] Wood et al. (2001: p.169).
[89] Wood et al. (2001: p.169).
[90] Wood et al. (2001: p.6).

returns and acquire plantation assets (an "alternative assets" under investment asset classification[91]) that complement and provides balance in their overall investment portfolio. In general, institutional investors purchase brownfield going concern plantation estates with current cashflows, rather than investing in establishing new (greenfield) plantations. The value of the underlying land base forms part of the investment equation. This may mean that some current plantation sites are sold if the land value for alternative uses has increased sufficiently (e.g. highest and best use of the land). The future of the plantations acquired by farm-forestry owners from MIS projects also requires careful consideration from a wood-fibre-flows perspective (see Figure 4 and Figure 5 for current identified changes on the plantation estate).

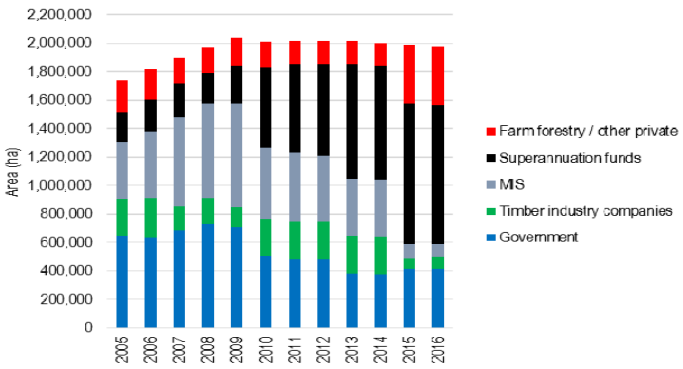


Figure 8: The change in ownership of the Australian plantation estate.[92]

A better understanding of the origins of the estate can be gained by analysis of the split between public, private and joint ventures. Joint venture plantations have resulted from a joint arrangement between State agencies and private parties to grow trees: an important point is that the business arrangement is for the life of the project rather than on an ongoing basis. Based on the NPI definition, private : private joint venture are excluded. Figure 9 presents data for year 2000 and 2016 to take account of change in ownership, harvesting or the end of the joint venture arrangement (see the Tasmanian estate). Joint venture arrangements in WA, Tasmania and NSW are the most significant with 71,100 ha under this arrangement in 2016.

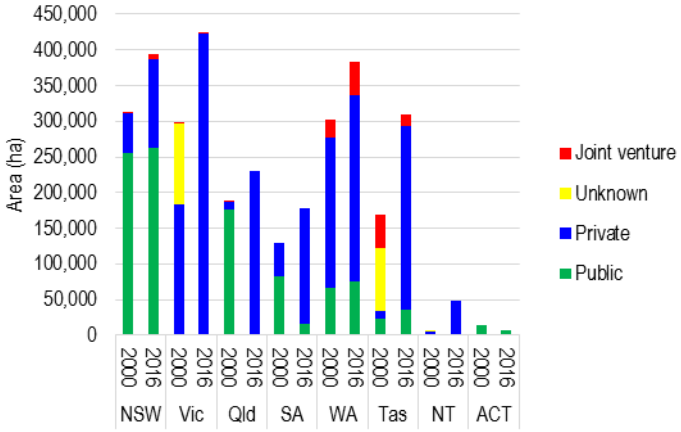


Figure 9: The change in ownership of the Australian plantation estate segmented by public, private and joint ownership. The category of "unknown" has been used by the NPI for areas identified but unable to allocate to an owner. [93]

[91] See Appendix 1 Investment asset classes.
[92] Based on NPI / ABARES data.
[93] Based on NPI / ABARES data.

The farm forestry estate

The NPI captures data[94] of the Australian estate and periodically presents specific data on the farm forestry estate, and other sources of historic data have been identified (see Figure 10 and Figure 11). The year 2000 farm forestry estate was 67,021 ha: 22,958 ha as major hardwoods species and 22,194 ha as major softwood species. 32.6% of the farm forestry estate was recorded as minor species, unknown species or mixed species. The main hardwood species was Tasmanian bluegum (13,099 ha) and Shining gum (9,302 ha)[95], and for the softwoods Radiata pine was the dominant species. A 2005 survey of Victorian farm forestry participants identified 70 different species planted with half of the stands less than 3 ha in size.[96] The data indicated that Radiata pine was the dominant species characterised by sequential planting during the 1970's and Tasmanian blue gum was the dominant species from the 1990's onwards.[97]

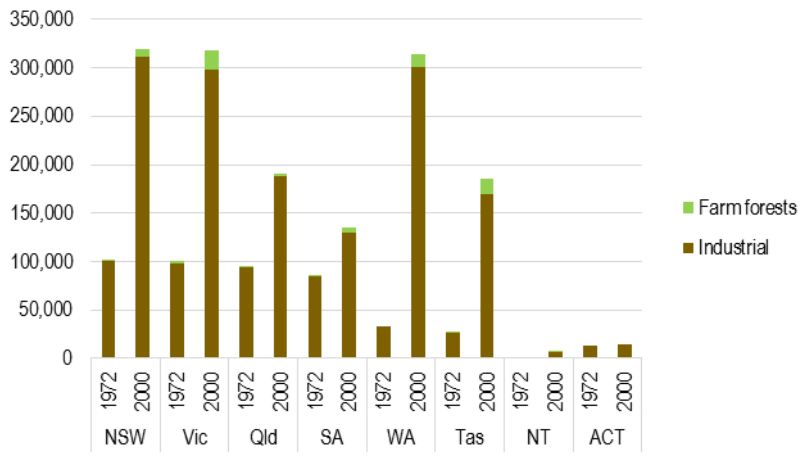


Figure 10: The Australian plantation estate segmented into industrial plantations and farm forestry plantings for 1976 and 2000.[98]

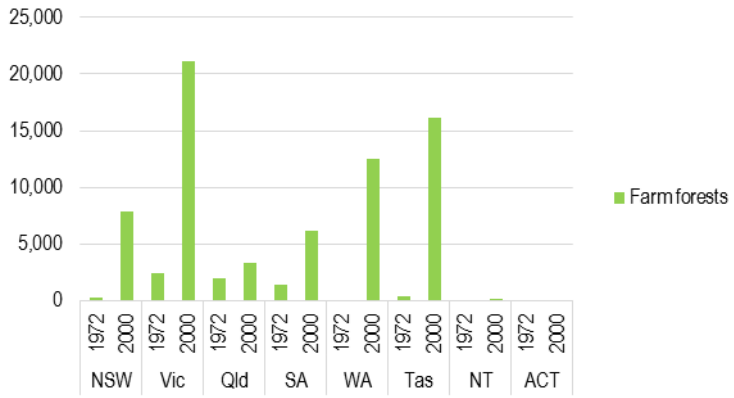


Figure 11: The farm forestry estate for 1976 and 2000.[99]

[94] For this data see Wood et al. (2001: p.19).
[95] Wood et al. (2001: p.19).
[96] Jenkin (2005: p.17).
[97] Jenkin (2005: p.21).
[98] Based on McCarthy (1977: p.54; Table 4.2) for the 1972 data and Wood et al. (2001: p.19).
[99] Based on McCarthy (1977: p.54; Table 4.2) for the 1972 data and Wood et al. (2001: p.19).

Government loans to support plantation development

Summary

In support of a policy objective of self-sufficiency in softwoods, the National Softwood Plantation Development Program (as an aggregate of combined State and Territory efforts) was underpinned by agreements made under the Softwood Forestry Agreements Acts of 1967, 1972 and 1976, which committed the Commonwealth to provide favourable loans to the States to establish and maintain softwood plantations. The Commonwealth loaned $78.1 million under these arrangements with approximately 730,000 ha planted (a mean rate of 45,625 ha/y). State Government agencies initiated farm forestry loan schemes in support of private plantation development (aimed at private parties and farmers). For example, the Victorian Government's Farm Forestry Loan scheme ran from 1966/67 until 1982/83 (8,270 ha) and the NSW Government's Farm Woodlot Loan commenced in 1966 (2,881 ha over nine years). The terms and conditions of the loans included an inability to transfer the arrangements and limitations on species: Victoria allowed Radiata pine; Poplars; *E. regnans* (Mountain ash); NSW allowed Radiata pine and Poplars.

Introduction

Funding of plantation development is a core component of any required business models and there are many sources of funds. Recognising the national drive for self-sufficiency during phase 2 of the development history, the Commonwealth Government developed debt funding mechanisms as a direct incentive in support of State plantation estate development. The following provides and overview of these mechanisms.

The Commonwealth Government's Softwood loans

The National Softwood Plantation Development Program (an aggregate of State and Territory efforts) was underpinned by agreements made under the Commonwealth Government's Softwood Forestry Agreements Acts of 1967, 1972 and 1976, which committed the Commonwealth to provide favourable loans to the States to establish and maintain softwood plantations. The loans were restricted to State agencies enabling the State Governments to dramatically increase plantations development commencing in 1966/67[100] and these arrangements expired at the end of 1981/82, following a broader review of Commonwealth functions.[101] Loans were made on an annual basis from 1967 to 1982 to enable land purchase, establishment and tending of an additional 100,000 ha (approximately) of new softwood plantations.[102] The States undertook to "*carryout efficient planting and tending and in conformity with sound forestry, financial and environmental practices"* and "*to keep full accounts, books vouchers, plans, documents and other records relating to planting and tending under the agreements"*. The works undertaken were monitored by the then Australian Forestry Council (AFC).[103] The loans included a 10 year interest free period and were repayable over 20 years with repayments commencing 15 years after the date of each advance (a total 35 year life). The loan period matched the planned harvest timing based on sawlog rotations at that time. Interest was at the long-term bond rates at the time of payment and it could be either capitalised over the deferment period or paid as it fell due.[104]

[100] AFFA (2002: p.16).
[101] AFFA (2002: p.15).
[102] AFFA (2002: p.15).
[103] AFFA (2002: p.15).
[104] AFFA (2002: p.15).

The Commonwealth loaned a total of $78.1 million under these arrangements with approximately 730,000 ha of new plantations developed (a mean rate of 45,625 ha/y).[105]

The State farm forestry loan schemes

State Government agencies initiated farm forestry loan schemes in support of private plantation development (aimed at private parties and farmers). For example, the Victorian Government's Farm Forestry Loan scheme ran from 1966/67 until 1982/83 and the NSW Government's Farm Woodlot Loan commenced in 1966. A summary of the details of the two schemes is presented in Table 1. An important attribute of the schemes was a narrow focus on commercial species:

- *NSW:* Radiata pine and Poplars
- *Victoria:* Radiata pine, Poplars, *E. regnans* (Mountain Ash). .

The Victorian scheme noted that '*some limited use, now or in the future, may be made of the wood of E. globulus or related species, but the outlook is not sufficiently satisfactory to grant loans to plant this species*'.[106]

The outcomes of the arrangements are presented in Figure 12 to Figure 14. The Victorian Government Farm Forestry loan scheme included widespread promotion.[107] The data for NSW is incomplete with 2,881 ha planted over nine years (320 ha/y) and total establishment for Victoria was 8,270 ha (a rate of 466 ha/y). It was reported that '*many of these schemes were criticized for being ineffective as incentives for farmers to plant trees and they incurred high administration costs...'*, e.g. the Victorian State Government Farm Forestry Loan cost $4,000 per agreement or $166/hectare in administration costs with alterations to agreements and follow-up costs.[108] In another example, various Commonwealth and Tasmanian government schemes attempted to establish small (<10 ha) and large (>40 ha) plantations on private land during the 1970's, with less than 1,000 ha established.[109]

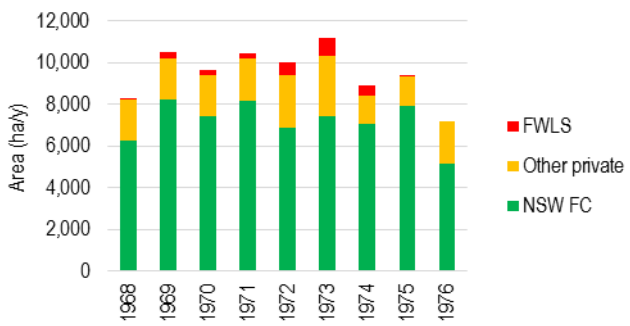


Figure 12: The outcome of the NSW Forestry Commission Farm Woodlot Loan Scheme (FWLS) for 1968 to 1976.

[105] AFFA (2002: p.15).
[106] Based on Semmens (1977: p.187).
[107] de Fégely et al. (2011: p.54).
[108] de Fégely et al. (2011: p.55).
[109] Curtis and Race (1998: p.7).

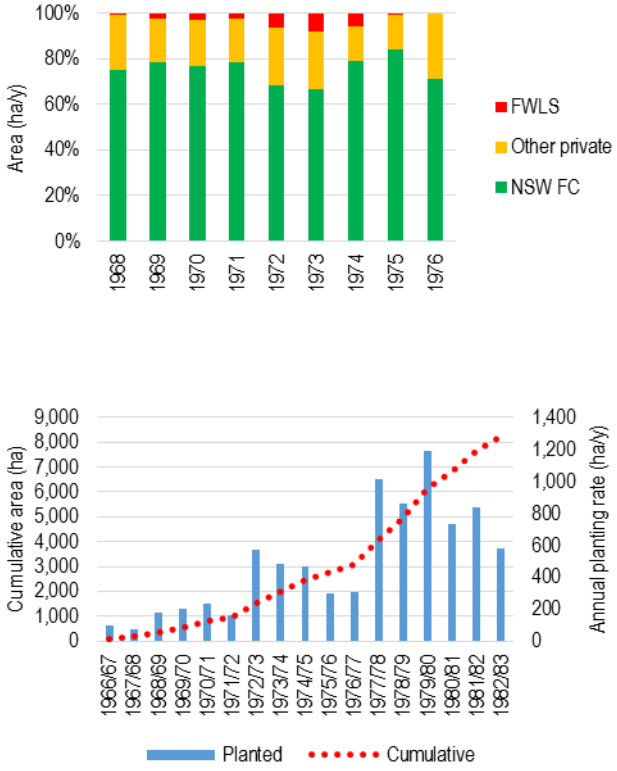


Figure 13: The outcome of the Forests Commission, Victoria Farm Forestry Loan Scheme for 1966/67 to 1982/83[110].

Figure 14: The outcome of the NSW Forestry Commission Farm Woodlot Loan Scheme for 1968 to 1976 and the Forests Commission, Victoria Farm Forestry Loan Scheme.

[110] Data taken from Hurley (1986: p.88, Table 4.1).

Table 1: A summary of the details of the Victorian and New South Wales farm forestry loan schemes.

Scheme	Farm Forestry Loan Scheme of the Forests Commission[111]	Farm Woodlot Loan Scheme[112]
Lead agency	Forests Commission, of Victoria.	Forestry Commission of NSW.
Commencement	Approved 1964 with first plantings in 1966.	Approved 1966.
Authority	Commission seals the agreement and requests Ministerial approval.	
Party	Granted to an owner of property in fee simple and to a lessee of not less than six years under a purchase lease from the Crown, to whom a Certificate of Title has been issued. Not enter into agreements with companies, except those established to carry on a family-owned farm or one owned by a small partnership.	Granted to property owners engaged in agricultural or forestry pursuits on their property and who are primarily dependent upon them for their livelihood and/or those property owners considered by the Forestry Commission to be genuinely running a farm. Exclude a growing number of sub- division proposals in which large numbers of applicants, usually with the initiative of a contractor or other party, were investing in areas of land just large enough to attract the maximum loan available.
Duration	Maximum period of 25 years, free of interest for 12 years	Maximum period of 40 years, with an interest-free re-payment-free period (seven years for poplars, 15 years for pines).
Loan	Fully metricated to loan $125 /ha again with a maximum of $5,000. In 1976, the amount was increased to $200 /ha with a minimum of $400 and a maximum of $8,000	Loans of $125 /ha were made available for pine plantings and $200 /ha to establish poplar plantations species. A maximum amount of any loan was $5,000.[113]
Interest rates	Interest was originally set at 5%, but changed to the long-term Commonwealth Bonds.	
Actions	The owner is required to plant a minimum of two hectares within two years of receiving the loan.[114]	The farmer undertakes the works and once a woodlot is established, the property owner is committed to a further period in which to tend the cop unassisted.
Land	Over 750mm annual rain-fall with reasonable access and not too distant from a conversion centre. Suitable for growing the species proposed. Conditions for logging and log cartage.	A minimum of 2 and a maximum of 40 hectares.
Liquidity	Loans are not transferable.	Loans are not transferable.
Species	As approved by the Commission: Radiata pine; Poplars; Mountain ash shows the most promise. Some limited use, now or in the future, may be made of the wood of *E. globulus* or related species, but the outlook is not sufficiently satisfactory to grant loans to plant this species.	Radiata pine and Poplars
Land title	Commission is not authorised to require a mortgage to be registered in the Certificate of Title. The entire undertaking is subject to an agreement involving covenants on the part of both the landowner and the Victorian Forests Commission[115]	Mortgage is extended
Advice	Provides advice on tree farming	Provides advice on tree farming

[111] Based on Semmens (1977: p.185 to 187).
[112] Hawkes (1977: p.188&189).
[113] McCarthy (1977: p.84).
[114] McCarthy (1977: p.83&84).
[115] McCarthy (1977: p.83&84).

Direct investment: planted forest business structure and attributes

Summary

Business structures and arrangements

A direct investment is where the parties invest in a tree project directly rather than via a more sophisticated financial instrument. A range of instruments are available for use in regards to arranging wood fibre supply and each instrument can be used on a fit- for-purpose basis in project and business model development. A wood supply agreement is a current and actual contract between parties regulating wood supply; an off-take agreement is a guarantee of supply into a yet to be developed supply chain and the conditions of that future supply at that time; a forward contract is an agreement to supply at some point in the future; a futures contract is a financial instrument that can only be traded on a futures exchange (all other mechanisms are between the parties). In some cases a party may develop a wood resource independent of an off-take agreement and take a risk that a market will develop. If a project develops a commercially viable species at sufficient scale in a location with access to a market, then a market is more likely to develop. The details of the basis of supply are defined in the instrument and can be on a first right of refusal, take or pay or supply or replace basis, each of which allocate market risk between the parties.

Tree spatial arrangements

Trees can be planted on cleared land in six general spatial arrangements: as individuals, in clumps, as a woodlot, a plantation, with specific fit into agriculture (a subset includes agroforestry) or across 100% of a property. Species selection is critical. A market will generally have a very specific species requirements and only a small number of species have been fully commercialised in Australia (from silviculture through to processing and product supply at a commercial scale and on a commercial basis). Many other species are part-way along the commercialisation process BUT as yet are not commercial, hence the use of such species entails additional risk. A processor (market) will seek a known wood supply (timing, quantity and quality) and once-off plantings may or may not meet such requirements. It is more likely that in the absence of resource aggregation by a cohort of growers, that a continuous planting program is required: there are many examples of where projects have failed to reach critical mass and have become stranded assets.

Generic business models

There are three broad generic business models for tree investment: a lease where trees are planted on land not owned by the grower on an at arm's length basis, where a party owns the land and trees and where multiple parties join into a tree growing arrangement by sharing the risk and returns. The simplest arrangement is where a party owns the land and trees (and the risk and returns). The party could have some form of arm's length wood supply agreement in place with a market but remain 100% independent. A variation observed was where a landowner receives grant funding (a non-repayable gift) towards tree establishment. A number of examples have been observed but the overall outcome in terms of trees in the ground has been poor e.g. the Farm Forestry North East Project (FFORNE) had a goal of 16,000 ha but only managed to attract 70 members who planted a total of 1,700 ha after 10 years.

A range of terms borrowed from agriculture are used by forestry but with some variation to the agricultural understanding (e.g. sharefarming is broadly used to describe all situations where land is accessed from a farmer). The usual definition is more

precise and entails the parties 'sharing' the risk and returns. A lease is a simple mechanism where the landowner forgoes all rights to access their land for a period of time in return for a payment independent of the project outcomes. An annuity is another land access payment mechanism that provides a series of equal payments for land access, but unlike a lease, the value is tied to the crop outcomes (as a pre-payment). A crop-share is a mechanism that allocates the net harvest proceeds based on the share of the inputs by the parties.

A landowner has to be convinced to provide their land to another party. The motivation and decision making will be informed by the context in which the decisions are made: in the 1990s under a depressed farming environment, landowners were eager to enter into tree growing arrangements generating a good income while retaining title to their land, but now with more sophisticated, business like and rationalised farming and the rise of use of advisors (agricultural, accounting and legal) such ventures must be presented as a business proposition generating an acceptable rate of return. Under a lease arrangement, land access can be based on land values (e.g. 3% to 5%) or on a capacity to pay basis (e.g. $/ha). The area of land on offer is critical to the commercial viability of a project and projects generally set a minimum acceptable standard e.g. greater than 10 ha to give harvest economies of scale. Shared direct investments bring together parties to share risk and returns. Under a joint venture parties enter into a project related arrangement but retain their individual identity. They have agreed inputs and an agreed share of the outputs. As with the use of the term sharefarming, the term joint venture is often used outside of its technical definition (e.g. a lease joint venture is an oxymoron). There are two general types of joint ventures used in forestry projects. A marketing joint venture generally involves a first right of refusal provision, which gives the process an out and exposes the grower to market (or lack of) risk. Such agreements were often referred to as farm forestry agreements. A second type is a crop-share joint venture where the parties share the inputs and are allocated a share of the crop outcomes. The use of joint ventures in Australia commenced in the early 1980s and is the third most prominent project agreement mechanism after MIS projects based on the area planted. The attractiveness of joint ventures to all parties underpins their success: there is the ability to design a joint venture on a bespoke basis for each arrangement but the level of variation will increase administrative costs. Based on experience a number of design options are presented to enhance the attractiveness of a joint venture. An important point noted was that the attractiveness of a joint venture can be enhance by drafting from the counter party perspective.

Introduction

The elements of a business model for a tree growing arrangement between parties is presented in Figure 1 and at the core of the arrangement is the attributes of the underlying project (e.g. markets, capital inputs, land and silviculture). The requirements of robust projects are understood (see Box 7) but often ignored. The legal instrument which binds the parties is a critical tool to provide certainty and is core to management of expectations provided that the details and mechanism are complete and transparent. Management of expectations is a fundamental goal to assist in reducing the risk of repeating many of the identified and recurring negative themes associated with Australia's history of forestry investments. An important element of management of expectations is the precise use of language (in communications with the agricultural sector, all terminology should be consistent with the use by agriculture and be correct in a strict definition context). The following section of the report addresses direct investments and a direct investment is defined that the parties developing the trees doing so via a direct relationship rather than through intermediary investment structures. The analysis includes identification of key elements, details and options that can specifically inform the development of a business model or more likely, the elements will form part of a portfolio of options from which tree growing arrangements are developed.

Box 7: The requirements for a successful plantation have been documented in the past, but in some cases such simple rules have been ignored.[116]

The value and success of a stand of trees will be determined by:

- *the species and how it has been managed;*
- *its distance from a processor and its accessibility;*
- *the volume of product available; and*
- *whether production can be continued in the long term.*

Species: While it is important to choose a management regime that suits the skills and objectives of those involved, species selection will also help determine the viability of the operation.

Critical mass & continuity of supply: Is the volume of product available annually enough to maintain a long-term, economically viable industry? This needs to be determined within a region!

Marketing: The type of market and selling strategies are linked closely to the product being produced. Currently many companies in Victoria are offering annual leases to farmers to grow pulpwood. These offers should be considered, as they provide an ongoing return throughout the rotation. However for furniture and specialty timber, the markets are much smaller and fragmented.

Attributes of the tree planting project

Markets

A range of instruments are available to arrange wood fibre supply (see Table 2) and each instrument can be used on a fit- for-purpose basis in project and business model development. For example, a party developing a plantation estate may seek an off-take agreement to underpin seeking investors, to demonstrate a future capacity to generate returns. Large plantation companies are closely tied to foreign companies via wood marketing agreements (e.g. with Japanese pulp and paper enterprises), however many projects have been developed and initiated in the absence of a clear and actual market creating risk and uncertainty. This is evidenced by projects which have failed to obtain critical mass to attract a processors or to be able to supply fibre to a project. The WA experience was that the Tasmanian bluegum estate was developed to supply an existing processing facility which was currently exporting natural forest woodchips into the market (e.g. export via the Port of Bunbury). A driver identified was that the *'export chip industry has traditionally been very profitable' for processors, with industry continuing to develop a substantial bluegum resource for woodchip export.'*[117] In other examples, projects have been developed with nil direct links to processors at the outset, but once sufficient critical mass was obtained, they successfully negotiated wood sale agreements usually for woodchip exports to Japan or Korea;[118] for example, *Acacia mangium* (Mangium) plantations were established on Melville Island (of the coast of Darwin) with nil market in place but given that Mangium has mature Asian markets AND that a critical mass (30,000 ha) was achieved, the project was able to secure an wood supply agreement via a transaction memorandum with Mitsui.[119] In aligning the interests of parties in a planted forest project, a wood processor benefits by reduced exposure to increasingly competitive or volatile world markets. It has been suggested that large processors are '*increasingly willing to invest in certainty of future raw materials supply to protect sizeable manufacturing investments from market volatility, increased competition or declining availability*.'[120]

[116] DPI (2002).
[117] Lancefield (1993, p.30) cited in Curtis and Race (1998: p.10).
[118] Catton et al. (2004).
[119] Herbert, L. (2016).
[120] Alexandra and Hall (1998: p.xxiv).

Table 2: A summary of the different contract mechanisms for wood supply.

	Parties	Basis	Basis	Timing
Wood supply agreement	Grower and processor	Between the parties	A bespoke contract setting terms and conditions.	For a current fibre supply.
Off-take agreement[121]	Grower and processor	Between the parties	A bespoke contract setting terms and conditions.	A future and yet to be initiated fibre supply.
Forward contract[122]	Grower and processor	Between the parties	A bespoke contract setting terms and conditions.	For a future sale.
Futures contract[123]	Market to market (traders)	Trading on a futures exchange	A standard contract / instrument.	A current sale for a future outcome.

Table 2 presents the different contract mechanisms, but the detail will define project obligation placed on the parties. There are three basis of supply of logs, each with different implications for the parties to the contract. These are: first right-of-refusal; take-or-pay; supply-or-replace and the attributes of each are presented in Table 3.

Table 3: A summary of the different basis of wood supply obligations placed on the parties to an agreement.

Supply basis	From the grower's perspective	From the processor's perspective
First right-of-refusal	The grower is obligated to offer the resources to the processor. A grower can be left without a market as there is nil guarantee.	The processor can assess the offer and either accept or reject the offer. The processor has maximum flexibility.
Take-or-pay	The grower is guaranteed a market and if the processor does not purchase the resources, they will need to compensate the grower. This usually set to a % limit of the overall supply.	The processor is obligated and connected to the grower.
Supply-or-replace	A grower must guarantee to supply a set quantity of resource or pay for an alternative supply.	A processor has a guarantee supply provided that the grower is solvent. This protects the processor from the grower changing their mind and preferring the trees as landscape or shelter belts.

Land access and planted tree design: spatial arrangements

It is incorrect to assume that cleared farmland with a high average property land value ($/ha) will not be made available for trees. Most farming enterprises will have areas not suited to the primary agricultural activity, and these could be accessed by judicious development of planted tree options to fit into agriculture. The spatial arrangement of trees planted into farmland is a critical project design consideration. There are six broad but not mutually exclusive options from a landowner's perspective:[124]

- *Individual trees:* Individual trees planted across a landscape;
- *Clumps of trees:* A number of trees planted in a clump within a landscape;

[121] Based on https://www.investopedia.com/terms/o/offtake-agreement.asp downloaded on the 23/05/2018.
[122] Based on https://www.investopedia.com/terms/f/forwardcontract.asp downloaded on the 23/05/2018.
[123] Based on https://www.investopedia.com/terms/f/futurescontract.asp downloaded on the 23/05/2018.
[124] While other authors have developed classification systems e.g. Alexandra & Hall (1998: p.30), this classification reflects observations in the field.

- *A woodlot:* A contiguous block of trees planted with regular spacing within a management unit of a farm (e.g. see Figure 15 in part of a paddock[125]);
- *A plantation:* A complete farm management unit planted to trees (e.g. a full paddock);
- *Fit with agriculture*: The tree planting specific to the needs of the farm enterprise.
    - Residual land: Planting of trees on sections of a property not required and/or nor suitable for the primary agricultural enterprises.
    - Boundary shelter belts: Planting of trees around the perimeter of a management unit to provide some form of shelter.
    - Internal shelter belts: Planting of trees longer than wide to provide some form of shelter within the management unit.
    - Specific management: Planting trees around a specific agricultural activity (e.g. around a centre pivot providing irrigation).
    - Agroforestry: Trees and agriculture occurring within the same land management unit.
- *Complete property:* The planting of all agricultural management units across a property.

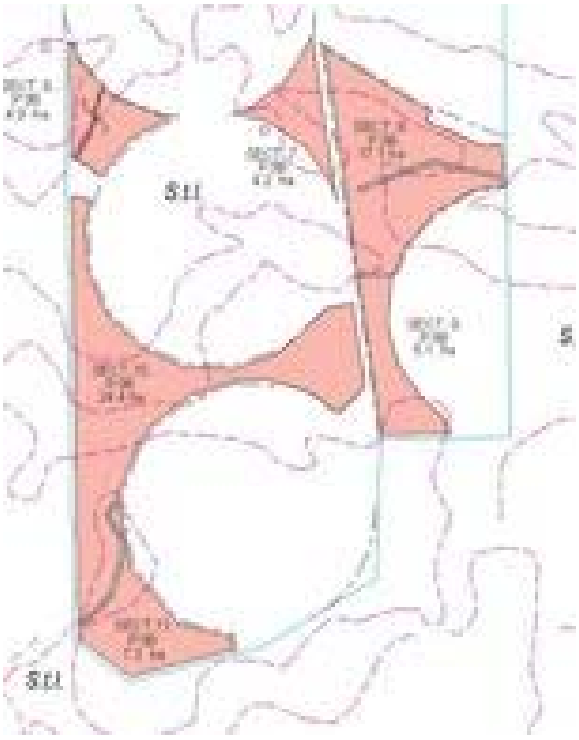
The development of the WA Tasmanian bluegum estate included a wide range of spatial arrangements (including shelter belts and woodlots) to satisfy landowner needs and to maximise land access (see Figure 16; Box 8; Box 10; Box 9). Shelter belt arrangements are a common approach consistent with broader experience in other countries, where trees are integrated into agriculture.[126] While agroforestry was not generally implemented (e.g. wide spaced trees with cattle grazing), most plantations can be grazed once the trees are of suitable condition to cope with stock. There is a train of thought that use of agroforestry systems is generally increasing, particularly in regard to pastoral and woodland grazing systems in Australia[127] and overseas.[128] The cost impact of alternative designs is recognised[129] suggesting that on-farm benefits and/or environmental services may offset the costs.

Figure 15: Small woodlot of Radiata pine being harvested (Sylva Systems 10/06/2018).

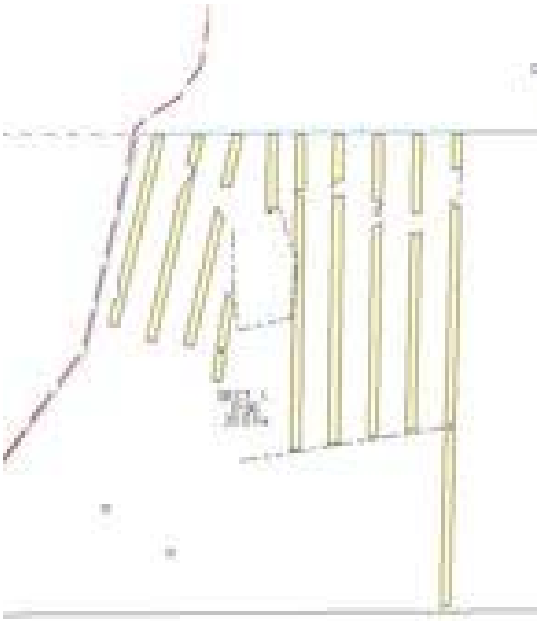
[125] Agricultural management can segment a farm based on site and management intent into management zones, but the actual management occurs based on paddocks bounded by a contiguous fence.
[126] Prinsley (1991); Matthews et al., 1993; Nair, 1993; Rule et al., 1994; ABARE, 1995 cited in Race and Curtis (1996: p.181)
[127] Donaghy et al (2010); Thompson (2008) cited in de Fégely et al. (2011: p.12)
[128] Stephens (2009).
[129] de Fégely et al. (2011: p.13).

A) A property 100% developed as plantations.

B) A series of sections of a property developed as plantations.



C) A fit with agriculture: plantation development around a centre pivot irrigation system.



D) Trees planted as shelter belts across a property.

Figure 16: A series of plantation spatial arrangements as trees into agriculture.

Box 8: A summary of the identified issues associated with small blocks (Figure 16: Layout B).

- *Isolated blocks:* Where a land owner offers a series of isolated and unlinked sections of a property this creates access issues for the site at harvest.
- *Native vegetation:* Under certification, it is not possible to cross through native vegetation, hence where such is in a property, this must be planned for in the plantation layout.
- *Small blocks:* Some small blocks are planted.

Box 9: A summary of the identified issues associated with the use of centre pivot (Figure 16: Layout C).

- The spatial arrangement did increase the complexity for establishment (the alignment of the planting rows) and transport (where access tracks could be placed).
- On one site, the trees were planted around a centre pivot used to irrigate horticultural crops.
- From the landowners perspective the land around the centre pivot was unusable as they could not graze in the absence of building extensive fencing, hence the establishment of trees was a good fit with agriculture.
- The trees had the additional benefit of reducing air flows (wind) across the horticultural crops allowing the applied water to fall more vertically onto the crop reducing water waste and losses due to evaporation.

Species

A small number of species have been fully commercialised under Australian conditions through to harvest, sale and utilisation of the resulting fibre resources (e.g. hardwoods - *E. grandis* (Flooded gum), Mountain ash Shining gums and Tasmanian bluegums; softwoods – Caribbean pine, Hoop pine, Radiata pine and Slash pine). Many species remain at the experimental stage as they have not gone through to harvest, sale, processing AND supply of a product on a commercial scale (e.g. *E. saligna* - Sydney bluegum - in WA for sawlogs or *E. botryoides* - Southern mahogany - in Gippsland managed for sawlogs). Use of current proven species in appropriate locations (e.g. biophysical requirements and within economic haul distance of a market) and with access to a current market is a least risk option. A wide range of other species have been planted out in trials and on farms. It is acknowledged that there is little knowledge about the performance of many potentially important species, even though many have been long recommend (in the absence of full commercialisation). The selection of alternative species has been described as potentially *'hit or miss, but the potential for learning from the mistakes is limited, as is the capacity for building up and transferring knowledge gained from experience'*.[130] A point of caution is the fungibility of utilisation of natural forest origin species for timber production with that of planted trees. For example, the CRRP projects operating in the wet tropics areas of north Queensland aimed to establish a wide range of high value cabinet timber species.[131] The project planted c.1,780 ha in 692 blocks (51.3% were less than 2 ha in size and 84.3% were less than 5.0 ha) over 6 years from

[130] Alexandra and Hall (1998:p.xxii).
[131] Curtis & Race (1998: p.21).

1992/93 to 1997/98. Over 100 species were planted[132] and with the exception of Hoop pine, all other species were not fully commercialized nor proven as able to supply high value cabinet timber under plantation conditions.

Box 10: A summary of the identified issues associated with the use of shelter belts (Figure 16: Layout D).

Shelter-belts were the least satisfactory spatial arrangement and the company would never again enter into such arrangements is not commercial. The issues are:

Fit for purpose:

- The aim should be to reduce the level of complexity in the planting arrangements – the use of many lines of planted trees adds too much complexity.
- Tasmanian bluegums are not the most suitable shelter belt species due to the structure of the trees.
- Other species more suitable would not meet the needs of the company in terms of wood properties.
- The trees also impact on the pasture by competition.

Growing costs:

- The growing costs are higher as there is a greater need for fencing to exclude stock.
- Other operations are more complex as they have to move from belt to belt rather than having longer runs.
- If the site are not fenced there is a need to exclude stock from the whole paddock until the trees are large enough to cope with stock grazing.

Edge trees:

- The percentage of trees growing as edge trees is maximised.
- Edge trees have heavy branching as the branches are more persistent as they are not overshadowed by surrounding trees.
- The persistent branches are significantly larger in diameter.
- This leads to more difficult harvesting as single grip harvesters cannot cope with the trees.
- Therefore, more expensive harvesting results c. a 15% increase in costs.

Harvest damage:

- As the trees are fallen into the pasture, there will be harvest residues out in the paddock which need to be swept up and returned to the windbreak area.
- This becomes an additional cost and damages the pasture.

Haulage:

- Haulage of the trees is more complex as the trucks may have to cross paddocks to get to the trees.
- This can damage the pasture and reduce productivity by soil compaction.
- This is complicated / compounded where the trees are some distance to access roads.
- The cost of access tracks is increased as the distances are greater and potentially more complex.

Processing:

- The larger branch sizes results in larger knots within the tree;
- At the point of chipping, the large knots result in large chip sizes compared to pure wood, creating a greater and unacceptable level of variation in chip size.
- If the trees are infield chipped, this creates a need to screen the chips on receival at the port, or prevents the use of infield chipping to ensure that the resulting chips can be screened and the oversized chip removed and re-chipped.

Contamination:

- With the need for additional fencing, there is a greater risk of woodchip contamination with wire and steel posts.
- Shelter belts or tree belts were often cropped in between the tree lines. Farmers often burn stubble for re cropping and there are occasions where fire was allowed to enter the plantation areas. This often caused carbon contamination and burnt tree areas have been excluded for this reason.

[132] Skelton & Sexton (2003: p. 7, 16 & 21).

Continuity of planting

Scale of supply to match the needs of a market is critical and differences in approach may not be fungible. For example, historically in Tasmania, small volumes of specialty timbers (e.g. craft/furniture timber at 5,700 m^3/year from private land) were primarily sourced from native forests, processed and then sold on domestic and international markets.[133] It may be practical and realistic to develop a small-scale and boutique planted tree program to supply such a market. Assuming a 20 year rotation, a growth rate of 20 m^3/ha/y with 50% recovery of the target logs the tree stems, an annual harvest of 28.5 ha would be required, from a TOTAL net estate of 570 ha. An important consideration is the sale and/or utilisation of the non-target stem wood – which markets would this resource be supplied into? Following this point, it is possible to supply logs into a spot market such as a sawmill processing logs into timber for bespoke furniture manufacturing where the demand is intermittent whilst the crafts-person makes furniture by application of many hours of skilled labour. Alternatively a market will require a known quantity of logs each day or week of the year. To supply such an operation requires either an aggregation of a range of grower's resources into a wood-flow or the planting each year of a set area to generate a reliable and continuous woodflow. In the absence of a spot market or the ability to aggregate supply, a plantation will become a stranded asset. It is possible that minor sales and/or utilisation is possible (e.g. for firewood) but effectively the trees will remain un-harvested.

Generic business tree growing arrangements

Based on experience and observations, it is possible to categorise planted trees growing commercial arrangements from a landowner's perspective (see Table 4). The typology is defined based on land-ownership, tree-ownership and any encumbrance obligations associated with the trees.

Table 4: A snap-shot of the different generic business models from the landowner's perspective.

	Land	Trees	Marketing agreement	Payment	Wood purchaser
Lease	Owned	No	N/A	Independent and regular by lessee	Controls the resource
100% ownership	Owned	Owned	Freelance	Based on market at harvest if accessible	Buys on an *ad hoc* basis
	Owned	Owned	A Wood Supply Agreement in place.	On an agreed basis	A controlled supply
Linked out-growers 100% of supply	Owned	Part owned	A Wood Supply Agreement in place.	On an agreed basis	Controlled 100% supplied by out growers
	Owned	Owned but with an obligation to sell	A Wood Supply Agreement in place.	On an agreed basis	Controlled 100% supplied by out growers
Linked out-growers to a nucleus estate	Owned	Co-owned	A Wood Supply Agreement in place.	On an agreed basis	Controlled. Total resource part supplied by out-growers
	Owned	Owned but with an obligation to sell	A first right of refusal in place.	On an agreed basis	Controlled. Total resource part supplied by out-growers

Direct 100% ownership including grant mechanisms

There are two broad types of direct investment and ownership defined by the funding mechanism:

[133]King 1996, p.191 cited in Curtis and Race (1998: p9).

- *Fully self-funded:* Direct investment and therefore ownership is usually by the allocation of land and capital for plantation development with the funds either borrowed or internally generated by other income sources with returns realised at harvest;
- *Assisted by a government grant:* A grant is a gift (usually of money) given for the common good linked to a particular purpose.[134] There are a range of types of grants as noted in Table 5. For example the National Afforestation Program (NAP) aimed to increase plantations via direct grants to investors, however, it had little success in facilitating large scale plantings with only 6,000 hectares (nationwide) reportedly planted and very little private sector investment. Around 86% of the program funds were allocated to state government projects.

Table 5: A segmentation and classification of grants based on attributes and mechanisms.[135]

Term / product	Description
Grant	A grant is a gift (usually of money) given for the common good. Most grants are given for a particular purpose. Grants are most commonly made to non-profit organisations, but may also be made to individuals, often in the form of a scholarship or fellowship for study or research.
Disbursements	The grant funds distributed by a foundation to grantseekers. Grant funds which are distributed according to a donor or trustee's discretion rather than by predetermined priorities.
Capital grant	A grant made to an organisation towards a major item of capital expenditure, such as the construction of a building. Although many trusts and foundations specifically exclude funding such appeals, there are exceptions where there is community benefit.
Evaluation grant	Made to a project that has run successfully as a pilot project and requires a formal external evaluation before seeking major support or sponsorship. The grant effectively works as a leveraging tool, enabling the recipient to seek further funding with accurate, extensive and impartial information on their project for potential grantmakers to consider.
Challenge grant	A grant that is paid if the recipient organisation is able to raise additional funds from other sources, which may be used to stimulate giving from other donors. The term can also refer to fundraising, with a private trust or foundation matching dollar for dollar contributions from, for example, the local community. This is sometimes also referred to as 'match-funding'.
Conditional grant	Conditional grants involve one grantmaker seeking the involvement of others, by making their grant of a part of the project funds conditional upon the remainder being available from other sources. Proof of the conditional offer can be used in seeking funding elsewhere, or to raise a loan for the balance of funds sought.
Matching grant	A grant or gift made with the specification that the amount donated must be matched one a one-to-one basis or some other prescribed formula. See also 'Challenge grant'.

In Victoria, a government run 'grant' scheme operated to support landholders establishing farm forestry in north-east and north-central areas of the State to subsidise tree establishment (the Farm Forestry North East Project – FFORNE as a cooperative of landowners). Approved landholders contributed (cash), with the Department of Natural Resources and Environment (DNRE) organising the establishment eucalypt species as for hardwood sawlog production. Participation by landholders was recorded on their Land Title outlining their intention to grow a hardwood sawlog resource. The DNRE was directly involved with plantation management for the first 18 months. The DNRE did not retain a formal interest in the tree crop, nor a share of any financial returns (hence FFORNE was not a joint venture). The intention of the scheme was to create sufficient resource (e.g. planting 800 ha/year for 20 years = 16,000 ha) to attract a hardwood sawlog processor to the region and it was intended that industry interests would 'emerge' to continue the funding arrangement with prospective growers.[136] In the scheme's first year of planting (1999), an area of 340 ha was established, and an additional 600 ha established in the

[134] Downloaded from http://www.philanthropy.org.au/tools-resources/glossary/ on 22/01/2015.
[135] Downloaded from http://www.philanthropy.org.au/tools-resources/glossary/ on 22/01/2015.
[136] Curtis and Race (1998: p.21).

second year[137] and by 2009 when FFORNE was wound up, it had 70 members and 1,700 ha of Tasmanian bluegums and Shining gum managed on a sawlog regime[138] short of the target of 16,000 ha. The use of grants has continued with a recent initiative by WA's Forest Products Commission (FPC) providing an unencumbered grant of upto $500 /ha planted to softwoods for upto 50 ha planted with a total budget of $100,000 (a capacity for 200 ha - see Box 11 & Box 12). While the allocated budget is transparent, the true cost of the grant per hectare must include all overheads associated with the project to assess the financial viability of any scheme (recall the comments regarding the overheads associated with the Victorian Farm Forestry Loan Scheme): note that the FPC received nil interest in return for the grant, hence nil joint venture is formed. The FPC grant offer has the following advantages:

1. It targets a known species to add to an existing supply chain, but with limitations for some products due to distances to export ports;
2. The scale of the plantings are to be commercial.

A point of caution is the level of monitoring and control over the quality of the establishment and management of the resource: will it yield merchantable trees?

Box 11: An overview of the FPCs Farm Forestry Assist.[139]

Farm Forestry Assist is a one-off grant for farmers and other land owners to plant radiata or maritime pine trees on their land in 2018. This grant of $500 per hectare is available to landowners who are interested in establishing new 20 to 50 hectare plantations to support the State's vibrant softwood industry. Grant recipients may opt for free, high-quality radiata pine seedlings from the Forest Products Commission's (FPC) nursery instead of the $500 per hectare.

- *The aim is to expand the plantation estate, with farm forestry contributing a meaningful supply of timber to industry.*
- *Second rotation plantings will be eligible for half the grant amount being $250 per hectare or free seedlings for half the area established.*
- *You will have ownership of and responsibility for the trees.*
- *The Forest Products Commission Farm Forestry Officer will work with grant applicants and recipients and will be available to provide advice and support the establishment of viable and productive plantations on farms.*
- *What happens to the plantations in the future?*
- *This is your choice, however the Forest Products Commission is providing this grant to support the planting of radiata pine and pinaster pine for timber production to support our vibrant softwood industry of the future. The Forest Products Commission's Farm Forestry Officer can help explain your options.*
- *The Forest Products Commission is allocating $100,000 from an industry development fund that was included in the 2016 Softwood Industry Strategy to this initiative.*
- *This is not a Managed Investment Scheme or Sharefarm arrangement because the trees will belong to the landholder.*

[137] Curtis and Race (1998: p.21).
[138] Stewart (2010: p.9).
[139] Downloaded from http://www.fpc.wa.gov.au/farm-forestry/farm-forestry-assist on the 25/05/2018.

Box 12: The FPCs Farm Forestry Assist grant eligibility criteria.[140]

The following criteria must be met by applicants for Farm Forestry Assist.

1. *Species*
   a. *must be established to radiata pine (Pinus radiata) or maritime pine (Pinus pinaster).*
2. *Location*
   a. *The plantation must be established within the Softwood Industry Hubs as outlined in the Softwood Industry Strategy.*
3. *Scale*
   a. *Planting must be a minimum 20ha in size (minimum 12 row belts plantings – 36 m wide)*
   b. *The Farm Forestry Assist is available for a maximum of 50 hectares on any property but this may form part of a larger planting area on the site.*
   c. *Only one Farm Forestry Assist grant is available to any person, partnership or other entity in any single year.*
4. *Site selection*
   a. *Soils must be free draining to minimum of 2.5m deep and not saline. Site suitability will be assessed by the FPC.*
   b. *Plantings must have access for heavy machinery and trucks to facilitate harvesting in the future.*
5. *Plantation Management*
   a. *Plantations must be established in accordance with the FPC's Guidelines for softwood establishment in WA.*
   b. *The landowner must maintain fire protection and firebreaks that are consistent with local government requirements.*
   c. *The FPC has no ongoing obligations in relation to the management of Farm Forestry Assist plantations.*
6. *Timing*
   a. *Plantations must be established during the winter 2018 planting season.*
7. *Ownership*
   a. *The owner of the property has full possession of the trees and has all rights to the trees. The FPC has no claim on any resource established under the Farm Forestry Assist.*
   b. *The owner may enter into any arrangement to supply timber to any party at any stage.*
8. *Eligibility*
   a. *The FPC reserves the right to alter any eligibility criteria for the Farm Forestry Assist as required.*

Land access mechanisms, observations and issues

Precision of language

The use of land-leasing and joint venture sharefarming is well established in agriculture with very specific attributes of each arrangement. The agricultural term "sharefarming" is often used to describe plantation arrangements and the agricultural definition is that *'...share farming means that both the share farmer and the land owner share in the risks of farming. Whoever has the greater share of costs takes the greater risk and thereby takes a greater share of income.'* [141] A point of caution for communications with farmers and technical advisors to farmers (e.g. agricultural, legal and accounting), is that the 'usual' agricultural definition of sharefarming is used in a precise manner to avoid confusion and to manage expectations. For example, a joint venture arrangement with a first right-of-refusal (see Table 3) could not be regarded as sharefarming.

[140] Downloaded from http://www.fpc.wa.gov.au/farm-forestry/farm-forestry-assist on the 25/05/2018.
[141] Hudson & Krause (2014: p.10).

Land access motivation

Access the land owned by a 3rd party must be by mutual agreement in the absence of some form of Government intervention. Therefore the landholder must be convinced to allocate land to tree planting. The motivations of a landowner will be numerous but importantly they will be framed by the context of the operating environment. In WA during the late 1980s and early 1990s when Tasmanian bluegum plantation projects were developed, a declining value of traditional agricultural commodities is suggested as prompting rural community to examine alternative enterprises to maintain farm viability, one of which was plantations.[142] Comments from individuals involved with land acquisition during that time suggest that a contributing factor was the farmers (e.g. enthusiasm, general motivations and skills) who sought to retain title to their land and a residence; hence provision of land for plantations met their objectives. An important point is that since that time, the nature of farming has significantly changed with better economies of scale, skills and a business-like approach, hence landholder motivations will have evolved. In additional and consistent with a business-like approach, is the reliance on external farm advisors – agronomists, agricultural consultants, accountants and lawyers. It is likely that farm advisors will require convincing more that the landowners as to the benefits and viability of tree planting. An important step in enhancing performance was noted in a 1998 review: End the culture of blame: [143]

> *'If the economic and environmental opportunities are to be realised, all major players in the farm forestry sector need to improve their performance. Effective and cooperative solutions to many of the impediments were readily identified. These could be implemented fairly simply. Continuing to shunt blame between the various parties will fail to achieve useful outcomes. Governments, industry and farmers must collectively show a willingness to advance the opportunities.'*

Land access mechanism types

There are four broad land-access mechanisms often referred to incorrectly as synonyms (see Table 6). A key difference is the timing of payments and the share of projects risk. The NPI defines leaseholds as '*leased land where the grower has sole primary production and access rights of the trees'.*[144] From a landholder's perspective, a lease provides regular 'almost risk free'[145] payments potentially indexed over an agreed period of time, therefore overcoming cash-flow problems associated with tree growing in their own right. However, leases require on-going funding with regular payments by the plantation developer. It is suggested that this option is the most successful of all arrangements[146] including in WA and that this approach would be popular elsewhere in Australia.[147] An annuity is an annual payment, and technically it is tied to the outcome of the planted tree crop, however this term is often used in place of the term lease. Under a joint venture (crop-share) arrangement, the landowner and the plantation developer share the risk by a pre-defined allocation of the net returns from a project, hence the timing of the returns is mostly at the project end. A joint venture agreement will usually include a sunset clause and a point of review for potential renewal. While lease arrangements are often referred to as joint ventures,[148] this is an incorrect description as a joint venture involves the parties sharing the risk. Further comments indicated that in WA lease schemes with competitive

[142] Inions (1995).
[143] Alexandra and Hall (1998: p.xi).
[144] Wood et al. (2001: p.169).
[145] Counter party risk is that the party leasing the land remains viable and can continue payments.
[146] Curtis and Race (1998: p.vii)
[147] Curtis and Race (1998: p.x).
[148] For example, see Curtis and Race (1998: p.vii).

(high) lease payment attracted better quality agricultural land closer to regional centres whereas joint ventures with delayed or uncertain (crop-sharing / speculative financial returns) tend to attract marginal farming land in more remote locations.[149]

Table 6: A snap shot of the differences in land access mechanisms.

	Basis	Duration	Landowner			Payment timing
			land access	Payments	Risk	Payments
Lease[150]	An interest in land given by a land-owner (the land lord or lessor) to another person (lessee or tenant) for a fixed duration	Finite period	Nil use	Fixed and independent of the crop outcomes.	That the counter-party fails and depending on the reason, then who owns the trees?	Periodic e.g. annual.
Annuity	Under taxation and revenue, an annuity is an investment generally by way of a single outlay of money or other property which returns a fixed annual sum over a fixed number of years. [151]	Finite period	Potentially	A series of cash flows of equal amount, equally spaced in time.[152]	That the counter-party fails and depending on the reason, then who owns the trees?	Annual
Crop share[153]	An agreed share of the net harvest revenues, hence there is uncertainty as to the returns.		Potentially	Linked to the crop outcomes.	Counter-party and crop risks.	At harvest and based on the actual harvest returns

Land access mechanisms details

The following points should be considered in regards to land access mechanisms:

- *Registration:* The interests in the land may or may not be registered on the property title;
- *Environmental services:* An instrument used should document the treatment of any carbon benefit from the plantation, and in particular, detail the treatment of any resulting carbon liability (during and at the end of the land access arrangement);
- *Condition at hand-back:* The condition of the land at hand-back to the owner should be documented (e.g. who is responsible for the stumps and site clean-up?);
- *Transferability:* The ability to transfer interests to another party should be documented to ensure all parties are comfortable with the counter-party to the arrangement. This should include addressing land liquidity (e.g. the ability to sell the property).

Land lease costs

Land lease costs can be expressed (defined) on a relative basis (e.g. a percentage of land value converted into an absolute value $/ha/y) or be expressed on a relative basis driven by tree crop returns (e.g. considering growth rates x rotation x mill door price – harvest & haulage costs = capacity to pay). Leasing land at 3% to 5% of land value reduces pressure of high initial upfront land purchase costs.[154] A 1996/97 WA example indicated an annual lease payment of $200 /ha/y for cleared

[149] Curtis and Race (1998: p.22).
[150] Nygh et al. (1997: p.320).
[151] Nygh et al. (1997: p.24).
[152] Pearson et al. (1998: p.75).
[153] Curtis and Race (1998: p.vii).
[154] de Fégely et al. (2011: p.iv).

agricultural land with expected growth rates of 20-25 m³/ha/y.[155] Competition for quality land increased lease rates to as high as $300/ha in the early 1990's. Leasing land at rental rates of around 3% to 5% of land value can reduce the pressure of a high upfront cost of land purchase.[156]

Setting a minimal land area for plantations

In a very limited range of situations, it could be possible for a landholder to harvest and deliver logs to a mill gate, but liability and a range of wood purchasing considerations for larger sites make this unlikely. It is more likely that a contract harvest team will harvest trees and recovery logs for delivery to a mill gate. Even if a party develops a plantation in their own right (e.g. 100% direct ownership), minimum harvest areas will be defined by the purchaser at the time of harvest. It may be possible to aggregate a number of smaller woodlots provided that harvesting equipment can safely and efficiently walk between sites. Considering the area to be planted, a 1998 review noted that '*while many landholders will establish small areas (<5 ha) of trees for agricultural, environmental or conservation benefits, few will invest in medium to large scale farm forestry (>10 ha) if forestry is not considered viable compared to alternate landuses*'.[157] In most tree planting arrangements, a minimum harvest area is set before entering into an agreement e.g. the 1991 APM Forests Pty Ltd farm forestry agreement required *'a woodlot of greater than 5 hectares in size (a minimum of 400 m³ must be extracted in any single harvesting operation)*'.[158] Considering more recent examples in WA, *'most farm forestry consists of 10 ha or larger plantings of bluegums established in multi-rowed timberbelts or woodlots under joint venture arrangements with Bunnings Pty Ltd. or CALM*'.[159] Assuming a mean annual increment of 20-25 m³/ha/y over a 10 year rotation, this would yield 2,000 to 2,500 m³/woodlot. A proviso is that '*transaction costs must be recognised and the lack of economies of scale from managing modified commercial plantations and/or parcels of land would need to be compensated or industry supply chains adapted to manage these new production systems'*.[160] The impact of harvest area is demonstrated (see Box 13).

Shared direct investment –joint ventures

Definition and attributes

Joint venture arrangements first appeared (to any extent) in the mid to late 1980s, primarily linking State Government forestry agencies and private landowners. This was driven by the end of the Commonwealth Government Softwood Loan Scheme, and States considering joint ventures as one option to continue expanding commercial plantations and promote smaller-scale farm forestry. A joint venture agreement has a usual and legal definition as:[161]

> *'A joint venture is an association of persons formed for the purpose of pursuing a particular business objective together. It involves a level of integration between the participants which is less than would amount to a merger. The term 'joint venture' does not have a settled common law meaning in Australia, reflecting the fact that joint ventures can take various forms. A joint venture may be undertaken through a partnership or some other form of unincorporated association or through an incorporated body. A joint venture is usually undertaken to pursue a single*

[155] Curtis and Race (1998: p.11).
[156] de Fégely et al. (2011: p.iv).
[157] Curtis and Race (1998: p.viii).
[158] Borland et al. (1991: p.41).
[159] Curtis and Race (1998: p.11).
[160] de Fégely et al. (2011: p.13).
[161] Review Committee (2003) Chapter 9: Joint ventures and dual listed companies. In: Trade Practices Act Review. http://tpareview.treasury.gov.au/content/report/html/chpt9.asp accessed on the 21/05/2018.

project and is often intended to last for a limited period. The relationship between the participants in a joint venture is usually governed by a joint venture agreement.'

Box 13: A snap-shot of the impact of minimal harvest area based on WA experience.

The target minimal area for planting is 15 ha based experience of harvesting costs, where a woodlot is isolated from other woodlots.

Machine movements:

- The other factors are the spatial arrangements of other plantings in the local area where the machines could walk between sites.
- If this can be achieved small blocks could be harvested;

Harvesting fixed costs: This is explained as follows.

- With a standing volume of 150 to 200 t/ha this would be 2,250 to 3,000 GMt/ 15ha woodlot.
- At a harvest production rate of 450 to 500 t/day, this gives 5 to 6 working days to complete a harvest utilising two machines.
- The cost to shift machines is $1,500 /machine, hence a fixed overhead cost of $3,000 results or $1.00 to $1.30 /t of logs.
- This can be modified if the woodlot is in close (machine walking distance) proximity of other woodlots to be harvested, diluting the fixed machine shift costs to the area.

Administration costs:

- The other consideration is the administration costs to support a woodlot.
- If the company owns a plantation, the administration costs of managing the wood is 25% of those required to administer a third party woodlot.
- This would include the cost of establishment of the JV or lease arrangement.

An important point is that while the parties are joined for the duration of the agreement, they remain legally as separate entities and a legal partnership is not formed. This can be explicitly stated in the Joint Venture agreement: for example the 1989 APM Forests Farm Forestry Agreement stated that:[162] '*Clause 16: Nothing in this Agreement shall be constructed to create d partnership between the parties'.* The NPI defines a joint venture as: *'.....joint ownership of the trees with another party, where each parry has at least ten per cent share in the tree crop.'*[163] The NPI clearly distinguishes between a joint venture and leasing and defines leasehold as: '*....leased land where the grower has sole primary production and access rights to the trees.'* [164] In another example, researchers developed an independent definition of a joint venture:[165] *'.....a legal arrangement (ie. contract) between two or more parties to combine land, capital, management, and market opportunities for commercial treecrop production.*' It is argued that this definition is incorrect as under a joint venture, the parties are linked to up until the outcome (final harvest) and this definition is not explicit in this regards.

The following are the two broad forms of correctly titled joint ventures:

[162] APM Forests Pty Ltd (1989).
[163] Wood et al. (2001: p.169).
[164] Wood et al. (2001: p.169).
[165] Curtis and Race (1998: p.15).

- *A 'crop-share' joint venture:* The landholder and industry/government partners contribute inputs and proportionally share returns at any harvest throughout the life of the tree crop;[166]
- *A 'market' joint venture*: A sales mechanism for the grower, usually based on market price at the time of harvest (see Table 7).[167]

The following are not joint ventures although titled as such by many parties:

- *A 'grant' joint venture*: Government support of landholders establishing commercial farm forestry by a grant for tree establishment with a co-contribution by landholders. In one example a State Government agency organised the establishment of eucalypt plantations for future hardwood sawlogs but the Government did not retain a formal interest in the tree-crop, nor a share of any financial returns;[168]
- *A 'Lease' joint ventures:* Provides regular payments indexed over an agreed period but the parties do not share the returns and risk.

The parties to a joint venture are likely to be landholders (e.g. providing land, and/or management) and industry/Government (e.g. providing initial finance/capital, management and market opportunities)[169] and the final crop value is realised at harvest returning the prevailing market prices at that time. To protect the joint venture partner with an interest in wood consumption, they have sole right of purchase[170] (see Table 3). With time and in response to landowner needs, joint venture arrangements evolved to include a range of elements:[171]

1. Supply of seedling stock;
2. Seedling stock plus technological advice;
3. The above plus security of markets (sales agreements);
4. The above plus flexibility of spatial arrangements including agroforestry.

The scale of joint venture development

Since the 1980's, joint ventures have become an important tool in plantation development (see Figure 9 & Figure 17), and have been used to attract overseas investment:[172] in 2016 there were 71,000 ha of joint venture plantations[173] down from 72,571 ha in 2000. The prevalence of WA and Tasmania in using joint ventures is evident (Figure 17). The first major joint venture agreement was in 1993 and was in WA between the State Government and Oji Paper and Itochu (with expected investment of $60 million over ten years)[174] to plant 20,000 ha of Tasmanian bluegum in small-farm woodlots and shelterbelts of 10 to 20 ha in size. The trees were to be harvested at age 10 years and woodchips exported to Japan for papermaking and coppiced for second crop. The project claimed substantial direct benefits to the wood processing sector and environmental benefits (e.g. reducing water tables and addressing dryland salinity problems).[175] A second agreement was made between

[166] Curtis and Race (1998: p.vii)
[167] Curtis and Race (1998: p.vii)
[168] Kevin (2006: p.199 & 200).
[169] Curtis and Race (1998: p.15).
[170] Whyte (1990: p.172).
[171] While de Fégely et al. (2011: p.55) referred to each as 'incentives', it is argued that each is better regarded as consideration as part of the joint venture agreement.
[172] AFFA (2002a: p.19).
[173] Downham & Gavran (2017: p.6, Table 7).
[174] Dargavel (1995).
[175] AFFA (2002: p.18).

the State Government and Hansol Forest Products Company, to establish 15,000 hectares of plantations over 10 years.[176] Not all joint venture projects have been successful. For example, in 1996 the Queensland Government funded initiative the DPI Joint Venture Scheme which offered equity and shared harvest rights between participating landholder resulted in 160 ha established.[177] By 2000, the Queensland Government decided that its core business was to focus on vegetation management and not farm forestry. DPI's Joint Venture program had not been further funded and DNR closed down its Treecare group.[178]

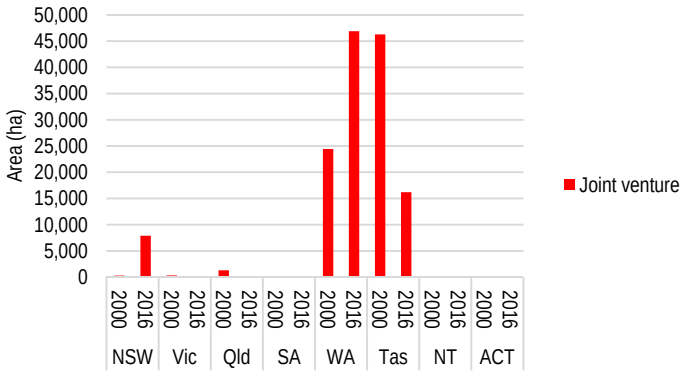


Figure 17: The area of joint venture plantations for 2000 and 2016 by state.[179]

Joint venture marketing agreements: farm forestry marketing agreements

In order to expand resources, some fibre processing companies developed both their own plantations and farm forestry joint venture marketing agreements (e.g. APM Forests Pty Ltd in Gippsland in Victoria, CSR Softwoods in the Green Triangle and Australian Newsprint Mills in Tasmania and New South Wales).[180] The aim of farm forestry marketing agreements was to provide a "guaranteed market" for the wood grown and a summary of two agreements is presented in Table 7. APM Forests Pty Ltd offered a 'marketing joint venture' for 14 years (1978-92) providing growers genetically-selected seedlings at upto 48% price discount and silvicultural advice, in exchange for a first right-of-refusal for purchasing the resulting resources (see Box 14). The program resulted in about 2,000 ha of softwood plantations on about 60 properties:[181] the project achieved c.50% of the target area with farmers citing loss of productive land, initial cost of establishment and lack of information about forestry investments (uncertainty and risk) as reasons for their non-participation.[182] For the land holders who entered the scheme, an oversupply of softwood pulpwood in Gippsland reduced the prospect of commercial thinning operations in non-company Radiata pine plantations.[183] The nature of joint venture marketing agreements in the past has been one sided with much at the discretion of the log purchaser: for example the APM Forests Pty Ltd agreement stated that "*providing it has resources available at the time, assist where it has special knowledge, with advice on silviculture protection and economic management, in fire suppression, and in obtaining contractors for establishment, maintenance or harvesting*"[184]. In this case the extreme interpretation is that the company may or may not provide support. The agreement to purchase logs on first right- of-refusal assumes that alternative markets exists. In the case of the Softwood Holdings Agreement, a practical requirement is that: *"at such time or times as the parties hereto mutually agree upon so much of the landowner's pines as is marketable and is of the*

[176] AFFA (2002: p.18).
[177] Lott et al. (2005: p.8&25).
[178] Lott et al. (2005: p.18).
[179] Downham & Gavran (2017: p.6, Table 7).
[180] de Fégely et al. (2011: p.56).
[181] Curtis and Race (1998: p.20).
[182] Bhati *et al*. (1991) cited in Catton et al. (2004).
[183] Curtis and Race (1998: p.20).
[184] Pollock (1977: p.196).

shape, size and quality normally accepted in the radiata pine industry as being suitable for sawmilling or the manufacture of posts, poles or similar article".[185]

[185] Ollerenshaw (1977: 195).

Table 7: A summary of the elements of two farm forestry joint venture marketing agreements.

Agreement	Year	Region	Species	Mechanism	Assistance	Location	Price setting mechanism	Point of purchase	Farmer
Softwood Holdings Limited Farm Forestry Agreement[186]	1967	Portland and Mt Gambier	Radiata pine	An assured outlet for the wood. At times mutually acceptable to both parties The grower shall sell to the company and the company shall buy at such time or times as the parties hereto mutually agree upon so much of the landowner's pines as is marketable and is of the shape, size and quality normally accepted in the radiata pine industry as being suitable for sawmilling or the manufacture of posts, poles or similar articles.	Technical help and practical assistance in the establishment and maintenance. Option of insuring their plantations under our own company's insurance umbrella. Seedlings from us at ruling wholesale rates.	A limit beyond which wood cannot be transported to sawmills.	At ruling government forest service royalty rates at the time of sale.	On the stump.	Plant and thereafter maintain pines on the whole of the said land, or continue to maintain pines on the said land.
APM Forests Pty Ltd[187]	c.1977	Gippsland	Radiata pine	Purchase pulpwood and sawlogs from private plantations established or to be established under the Forests Commission Scheme. Undertakes to give APM Forests first right of refusal.	Providing it has resources available at the time, assist where it has special knowledge, with advice on silviculture protection an economic management, m fire suppression, and m obtaining contractors for establishment, maintenance or harvesting. Provide seedlings at cost given.	Gippsland being defined here as an area south of the Great Divide, east of Melbourne and west of the Mitchell River.	Not be less than the Forests Commission royalty rates.	On stump or as billets or logs; on property or delivered.	Plant and thereafter maintain pines on the whole of the said land, or continue to maintain pines on the said land.

[186] Ollerenshaw (1977: p.192)
[187] Pollock, 1977: p.195&196).

Box 14: A summary of the APMF Joint Venture (1991) agreement obligations.[188]

The land owner was to receive:

- A guaranteed market for pulpwood
- Access to genetically improved planting stock at cost (up to 48% cheaper)
- Free technical advice
- Full pulpwood royalty rates as set periodically by the Department of Conservation and Environment (or its successors). Ordinarily the private forest owner would only receive between 80% to 85% of the full royalty without FFA (because APMF have to make deductions for contractor supervision and administration).
- APMF arranges all harvesting and transport of woodlot timber using fully trained, experienced contractors.

APM Forests Pty Ltd was to:

- APMF have the right of first refusal to the timber produced from the woodlot and a guarantee that if the property is sold before the expiry of the FFA that the agreement is honoured by the new owner.
- If the land holder is able to get a higher price for his wood and APMF are unable to match that price then the landholder is entitled to sell to the highest bidder.

In order to qualify for FFA the woodlot must generally be within 100 km of the Maryvale mill (although greater distances will be considered provided that harvesting and haulage costs are low enough to make it an economic operation). The landholder must also be prepared to plant a woodlot of greater than 5 hectares in size (a minimum of 400 m^3 must be extracted in any single harvesting operation in order to economically justify using mechanical harvesting equipment).

Table 8: A summary of the APMF Joint Venture (1989) agreement obligations.

The land owner	The company
1. Availability of Land	1. No impedance or disturbance of farming or disturbance of livestock.
2. Stock proof fence.	2. Owner has first option on grazing rights but Company may offer g razing to further management of the area.
3. No use of chemicals injurious to trees.	3. Harvesting may commence after 6 yrs under terms and conditions of this Agreement.
4. Warrants free use of land.	4. No blocking impedance or pollution of watercourses or dams.
5. Freedom of encumbrances on land.	5. No application of any chemical substance which might damage forest land, other land or stock of the owner.
6. No disposition of land mentioned in agreement without consent of the Company.	6. Company to repair damage it causes to any fences, gates, road or plant.
7. Disposition of land requires incoming owner's prior agreement to terms of Joint Venture.	7. Definition of plantable land.
8. Free access.	8. Good husband like forestry practices.
9. Owner pays all taxes and other outgoing in relation to land.	9. Unplanted lands shall cease to be part of forest land.
10. Exclusive entry to Company with free entry to owner. No fires on or near to forest.	10. Obligations at end of Agreement.
11. No act of derogation by owner.	11. Use of material for forest roads.
	12. Assignation of interest in land by Company.
	13. Company to Comply with Forestry Act of 1920 Section 59.
	14. Each party to indemnify each other.

[188] Borland et al. (1991: p.41).

Fit for purpose - benefits of JVs

Joint ventures have in the past been identified as the most likely mechanism to expand the national plantation estate.[189,190] As noted, a caveat must be applied to the documented attractiveness and benefits; in the past some companies offering joint ventures were unable to purchase the wood grown due to alternative and contracted supplies with take-or-pay clauses in the wood supply agreements.[191] In other examples, the expected and planned markets (processing capacity) had not materialised at the maturation of the joint venture woodlots and due to oversupply (relative to capacity) wood prices fell.[192] Otherwise, the benefits (see Table 9) and potential of joint venture arrangements have been well documented with attractiveness framed by the context of the time:

- *Cashflows:* '*landholders tend to be 'asset rich' yet 'cash poor', requiring '... loans, joint venture investments or other cost sharing arrangements enable them to adopt commercial farm forestry;'*[193]
- *Reduce uncertainty:* Reducing the long-term uncertainty, particularly for small-scale growers with little bargaining power;[194]
- *Linkages:* '*While they* [joint ventures] *took time to establish they provided a social and business link between the plantation industry and local farmers.'* [195]

Table 9: A summary of the benefits realised under joint ventures.[196]

Typical offered small-scale growers benefits:	Typical benefits to industry by providing:
• Financial support with full/part-establishment costs; • "Guaranteed" financial returns (note previous comments); • Reduced market risk with an assured sale (note previous comments); • Silvicultural advice; • Physical support with tree establishment and management.	• Increased supply of future resource; • Resource security without the need to purchase land; • Access to productive farmland for tree growing close to mills; • Diversified sources of supply; • Shared participation with local communities in timber production (i.e. good public relations).

Improving a joint venture offer

There is a high degree of support of joint ventures as they are likely to be important in encouraging farm forestry adoption.[197] Development of a joint venture business model, should be informed by past experience; '*a significant amount of effort was put into various schemes in each state but all had limited success*'.[198] A 1987 review of the effectiveness of incentive schemes noted drivers of a lack of success:[199]

- *Capital costs:* Cost of finance (in 1987 investment loan interest rates of up to 20 percent);

[189] Byron and Boutland (1987: p.243&244).
[190] Humphreys (2010) cited in de Fégely et al. (2011: p.56)
[191] de Fégely et al. (2011: p.56).
[192] de Fégely et al. (2011: p.56).
[193] AACM *et al*. (1996, p.74).
[194] Alexandra and Hall (1997) cited by Curtis and Race (1998: p.15).
[195] de Fégely et al. (2011: p.56).
[196] Curtis and Race (1998: p.16): note excluding elements that are not part of true joint ventures.
[197] Curtis and Race (1998: p.15); Boutland *et al*. (1990) Prinsley (1991); Lyons (1993); Lyons (1994); Furrer (1994); Dunchue and Sinclair (1995); AACM *et al*. (1996).
[198] Informed by de Fégely et al. (2011: p.56).
[199] Byron & Boutland (1987),

- *Scale:* Many farms were too small to support viable woodlots in combination with agriculture;
- *Focus*: Decision-making was influenced by agricultural priorities;
- *The farmer:* Varying levels of expertise from innovative and successful to very poor;
- *Time:* Slow return on investment;
- *Returns:* Uncertainty of markets, exacerbated by a lack of political or marketing leverage;
- *Tax:* Doubts about the future taxation liabilities.

While many prospective participants would prefer industry to develop flexible joint venture arrangements that allow financing and payment on a bespoke basis, industry prefers joint ventures that give control of establishment and silvicultural practices to ensure timber quality at harvest.[200] Therefore, the nature and elements of a joint venture would require a degree of negotiation. The level of negotiation will depend on the degree of latitude in the offer (e.g. a processor of Radiata pine will have little interest in a short term eucalypt pulpwood crop). The following are documented mechanisms to improve the attractiveness of joint venture offers.

- *Design principles:*
    - Past experience: Learn from past experience (e.g. WA learnt valuable lessons from the experience that Tasmania gained through setting up a Tasmanian Private Forestry Division - after the Everett and Gently Inquiry of 1976-77).[201]
    - Focus on farmer needs: Schemes should be based on the needs of landholder instead of utilising what is convenient to the sponsor and that from the landholder's perspective, the marketing of forest products was particularly important.[202]
    - A bespoke solution: landholder prefer flexible joint venture arrangements allow financing and payments options to be negotiated on an individual basis with industry.[203]
    - Cost-effective: Develop a trade-off between bespoke capacity and the cost of development and administration of joint ventures.
    - Land used: Ensure that a landholder has the option to NOT include the most productive farming land.[204]
    - Returns flexibility: Lower any annuity payments combined with free seedlings and/or an option for the landholder to purchase a share in the tree crop (e.g. 'split-area' joint venture).[205]
    - Access to capital: Either reduce the total capital inputs or the cost of capital to fund initial establishment costs.[206]
    - Project costs: Ensure that information about forestry investments (uncertainty and risk) is provided in an effective and transparent format.[207]
- *Return basis:*
    - Diversity: Joint ventures could include multiple products (e.g. pulpwood & sawlogs) and a range of species to attract greater interest from prospective grower and industry partners;[208]

[200] Curtis & Race (1998: p.x).
[201] Byron & Boutland (1987) cited in AFFA (2002a: p.18).
[202] Byron & Boutland (1987) Cited in de Fégely et al. (2011: p.55).
[203] Curtis and Race (1998: p.ix).
[204] Informed by Bhati *et al*. (1991) cited in Catton et al. (2004).
[205] Curtis and Race (1998: p.x).
[206] Bhati *et al*. (1991) cited in Catton et al. (2004).
[207] Bhati *et al*. (1991) cited in Catton et al. (2004).
[208] Curtis & Race (1998: p.x).

- Physical products: Allow landholder to receive a share of the physical product, rather than a share in the 'net returns' after harvest to allow the landholder the flexibility to join with the industry's share or seek alternate markets.[209, 210]
- Maximise returns: Projects could encourage partners to focus upon improving product value rather than necessarily the percentage share of the arrangement.[211]
- Forward contracts: 'Forward marketing' to minimise the impact of market fluctuations (e.g. as used with commodities such as wool and wheat) which may prove advantageous for small-scale growers who operate without industry contracts.[212]
- Contract basis: In the past some growers were excluded from markets by oversupply by state forest agencies with 'take-or-pay' supply contacts hence develop take-or-pay arrangements as part of joint ventures.[213, 214]
- Market knowledge: Enhance market knowledge providing confidence to participate.[215]

- *Returns sharing:*
  - Returns basis: Base returns from 'crop share' joint ventures by recalculating the contribution and therefore shares to partners using 'actual' costs (e.g. for establishment, silviculture) rather than 'budgeted' costs.[216]
  - A periodic update: There could be scope to develop long-term supply arrangements allowing for cost and price review and renegotiated at regular periods (e.g. every 5 years) which incorporates more accurate market forecasts.[217]

[209] Curtis & Race (1998: p.x).
[210] Curtis & Race (1998: p.x).
[211] Curtis & Race (1998: p.x).
[212] Curtis & Race (1998: p.x).
[213] Informed by de Fégely et al. (2011: p.56).
[214] Curtis and Race (1998: p.20).
[215] Informed by de Fégely et al. (2011: p.56).
[216] Curtis & Race (1998: p.x).
[217] Curtis & Race (1998: p.x).

Indirect investment - investment vehicles

Summary

An indirect investment in forestry assets is where an intermediary financial product is used rather than by direct owner ship of the trees (and potentially the land). The scale and significance of the impact of indirect investments in the Australian sector is documented with significant greenfield developments during phases 4 and phase 5 via MIS funding and the change of ownership of brownfield plantations from Government and MIS to institutional investors (commencing in phase 3 with the sale of Government assets and in phase 6 with the failure of MIS). This provides an important insight for business model development that there can be sequential owners and that different funding mechanisms and the underlying investors have specific appetites for different stages of development of plantations in a region. Given the significance of the MIS, this mechanisms is defined and in simple terms it is a pooled investment structure that combines the resources of individual investors for management (investment) by an independent third party. An important distinction is required to separate the performance of the financial instrument and the underlying project (e.g. plantations) and the cause of the failure of many MIS arrangements. Institutional investment is in trees has created a new asset class – timberland and the current scale of timberland investment is US$100 billion. Institutional investors will allocate funds to an intermediary party (a Timber Investment Management Organisation - TIMOs) to purchase timberlands and the asset is then managed on behalf of the institution by expert managers. The top 10 TIMOs by funds under management control US$44.4 billion and 10 million ha of land. Inclusion of Timberland in investment portfolios has been demonstrated to improve overall returns and reduce risk due to the countercyclical nature of the returns (e.g. UniSuper and VicSuper both hold timberland assets. In support of analysis, there are a number of investment indices published for timberlands (e.g. the US National Council of Real Estate Investment Fiduciaries –NCREIF; the UK, Independent Property Databank (IPD) developed and has reported on the IPD UK Forestry Index). The overall total returns performance of timberlands has been more stable that the underlying assets to the S&P 500 Total Returns Index and the NCREIF National Property Index, which was most evident during the impacts of the global financial crisis.

Introduction

Discussions of plantation develop funding and business models up to this point has focused on direct investments where the parties directly own the plantation asset and potentially the underlying land. Indirect investments are investments where the funds invested are via a third party or financial instrument: that is there are intermediaries between the underlying project (asset) and those funding the project e.g. via MIS or institutional funds. The role of MIS and institutional funds in the development and ownership of the Australian plantation estate is noted in Figure 2 and documented in Figure 8. Previous discussion has noted the importance of these two mechanisms. This section of the report considers and analyses indirect investment as it relates to plantations.

The importance of language and terminology

To begin consideration of indirect investments, the language must be defined. The following are foundation terms:

- An instrument: '*An instrument is a tradeable asset or negotiable item such as a security, commodity, derivative or index, or any item that underlies a derivative. An instrument is a means by which something of value is transferred, held or accomplished.'*[218]
- A financial intermediary: '*A financial intermediary is an entity that acts as the middleman between two parties in a financial transaction, such as a commercial bank, investment banks, mutual funds and pension funds. Financial intermediaries offer a number of benefits to the average consumer, including safety, liquidity, and economies of scale involved in commercial banking, investment banking and asset management.'*[219]
- A fund: *'A fund is a source of money that is allocated for a specific purpose. A fund can be established for any purpose whatsoever.'* [220]
- Funds management: '*Funds management is the management of the cashflow of a financial institution. The funds manager ensures that the maturity schedules of the deposits coincide with the demand for loans. To do this, the manager looks at both the liabilities and the assets that influence the bank's ability to issue credit.'*[221]
- An investment mandate is: a '*Written authorization and/or command by a person, group, or organization (the 'mandator') to another (the 'mandatary') to take a certain course of action'*;[222]
- A fund manager: '*A fund manager is responsible for implementing a fund's investing strategy and managing its portfolio trading activities. A fund can be managed by one person, by two people as co-managers, or by a team of three or more people.'*[223]
- A portfolio: *'A portfolio is a grouping of financial assets such as stocks, bonds, commodities, currencies and cash equivalents, as well as their fund counterparts, including mutual, exchange-traded and closed funds. A portfolio can also consist of non publicly tradable securities, like real estate, art, and private investments. Portfolios are held directly by investors and/or managed by financial professionals and money managers. Investors should construct an investment portfolio in accordance with their risk tolerance and their investing objectives. Investors can also have multiple portfolios for various purposes. It all depends on one's objectives as an investor;'*[224]
- Risk: '*Risk involves the chance an investment's actual return will differ from the expected return. Risk includes the possibility of losing some or all of the original investment. Different versions of risk are usually measured by calculating the standard deviation of the historical returns or average returns of a specific investment;'*[225]

There is a specific class of investors of interest:

- An institutional investor: *'An institutional investor is a nonbank person or organization that trades securities in large enough share quantities or dollar amounts that it qualifies for preferential treatment and lower commissions.'*[226]
- An institutional fund: '*An institutional fund is a fund with assets invested by institutional investors. Institutional funds can include investments for a variety of institutional purposes including educational endowments, non-profit foundations, government and corporate investment funds, and government and corporate retirement plans.*

[218] Downloaded from https://www.investopedia.com/terms/i/instrument.asp on the 09/06/2018.
[219] Downloaded from https://www.investopedia.com/terms/f/financialintermediary.asp on the 09/06/2018.
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[224] Downloaded from https://www.investopedia.com/terms/p/portfolio.asp on the 09/06/2018.
[225] Downloaded from https://www.investopedia.com/terms/r/risk.asp on the 09/06/2018.
[226] Downloaded from https://www.investopedia.com/terms/i/institutionalinvestor.asp on the 09/06/2018.

Investment managers offer institutional funds with varying market objectives. These funds are used to build comprehensive investment portfolios for institutional clients.'[227]

A next consideration is segmentation of retail ('mums and dads') and sophisticated investors (see Box 15). A retail investor does not meet the requirement of definition as a sophisticated investor.

Box 15: The definition of a sophisticated investor as per the Corporations Act 2001 p.269.[228]

Sophisticated investors

8. An offer of a body's securities does not need disclosure to investors under this Part if:

a. the minimum amount payable for the securities on acceptance of the offer by the person to whom the offer is made is at least $500,000; or

b. the amount payable for the securities on acceptance by the person to whom the offer is made and the amounts previously paid by the person for the body's securities of the same class that are held by the person add up to at least $500,000; or

c. it appears from a certificate given by a qualified accountant no more than 6 months before the offer is made that the person to whom the offer is made:

i. has net assets of at least the amount specified in regulations made for the purposes of this subparagraph; or

ii. has a gross income for each of the last 2 financial years of at least the amount specified in regulations made for the purposes of this subparagraph a year; or

d. *the offer is made to a company or trust controlled by a person who meets the requirements of subparagraph (c)(i) or (ii).*

The Australian dynamics: the role of MIS and institutional funds

The information presented in Figure 8 highlights development of the plantation estate and change in ownership. Up to 2009 the estate's ownership was stable after initial sales of Government plantations to private interests (e.g. the sale of the Victorian government's Plantations Corporation to a consortium via Hancock Victorian Plantations in 1998[229]). From 2009, while the area of relatively stable, ownership changes occurred with increased area owned by institutional interests (e.g. superannuation funds). The change in ownership and the roles of the different investment vehicles provides a useful insight. The first point is that ownership is dynamic and second is that different financial mechanisms invest in different types of plantations (see Table 10). This insight can be used to develop an investment offer strategy and the underlying business models.

Table 10: A summary of the investment targets for MIS and institutional investors.

	MIS	Institutional funds
Greenfield plantations	Yes: investment and development using such vehicles has occurred during a number of periods. Phases 4 & 5 of the expansion of the Australian estate were via this type of vehicles.	Unlikely: Historically institutional funds have not invested in new plantings,
Brownfield plantations	No: investment in going concern plantations will impact on the tax treatment and the intent of the MIS structures.	Yes: There is a strong preference for investing in going concerns with cash flows. The risk of the investment is lower as the biological (tree growth) and management outcomes (products) can be assessed. Transfer of ownership of the Australia estate from public to private and from MIS to institutions (phases 4 to 6).

[227] Downloaded from https://www.investopedia.com/terms/i/institutionalfund.asp on the 09/06/2018.
[228] The Corporations Act 2001 p.269: Fundraising Chapter 6D Disclosure to investors about securities Part 6D.2 Offers that need disclosure to investors Division 2 Section 708.
[229] VPC (2017).

Managed investment schemes

An MIS defined

An MIS is a form of investment regulated by the Corporations Act 2001 as implemented by the Australian Securities and Investment Commission (ASIC). The attributes of an MIS are presented in Box 16. MIS offers are required to provide information to the investor in the offer document: via a current Product Disclosure Statement (PDS). It is an offence to offer a MIS without a PDS and a PDS must be registered with ASIC. A PDS must contain all the information required by the investor or investment advisers to make an "informed decision". They may include “independent experts” reports. The experts reports should verify the assumptions used in the documentation. The assumptions used and the basis of any calculations should be transparent and reproducible. Further information can be gained by reviewing specialist research house reports or ratings of such offers.

Box 16: A Managed investment scheme defined.[230]

Managed investment schemes are also known as 'managed funds', 'pooled investments' or 'collective investments'. Generally in a managed investment scheme:

- *People are brought together to contribute money to get an interest in the scheme ('interests' in a scheme are a type of 'financial product' and are regulated by the Corporations Act 2001 (Corporations Act))*
- *Money is pooled together with other investors (often many hundreds or thousands of investors) or used in a common enterprise*
- *A 'responsible entity' operates the scheme. Investors do not have day to day control over the operation of the scheme.*

Managed investment schemes cover a wide variety of investments. Some of the popular managed investment schemes that may be offered include:

- *Cash management trusts;*
- *Property trusts;*
- *Australian equity (share) trusts;*
- *Many agricultural schemes (eg horticulture, aquaculture, commercial horse breeding)*
- *International equity trusts;*
- *Some film schemes;*
- *Timeshare schemes;*
- *Some mortgage schemes.*

The distinction between the financial instrument and the underlying project

There is a clear and fundamental distinction between a MIS as financial product and the underlying project (assets) developed by the pooled funds of those investing via MIS products. The underlying project is within the MIS framework (see Figure 18). A scheme structure includes promoters of the financial product and those who undertake the technical and commercial management of the trees (e.g. plantation managers). In the past this distinction was blurred with the forest management entities linked to the MIS promoters. A plantation MIS must be properly structured, managed and regulated to safeguard the

[230] Downloaded from https://asic.gov.au/regulatory-resources/funds-management/#mis on the 08/06/2018.

investors' interests (the structure of an MIS offer involved many parties and functions of the parties - see Figure 18). The MIS business model, the ability to attract investors and availability of lending facilities to the major MIS (funds management) companies were affected by the global financial crisis and other external factors. This in turn affected the funding of the underlying plantation assets. The attractiveness of the developed forest assets attracted large scale institutional investment due to the failure of many MIS structures (see Figure 8).

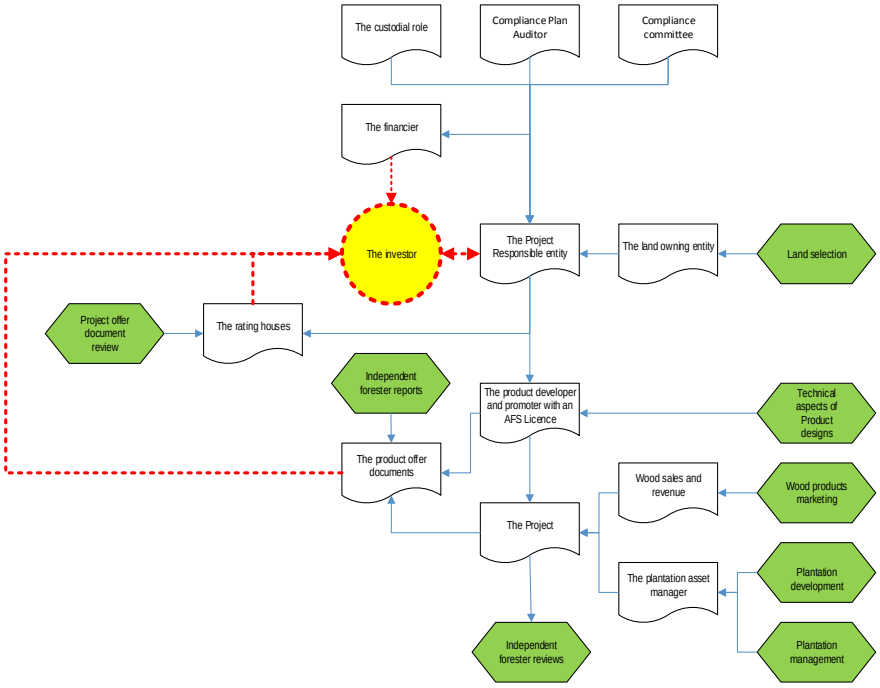


Figure 18: A generic structure of the forestry MIS project. The green cells highlight the inputs from forestry experts.

The underlying project

A wide range of underlying projects can be included in an MIS structure, not just plantation forestry investments (as noted in Box 16). The underlying project sits at the core of an MIS (see Figure 18) and a plantation forestry PDS generally offers "units" based on area of plantation development (i.e. an offer to purchase a one-hectare "woodlot"). Returns are generally realised at harvest with the scheme arrangements specifying the sharing of any returns. The tax treatment of any MIS offer will depend on the scheme itself. A PDS may highlight the tax advantages and the investment may be considered as tax-effective. A feature of many is the inclusion of an ATO ruling allowing for (a proportion of) the costs to be claimed as a tax deductible expense. In summary, an MIS is a tax deferral mechanism. Any changes to taxation law may affect current or future taxation deferrals, or worse require repayment of tax deductions claimed in previous years. In order to reduce the taxation risk element, an ATO ruling can be applied for and once granted, be included in any offer document.

Institutional investment – the rise of the TIMOs

Portfolio theory and returns

Design of a project and financial product with financial and non-financial returns must be informed by the process and tools utilized by a fund manager to determine the fit and suitability of a product after filtering by a fund's investment mandate. A

fund mandate will limit investment options to a very narrow range and a fund manager will develop an investment strategy to achieve the intent of the fund (as defined by the fund mandate). Where only one investment is to be undertaken the decision is relatively straight forward compared to comparison of multiple options for inclusion in an investment portfolio. The aim of portfolio management is to optimize risk and return of the overall portfolio with risk measured by the standard deviation of the returns generated by the combined assets in the portfolio.[231] In financial terms, the nature of returns depends on the structure of the investment: with a loan, there is an expectation of a return of the initial capital plus interest, and with an equity position, there is an expectation of a dividend as a return on investment.

Forestry as an asset class

Appendix 1 Investment asset classes presents a summary of the four broad asset classes utilized in portfolio construction to determine the optimal combination of options: cash, fixed interest, properties and equities. Often a fund's investment strategy will list a percentage allocation to the different asset classes as a basis of defining a fund. Therefore any business model and therefore product developed must be able to be classified. While there are four classic asset classes, the rise of novel products resulted in fund managers developing sub-classes and/or new classes of assets: some having added a fifth asset class referred to as Alternative assets:[232]

> *'An alternative asset is an investment that does not conform to the traditional asset classes of stock, bond or certificate. Alternative asset is usually used to describe more exotic investment options like works of art or bottles of fine wine, but the term applies to relatively common investments like residential rental real estate, as well.*

A recent pertinent example of a non-conventional investment is the rise of Timberland as a main-stream investment option. Forest assets are a specific type of investment and in the international context they are referred to as timberlands. Timberland is defined as: [233]

> *'An investment instrument used primarily by large institutional investors (such as public and private pension funds). The two main assets that underlie timberland investments are tree farms and managed natural forests. The returns on these forestland investments come from biological growth, upward product class movement, timber price appreciation and land price appreciation.'*

The rise of forests as an investment resulted in a need for services providers and a Timber Investment Management Organisation (TIMO) is one such provider:

> *'A Timber Investment Management Organization (TIMO) is a management group that aids institutional investors in managing their timberland investment portfolios. A TIMO acts as a broker for institutional clients. The primary responsibilities of TIMOs are to find, analyse and acquire investment properties that would best suit their clients. Once an investment property is chosen, the TIMO is given the responsibility of actively managing the timberland to achieve adequate returns for the investors.'*[234]

Institutional investment interest

Institutional investors have targeted forest assets as an investment since the mid 1980's and from a very small scale, by 2015, global timberland investments in timberlands was close to US$100 billion.[235] The top TIMOs by value control have USD44.4

[231] See Markowitz (1952).
[232] Downloaded from https://www.investopedia.com/terms/a/alternativeassets.asp on the 09/06/2018.
[233] Downloaded from https://www.investopedia.com/terms/t/timberlandinvestment.asp on the 09/06/2018.
[234] Downloaded from https://www.investopedia.com/terms/t/timo.asp on the 09/06/2018.
[235] New Forests (2107: p. 5) citing RISI (2015).

billion in funds and 10 million ha of land (Figure 19).[236] Australian institutional investment in plantation forestry is an area of interest with fund managers such as UniSuper maintaining forest asset investments: classified as infrastructure, Taumata Plantations (New Zealand timberlands) is one of the top 6 holdings in the asset class.[237] Another major Industry Super, Vic Super holds direct Investments via the VicSuper Future Farming Landscapes Trust worth approximately less than $200m and it also holds significant farmland, forestry and water interests in north-western Victoria.[238]

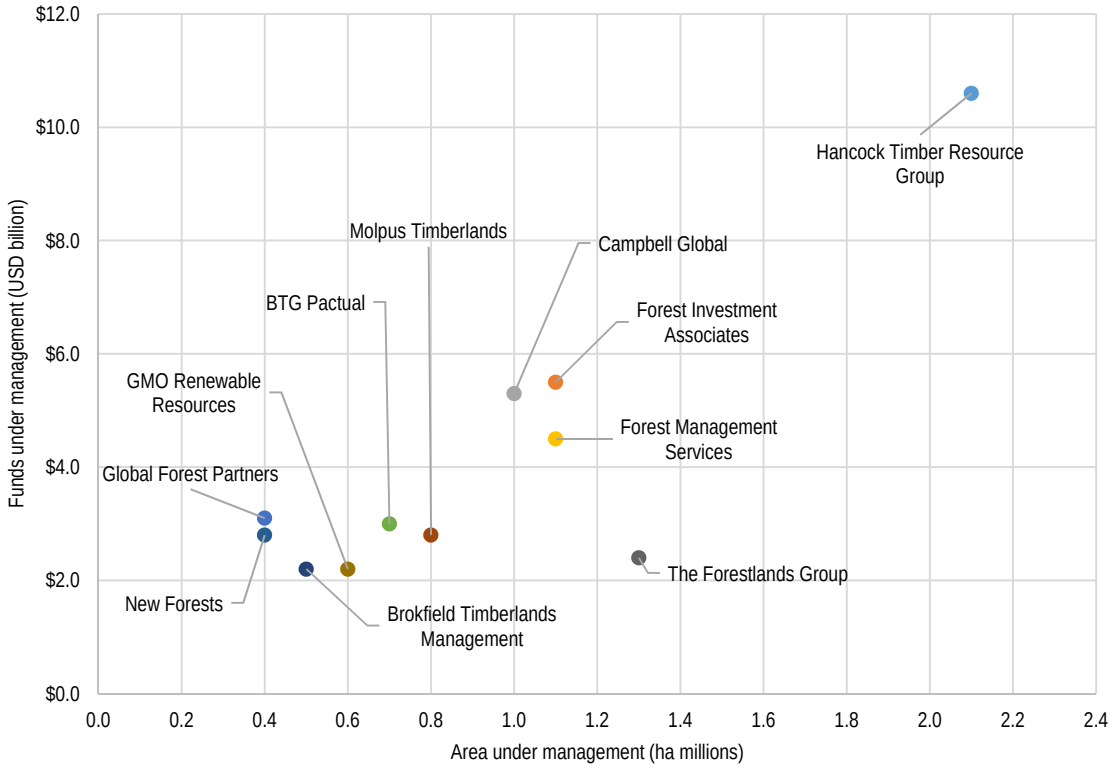


Figure 19: The top 10 TIMO by funds under management, indicating the funds managed and the area controlled.[239]

Portfolio returns and timberlands

As noted investment returns are a critical driver of interest and the ability to invest via a financial product, and a project developer is confronted with the challenge of future estimates of performance. Research has indicated that inclusion of timberland into an investment portfolio can improve returns for risk:[240]

> *'The benefits of timberland investments arise from the tendency for the investments to be negatively correlated with other investment instruments such as stocks and bonds. This negative correlation allows timberlands to be used to diversify a portfolio. Timberland investments also provide relatively high returns for the low risk they carry. However, timberland investments are not perfect investments; they are still open to risks such as high purchase prices that can depress returns, natural disasters that can destroy the forestland underlying the investment and price risks associated with the price of the trees on the land.'*

[236] Based on New Forests (2017: p.15, Table 6).
[237] Downloaded from https://www.unisuper.com.au/investments/investment-options-and-performance/major-holdings on the 09/06/2018.
[238] Industry Super (2017: p.45).
[239] Based on New Forests (2017: p.15, Table 6).
[240] Downloaded from https://www.investopedia.com/terms/t/timberlandinvestment.asp on the 09/06/2018.

Analysis has tested the impact of timberlands in an investment portfolio with positive results (see Figure 20): inclusion of timberland in the portfolio increased annual returns by 2% over a portfolio without a timberland investment for the same level of risk.

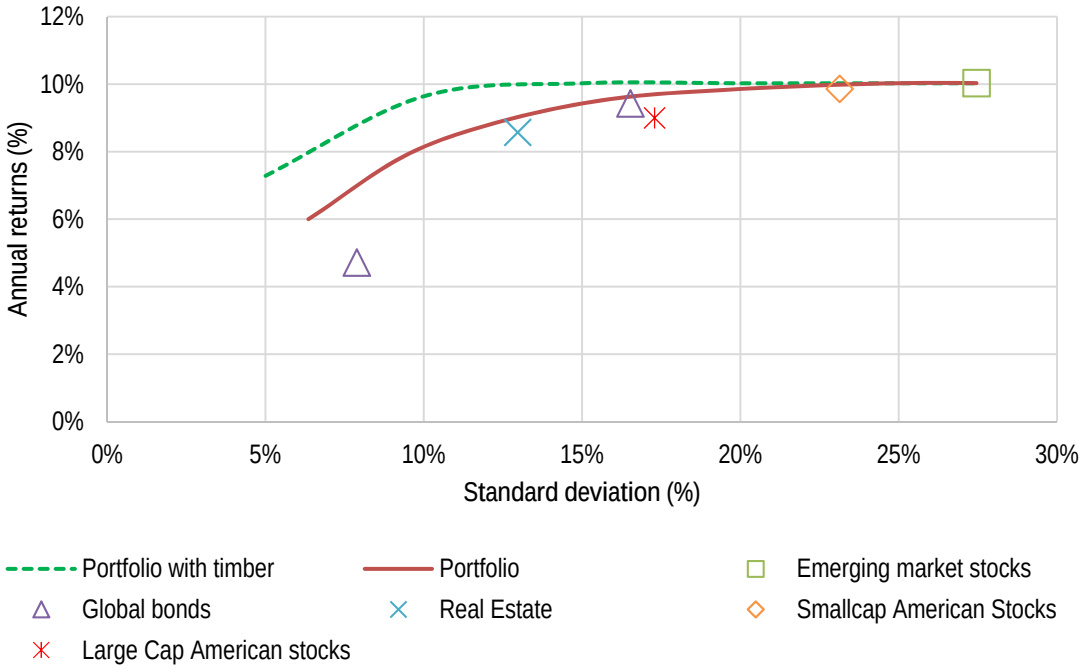


Figure 20: An example of a range of investment portfolios with and without timberlands.[241]

Returns behaviour

Investment returns indices are important tools *to compare total returns and trends* (both within and between asset classes) and returns indices are available for country specific share markets (e.g. the S&P 500 Index for the US: see the S&P web site). Care must be taken when using indices in that they may include a range of elements.[242] A number of Timberlands indices are also published, for example:

- *NCREIF Timberland Index:* The US National Council of Real Estate Investment Fiduciaries[243] (NCREIF) created and reports on a timberland index[244] since 1987[245] which includes a measure of income returns and capital appreciation;[246]
- *IPD UK Forestry Index:* In the UK, Independent Property Databank (IPD) developed and has reported on the IPD UK Forestry Index.[247]

[241] Based on IWC (2013: p.3).
[242] See S&P (2007) for more information on the S&P US indices.
[243] NCREIF - an independent association of real estate professionals (NCREIF, 2012a).
[244] See HTRG (2000a) for an overview.
[245] Downloaded from https://epitest.ncreif.org/timberland-returns.aspx on the 09/06/2018.
[246] Lutz (2001).
[247] Downloaded from https://www.struttandparker.com/knowledge-and-research/uk-ipd-forestry-index on the 09/06/2018.

Indices can be presented on a cumulative basis (see Figure 21[248] which presents quarterly NCREIF Timberland, NCREIF Farmland and NCREIF National Property indices and the US S&P 500 Total Returns Index all converted to 100 at 31st December 1992) or as quarterly returns (see Figure 22 which presents the quarterly returns for the indices presented in Figure 21). Based on the data, the US S&P 500 Total Returns Index presents a greater level of returns variation (volatility) compared to the other indices presented. The NCREIF Property Index presents the least level of returns variation.

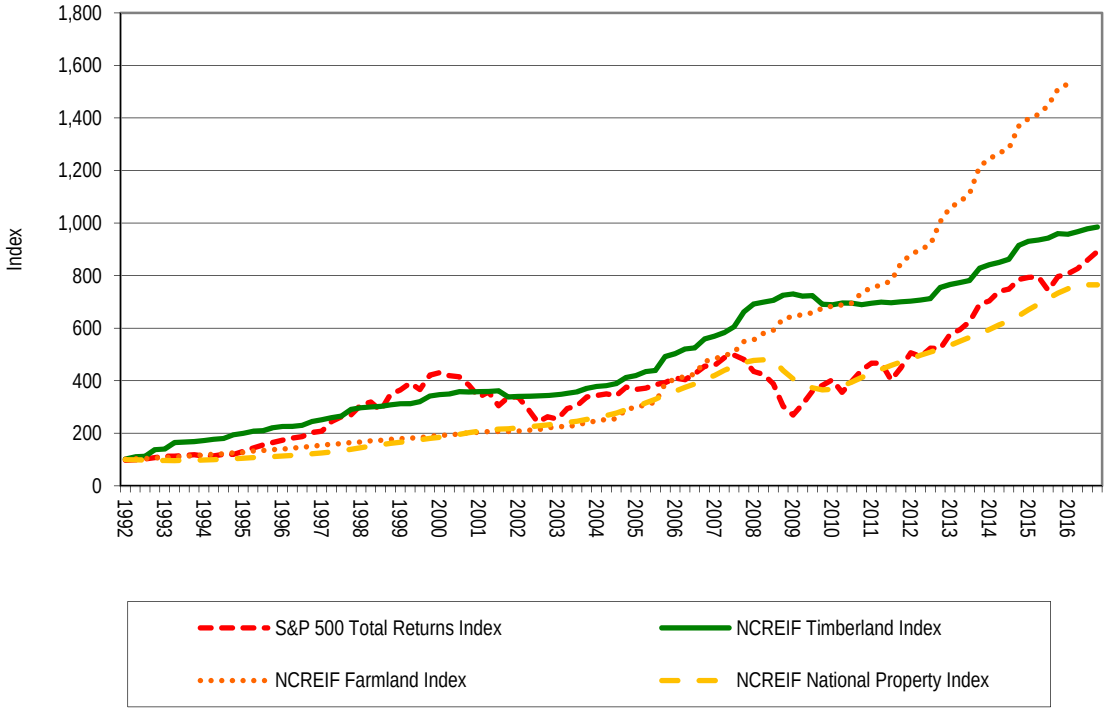


Figure 21This chart presents the quarterly NCREIF Timberlands, Farmlands and National US property indices and US S&P 500 Index. The data was converted to a base of "100" in 31st December, 1992. Note: past performance does not guarantee likely future performance, but is for information only.[249]

[248] This chart is based on Sylva Systems datasets collated from NCREIF and S&P data obtained from publicly available sources.
[249] Sylva Systems Pty Ltd datasets from publically available data: downloaded on the 09/06/2018 from https://epitest.ncreif.org/farmland-returns.aspx; https://epitest.ncreif.org/timberland-returns.aspx; https://epitest.ncreif.org/property-index-returns.aspx

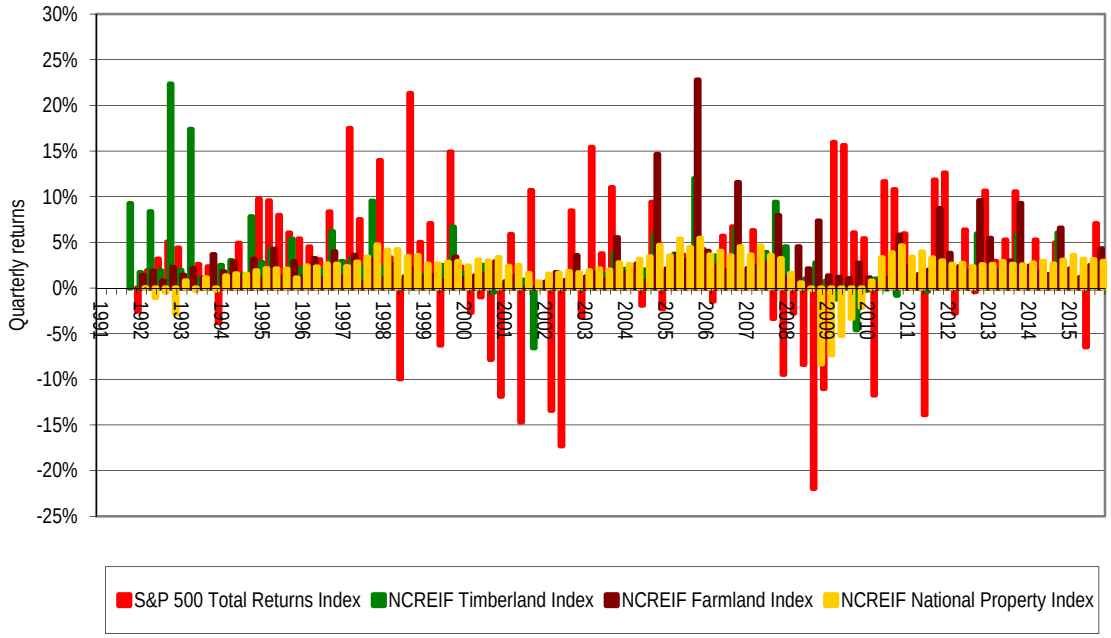


Figure 22 This chart presents the data from Figure 21 expressed as quarterly returns to indicate returns variation. Note: past performance does not guarantee likely future performance, but is for information only. (Source: *Sylva Systems Pty Ltd.*)

Part C: Forest policy in Australia

Forest policy in Australia

Summary

Policy initiatives have been highly successful in developing the national softwood estate towards self-sufficiency (via The Softwood Forestry Agreement Acts -1960s and 1970s; State-based farm woodlots loans 1960s and 1970s). An adverse outcome of the conversion of many natural forest sites to softwood plantations included a significant loss of social licence. More recent Government policy initiatives have aimed to improve the profitability of private land used for plantations by removing impediments to investment and providing greater certainty to long-term forest investments, rather than by direct facilitation:

- The National Afforestation Program (1987 to 1992);
- The National Forest Policy Statement (1992);
- The Wood and Paper Industry Strategy (1995 to 1999);
- The National Farm Forestry Programme (1996 to 2001);
- The Plantations for Australia: The 2020 Vision (1997; 2002):
- Action Agenda for the Forest and wood products action agenda (2000):
- The Farm Forestry National Action Statement (2005) ;
- Transforming Australia's forest products industry (2016).

Recognising the need for expanded hardwood plantations, the National Afforestation Program (NAP) sought to increase the knowledge base while providing environmental repair by direct engagement with industry. It also provided direct support to the establishment of 6,000 ha of plantations. The NAP experience provided insights to inform the development of subsequent policy (e.g. a need for an enabling policy environment, the need to match grant structures to policy and how generate commercial outcomes and address environmental goals).

The 1992 National Forest Policy Statement (NFPS) was significant as it created the foundation of plantation development post the previously successful loan schemes. A key intent was the integration of environmental sustainability and commercial production while expanding the estate supported by R&D (e.g. increasing productivity, land capacity assessments and integration of trees into agriculture). As an evolution from natural forest conversion its focus was on cleared agricultural land and the integration of trees into agriculture (with associated benefits). The NFPS recognised the importance of focus on land within economic haul distance of markets. The NFPS initiated taxation reviews (leading to MIS), enabled a range of other mechanisms (e.g. joint ventures and forestry rights), encouraged States to address planning and land rating issues, and sought to promote the wider benefits of trees via Landcare and other community groups.

In support of research, the Forest and Wood Products Research and Development Corporation (FWPRDC) was established in 1994 allowing industry co-contribution towards an internationally competitive, sustainable and environmentally responsible forest and wood products industry. The Wood and Paper Industry Strategy (WAPIS) ran from 1995 to 1999 and aimed to develop the wood and paper industries while protecting forests for future generations. The approach was to enable the industry

by among other things, encouraging a significant expansion of Australia's plantation and commercial farm forestry resource and addressing impediments to investment. A critical success of the WAPIS was the establishment of the NPI in 1997. The National Farm Forestry Programme (NFFP: 1996 to 2001) aimed to encourage the incorporation of commercial tree growing and management into farming systems for wood and non-wood production, increasing agricultural productivity and sustainable natural resource management. A key outcome of the NFFP was the establishment of a network of Regional Plantations Committees (RPCs) which operated until 2009. A milestone policy initiative was the establishment of the Plantations for Australia: the 2020 Vision in 1997 with an aim to treble the plantation estate by 2020. The strategy aimed to enhance regional wealth creation and international competitiveness through a sustainable increase in Australia's plantation resources. The Vision was revised in 2002 in response to social disruption caused by rapid expansion of the hardwood estate, to respond to market opportunities and to take account of a swap from public to private ownership of a significant proportion of the national estate. The Action Agenda for Forest and Wood Products initiative in 2000 provided a framework by which industry could pursue sustainable competitive advantages via 12 strategies including the key outcome of developing the Australian Forestry Standard (AFS). Other strategies focussed on markets, investment, innovation and linkages (national and regional). This was the first main forest policy initiatives to not make specific reference to farm forestry nor plantations. A Farm Forestry National Action Statement was launched in 2005 with a vision to increase the adoption of commercial tree growing and management as a widely accepted part of Australian farming and as a component of regional natural resource planning for the production of wood and non-wood products, and natural resource management benefits. A key focus was the coordination of Australian, State and Territory government policies, develop linkages between parties, quantify the benefits of farm forestry and promote markets for farm forestry outputs.

The Forest Industry Advisory Council's (FIAC) statement 'Transforming Australia's forest products industry' 2016 recognised the significant changes in the operating environment (e.g. the rise of bio products) and the resulting opportunities that demand change to the Australian sector in order to realise the potentials. Recognising lessons from previous experience, a caveat is placed on plantation expansion on unsuitable sites (as defined by biophysical and logistics considerations such as distance to market). While previous policy had described an objective of commercial plantings, FIAC's statement defines this important concept. Access to renewable energy opportunities created by renewable energy targets (RETs) and access to the Emissions Reduction Fund (ERF) was regarded an imperative.

Given the importance of taxation issues, a past review focused on implications for the forestry sector was analysed and many of the resulting changes have had direct relevance to plantation forestry: a key point is that analysis is required of any proposed and actual changes to the taxation system to identify any subsequent taxation related issues which require addressing.

Numerous State Acts address conservation issues with implications for forestry, including Codes of Logging Practice, land-use planning, and flora and fauna protection. Other acts or legislation also cover the establishment and administration of National Parks, and regulate water rights and use. This project did not specifically assess the current state of State policy in regard to the treatment of plantations. A specific point is that State and Territory Governments have more direct opportunities to invest directly in plantations compared to the Australian government.

Introduction

Australia has developed and implemented an almost continuous string of national 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 evolve and expand. Thew following section presents an analysis of the national policy frameworks and specific examples of State policy to better understand the content and intent of policy.

Forest policy tools

A significant proportion of the Australian plantation estate developed over the past five decades has been associated Australian Government and State Government policies to actively promote of plantation expansion (see Figure 2, Figure 8 & Figure 9) including:[250]

- The Softwood Forestry Agreement Acts (in the 1960s and 1970s);
- State-based farm woodlots loans (in the 1960s and 1970s);

More recent Government policy initiatives have aimed to improve the profitability of private land used for forestry by removing impediments to investment and providing greater certainty to long-term forestry projects. Details are presented in Table 11 and following are the main initiatives:

- The National Afforestation Program (NAP) (1987 to 1992);
- The National Forest Policy Statement (1992);[251]
- The Joint Venture Agroforestry R&D Program (1993 to present)
- The National Forest Policy Statement (1995);[252]
- The Wood and Paper Industry Strategy (1995 to 1999);[253]
- The National Farm Forestry Programme (1996 to 2001);[254]
- The Plantations for Australia: The 2020 Vision (1997; 2002);[255]
- Action Agenda for the Forest and wood products action agenda (2000);[256]
- The Farm Forestry National Action Statement (2005);[257]
- Transforming Australia's forest products industry (2016). [258]

[250] Low et al. (2010: p.3).
[251] Commonwealth of Australia (1992).
[252] Commonwealth of Australia (1995a).
[253] Commonwealth of Australia (1995b)
[254] AFFA (2002: p.24).
[255] Plantations 2020 (1997).
[256] AFFA (2000).
[257] AFFA (2005: p.1).
[258] Commonwealth of Australia (2016: p.2).

Table 11: A summary of the key Government initiatives (up to 2002, based on Catton et al. 2004; post 2002 based on identified actions).

Date started/ ended	Brief description of incentive	Initiated by	Target group	Funding	Outcomes/impacts
1966 - 1982	Commonwealth Softwood Loan Agreement Act	Commonwealth	State forest agencies	Direct	Large increase in softwood planting
1980 - present	Taxation deductibility arrangements for plantation establishment, Managed Investment schemes, reduction of company tax rates	Commonwealth	Timber industry	Direct	Improved attractiveness of plantations as investment vehicles and viable alternative options for diversification
1987 - 1989	National Afforestation Programme	Commonwealth	State and private forests	Direct	Contributed to a 6 000 ha increase in hardwood plantations
1989 - present	Landcare: environmental issues an additional factor in planting trees	Joint Commonwealth and state	Timber industry and conservationists	Direct	Enhanced environmental gains arising from community participation and strategic targeting of national environmental issues, greater public awareness and acceptance of forest management practices
1990	Grants to downstream processors	Commonwealth	States	Direct	Improved integrations and efficiency, value adding, greater market demand
1990 - present	Relaxation of foreign investment rules	Commonwealth	International timber industry	NA	Increased foreign investments in plantations with improved attractiveness to potential new investors
1990s - present	Dissemination of information for investors and landholders	Commonwealth, states and industry	Timber industry	NA	Greater awareness of government programmes, superior decision-making, increased plantation rates and areas
1990s Early mid	Numerous development incentives designed to attract and encourage new investors to forest plantation, maintain and improve quality and quantity of existing plantations, incentives for large-scale processors	State and private (normally larger timber and paper companies)	Private landholders	Direct	Numerous - often specific according to who funded the incentive ,e.g. encourage reforestation within reasonable distance of paper mills, establish private softwood and hardwood plantations, increase pulpwood supply, re-establish plantations on suitable lands after harvesting, farmers to grow trees commercially
1992 - present	National Forest Policy Statement	Joint Commonwealth and state	Timber industry	NA	Integrated environmental sustainability and commercial production for Australia's public and private forests, with specific commitments to improve the management of commercial plantations
1993 - present	Joint Venture Agroforestry Programme	Commonwealth	Timber industry (including farm forestry)	Direct	Integrating sustainable and productive agroforestry within farming systems
1993 - present	National Plantation Inventory	Joint Commonwealth and state	Timber industry	NA	Support the 2020 Vision, through provision of reliable and transparent quantitative data series to aid regional and national resource planning and guide investment in plantations and associated downstream industries
1995 - 1999	WAPIS	Commonwealth	Timber industry and processors	NA	Greater research and downstream processing, expansion of farm forestry and the plantation sector, and improved information on plantation areas and wood flows
1995 - present	Regional Forest Agreements	Commonwealth	State, timber industry and conservationists	Direct to state	Certainty of resource availability, comprehensive reserve system and sustainability
1995 - present	Establishment of networks to provide advice and streamline planning approvals (Regional Plantation Committees)	Commonwealth	Timber industry and private landowners	Indirect	Provide focal point in 17 regions to disseminate information and encourage plantation establishment and farm forestry

Date started/ ended	Brief description of incentive	Initiated by	Target group	Funding	Outcomes/impacts
1995 - present	National Competition Policy	Joint Commonwealth and state	Timber industry	NA	Removal of unfair competitive advantage of state-owned forest corporations
1996 - present	Removal of Export Controls on wood from plantations	Commonwealth	Timber industry	NA	Increased access to export markets, creating additional demand for forest products
1997 - 2001	Natural Heritage Trust 1	Joint Commonwealth and state	Commonwealth, states, timber industry, private and communities	Direct	Assists farm forestry programmes and contributes to broader environmental services by, in part, community involvement and stimulating additional investment in the natural environment sustainably
1997 - present	Plantations 2020 Vision strategy	Joint Commonwealth, state and industry	Timber industry	NA	A trebling of Australia's forest plantation area by 2020 through removing impediments, encouraging value adding and regional development, and contributing to environmental services and a market-driven timber industry
1998 - present	National Farm Forest Inventory	Joint Commonwealth, state and industry	Farm forestry	NA	Support the development of farm forestry and plantations generally by the collection, interpretation and dissemination of data, and assist to monitor the outcomes of the NFFP
2000 - present	Australian Forestry Standard	Joint Commonwealth, states and industry	Timber industry	NA	Provides credibility of Australia's sustainable forest management practices and improved sale of forest products to global markets
2000 - present	Action Agenda for Forest and Wood Products	Commonwealth	Timber industry	NA	Promotion of demand-side initiatives, encompassing such issues as value adding, expanding non-traditional forest and wood uses, and market and investment development
2001 - present	Investor attractiveness framework e.g. reduced interest rates, attractive exchange rate, incentives for large-scale processors	Commonwealth	Timber industry	NA	Attracts and facilitates investment, reduced cost of production, improved competitiveness of operations
2002 - present	Tax equity package	Commonwealth	Timber industry	NA	A range of tax measures for current and future investors in plantations. Removed impediments will ensure forest plantations are treated equally with other rural industries, especially agriculture.
2002 - present	Natural Heritage Trust 2 (restructure of Natural Heritage Trust 1 with additional funding)	Joint Commonwealth and state	States, timber industry, private and communities	Direct	More strategic focus on environmental services and improved natural resources management. Mainly assists farm forestry
Ongoing	Infrastructure provision (e.g. roads and port facilities)	Commonwealth and state	Regional Australia and associated rural industries	Indirect	Attracts and facilitates investment, reduced cost of production, opens new areas to forestry
2005	The Farm Forestry National Action Statement	Commonwealth and state	States, timber industry, private and communities	NA	The FFNAS vision was to increase the adoption of commercial tree growing and management as a widely accepted part of Australian farming and as a component of regional natural resource planning for the production of wood and non-wood products, and natural resource management benefits.
2016	Transforming Australia's forest products industry	Joint Commonwealth, states and industry	States, timber industry, private and communities	NA	The statement recognised that there are emerging product and market opportunities, and that there was a need to improve productivity and competitiveness, while securing a sustainable supply of forest resources..

National forest policy and actions

Self-sufficiency and the National Softwood Loans (1963)

In 1949, the State and Commonwealth forest service heads met with a residual 'co-operative federalism' resulting from World War II's timber control and a strong resolve never to see again timber shortages (a complete cessation of imports during World War II) and with the added pressure of the demand for wood for post-war reconstruction.[259] The policy objective was enhanced by declining native hardwood forest supply and a steadily increasing supply from plantation softwoods.[260] The Australian Forestry Council (AFC) was created in 1963-64 and had a major function and objective not just *'to formulate and recommend a forestry policy for Australia*' *but to do so 'directed in particular to the development of Australian forests to meet the national requirements for timber and forest products, both for domestic use and for export'.* [261] At a second meeting of AFC in 1964 it was agreed in principle to *'making Australia self-sufficient in softwood timber by the year 2000' through an accelerated annual program of 30,000 hectares*[262] *on the grounds of replacement of imports (then worth about £100 million), its contribution to decentralisation (a matter of particular political interest at the time) and the provision of additional employment*".[263] M. R. Jacobs as advisor to the Commonwealth Government (in his role of Director-General of the Forestry and Timber Bureau) suggested that:[264]

> *"….an appreciable proportion of imports should be phased out because of their relative cost and their effect on the level of foreign exchange; because most of their alternatives could be grown in Australia to the benefit of rural communities; because it would avoid a repetition of past shortages in times of military and economic crisis; and because of the long-term uncertainty of supply from other countries".*

Each State service directed its own program to suit State political philosophies and economic constraints, while drawing on the "spirit of community effort" toward the goal of national self-sufficiency.[265]

The National Afforestation Programme (1987 to 1992)

The Australian Government established the National Afforestation Program (NAP) in 1987 to stimulate an expansion of commercial hardwood timber, assist in land rehabilitation and control degradation through afforestation. Nearly $15 million over three years was targeted for state and large private industrial growers: it was the first production forestry initiative that directly sought to engage private landholders, but it was not really designed to address the needs of non-industrial forest managers.[266] NAP funded the establishment of 6,000 ha of hardwood plantations and supported research on tree productivity.[267] In 1989, NAP was expanded and replaced by the "One Billion Trees and Save the Bush" programmes with a clear focus on biodiversity conservation and was later supplemented by initiatives such as the 'Corridors of Green Programme' and the 'Wet Tropics Tree Planting Scheme' in North Queensland. In 1997, these were all incorporated in the Bushcare Programme with the advent of the Natural Heritage Trust 1.[268] The outcomes of the NAP program were attributed to:

[259] Carron (1990: p.17).
[260] Carron (1990: p.17).
[261] Carron (1990: p.17&18).
[262] This would equate to an estate of 36 years by 30,000 ha/y = 1,080,000 ha on top of the existing estate at that time.
[263] Carron (1990: p.17&18).
[264] Carron (1990: p.17&18).
[265] Carron (1990:
[266] Catton et al. (2004).
[267] Dargavel (1995)
[268] Catton et al. (2004).

- *Policy issues:* It lacked a supportive policy framework to deal with the underlying social, economic and institutional impediments to plantation development;[269]
- *Reduced efficacy:* Impediments from the lack of a broader enabling policy environment which offset the advantages and effectiveness of a direct grant;[270]
- *Focus:* A dilution of program objectives away from commercial objectives (e.g. environmental goals).

Australia's National Forest Policy Statement (1992)

The Australian Government developed a National Forest Policy Statement (NFPS) in 1992[271] in conjunction with the States as a primary means for integrating environmental sustainability and commercial production.[272] The policy vision and national gaols are presented in Box 17 and Box 18. The policy addresses all aspects of forest management and the forestry sector with specific national goals in regards to plantations and supporting research and development:[273]

- *Plantations. One goal is to expand Australia's commercial plantations of softwoods and hardwoods so as to provide an additional, economically viable, reliable and high-quality wood resource for industry. Other goals are to increase plantings to rehabilitate cleared agricultural land, to improve water quality, and to meet other environmental, economic or aesthetic objectives;*

- *Research and development. The goals are to increase Australia's national forest research and development effort and to ensure that it is well coordinated, efficiently undertaken and effectively applied. This research will expand and integrate knowledge about the many aspects of native forests, plantations, forest management, conservation, and forest product development.*

Box 17 The National Forest Policy Statement vision. [274]

The vision

The Governments share a vision of ecologically sustainable management of Australia's forests. This vision has a number of important characteristics:

- *The unique character of the Australian forested landscape and the integrity and biological diversity of its associated environment is retained.*
- *The total area of forest is increased.*
- *There is a 'holistic' approach to managing forests for all their values and uses so as to optimise benefits to the community.*
- *Private forests are managed in an ecologically sustainable manner and in close cooperation with public forest managers, to complement the conservation and commercial objectives of public forests.*
- *A range of sustainable forestbased industries, founded on excellence and innovation, will be expanding to contribute further to regional and national economic and employment growth.*
- *Forests and their resources are used in an efficient, environmentally sensitive and sustainable manner.*
- *Forest management is effective and responsive to the community.*
- *The Australian community will have a sound understanding of the values of forests and sustainable forest management, and will participate in decision-making processes relating to forest use and management.*

[269] Donaldson (2001) cited in Catton et al. (2004).
[270] Catton et al. (2004).
[271] Commonwealth of Australia (1992; 1995).
[272] Catton et al. (2004).
[273] Commonwealth of Australia (1992; 1995: p.4&5).
[274] Commonwealth of Australia (1992; 1995: p.3).

Box 18 The National Forest Policy Statement national goals.[275]

The Governments agree that, to achieve their vision for the forest estate and to ensure that the community obtains a balanced return from all forest uses, eleven broad national goals must be pursued. These goals should be pursued within a regionally based planning framework that integrates environmental and commercial objectives so that, as far as possible, provision is made for all forest values. The eleven broad national goals are as follows:

- *Conservation. The goals are to maintain an extensive and permanent native forest estate in Australia and to manage that estate in an ecologically sustainable manner so as to conserve the full suite of values that forests can provide for current and future generations. These values include biological diversity, and heritage, Aboriginal and other cultural values.*
- *Wood production and industry development. The goal is for Australia to develop internationally competitive and ecologically sustainable wood production and wood products industries. Efficient industries based on maximising value-adding opportunities and efficient use of wood resources will provide the basis for expansion in wood products manufacturing, which in turn will provide national and regional economic benefits.*
- *Integrated and coordinated decision making and management. The goals are to reduce fragmentation and duplication in the land use decision-making process between the States and the Commonwealth and to improve interaction between forest management agencies in order to achieve agreed and durable land use decisions.*
- *Private native forests. The goal is to ensure that private native forests are maintained and managed in an ecologically sustainable manner, as part of the permanent native forest estate, as a resource in their own right, and to complement the commercial and nature conservation values of public native forests.*
- *Plantations. One goal is to expand Australia's commercial plantations of softwoods and hardwoods so as to provide an additional, economically viable, reliable and high-quality wood resource for industry. Other goals are to increase plantings to rehabilitate cleared agricultural land, to improve water quality, and to meet other environmental, economic or aesthetic objectives.*
- *Water supply and catchment management. The goals are to ensure the availability of reliable, high-quality water supplies from forested land and to protect catchment values.*
- *Tourism and other economic and social opportunities. The goal is to manage Australia's forests in an ecologically sustainable manner for a range of uses, including tourism, recreation and production of non-wood products.*
- *Employment, workforce education and training. The goal is to expand employment opportunities and the skills base of people working in forest management and forestbased industries.*
- *Public awareness, education and involvement. The goals are to foster community understanding of and support for ecologically sustainable forest management in Australia and to provide opportunities for effective public participation in decision making.*
- *Research and development. The goals are to increase Australia's national forest research and development effort and to ensure that it is well coordinated, efficiently undertaken and effectively applied. This research will expand and integrate knowledge about the many aspects of native forests, plantations, forest management, conservation, and forest product development.*
- *International responsibilities. The goals are to promote nature conservation and sustainable use of forests outside Australia and to ensure that Australia fulfils its obligations under relevant international agreements.*

The NFPS committed Governments to objectives in relation to Australia's plantation resource:[276]

- *Land and Agriculture: To increase commercial plantation development on cleared agricultural land and, where possible, to integrate plantation enterprises with other agricultural land uses;*
- *Productivity: To improve the productivity of existing plantation areas by means of improved technology, breeding of genetically improved stock, and selection of species;*

[275] Commonwealth of Australia (1992; 1995: p.4&5
[276] Commonwealth of Australia (1992; 1995: p.25).

- *Expansion: To continue to encourage industrial growers, and where appropriate public forestry agencies, to expand their plantation base to satisfy specific requirements.*

The NFPS acknowledged the merit of commercial wood production integrated with other agricultural pursuits on cleared agricultural land, particularly in higher rainfall areas within economic haul distances of markets. The NFPS recognised that plantations can increase agricultural productivity and profitability; diversify farm income; provide land and water conservation; rehabilitate degraded lands; on cleared agricultural land provide a carbon sink, which may have benefits in reducing the impacts of the enhanced greenhouse effect.[277] The NFPS proposed the following:[278]

- *Taxation:* The Australian Taxation Office is to issue a comprehensive public ruling relating to private forestry activities;
- *Export controls:* Remove controls on the export of unprocessed wood from private plantations;
- *Forestry rights:* State Governments will establish a legal basis for separating the forest asset from the land asset for the purposes of selling timber;
- *Joint ventures:* Joint ventures between plantation development companies and landowners are subject to the fundraising provisions of the Corporations Law. The provisions including joint venture arrangements, were reviewed by the Australian Law Reform Commission and the Companies and Securities Advisory Committee;
- *Managed Investment Schemes:* The long-term nature of plantation investments, can cause difficulties in attracting investment capital. The Commonwealth will encourage the establishment of 'pooled development funds' for promoting long-term investments, including plantation development. These funds are investment companies that provide 'patient equity capital' for Australian companies, subject to some conditions. Companies registered as pooled development funds are concessionally taxed at a rate of 30 per cent rather than at the general company tax rate of 39 per cent. The funds will provide an incentive for companies and individuals to invest in a range of plantation companies;
- *State planning:* There was a need for State and local governments to simplify planning procedures and to ensure that land use planning controls and land rating systems do not discriminate against plantation development. In this regard the States were to take two actions:
    - State Governments were to pursue planning policies that provide zoning suitable for commercial planting on private lands: tree planting and subsequent harvesting for commercial wood production will be an 'as of right' use.
    - The State Governments were to ensure that the local government rating supported the retention of native forests and expansion of the forest estate by removing disincentives to the conservation of native forests and the establishment of plantations on cleared agricultural land.
- *Information:* The Governments also recognised that there was a need for further public education and better training in relation to plantation development. Information about the financial, social and environmental benefits of tree planting on cleared land for commercial purposes was to be directed at farmers and other landowners and at investment advisers, bankers, accountants and investment institutions;

[277] Commonwealth of Australia (1992; 1995: p.26).
[278] Commonwealth of Australia (1992; 1995: p.26 to 28).

- *R&D:* The Governments was to support enhanced plantation research and development efforts, particularly in relation to improved technology and processes, tree breeding, species selection, land capability assessment, and integration of commercial wood production with agricultural activities;
- *Other benefits:* The Governments acknowledged the importance of reforestation for environmental, aesthetic purposes, major economic benefits for private landowners, widespread community benefits and facilitating the conservation of native fauna. The Governments was to seek to promote the wider benefits of plantations through Landcare and other community groups.

The Forest and Wood Products Research and Development Corporation (1994 - ongoing)

As a key initiative under the NFPS, was the establishment in 1994 of the Forest and Wood Products Research and Development Corporation (FWPRDC) in partnership with industry. The aim of FWPRDC was to promote and facilitate effective R&D, to advance an internationally competitive, sustainable and environmentally responsible forest and wood products industry in Australia.[279] In 2007, the FWPRDC was converted into Forest and Wood Products Australia (FWPA). FWPA operates within the rules and laws set by its Constitution, the Corporations Act of 2001 (Cth), and a Statutory Funding Agreement (SFA) with the Australian Government.[280] The current FWPA's vision and mission are:[281]

> *Our Vision: That forest and wood products are the preferred, sustainable material that meets the market needs.*
>
> *Our Mission: To work with stakeholders to identify and deliver collaborative programs that improve the competitiveness, and market and community acceptance, of forest and wood products.*

The Wood and Paper Industry Strategy (1995 to 1999)

The development of the Wood and Paper Industry Strategy (WAPIS) strategy was driven by the Wood and Paper Industry Council, chaired by the Minister for Industry, Science and Technology. The council membership was drawn from industry, unions and other key stakeholders.[282] In December 1995, the Commonwealth launched the four-year WPIS, aimed at developing the wood and paper industries while protecting forests for future generations. It focused on industrial development, value adding and new investment.[283] The WAPIS aimed to enable investment with a focuses on:[284]

- *Promoting international competitiveness, value adding and ecological sustainability;*
- *Providing certainty of access to resources from native forests, plantations and recycled materials;*
- *Encouraging a significant expansion of Australia s plantation and commercial farm forestry resource;*
- *Removing impediments to investment and tackling microeconomic reform;*
- *Opening up markets, particularly in the Asia-Pacific region;*
- *Ensuring a skilled and flexible workforce;*
- *Encouraging innovation and research and development;*
- *Improving regional job opportunities;*

[279] AFFA (2002: p.12).
[280] Downloaded from http://www.fwpa.com.au/about-us.html on the 23/05/2018.
[281] Downloaded from http://www.fwpa.com.au/about-us.html on the 23/05/2018.
[282] Department of the Prime Minister and Cabinet (1995).
[283] AFFA (2002a: p.24).
[284] Downloaded from http://www.agriculture.gov.au/forestry/policies/rfa/publications/deferred/wood-paper/why on 20/05/2018.

- *Fostering community understanding of and involvement in the wood and paper industry in the regions.*

The initiative included:[285]

- *Encouraging greater innovation, value-adding, and downstream-processing of woodchips currently exported;*
- *Removing impediments to investments and hastening the pace of microeconomic reforms crucial to the international competitiveness of the industry;*
- *Opening export markets -- particularly in the Asia-Pacific region -- and maximising import replacement;*
- *Helping to build the industry's skills and creating regional job opportunities · encouraging increased plantation and farm forestry development, and*
- *Improving data on the resources potentially available to the industry, especially from plantations, farm forests, and recycled materials.*

Improved information on plantation areas and wood flows was one of the key achievements of this Strategy, aided by the creation in 1997 of the NPI.[286]

The Joint Venture Agroforestry R&D Program (1993 to present)

The Joint Venture Agroforestry R&D Program (JVAP)[287] was established in 1993 and aimed to integrate agroforestry into Australian farming systems (see Box 19). Its core partners are the Rural Industries Research and Development Corporation (RIRDC – as managing agent), Land & Water Australia, and Forest & Wood Products Australia. The Natural Heritage Trust and Murray-Darling Basin Commission also contributed significant resources to the program.

Box 19: JVAP the peak research body for farm forestry related issues.[288]

'The objective of the program was to provide knowledge to underpin profitable, sustainable and resilient agroforestry within Australian farming systems and landscapes. Farm forestry has a critical role to play in the dramatically changing contexts of climate change and emissions trading policies and programs.

JVAP has:

- *developed an economic model to show agroforestry benefits*
- *highlighted market links between farming and processing*
- *reviewed the removal of impediments to farm forestry development*
- *released information on tree water use and species selection*
- *published guidelines for revegetating areas that have shallow, saline watertables, and*
- *released a report on tree performance databases and selection systems.*

The program disseminates information through reports and newsletters. It has developed a series of publications titled Water and Salinity Issues in Agroforestry and has produced the book Commercial Timber Species for Sub-tropical Australia.'

[285] Beddall & Cook (1995).
[286] AFFA (2002: p.24).
[287] Downloaded from http://lwa.gov.au/programs/joint-venture-agroforestry-program on the 26/05/2018.
[288] Downloaded from http://lwa.gov.au/programs/joint-venture-agroforestry-program on the 26/05/2018.

The National Farm Forestry Programme (1996 to 2001)

The National Farm Forestry Programme (NFFP) was a Commonwealth Government programme operated from 1996 to 2001, funded from National Heritage Trust 1 (NHT 1). The aim of the NFFP was to encourage the incorporation of commercial tree growing and management into farming systems for wood and non-wood production, increasing agricultural productivity and sustainable natural resource management. This was to be assisted at the regional level by establishing Regional Plantation Committees (RPCs), to promote information networks, increase the skill base, initiate demonstration projects and design regional strategies.[289] Funding of RPCs continued until withdrawn in 2009, leading to the closure of some RPCs and moves toward greater cost-sharing with state government and other partners for those RPCs still operating in key plantation regions.[290] The motivation of adoption of farm forestry was assisted by farmers seeking to diversify and enter new market as a risk management strategy, investors establishing plantations on farmland through joint ventures or annuity schemes, agricultural gains (e.g. increased agricultural yields) and environmental services (e.g. soil and water conservation).[291] This was mitigated to some extent by the initial establishment costs and long lag-time for returns, future market uncertainty and initial lack of information and support networks.[292]

Plantations for Australia: the 2020 Vision (1997)

The Plantations for Australia: the 2020 Vision[293] was developed by industry and Government in response to the NFPS.[294] The 'Plantations 2020 Vision' strategy aimed to enhance regional wealth creation and international competitiveness through a sustainable increase in Australia's plantation resources, setting a notional target of trebling the area of commercial tree crops by 2020 (see Box 20, Box 21 & Box 22).[295] The 2020 Vision was endorsed in July 1996 by the Ministerial Council on Forestry, Fisheries and Aquaculture accepting the industry target of trebling the plantation estate by the year 2020. The 1997 version of the 2020 Vision was revised and re-published in 2002[296] in response to a number of matters including:[297]

- *Social and environmental changes being experienced by communities in areas where plantations have developed rapidly;*
- *Maximising the potential economic and environmental benefits of plantations through market development, and integrating growers and processors;*
- *The change in the plantation estate from public to private ownership (around one quarter of the resource established since 1990 is wholly publicly owned); and*
- *The contribution to the resource by farm foresters.*

The 2020 Vision was to be achieved by the development in consultation with relevant stakeholders, of a realistic and achievable national strategy.[298]

[289] AFFA (2002: p.24).
[290] de Fégely et al.(2011: p.54).
[291] AFFA (2002: p.24).
[292] AFFA (2002: p.24).
[293] Plantations 2020 (1997).
[294] Commonwealth of Australia (1992).
[295] Plantations 2020 (2002: p.1).
[296] Plantations 2020 (2002).
[297] Plantations 2020 (2002: p.4).
[298] Plantations 2020 (2002: p.1).

Box 20 The Plantations for Australia: the 2020 Vision's vision.[299]

The Vision

The sustainable expansion of the plantation forest estate will be achieved with significant private sector investment. By 2020, the expanded plantation forest estate will provide Australia's plantation-based processing industries with the capacity to:

- *operate in the global marketplace;*
- *be internationally competitive; and*
- *be commercially oriented—market driven and market focused in all their operations.*

Returning trees to the landscape as a profitable crop can also significantly benefit rural and regional communities and the environment.

Box 21 The Plantations for Australia: the 2020 Vision's target.[300]

The Target

The Vision has a notional target of trebling the effective area of Australia's plantations between 1997 and 2020. This does not necessarily mean each region must treble its plantation area. Different regions will make different contributions to achieving the target, in line with the availability of suitable land and prevailing market opportunities. It is noted that plantation area is only one measure of the success of the Plantations 2020 Vision. The quality, product mix, location and effective management of the plantation resource will also be vital to the delivery of maximum social, economic and environmental benefits to Australia.

Box 22 The Plantations for Australia: the 2020 Vision's strategy.[301]

The Strategy

The Vision partners will collaborate in facilitating an environment that will attract the private investment necessary to develop a significant plantation resource, which will:

- *enhance the growth in Australia's forest industries;*
- *enhance the contribution made by plantations to the Australian economy, rural communities and regional development; and*
- *enhance the contribution made by plantations to solving natural resource management problems, including climate change and salinity.*

A key change to the 2020 Vision as a result of the revision (see Table 12) was to go from in 1997: *Goal 1: Government recognition of plantations as an agricultural crop.* To in 2002: *Strategic Element 2: Action 3: plantations are treated as long rotation agricultural crops in terms of the planning approval process.* This change should be regarded as counter-productive given a need to have tree crops treated as part of agricultural systems.

[299] Plantations 2020 (2002: p.5).
[300] Plantations 2020 (2002: p.5).
[301] Plantations 2020 (2002: p.5).

Table 12: The elements and actions of the revised Vision 2020.[302]

Element	Title	Actions
Strategic Element 1	The Policy Framework	1. Facilitate better regional planning for plantation expansion. 2. Pursue a comprehensive policy approach to support plantation development.
Strategic Element 2	The Regulatory Framework	3. Promote development of legislation covering the rights to plant, harvest and trade plantations and their products. 4. Promote the development of appropriate structures to encourage investment in the plantation sector. 5. Promote the development of guidelines and codes of practice that support sustainable plantation development. 6. Work with State forestry organisations in terms of National Competition Policy and developing transparent and competitive markets. 7. Promote the development of State and Commonwealth legislation that complements plantation establishment.
Strategic Element 3	Investment Growth	8. Provide better information to maintain foreign and local investor confidence in the plantation sector and build on existing investment levels. 9. Improve grower and investor access to markets. 10. Inform farmers of the comparative profitability of plantations. 11. Identify research and development priorities for the plantation sector to complement the industry's potential growth. 12. Improve skills and safety of commercial tree growers through extension, education and training.
Strategic Element 4	Social and Environmental Factors	13. Improve stakeholder engagement in plantation industry expansion and inform communities about the strategic role of plantations in wood and fibre supply and environmental service delivery. 14. Review and promote opportunities for environmental services to enhance plantation forestry. 15. Promote the natural resource management benefits of commercially planted trees.
Strategic Element 5	Monitoring and Review	16. Monitor the implementation of Vision Actions and identify future opportunities to maintain investment in the plantation sector.

Action Agenda for the Forest and Wood Products Industry (2000)

The Action Agenda for Forest and Wood Products initiative in 2000 provided a framework by which industry can pursue sustainable competitive advantages.[303] It includes 12 of strategic imperatives focused on market (demand side) related issues (e.g. value adding, expanding non-traditional forest and wood uses, and market and investment development).[304] The Action Agenda vision was:[305]

> *"Maximising sustainable and profitable activity for tree growing, value-adding and marketing of Australian forest products".*

The Action Agenda included the following strategic imperatives:[306]

1. *Develop and implement an Australian Forestry Standard (AFS);*
2. *Promote international acceptance of environmental and product certification schemes;*
3. *Improve community awareness;*
4. *Establish and maintain a consolidated forest and wood products industry database;*

[302] Plantations 2020 (2002: p.8&9).
[303] Downloaded from http://www.affa.gov.au/content/output.cfm?ObjectID=D2C48F86-BA1A-11A1-A2200060B0A03643. On the 20/05/2018
[304] AFFA (2002: p.11&12).
[305] AFFA (2000: p.7).
[306] AFFA (2000: p.7&8).

5. *Encourage an innovative framework to enhance product development and utilisation;*
6. *Ensure the views of the forest and wood products industry are fully considered when developing policies on environmental issues;*
7. *Pursue an integrated approach to market development;*
8. *Pursue an integrated approach to investment development;*
9. *Ensure co-ordinated education and training arrangements are responsive to industry needs;*
10. *Improve occupational health and safety performance;*
11. *Improve linkages at national level;*
12. *Improve linkages at a regional level.*

The Farm Forestry National Action Statement (2005)

A National Farm Forestry Roundtable was established by the Australian Government running from 1998 to 2000 and it identified the need for a Farm Forestry National Action Statement (FFNAS). A workshop including 38 farm forestry representatives from governments, non-government organisations and private enterprise prepared a list of actions for the first draft in March 2003 and the final FFNAS was endorsed by the Natural Resource Management and Primary Industry Ministerial Councils in August 2005.[307] The FFNAS vision was to increase the adoption of commercial tree growing and management as a widely accepted part of Australian farming and as a component of regional natural resource planning for the production of wood and non-wood products, and natural resource management benefits.[308] The FFNAS was to complement the *Plantations for Australia: the 2020 Vision* (the 2020 Vision) and the regional natural resource management planning and investment framework defined by the National Action Plan for Salinity and Water Quality (NAPSWQ) and the Natural Heritage Trust.[309] A list of 16 actions were developed, grouped under four action imperatives (see Box 23).

Transforming Australia's forest products industry (2016)

The Forest Industry Advisory Council (FIAC) published an issues paper in March 2015 seeking input to identify how the forest products sector could best be positioned to capitalise on opportunities and address challenges over the medium to long term.[310] Based on analysis of the feedback, FIAC developed recommendations (see Box 24) prefaced by a statement that '*Australia's forest industry needs to recognise that it is at a crossroads. Minor adjustments to the current forest industry will not be enough for a sustainable future'*. The statement recognised that there are emerging product and market opportunities, and that there was a need to improve productivity and competitiveness, while securing a sustainable supply of forest resources. FIAC stated that the solutions offered needed to be innovative and collaborative in order to benefit from an '*emerging global bioeconomy that will revolutionise the way wood and wood fibre are used*'.[311] The statement framed the following vision and goal statements: [312]

> *'Vision: The forest industry will lead the transition to a bioeconomy of which Australians can be proud.'*
> *'Goal: To triple the economic value of the forest industry by 2050.'*

[307] AFFA (2005: p.1).
[308] AFFA (2005: p.3).
[309] AFFA (2005: p.3).
[310] Commonwealth of Australia (2015: p.1).
[311] Commonwealth of Australia (2016: p.2).
[312] Commonwealth of Australia (2016: p.2).

Box 23: The Farm Forestry National Action Statement's action imperatives and actions. [313]

1. *Develop appropriate, integrated and consistent Australian, State, Territory and local government policies for farm forestry*
    - i. *Ensure national, state and local government policy priorities reflect farm forestry's potential to deliver regional economic, environmental and social benefits.*
    - ii. *Undertake regional surveys of farm forestry resources (hectares of trees under management) for improved policy and planning outcomes.*
    - iii. *Undertake regional surveys of landholders to identify and analyse their willingness and capacity to adopt farm forestry, and identify impediments.*
    - iv. *Develop state and regional farm forestry strategies that integrate with natural resource management frameworks.*
2. *Coordinate actions and build relationships to support farm forestry*
    - I. *Encourage partnerships between existing agencies at national, state and regional levels.*
    - II. *Facilitate commercial partnerships between industry and landholders to increase the area of trees under active management and the supply of farm forestry outputs.*
    - III. *Facilitate improved communication to transfer knowledge to and between landholders.*
    - IV. *Support farm forestry research and development that will promote commercialisation of new species and development of new products, investment frameworks and production systems.*
    - V. *Improve the capacity of landholders and regional planners to implement commercial farm forestry, which is integrated on-farm and in-landscape, to meet commercial and natural resource management objectives.*
3. *Recognise and, where possible, quantify farm forestry's economic, environmental and social benefits and costs*
    - i. *Promote the economic, environmental and social benefits of farm forestry to landholders, government agencies, local governments, regional natural resource management groups and communities.*
    - ii. *Seek to ensure that regional natural resource management investment plans recognise the potential of farm forestry as a tool for addressing regional natural resource management priorities.*
    - iii. *Promote liaison between relevant State/Territory government agencies, regional and catchment water managers and landholders to identify and manage the potential impact of farm forestry on water resources.*
    - iv. *Prepare financial analyses for representative farming situations in each region to provide landholders with data on realistic economic returns from farm forestry.*
    - v. *Promote forest certification and best practice forest management for farm forestry.*
4. *Promote the development of markets for farm forestry products and services.*
    - i. *Facilitate better access to competitive markets through cooperatives, marketing agents or other structures suitable to regional and local circumstances.*
    - ii. *Encourage development of markets for the environmental services provided by farm forests, including carbon sequestration.*

[313] AFFA (2005: p.5&6).

Box 24: The structure of the specific FIAC recommendations.[314]

- *Objective: We will have the right trees in the right place at the right scale*
    1. *Strategy: Preserve the existing productive forest estate*
    2. *Strategy: Optimise forest management by focusing on strategic regions*
    3. *Strategy: Expand the productive forest estate in strategic regions*
- *Objective: We will produce bioproducts using all parts of the tree to a cellular level*
    4. *Strategy: Discover new and enhanced ways to use wood fibre*
    5. *Strategy: Develop technologies to commercial scale*
    6. *Strategy: Promote and enable market adoption*
- *Objective: We will distinguish ourselves by being environmentally friendly, socially responsible and valued by the community*
    7. *Strategy: Promote the industry as being environmentally friendly and socially responsible*
    8. *Strategy: Broaden community support for the industry*
    9. *Strategy: Responding to the recommendations*

A core element of the recommendations was a focus on processing hubs to address the fundamental commercial reality of haulage costs and the limitations of the distance between the planted trees and the processor / market. Plantation development was proposed to include matching he required species to sites in the right location (around the hubs) and for plantations to be at the appropriate scale (Box 25). Recognising lessons from previous experience, a caveat was placed on plantation expansion on unsuitable sites (defined by biophysical and logistics considerations such as distance to market).[315] Industry viability was suggested to be enhanced by improved transparency (harvest and transport logistics and costs); forest product markets and forest management practices knowledge; promoting an enabling regulatory environment for on-farm plantations; and fostering a cooperative marketing approach to optimise financial returns for landholders.[316] The importance of accurate estate information (e.g. species planted, quantity, proximity to wood processing facilities and markets, or whether harvesting is operationally feasible) was recognised and promoted, with specific reference to the small-scale plantings on private land.[317]

Box 25: The core of the transformation policy was a focus on commercial realities of plantation development.[318]

'The establishment of future plantations must be based on matching the ideal species to the right location and for plantations to be at the appropriate scale. Considerations include matching species with soil and climatic conditions, deciding whether to grow short or long rotation plantations, and proximity of infrastructure for processing.

However, the market must drive industry—the types of trees being planted must reflect market demand for particular products. This can be difficult for an industry with up to 30 years or more between planting and harvesting.'

Renewable energy market opportunities were recognised and promoted: it was suggested that biomass as a renewable energy source offers Australia's forest industry the potential to use or sell residues while addressing environmental, social and

[314] Commonwealth of Australia (2016: p.3&4).
[315] Commonwealth of Australia (2016: p.3).
[316] Commonwealth of Australia (2016: p.3).
[317] Commonwealth of Australia (2016: p.8).
[318] Commonwealth of Australia (2016: p.5).

economic challenges associated with energy production.[319] To realise this potential the Australian Government should be encouraged to include thermal heat from wood waste in the Renewable Energy Target (RET) scheme.[320] The Emissions Reduction Fund (ERF) (the Australian Government's primary mechanism for meeting Australia's greenhouse gas emissions reduction target) should include new methods benefiting plantation development in regional hubs. It could also provide an incentive for investment and reduce risk associated with establishing long-rotation plantations.[321] To achieve this, enabling policy measures including national and state level regulations, targets, mandates, incentives, tax rules and standards, relating to vegetation removal, water, forestry, electricity, transport, infrastructure, regional development and sustainable planning are required.[322]

Government policy – taxation

Key details of the taxation treatment of plantations and forestry are documented in the Australian Taxation Office (ATO) Taxation Ruling TR 95/6 (see Box 26 for the definition of the term primary production as it relates to forestry).

Box 26: The ATO's definition of primary production relating to forestry.[323]

5. The definition of the term 'primary production' in subsection 6(1) of the Income Tax Assessment Act 1936 (the Act) includes 'forest operations'. The term 'forest operations' is defined in subsection 6(1) as:

- *the planting or tending in a plantation or forest of trees intended for felling; or*
- *the felling of trees in a plantation or forest;*

and includes:

- *the transport, by a person who has felled trees in a plantation or forest, of those trees or parts of those trees from the plantation or forest to a place where they are to be first subjected to milling or processing (including processing for the production of posts, poles or railway sleepers) or to a place from which they are to be transported to such a place;*

where

- *the operations are carried on in the course of, or for the purposes of, a business.*

A previous analysis of Commonwealth Government taxation policy identified a wide range of past taxation reforms with direct implications for plantation forestry.[324]

- *Review of Business Taxation:* The Ralph Report (July 1999) recommended a 'right to harvest' could be sold separate to land, shifting *profits à prendre* mechanisms into the income tax stream. The change was suggested to stimulate the development of secondary markets, establishment of technical and cost effective plantations and increasing joint venture arrangements;
- *New Tax System:* The New Tax System (NTS) introduced on 1 July 2000 included a broad based 10% Goods and Services Tax (GST) and the abolition of wholesale sales tax and some State taxes, and when combined with marginal tax rate changes and tax brackets, a lowering of indirect taxes; thereby lowering business cost operations

[319] Commonwealth of Australia (2016: p.12).
[320] Commonwealth of Australia (2016: p.13).
[321] Commonwealth of Australia (2016: p.12)
[322] Commonwealth of Australia (2016: p.12).
[323] Australian Taxation Office (2010).
[324] AFFA (2002a: p.20).

and assisting businesses to be internationally competitive. The main benefits for the forestry sector (e.g. transport) was via removal of a number of State taxes, a reduction in embedded taxes and lower on-road transport costs for wood products;

- *Diesel and Alternative Fuels Grants Scheme:* The Scheme was part of the NTS assisting with lower transport and production costs for on-road transport (separately to the Diesel Fuel Rebate Scheme for off-road fuel use);
- *Prepayments (the 12 month rule):* Prepayments taxation amendments came into effect in 2002 and are specific to forestry activities, applying to expenditure incurred on or after 2 October 2001. Investors could claim an immediate deduction for certain prepaid expenditure invested in a plantation forestry managed agreement: prepaid activities were to be completed within 12 months of the activity commencing and by the end of the following income year. The amendment met industry concerns, boosting industry investment by providing greater flexibility and by helping to better plan land, contractor and seedling requirements;
- *Non-Commercial Losses:* The Non-Commercial Losses taxation amendment came into effect in 2002 (and applied from the 2000-01 financial year) preventing losses from a non-commercial business activity being offset against other income in the year in which they occur. Hence the tax was to be realised only when income from the investment is realised;
- *Capital Gains concessions:* Capital Gains concessions were reduced and streamlined in September 1999, enabling trusts and individuals to reduce capital gains from assets owned for at least 12 months by 50%. The CGT is relevant to forest plantations due to rotation lengths and impacted on commercial plantation based annuity schemes as many annuity schemes promoted tax benefits, with the onus is on the investor to clarify and claim such benefits. Small business operations may have also qualified for one or more of the following concessions:
    - The 15 year exemption. A full exemption for capital gains from an asset continuously owned for at least 15 years.
    - The 50% active asset reduction. A 50% reduction of a capital gain from an active asset.
    - The retirement exemption. An exemption for capital gains from active assets, up to a lifetime limit of $500,000, were proceeds were to be used for retirement.
    - The small business roll-over. A capital gain deferral if a replacement asset was acquired.
- *Immediate deductibility of non-capital expenditure:* Non-capital expenditure on plantations such as plantings, establishment costs and management fees could be claimed as an immediate tax deduction. Expenditure on capital items (e.g. roads and dams) are deductible over a period of time;
- *Farm Management Deposits Scheme:* A tax-linked saving scheme allowing primary producers to preserve income from good years for use in relatively low or outlays are high years;
- *Income tax averaging for primary producers:* Primary producers could use an income averaging arrangement, which was useful for plantation enterprises in reducing the average tax rate applied to 'high' income occurring during years for thinning or clearfelling;
- *Spreading insurance recoveries for loss of timber or livestock:* Insurance recoveries from loss of timber or livestock and net income from forced disposal of livestock could be spread over five income years;
- *Landcare deduction:* Primary producers and users of rural land could claim an immediate deduction for capital expenditure on soil conservation, prevention of land degradation and related measures, boosting land rehabilitation that indirectly aids plantation establishment (particularly in the case of farm forestry);

- *Landcare offset:* Primary producers and users of rural land, with taxable income of up to $20,000 a year, could claim a 30 cents in the dollar tax offset for capital expenditure on soil conservation, prevention of land degradation and related measures. This measure was an alternative to the Landcare deduction and provides an incentive for plantation establishment in degraded lands which provide commercial and conservation benefits;
- *Thin Capitalisation:* Generally when an Australian company pays interest to an offshore party, tax is payable to the ATO (a "withholding tax"), and may apply to Australian forestry companies with foreign partners;
- *De minimis exemption for thin capitalisation:* De minimis exemption for thin capitalisation allows taxpayers to claim debt deductions of up to $250,000 without being subject to thin capitalisation rules. While the rule is not directly related to forests, it has benefits for forestry companies with foreign assets;
- *Prepaid Expenses - Tax shelters:* Under the tax shelter rules, prepaid expenses that would otherwise be immediately deductible are required to be apportioned over their eligible service period (ESP) - the period during which the activity under the agreement is to be undertaken. The rules do not apply to that part of a prepayment that represents "seasonally dependent agronomic expenditure" (see the "12 month rule");
- *Income tax exemption for funds established for scientific research:* Income of funds established for the purpose of enabling scientific research by, or in conjunction with, a public university or hospital are exempt from income tax;
- *R&D refundable tax offset for small companies:* Announced in 2001, the R&D refundable tax offset for small companies encourages smaller companies to undertake R&D with companies meeting the criteria receiving tax offset equivalent to the value of the R&D tax concession;
- *R&D tax concession:* Introduced in 1985, expenditure on R&D activities generally received an immediate 125% deduction. From 29 January 2001, eligible expenditure on R&D plant was deductible over its effective life and expenditure on `core technology' related to R&D activities was deductible at a rate of 100% over the period of the related R&D activities;
- *Premium tax concession for additional R&D expenditure:* Available from 1 July 2001, companies that increased their R&D expenditure to receive a 175% concession covering all R&D expenditure excluding plant, pilot plant, contracted plant, plant leases, core technology, R&D related interest and items excluded from the 125% R&D tax concession.

State forest policy

This project did not specifically assess the current state of State policy in regard to the treatment of plantations. Numerous State Acts address conservation issues with implications for forestry, including Codes of Logging Practice, land-use planning, and flora and fauna protection. Other acts or legislation also cover the establishment and administration of National Parks, and regulate water rights and use.[325] Past analysis suggested that State governments should develop guidelines for local planning schemes to improve consistency between regions.[326] States can develop State specific and evolving policies and targets in regards to plantations. For example, the WA Government identified five critical success factors in support of plantations and farm forestry for the period of 2008 to 2012 (see Box 27).[327] This has been updated to six step industry strategy for the softwood sector (see Box 28).[328] The strategy is supported by direct investment by the FPC of $21 million in plantation

[325] Catton et al. (2004)
[326] Curtis and Race (1998: p.44)
[327] FPC (2008: p.2).
[328] FPC (2016).

development over five years from 2016.[329] A key point of this strategy is that it is focussed on two currently commercial species (Radiata and Maritime pine) planted in hubs around existing industry which currently process these species.

Box 27: The five key success factors presented in the WA's strategy for plantations and farm forestry: 2008-2012. [330]

1. *Identify a **lead State agent** to coordinate a whole-of-Government approach to plantations and farm forestry, and to implement the Strategy.*
2. *Develop mechanisms to **encourage investment** that will support integration of plantations and farm forestry with agriculture in the State's medium and lower rainfall zones.*
3. *Facilitate industry **development planning** for future plantations and farm forestry, and value-adding processing industries.*
4. *Support **research and development** to optimise profitability of existing plantation investment and develop new tree crops for medium and lower rainfall areas where commercial options are currently limited.*
5. *Establish a consistent framework for **land use planning** for plantations and farm forestry on cleared private land.*

Box 28: The evolution of WA's plantation strategy with a focus on softwoods.[331]

1. *'The industry will be concentrated around hubs;*
2. *Enhance value through best practice certification;*
3. *Protect the industry from wildfire;*
4. *Ensure integrated benefits are delivered;*
5. *Promoting the value of forestry to the community;*
6. *Encourage and allow for future industry.'*

[329] FPC (2016).
[330] FPC (2008: p.2).
[331] FPC (2016).

Government policy as a tool

Summary

The intent to invest in establishment and management of plantations for sawlogs requires long time frames and inherent risk (e.g. biological, products, market and a lack of liquidity) and effective policy can assist in risk mitigation. Australia's National Forest Policy (NFP) should on the one hand be stable but also be made relevant by periodic updates: the use of subsets of special interest policy statement has been an effective tool. The developed (updated) policy should be simple but not simplistic to ensure ease of implementation and transparency. Based on past adverse externalities (e.g. regional social disruptions associated with the MIS sector) associated with past successful policy initiatives (e.g. as defined by the areas developed) the implications of policy should be carefully understood prior to implementation. Past attempts by Government to implement policy tools designed to stimulate plantation development have been variably successful with adverse outcomes associated with a lack of a comprehensive plan, a lack of ongoing funding and failure to secure ongoing third party investment. Successful projects are more generally associated with an existing supply chain. The target land-base for plantation development is cleared agricultural land and consideration should be given to focussing on the farming unit and promoting trees as and into agriculture to assist with the process of alignment of interests. The application of policy as a tool should recognise the differences between industrial plantations and other tree plantings, that there is nil 'silver bullet' and that a portfolio of complementary approaches are required. Plantation investment can also be stimulated where the outputs are a complementary good to another driver supported by a separate policy (e.g. renewable energy targets and biomass supply). As noted, to enable plantation investment, a degree of certainty is required, particularly given the time frames relative to political cycles. While a NFP framework exists, each State / Territory will have State / Territory specific policy and legal frameworks (e.g. forestry rights legislation). In other cases, changes to specific blocking State legislation has allowed development of a significant resource (e.g. native sandalwood in south west WA). A key point is that a drive to change policy and legislation can be either reactive to identified barriers or in anticipation of impediments. Plantation investment risk can be managed by the development of coordinating plans underpinned by regional plantation productivity assessments (which supports the FIAC hub concept). An outcome of some past policy initiatives (projects) has been the creation of stranded assets. Such outcomes taint the image of plantations as an investment.

Introduction

There is a requirement for Government policy to enable plantation investment, particularly for longer rotations designed to produce larger trees for sawlogs. For example an ABARE analysis suggested that long rotations are associated with:[332]

- A long-time frame for investment;
- Inherent risks (e.g. fire, drought pests);
- The biological nature of the investment;
- Lack of industry information;
- Lack of secondary markets;
- A technology gap for long rotation hardwood sawlog processing;

[332] Low et al. (2010: p.15).

- Environmental restrictions (e.g. water use).

As documented, Australia has witnessed an evolving forest policy environments and this dynamic approach should continue recognising that the underlying assumptions may and will change with time[333] and that '*planning the forestry sector's development is not a 'set and forget' process; it requires regular monitoring of assumptions and performance and active management. Any projection made more than ten years ago is unlikely to be a useful guide for decisions now and for the next five to ten years'*.[334] It is further cautioned that '*it would be essential to revise a program in the face of new opportunities, markets and technologies'*.[335] Australia's NFPS is over 15 years old and the current operating environment is significantly different. The use of element specific sub-set policies / initiatives is a prudent approach (e.g. the recent FIAC recommendations), but at some stage the overall policy framework should be revised. A review of the 1992 NFPS could be combined with the adoption of a united industry approach.[336] While revision is required, a point of caution is that '*the introduction of any new mechanism to ensure the full suite of potential costs and benefits particularly to local economies are considered.'*[337] This is an important point recognising the significant collateral damage associated with successful stimulus of large scale plantation development (e.g. under the Softwood Forestry Loans and MIS). The following section of the report presents a collation of insights and suggestions to assist with the drafting of future policy.

Past Government attempts

A range of past Government initiatives targeting plantation development have been identified and considered (see Table 13) with many failing to result in significant development of planted trees. While it is useful to analysis such outcomes to determine causal factors, it is cautioned that '*continuing to shunt blame between the various parties will fail to achieve useful outcomes. Governments, industry and farmers must collectively show a willingness to advance the opportunities'*.[338] Underlying success factors include a commercially viable project, a funded long-term plan and linkages to a specific supply chain.

Forestry as agriculture – trees into agricultural systems

A 1998 report suggested that farm forestry lacked ownership and recognition by forestry, agricultural or industry agencies.[339] All current policy directs that a most likely scenario is that trees will be planted on cleared land currently under agriculture and that if the planting is not a 100% full site planting, that the land owner will retain an interest in the land. If the tree planter is the landholder, an important point is how the trees are regarded by the landholder. Ideally the trees should be considered as just another crop as part of the landowner's portfolio of landuse and policy should focus on such a mindset. This concept was explored and it was noted that:[340]

> *'....if plantation forestry is considered as an agricultural enterprise and integrated into farming systems, it can have favourable financial results. Plantation development on areas of farms which are difficult to manage may allow landholders to manage the more favourable land with greater intensity. Many properties have seasonal labour requirements, and it is likely that plantation establishment and management can be carried out without the need to*

[333] Florence et al., (1990: p.27
[334] Florence et al., (1990: p.28).
[335] Florence et al., (1990: p.27).
[336] de Fégely et al. (2011: p.v Policy options).
[337] de Fégely et al. (2011: p.3).
[338] Alexandra and Hall (1998: p.xi).
[339] Alexandra and Hall (1998: p.xvi).
[340] Jenkin & Pitt (2002: p.1).

hire additional labour. In addition, farm foresters can be surprisingly self-sufficient: with adequate skills and safety equipment, landholders may effectively harvest and transport the timber they produce.'

Table 13: A snap-shot of identified past Government projects / initiatives to develop plantations.[341]

Project	Period	Duration (y)	Basis	Cost ($)	Outcome area (ha)	Unit cost ($/ha)
Softwood Loan Agreements[342]	1966/67 to 1981/82	16	Loan	$78 million	730,000 ha	A loan
Victorian State Government Farm Forestry Loan Scheme[343]	1966/67 to 1982/83	17	Loan	$166/ha in administration	8,270 ha	A loan
NSW Farm Forestry Loan Scheme	1966 -		Loan	?	Upto 1976 2,881 ha	A loan
NAP	1987 to 1992	5	Grant	$15 million	6,000 ha	$2,500/ha
CRRP (Qld)	1992/93 to 1997/98	6	Grant	?	1,780 ha	?
WA Japanese Oji Paper Company and Itochu[344]	1993 to 2003	10	Full cost	$60 million	20,000 ha	$3,000/ha
WA Korean Hansol Forest Products Company[345]	1995 to 2005	10	Full cost	?	15,000 ha	?
Department of Natural Resources and Environment (DNRE) grant[346]	1996-97 to 1997-98	2	Grant		940 ha	$500/ha
Department of Primary Industries and Energy's (DPIE) Farm Forestry Program (FFP) [347]	1993-1995	2	Grant	$5.7 million	1,500 ha demo + 500 ha stimulated	$3,800/ha
FFORNE (Vic)	1999 - 2009	10	Initially grants	?	1,700 ha	?
CALM 'wheatbelt' or low rainfall region (WA)[348]	Late 1990s	4	?	$3 million	6,000 ha (300 farmers)	$500/ha
West RFA Sawlog Farming Project (Vic)[349]	2002 - 2005	3	Grant	$1.45 million	500 ha	$2,900/ha
Collie River / Wellington Dam salinity recovery (WA)	2005 - 2008	5	Grants	$4 million of $30 million	207 ha	$3,000/ha
FPC Strategic tree farming (WA)[350]	2005 to 2009	5	JV	$64 million	17,982 ha	$3,559/ha

[341] $ are as reported at that time.
[342] AFFA (2002: p.16).
[343] de Fégely et al. (2011: p.55).
[344] Catton et al. (2004).
[345] Catton et al. (2004).
[346] Curtis and Race (1998: p.21).
[347] Race and Curtis (1996: p.181&182).
[348] Curtis and Race (1998: p.11).
[349] Kevin. (2006: p.199 & 200).
[350] GoWA (2010: p.113 to 118).

As noted, a significant change occurred between the 1997 and 2002 versions of the Vision 2020 in that the 1997 version included: [351]

> *'Goal 1: Government recognition of plantations as an agricultural crop.'*

Whereas the 2002 revision of the Vision 2020 lowered the status to:[352]

> *'Strategic Element 2: The Regulatory Framework*
>
> *Action 3 Promote development of legislation covering the rights to plant, harvest and trade plantations and their products*
>
> *State Governments to enact legislation covering the rights to plant, harvest and trade plantations, so that;*
>
> - *plantations are treated as long rotation agricultural crops in terms of the planning approval process;'*

It is suggested that this was counter-productive to the alignment of interests of the parties seeking to access cleared farmlands or to encourage landholders to plant commercial trees.

Policy tools

The differences between industrial plantations and other forms of tree planting have been noted and therefore appropriate and targeted policy approaches are required to realise the opportunities available.[353] While recognising that some past policy initiatives have been highly successful (e.g. the Commonwealth Softwood Loans Scheme), none has emerged as a 'silver bullet'. Past analysis of Australian and international policy tools and experience indicated a range of options for use in Australia in support of plantation investment (a summary is presented in Table 14). The deployment of a specific option will entail a range of pre-cursor analysis of the costs and benefits, as well as the practicalities of implementation (e.g. a change to taxation law is likely to be more complex and political compared to Government support of R&D). A point of caution is that the greater the complexity of a developed policy (or investment) the higher the administrative cost and potentially the lower the transparency.[354] The political palatability of any suggested changes must also be considered and a summary is presented in Table 15. An important considerations is that in the absence of a 'silver bullet' solution, a portfolio of combined and complementary solutions is required. For example, investment by the Australian Future Fund (as noted in Table 15) as Australia's sovereign wealth fund (as of the 24/05/2018, $165.9 billion funds under management[355]) may be possible given the fund mandate to be '*responsible for investing for the benefit of future generations of Australians'* and that it was *'established in 2006 to strengthen the Commonwealth's long-term financial position and today manage five public asset funds'*.[356] The fund has the ability to invest in tangible assets (e.g. real estate, infrastructure, utilities, timber and agricultural assets gained through public or private markets)[357] but must consider the potential to '*minimise the potential to effect any abnormal change in the*

[351] Plantations 2020 (1997: p.8).
[352] Plantations 2020 (2002: p.12).
[353] Alexandra and Hall (1998: p.xvii).
[354] de Fégely et al. (2011: p.v Policy options)
[355] Downloaded from http://www.futurefund.gov.au/ on the 24/05/2018.
[356] Downloaded from http://www.futurefund.gov.au/ on the 24/05/2018.
[357] Downloaded from http://www.futurefund.gov.au/investment/how-we-invest on the 24/05/2018.

volatility or efficient operation of Australian financial markets'.[358] Therefore, a policy of investment by the Australian Future Fund could be coupled with non-market benefits (see Table 15).

Table 14: Summary of policy options for forest plantation investment.[359]

Policy mechanism	Method of operation	Examples of similar policy	Effects
Tax-based mechanisms	Tax credits on establishment	New Zealand forest policy	Addresses the inter-temporal investment costs problem – brings forward the returns from forestry.
	Tax credits based on rotation length	Proposed in a 2004 Australian Senate Inquiry	Increases the returns to long term rotation investments. Provides a premium for investing in long rotation plantations.
	Flow on through tax schemes	Early Stage Venture Capital Limited Partnership Program	Reduces the barriers to entry for small investors by decreasing upfront capital costs. Reduces the taxation rate to encourage capital accumulation.
	Levies	Indonesia Reforestation users to Fund; Norway Forest Trust Fund	Increases accountability of forest users to long term plantation investment. Supports sustainability of the industry.
Government investment or support of forest enterprises	Facilitation of partnerships	Unit trusts; United States Forest Land Enhancement Program; Canadian forest cooperatives	Pools together funds from several investors, small and large; and can achieve scale economies. Facilitates technology development adoption and investment in processing capacity. Reduces the impact of skill shortages on forestry and related industries. Spreads risk across investors.
Government R&D and extension programs	Public private partnerships	Joint Venture Agro-forestry program; New Zealand Forest Policy; Uruguay Forest Policy	Transfers risk from private investors to the government. Improves coordination between government and the private sector.
	Improving data quality for investment decisions	Caring for our Country; Joint Venture Agro-forestry program; United States Forest Land Enhancement Program.	Reduces transaction costs and improves the knowledge flows associated with investment decisions. Reduces regulatory uncertainty, information asymmetries, and improved knowledge about social attitudes.
		Canadian forest cooperatives	Improves knowledge about environmental conservation polices such as land clearing restrictions.
Indirect Government policy	Market regulations	Competitive neutrality policy	Encourage competition across private and public investment and market pricing. Ensures a level playing field between forestry and other industries.
	Emissions trading scheme	Carbon Pollution Reduction Scheme	Develops a secondary market for forests in the form of carbon offsets. Also has an indirect impact on timber plantations.
	Environmental regulations	Australia's Mandatory Renewable Energy Target; Energy Star systems	Environmental regulations which encourage the development of biomass energy by-products, such as wood pellets, could increase the demand for timber.

[358] See Section 8a of Future Fund Investment Mandate Direction 2017 Dated 15-5-2017 downloaded from https://www.legislation.gov.au/Details/F2017L00597 on the 24/05/2018.
[359] Low et al. (2010: p.2; Table 1).

Table 15: The implications of policy options which influence investment mechanisms for longer rotation plantations.[360]

Land grants, Low cost seedlings, monetary grants.	• Likely to be viewed as favouring forestry over other land uses and distorting investment
Taxation arrangements (capital as a business deduction, accelerated depreciation, <100% deductibility, tax concessions at harvest, removal of stamp duty on standing plantation sales).	• Likely to be viewed as favouring forestry over other land uses and distorting investment • May face the same criticism as current MIS taxation arrangements • Waiving stamp duty may stimulate secondary market sales, hence longer rotations
Private mechanisms (Flow through investments, unit trusts, TIMOs, REITs).	• All involve concessionary taxation arrangements either in terms of cost deductibility or reduced tax on income, hence may face the same criticism as current MIS taxation arrangements • TIMO investment is already occurring in Australia. May be scope for Australian superannuation funds to link with TIMOs to invest in Australian forestry
Competition policy.	• Already moving toward privatising state forestry assets. Likely to foster more TIMO investment
Enabling environment (research, extension, removal of policy constraints, stability, security) and market information.	• Good progress in the past, though recent reduction in resources • Important for TIMO/institutional investment • Does not yet solve the lack of long-rotation investment which requires development of markets for earlier cash-flows (e.g. bioenergy, carbon) • Unlikely to create opposition regarding investment distortion
Australian Future Fund.	• May compete directly with MIS for investor funds • Potential avenue to attract more TIMO involvement in greenfields plantation investment • Could be conducted on public land avoiding land use conflict backlash
Non-market benefits.	• Provide earlier cash flows to stimulate more investment in long rotation projects • Would be favourable to MIS arrangements
Changes to MIS.	• Opportunity to build on the knowledge already accumulated • May require closer association between responsible entity and wood purchasers • Increased investor protection required • Initial tax deductibility will still important • May not solve lack of long rotation (sawlog) investment problem • Projects which involve investment in both land (low risk return) and trees (higher risk return)

Policy alignment, stability and certainty

The provision of a stable and coherent forest policy is recognised as a critical enabler of forestry projects.[361] While Government policy can and should evolve in response to a changing environment, there is a critical need for long-term certainty beyond the usual election cycle, given that even the shortest rotation plantations (e.g. Mangium for export pulpwood from the Tiwi Islands) have an expected 8 to 10 year life[362]. For example, Government can provide well-defined and stable property rights for land resources.[363] In contrast significant variation in Australia's carbon policy over the past decade has created uncertainty and is an example of sovereign risk. The impact of non-forest related policies is noted and that there is a need to ensure that other non-forest policies are aligned with plantation development (e.g. such as road and port infrastructure).[364] The plantation

[360] Thompson (2010: Fig 10; p.35).
[361] Alexandra & Hall (1998: p. p.xvii); Enters (2004a).
[362] Commonwealth of Australia (2009: s2.9).
[363] Catton et al. (2004).
[364] de Fégely et al. (2011: p.v Policy options)

sector can also be a secondary beneficiary driven by un-related policy where this sector provide a complementary good. Taking a United Kingdom example, The Renewable Heat Incentive has created demand for biomass fired boilers and fuel wood[365] with one grower noting that it '*has created a demand for chips/pellet/fuel for biomass boilers for the next 10-20 years - a virtually guaranteed market'*.[366]

State actions

Frameworks – legal and policy

The role of State government is generally limited to State issues and a specific area of control is planning laws and many forestry projects span multiple states and therefore planning regimes. A 1998 review proposed a '*uniform national approach to the introduction of simple and effective tree-tenure legislation and systems which guarantee rights to harvest will do much to overcome concerns about security and tenure held by growers and investors'*.[367] Addressing tree-tenure legislation was part of the 1992 NFPS and a useful summary of each state (with reference to carbon rights) was prepared in 2005.[368] A 1998 call for legislative reform to give 'harvest security' for trees managed as a commercial crop was also noted.[369] An assessment was not made of the state of as of right harvest and such a study should be undertaken. In another example, a change to WA state legislation enabled a whole new industry to develop: plantation grown native sandalwood (see Box 29). A key point is that a drive to change policy and legislation can be either reactive to identified barriers or in anticipation of impediments.

Box 29: An example of the impact of legislative change.

Management of natural stands of sandalwood in WA was first legally controlled by the *Sandalwood Act 1929*. This was amended in 1996 by the Sandalwood Amendment Act 1996 to recognise and compartmentalise sandalwood grown in plantations:

s2 amended: ".., other than sandalwood grown on a plantation"

This limited the Crown's powers to limit or restrict the quantity of sandalwood harvested.

s3 amended: (1a) Subsection (1) (b) does not apply to sandalwood grown on a plantation".

This was in regards to the Crown's power to licence the removal of sandalwood. Hence, prior to the 1996 Act, it was not legally possible to grow sandalwood in WA and retain title to it, even on private property.

Regional plans and plantation feasibility studies

An identified success factor of project was the existence of a detailed and funded plan (see Table 13) and the benefit of such planning has been noted by a range of studies[370] which suggested a need for regional based plans and underlying feasibility

[365] The UKs: The Domestic Renewable Heat Incentive Scheme (Amendment) Regulations 2018.
[366] Royal Forestry Society (_____).
[367] Quote from Alexandra and Hall (1998: p.xvi); and in Curtis and Race (1998: p.43).
[368] AGO (2005: Appendix B).
[369] Curtis and Race (1998: p.43).
[370] For example see Curtis and Race (1998: p.xi)

studies. In support of plantation development, a range of plantation productivity studies have been undertaken[371] which aligns with the recent FIAC concept of reginal hubs.

Stranded assets

A consistent and unfortunate outcome of many previous tree planting initiatives has been the creation of stranded assets where a plantation estate fails to reach a required scale to attract a processor (e.g. driven by a lack of ongoing investment due to funding limitations and/or available land), where the asset created is un-merchantable (e.g. the wrong species and/or tree attributes) or uneconomic to harvest (e.g. at too far from a market). The outcome is a cost to the investor, a loss of projected income and damage to the reputation of the industry as being able to provide a reliable economic alternative to agricultural crops.[372] Two examples are considered. The first in WA was a Radiata pine sharefarming project on the southwest coast. In the same region after a number of years of operations, there was a switch of interest from Radiata pine to Tasmanian bluegums resulting in 5,000 ha Radiata pine plantations without the scale required to establish a viable industry.[373] In another example (see Box 30), a 2002 Victorian Government project sought to provide three years of seed capital with an intent to attract third party investors, but unfortunately it was unsuccessful in securing an investor and the planting ceased with a total estate of 500 ha developed.

Box 30: An example of a lack of ongoing financial support.

The West RFA Sawlog Farming Project was initiated in 2002 by the state government as an incentive program designed to promote development of a hardwood sawlog resource on cleared agricultural land, whilst improving environmental and social outcomes. To compensate for reduced logging in state owned native forests, $1.45 million was allocated over three years to '*inspire hardwood sawlog plantations*'.[374] The project also aimed to attract external investment into sawlog plantations and to demonstrate a range of solutions to land degradation and creation of biodiversity.[375] Of the 2,500 ha registered for establishment,[376] 500 ha of plantations were established over the 3-year period.[377] The project and planting did not continue beyond the Government funded period. However, other outcomes from the project include development of a pilot process for identifying zones of opportunity for plantation establishment, development of a sliding scale for incentives that award projects that provide greater public good and adapting a process the incorporate community perceptions and aspirations in plantation development.[378]

Guiding principles for forest plantation policy

A useful summary checklist of 'dos and don'ts' has been prepared (Table 16) to guide policy development including an assessment of the current status. The second use of the checklist is to inform the development of an incentive system. The list can be compared to insights gained from past projects. For example, *'Consider 'DO NOT - Promote inequitable land-use policies that favour other sectors (e.g. agriculture) over forest plantations'.* In hindsight, MIS mechanisms did create distortions in land markets, but could this have been anticipated? In a similar manner, the rise of objections to the conversion of natural forests to softwood plantations under the Commonwealth's Softwood Loans was unexpected at the time. Therefore great case

[371] For example in Gippsland, see Borschmann, et al. (2000).
[372] Biggs (2002: p. 137).
[373] Biggs (2002: p. 137).
[374] Kevin (2006: p.199 & 200).
[375] Garbutt (2000).
[376] Natural Resources and Environment (2002).
[377] Kevin. (2006: p.199 & 200).
[378] Kevin. (2006: p.199 & 200).

would be required in an assessment of any policy instruments, incentives and indeed business models against this checklist but recognise that best endeavours and potentially a pre-cautionary principle should apply.

Table 16: Summary of key issues and strategies to improve farm forestry links between small-scale growers and industry.[379]

Do	Do not
Provide a stable and coherent forest policy that is supportive of economic activities.	Promote inequitable land-use policies that favour other sectors (e.g. agriculture) over forest plantations.
Ensure that other (non-forestry) policies are aligned so that plantation investment can occur on a level playing field.	Persist with export or import controls that hinder the development of efficient wood processing and/or forest plantation establishment.
Develop strong research and extension support for plantation development.	Maintain policies that allow plantation development with detrimental environmental and/or social impacts, causing conflict among private companies, communities and environmental groups.
Establish strong industry clusters, including supporting infrastructure, a competent labour force and appropriate practices and technologies.	Crowd out private-sector investment in plantations by unnecessarily maintaining public-sector involvement, and especially do not grant public plantations privileges that prevent the private sector from competing.
Collect and make readily available objective, high-quality resource information to support policy-making, forecasting, planning and monitoring.	Keep policies and incentives in place longer than necessary, keeping in mind that the most successful incentives are those that can be phased out.
Encourage healthy debate and discussion on the merits and reasons for offering particular incentives.	Retain bureaucratic procedures and other disincentives that directly or indirectly reduce returns to investors.

[379] Enters et al (2004a).

Plantation development stimulus Incentives

Summary

An incentive defined

The term incentive is broad and non-specific and includes any action that seeks a responding action. In a narrow sense and from a plantation forestry perspective, an incentive is any action or strategy that can induce tree planting. There are three broad types of incentives: direct, variable and enabling. Direct incentives pass to the party to be stimulated into action (e.g. costs sharing arrangements), whereas variable and enabling are more in regards to the operating environment (e.g. trade restrictions or land tenure arrangements respectively). Government implementation of incentives is justified where public good results (e.g. amelioration of salinity), and a private party is undertaking the works. In other cases an incentive may be implemented by a party seeking a resource (e.g. resource development on another party's land). In the Australian context it has been suggested that a strong public rationale for government intervention in the plantation forest industry could revolve around: development of the supply of renewable resources; maintaining a stable and economic regional industry; reforestation of degraded landscapes.

Policy-makers and industry have a range of incentive tools available and none has emerged as a 'silver bullet', although some are more effective than others. It is therefore prudent to develop a portfolio strategy on a fit-for-purpose basis, which allows bespoke solutions. A portfolio solution also ensures that impacts are maximised by addressing any impediments (e.g. with enabling incentives). The incentives used must match the stage of development of the specific target sector (immature; acceleration; maturation; rationalisation): it is argued that the industrial plantation estate is mature and requires more enabling incentives, whereas the farm forestry sector is still in the initiation stage after many failures to launch, hence it still requires direct incentives. Although not in the literature, a fourth stage is proposed – rationalisation. Under this stage, development stagnates (e.g. reduced second rotation 'R2' plantings) and more direct incentives may be required.

An assessment of past experience

An assessment of past direct incentive use in projects concluded that the key issue is that the incentive duration is critical. The primary impact of duration is the scale of the estate created: the scale required is on an individual situation basis (e.g. the scale required to support a highly specialised and boutique sawmill could be a 55 to 83 ha estate). Where an incentive aims to develop additional resources into an existing wood supply chain (brownfield development) a short term grant can be used (matching a political cycle) as the scale of the new trees is less critical. If the incentive aims to develop new trees in isolation (a greenfield estate) this requires a long-term commitment to fund over decades to develop a stand-alone estate. Examples of grants applied to greenfield development have naively assumed that an investor could be attracted. This approach created stranded assets. The most successful direct incentives were underpinned by: long-term funding, a highly motivated and empowered delivery group, a motivation to create resources and projects with known species into known markets. Species and intent is critical: there are a small number of fully commercial species regimes in place in Australia (e.g. actually supplying fibre to a processor) and many commercially un-proven cases. Success is most likely with incentives applied to a known species, and if an unknown species is to be planted, a long term commitment is required to create an estate that MAY possibly attract a processor.

Access to robust and commercial information

Information is vital and the Australian plantation forestry sector has a significant library available. Care is required as not all information is robust and commercial. Access to information is driven by a party's tree growing arrangements: a 100% owned project will seek external information whereas under a joint venture, the partner will provide the required information and advice. Extension agents can be a source of advice but great care is required to ensure that the advice is robust and commercial as many philosophical positions can impact that advice. An important point is that the farming sector is now highly sophisticated and reliant on professional advisors (agricultural, accounting/financial and legal) hence any information or prospects presented must pass intense scrutiny, placing pressure on the proponent. When dealing with an individual and a community, company staff can be highly effective if they are part of the local community and are trusted.

Development of an incentive structure and an associated offer should first determine the stage of development of the target sector, whether the actual project is greenfield or brownfield, determine the appropriate direct incentive and all complementary and enabling incentives and deploy the offer. A process of monitoring and review is required to ensure that the incentive structure remains effective.

Introduction

Based on Australia's experiences, conditions in which forest management and plantation investments may prosper include:[380]

- Political and macro-economic stability;
- Trade liberalization and open foreign investment;
- Well-defined and stable property rights for land resources;
- Government with adequate institutional capacity to enforce laws and administer incentive schemes;
- Availability of appropriate technologies and basic infrastructure (e.g. roads, electricity, ports) to support investment;
- Availability of commercial knowledge and expertise to establish, maintain, harvest, process and market plantation products;
- Critical mass of the plantation resource to support internationally competitive, integrated processing facilities.

Adding to the above list of requirements for advancement and success, Table 17 present a summary of issues and strategies that could enhance farm forestry. To ensure that the right conditions are in place and to address identified issues, a project developer or agency seeking to expand planted trees should consider the role and potential of incentives. The following section explore the nature, role, efficacy and development of an incentive system.

[380] Catton et al. (2004).

Table 17: Summary of key issues and strategies to improve farm forestry links between small-scale growers and industry.[381]

Issues	Strategies
Poor structure of regional markets.	Investment by industry to provide greater assurance of returns and government to improve access to competitive markets. Provide evidence that growers are likely to get fair returns.
Insufficient evidence of farm forestry viability to support investment by growers and industry.	Regional appraisals of farm forestry viability and findings widely disseminated.
Uncertain long term market prospects.	Detailed and regular assessments (e.g. every 5 years) of markets. Assessments to include competitiveness of small-scale growers in changing global markets.
Inflexible joint venture arrangements.	Flexible joint venture arrangements to include lease, marketing, and crop-share agreements.
Inconsistencies in the roles of Federal, State and local governments - with some government sectors promoting farm forestry while others appear to restrict its development.	Improved coordination between all levels of government and reciprocal involvement of representatives in research and development forums.
Unrealistic expectations by growers/prospective growers of low costs for marketing, harvesting and haulage operations.	Recognition that farm forestry viability will vary widely between regions. Improved information exchange between regional stakeholders, with regional plantation committee's encouraged to facilitate this process.
Little coordination amongst discrete, small-scale growers.	Grower cooperatives and/or market brokers to aggregate supplies from small-scale growers

An incentive defined

The ordinary definition of an incentive is: '*a thing that motivates or encourages someone to do something*'[382] however the literature notes that there is a lack of a single agreed definition.[383] In contrast a subsidy is '*a payment by a government to producers of certain goods to enable them to be sell the goods to the public at a low price to compete with foreign competition, to avoid making redundancies and creating unemployment etc'*.[384] The definition of an incentive is very broad compared to the narrow action and intent of a subsidy. In very broad terms, an incentive is anything that motivates or stimulates people to act[385] or signals that motivate action.[386] Other definitions refer to the 'incitement and inducement of action'.[387] Considering the various definitions, it was observed that incentives can be financial or non-financial in nature and include 'anything' that motivates.[388] As an example, provision of free seedlings to a landholder aims to motivate tree planting and this is an incentive. The contribution of seedlings by a processor in a joint venture arrangement with holders is part of the consideration to the contract in return for obligations placed on that farmer (e.g. supply of resource on a first right-of-refusal basis) but is this still an incentive? Overall, incentives include policy, inducements, climate etc: the definition is blunt and non-precise. Addressing this issue, one author defined incentives as '*policy instruments that increase the comparative advantage of forest plantations and thus stimulate investments in plantation establishment and management'*.[389] In the context of this project's analysis, incentives include any action that increases the comparative advantage of the establishment, management and supply of fibre products.

[381] Curtis and Race (1998: p.xii & xiii).
[382] The Oxford Dictionary downloaded from https://en.oxforddictionaries.com/definition/incentivehe on the 25/05/2018.
[383] Meijerink (1997) cited in Enters (2004b).
[384] Law (2006: p.505).
[385] Giger (1996); cited in FAO (1999: p.3).
[386] Sargent (1994; cited in Tomforde 1995) cited in Enters (2004b).
[387] Enters (2001) cited in Enters (2004b).
[388] Enters (2004b).
[389] Enters (2004b).

Classification of incentives

There are three broad types of incentives: direct, variable and enabling (Table 18). Direct incentives are provided by governments, development agencies, non-governmental organizations (NGOs) and the private sector directly to a target recipient project or party. Indirect incentives can be divided into variable and enabling incentives and are provided in non-target specific manner. Variable incentives are economic factors that affect the net returns producers earn from plantation activities. Enabling incentives unlock a project or individual's potential response to direct and variable incentives. As well, they are elements in the investment environment that affect decision-making behaviour.[390] '*A country's enabling incentives determine to a considerable extent investment risks, and information on them needs to be constantly updated to guide investors*.'[391]

Table 18: Distinguishing direct, variable and enabling incentives.[392]

Direct incentives	Variable incentives		Enabling incentives
	Sectoral	Macro-economic	
• Goods and materials (for example, seedlings, fertilizers etc.); • Specific provision of local infrastructure; • Grants; • Tax relief or concessions; • Differential fees and access to resources; • Subsidized loans; • Cost-sharing arrangements and price guarantees.	• Input and output prices; • Specific taxes; • Trade restrictions (e.g. tariffs).	• Exchange rates; • General taxes; • Interest rates; • Fiscal and monetary measures.	• Land tenure and resource security; • Accessibility and availability of basic; • Infrastructure (ports, roads, electricity etc.); • Producer support services; • Market development; • Credit facilities; • Political and macro-economic stability; • National security; • Research and development; • Extension.

Justification for development and implementation of incentives

An economist's perspective is that incentives are used to correct a discrepancy between the financial attractiveness and economic (e.g. the social) desirability of an action.[393] It has been suggested that incentives from public to the private sector are justified in an economic sense, under one or both of the following conditions:[394]

- The social benefits of a given private action are greater than the private benefits alone;
- The social costs associated with the given action are less than private costs and that the social benefits are at least equal to private benefits.

[390] Enters (2004b).
[391] Enters (2004b).
[392] Enters (2004b: p.15&16 Table 1).
[393] FAO (1999: p.3)
[394] Gregersen (1984) cited in Pardo (1990) cited in Enters (2004b).

Applying this logic, where plantations provide environmental services (e.g. watershed protection and carbon sequestration) incentives are appropriate because the private net returns can be lower than the social benefits.[395] In the Australian context it has been suggested that the rationale for government intervention in the plantation forest industry could revolve around:[396]

- Development of the supply of renewable resources;
- Maintaining a stable and economic regional industry;
- Reforestation of degraded landscapes.

A strategic portfolio of incentives to match the stage of sector development

Policy-makers and industry have a range of incentive tools available but none have emerged as a 'silver bullet', although some are more effective than others[397] and from a plantation development perspective, there is no simple or unique investment model for encouraging plantation development.[398] In a historical context, it is argued that incentives have largely been applied in an *ad hoc* manner.[399] With an improved understanding of the mechanisms and conditions as they relate to economic growth and development, international experience suggests that it has become apparent that, in many instances, incentives applied to plantations have been less successful than they might otherwise have been, had various disincentives also been addressed and had governments directed their attention to creating enabling environments.[400] Experience has shown that *it was wrongly assumed that cash incentives would deliver the desired outcomes* and that it is critical to understand the target landholders (see Box 31).

Box 31: The importance of an incentives strategy and package based on experience with the Collie River/ Wellington Dam salinity recovery project.[401]

'The project proposed that it link to the Forest Products Commission Strategic tree farming program to plant between 1100–1,750 ha of trees in the Collie South and East catchment. This was dependent on incentives, with Department of Water supplying up to $1500 ha in the up-front payment to participating landholders resulting in up to $3000/ha being available.

However, the generous incentive and significant effort to promote the offer to landholders resulted in only 207 ha being planted in 2008.

This poor uptake was due to a saturation of trees in the catchment and the desire of landholders to participate in more traditional land-use activities. It was wrongly assumed that cash incentives would deliver the desired outcomes.

DoW also committed $250 000 for incentives to encourage landholders to invest in perennial plantings. At $500/ha and one-on-one advice, this was a very successful component.

By understanding the requirements of the landholders prior to developing incentives programs, a greater chance of uptake occurs.'

The effectiveness of a particular incentive changes as sectors move from one development stage to the next (Figure 8).[402] Ultimately with sector maturation, enabling a favourable investment climate, technical assistance and well-established markets

[395] Enters (2004b).
[396] de Fégely et al. (2011: p.ii).
[397] Enters (2004b).
[398] de Fégely et al. (2011: p.25)
[399] Enters et al. (2004a).
[400] Enters et al. (2004a).
[401] GoWA (2010: p.109).
[402] Enters (2004b).

will have greater influence than direct incentives (e.g. free seedlings, subsidized credit or cost-sharing of planting expenses).[403] The application of incentives should be regarded as a system with a portfolio of options, well-targeted and flexible to engage the private sector in forest plantation development (see Figure 23 and Error! Reference source not found.). To determine the tactics (e.g. incentives) that increase the interest of investors, consideration must be given to factors that motivate investment in planting trees, rather than focusing on the needs and objectives of governments and their respective forest agencies (see Box 31).[404] An important point is that an incentive strategy must recognises that not all subsectors of the plantation forestry sector will be at the same point in their evolution (reinforcing the need for specific definitions of the sub segments to aid targeting with the most effective tools).

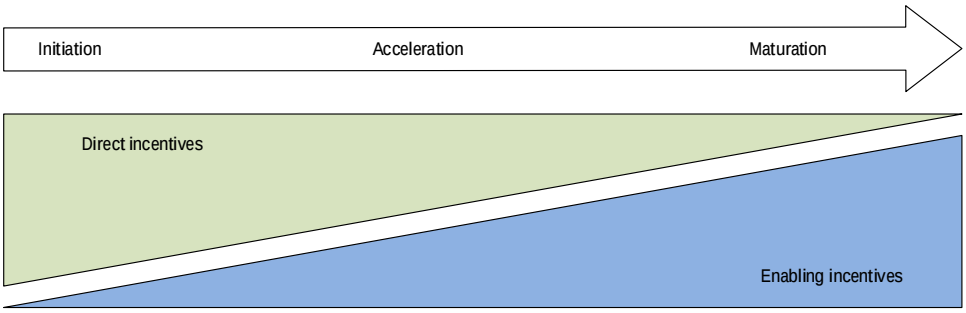


Figure 23: Adjustment of components within an incentive strategy and forest plantation sector development over time.[405]

Enabling incentives

The role of government policy and initiatives has been discussed: in general Government has been highly active in addressing many issues through policy reforms. An important consideration is that many of the issue addressed have resulted from recognition of an issue and seeking amendments to address a situation.

Fit for purpose: an assessment of past direct incentive use

Defining a successful outcome

In order to formulate a path forward, there is a need to make an assessment and form conclusions in regards to the outcomes of past investment in forest plantations with reference to the incentives used. A useful insight was posed in 1977 by the NSW Forestry Commission in regards to assessing the States Farm Woodlot Loan Scheme:[406]

> *"There could be some disagreement over what criteria one should use to measure the success of a farm woodlot loan scheme. From one point of view, the scheme would be considered a complete success if it has maximised the distribution of government loan funds to the greatest number of people regardless of the physical result (i.e. area established to plantation). However, the more conventional outlook (from a forester's point-of view) has been adopted in the statistics in assessing the viability of the scheme and in assessing the area actually successfully established as the indication of success."*

[403] Enters (2004b).
[404] Enters (2004b).
[405] Enters et al. (2004a).
[406] Hawkes (1977: p.189).

Table 19: Matching incentives to the stage of development of a forest plantation sector.[407]

Stage	Incentive	Comments
Initiation	Direct	Initiated by Governments either by directly investing or creating access to land and favorable taxation and other business incentives To raise awareness. To increase the pace and scale of tree planting. To build up raw material supplies. For an expanding processing sector. To attract subsequent processing investment.
Transition to acceleration	Direct	Once the private sector is engaged. Reduced provision of free inputs. Supply grants and loans. Followed by tax concessions. And/or joint venture arrangements. Direct incentives should be complemented and ultimately replaced by variable incentives accompanied by research and extension.
Acceleration	Variable	As experience is gained and both capacity and infrastructure develop, direct incentives become less important (they can also suffer from very high transaction costs). Use variable incentives complemented by research and development, and extension. A sign of success is that direct incentives become obsolete.
Maturation	Enabling	Key is to maintain private sector interest and investment in plantation development. A reduction of barriers to investments and removal of structural impediments and operational constraints. Clear and secure resource and property rights, and coherent and stable policies. Tax reforms, removing unnecessary regulations and eliminating bureaucratic procedures (licensing and permits). Support of healthy debate on the merits of planting trees and particular incentives, and transparent decision-making.
Rationalisation	Enabling & direct	A potential need to kick-start some projects by seeking new cash flows e.g. from environmental services.

The same dilemma is faced in assessing the outcomes of the direct incentives that have increased the Australian forest plantation estate: by area planted and resulting woodflows, MIS was a success (see Figure 8) but when externalities are considered, some may differ in their conclusions. In a similar manner while a principle of inclusiveness (e.g. everyone should have the option to be supported to plant trees) and the right to choose species (e.g. a *laissez-faire* approach) is appropriate and advocated by many farm forestry advisors, just because a farmer has planted trees does not automatically create a commercial resource that industry must purchase. FIAC's transformation strategy[408] provides a definition of success which can retrospectively inform the testing of outcomes of past direct incentives applied to projects (see Box 25). The key elements are to match a species demanded by industry to the right location (in hubs), on suitable sites and for forest plantations to be at an appropriate scale (e.g. to provide a critical mass). The types of trees planted must anticipate market demand for particular products: a difficult task with 8 to 30 years between establishment and harvesting. This can be combined with the stated intent of a project as a basis to assess success and therefore fit-for-purpose of the direct incentive used (see Table 20). Stripping away complimentary objectives, projects were assessed based on the area developed.

[407] Enters (2004b); de Fégely et al. (2011: p.25); observations from the analysis conducted.
[408] Commonwealth of Australia (2016: p.5).

Table 20: An assessment of the direct incentives (see Table 18) used in the development of Australia's plantation forest estate.

Direct incentives	Status of use	Outcome
Goods and materials (for example, seedlings, fertilizers etc.)	Yes: on an *ad hoc* basis at many field days.	Unknown: Many individual and clumps of trees planted in the landscape. Potentially some commercially viable plantings. While many past farm forestry agreements have provided seedlings, they have been as consideration in joint ventures.
Specific provision of local infrastructure	Yes: development of access roads and bridge upgrades.	Successful: Where applied, local government allowing a forestry company to upgrade a road for resource access, with or without a contribution.
Grants	Yes: examples in Victoria as seed funding for eucalypt plantations for sawlogs.	Unsuccessful: The estate development was driven by short-term Government extension and interested groups and required land holder motivation to participate. While the intent was to secure ongoing investor funding, this was not secured and the estates failed to reach a critical mass to attract a processor. The estates were composed of species and management (for sawlogs) not in commercial use. The estates were isolated from alternative markets. The NAP grants were also reported to have had limited success.
Tax relief or concessions	Yes: the MIS experience.	Highly successful: Where the estates were composed on known species for supply into known markets. The development of the estates were driven by highly motivated companies (marketing of financial instruments and plantation managers), gained critical mass and have commenced supply. The markets have expanded by the development of additional processor capacity. But with collateral damage due to social impacts.
		Failures: Where the estates were composed on unproven species under Australian conditions for supply into known or unknown markets. The development of the estates were driven by highly motivated companies (marketing of financial instruments and plantation managers), but did not gain critical mass and failed to commence supply. Processor capacity did not develop. Collateral damage due to social impacts.
Differential fees and access to resources	Nil examples identified	Unknown
Subsidized loans	Yes: The Commonwealth Softwood Loans.	Highly successful: The projects had long term funding, motivated developers (the State agencies coordinated towards self-sufficiency), in some cases building on existing supply chains and in others created a resource. Commercially proven species and regimes were applied. But with collateral damage due to natural forest conversion.
	Yes: State Farm Forestry Loans.	Less successful: Relied on motivation of landowners, but was associated with existing supply chains and use of commercially proven species regimes.
Cost-sharing arrangements and price guarantees.	The development of joint venture projects: in SW WA with Tasmanian bluegum for export woodchips).	Highly successful: There was a long-term funding commitment to develop an estate, highly motivated parties (Government agency developers actively seeking land and a partner purchaser of woodchips), a commercially proven regime and an active market (existing supply of natural forest woodchips via existing facilities).
	Farm forestry agreements	Less successful: Relied on motivation of landowners, but was associated with existing supply chains and use of commercially proven species regimes. The attractiveness of the schemes were marginal where they were based on a first right of refusal log supply, with examples of disappointed landowners when the "refusal" was implemented.

Critical mass

A key insight and lesson from analysis of past projects (see Table 20) is that an estate will have the greatest chance of success (commercial viability) if it can reach a critical mass (area and therefore potential woodflows). The definition of critical mass is project specific; for example a smallscale (500 to 750 m^3/y log intake) sawmill could be supplied all year round by an estate of 55 to 83 net ha (see Box 32) but a sawmill requiring 20,000 m^3/y would require an estate of in the order of 5,600 net ha. The definition of critical mass is also predicated on whether or not the new trees become part of an existing estate and supply chain (a brownfield estate) or create a new estate isolated from other planting and associated woodflows (a greenfield estate). The ability to supply an existing estate woodflow is only available if the tree species and management regime generates the same type of logs required by that supply chain: a supply chain dealing with Radiata pine is unlikely to be able to process Maritime pine, let alone a eucalypt species.

Box 32: A case study of a small-scale sawmill and the associated estate.

A field day was held on the 9/12/2017 hosted by the Gippsland AgroForestry Network (GAN) to present the outcomes of a case study of the Amber Creek Sawmill. The Amber Creek Sawmill commenced as a portable sawmilling company conducting onsite milling on a fee-for-service basis. The company now provides a complete, specialist building service: the buildings are high-end and hand-crafted utilising classical building techniques. The process is fully integrated and bespoke with the client providing plans from which engineering computations are completed, required timber dimensions calculated, cutting patterns and log requirements (dimensions and species) determined and logs sourced (specific to a project). The green-off-saw (GOS) sawn timber is taken to an onsite workshop for crafting into building components and the building frames are fully pre-fabricated including all routed sections and bolt holes drilled (see Figure 24 and Figure 25).

Figure 24: Details of the beam and post structure: the square hole allows the joining bolt to be tightened *in situ*.

Figure 25: An outside section of the building.

The sawmill operates 2 to 3 days per weeks to give a weekly output of 4 to 6 m^3 of sawntimber consuming 10 to 15 m^3/ wk of logs (assuming an average GOS recovery rate of 40%). Assuming that the mill operates 50 weeks per year, this equates to 200 to 300 m^3 /y of sawn timber from 500 to 750 m^3 /y of logs. In the early 1990's Frank Hirst[409] planted 14.5 ha of Tasmanian bluegum trees at wide spacing and in clumps to manage the trees for sawlog production. The trees were provided by APM Forests Pty Ltd as part of a NAP grant (seedlings provided). The wide spacing allowed pasture growth and grazing under the trees. The clumps of trees were thinned down to 100 stems/ha and pruned. The trees have grown to around 70 cm diameter at breast height over bark (DBHOB), with the largest tree at 93 cm DBHOB. The Amber Creek Sawmill processed 66 Tasmanian bluegum logs recovered from 25 trees, with a mean underbark sawlog volume of 2.28 m^3 /tree to a small end diameter (SED) of 40 cm[410] (an estimated standing tree sawlog volume of 228 m^3/ha of planted trees at age 25 years, excluding residue logs above the target SED). To satisfy the Amber Creek Saw Mill requirements would require the harvest of 2.2 to 3.3 ha/y or a total estate of 55 to 83 ha.

[409] At that time, Mr Frank Hirst was a Victorian Government farm forestry extension officer operating in Gippsland.
[410] Harvest data taken from Coote (2017: p.6, Table 1).

Species planted

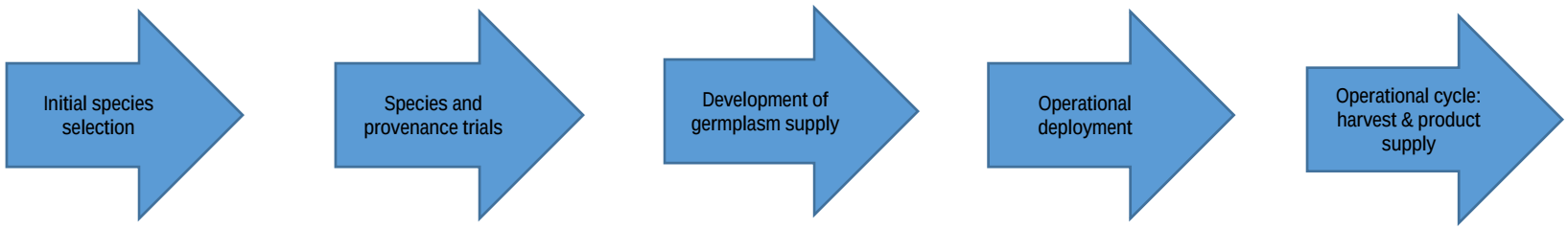
Species planted is critical. Taking guidance from the FIAC success factors, the species planted must match market demands. As an example, a 1997 survey of usage of, and attitudes to, rainforest cabinet timbers by cabinet-makers in Queensland was under taken reflecting back on the species planted (e.g. under the CRRP project) found that *'the species being planted were not a close match with those predicted by cabinet-makers to be in greatest demand in the future*.'[411] While many species have made a transition from natural to planted forest supply (e.g. *E. deglupta* – Kamarere - in Papua New Guinea; Teak across Asia or Hoop pine in Australia) many species remain un-proven and have not completed all steps of commercialisation (see Figure 26). Some species are part-way through the process successfully completing research or pilot scale growing and processing and others have been established and are providing raw materials to industry (e.g. Tasmanian bluegums). While natural forest origin logs may hold market acceptance (e.g. north Queensland tropical hardwoods[412]) it is recognised that the issues of timber properties and market prices for plantation-grown timbers are considerations.[413] Species fungibility (natural forest logs compared to plantation grown logs) is driven by the intended product: you may be able to grow a log of the target size, but the processing and output wood properties may not meet market requirements. In summary, the direct incentive applied must match the local situation e.g. a short-term grant program has the greatest chance of success if the trees planted add to an existing woodflow, whereas a long-term commitment with ongoing funding is required to support the development of a greenfield estate to the point of attracting a processor.

The role of extension and information generation

Information available

The quality and completeness of the information available varies from un-defendable and non-commercial through to robust and reliable in support of commercial decisions. A point of caution is that in many cases the decision maker may not have enough knowledge to detect deficiencies, hence the importance of a broad due diligence process in assessing a wide range of documents. A substantial library of texts relating to trees, trees on farms and plantation has been generated over the decades. The farm forestry literature has evolved from national based,[414] regional specific[415] to specialist topics such financial analysis.[416] The development of knowledge has been funded via a range of mechanisms and support (see Box 19 for an overview of the JVAP). A specific example of a knowledge collation and dissemination project was the the ANU Market Report project which contributed towards creating more informed forest product and input markets in Australia, primarily for small-scale forest growers.[417] The ANU Market Report assisted by providing log prices in light of the structure of the processing and exporting industries, which were dominated by a few major players, which undermined the confidence of the small grower.[418]

[411] Smorfitt et al. (2002: p.103).
[412] Smorfitt et al. (2002: p.103).
[413] Lott et al. (2005: p.35).
[414] For example see Brown & Hall (1968); Cremer (Ed.) (1990); Race (Ed.) (1993); Fitzpatrick (1994); Reid and Stephens (1999).
[415] For example see Reid & Stewart (1995); Washusen & Reid (1996).
[416] For example see Trapnell & Lavery (1989); O'Brien et al (1990); Elevitch and Wilkinson (2000).
[417] Catton et al. (2004).
[418] Alexandra and Hall (1998: p.XX).



Markets	This process should consider the needs of the market and the potential to develop markets based on wood attributes. It becomes a matching process of what can be grown (species) and what can be sold.	Tree growth and wood properties determined. At the end of trials, wood properties and therefore product options should be understood.	Tree breeding should include wood properties to match wood properties demanded by the market.	Initial wood properties and log attributes are determined and where possible projections made of the expected outcomes at rotation.	The wood attributes of the trees grown are known and supplied to the market. Logs are supplied to the market and products manufactured.
Biological requirements	Determine the proposed site attributes and match species needs. This can include the use of published information and locally planted examples of species.	This should include development of an understanding of the silviculture required e.g. pruning, thinning etc. At the end of the trials, yield and log by product volumes are understood.	The technology, methods and capacity for planting stock production is explored and expanded. For the selected species, seed and/or cuttings materials supply must be developed and nursery capacity increased.	The required sites are secured and the recommended silviculture applied. With experience both elements may be adjusted.	The actual operational yields across a range of sites is understood and documented to give greater confidence in the investment.
Costs	Determine the likely / potential cost profile for the target plantations		The cost of planting stock is understood.	An operational growing cost profile is understood and documented. The end result is that growing costs are understood.	A full operational cost of supply is understood and documented. The end result is a mill door price (land access + growing + harvesting + haulage costs).

Figure 26: The process of full commercialisation of a new tree species.

Provision of information – the role of extension and management of expectations

The source of knowledge provided to a tree planting project is generally determined by the structure and ownership of that project (see Table 4). Where a project is 100% owned by a landholder, the planting of trees is practiced using the resources and knowledge available to them. The farmer or landholder makes the critical decisions, from establishment and management to marketing of products and services.[419] Where a project has a direct linkage to another party such as a processor or plantation owner, it is likely that the other party will provide the required silvicultural knowledge as a set regional prescription (see Box 11 & Box 12). An important insight into the linkage between a company and the landholders was provided during discussions in WA. The commencement of the WA Tasmanian bluegum estate in the early 1980's resulted from the leadership and vision of Mr John Arrol Oldham who created WA Chip and Pulp Co Pty Ltd. The company developed a private forestry scheme (a joint venture) and it was reported that a key success factor was that the company officers liaising with the local farming community were well respected members of that community and as such the engendered a degree of trust. The staff remained as the face of the company underpinning the personal connection.

Government has historically provided extension support as has companies (e.g. as part of Farm Forestry Agreements) and specialist grower interest groups. An important point is the quality of the information provided: it should be scientifically factual, robust and be based on commercial realities. Many examples have been encountered where an enthusiastic advisor has promoted eucalypt sawlog plantations and the advice recipient has diligently planted, thinned and pruned their trees in full belief that they will be purchased and processed into sawn timber. The reality was that such stands were sold into woodchip markets as the expected sawmill market failed to materialise. In another example, given the species planted for sawlogs (Sydney bluegum) and while the stand was within 80 km of an export woodchip facility, if the logs were to recovered and sold, they would require transport over 270 km given that the closest export facility could not accept Sydney bluegum logs. In regards to the silvicultural regime applied, there will be regionally typical approaches. In a recent example considered, the landholder had dutifully aerially applied lime to a plantation at significant cost and when the advisor was questioned as to the scientific basis, nil could be provided.

The forestry sector has a significant knowledge base, and it is critical that factual based silviculture is applied.

The rise of the professional advisor

As noted, the success in securing land for trees in the 1990s was underpinned by a depressed farming environment at that time. Since that time, the nature of farming has evolved and become highly sophisticated (e.g. the implementation of precision agriculture) and business focussed. While some farms have become part of corporate enterprises (including via investment vehicles), many remain as family based enterprises. With increased business focus, many farming businesses rely heavily on three types of trusted advisors: agricultural consultants, financial advisors / accountants and lawyers. The level of sophistication in the advice required and provided in support of tree projects has increased. In order to promote the concept of tree growing arrangements, the information provided must be robust and capable of intense scrutiny. In many cases, information will be readily dismissed if it does not satisfy the reviewer's first impressions. This is a critical consideration in the

[419] AFFA (2005: p.1).

development of any form of business model. Insights to the implementation of change in the agricultural sector is presented in Box 33 based on the rules to make change applied in Gippsland by an agricultural consulting practice.

Completing consideration of trees into farming and as agriculture, the role of the farm forestry expert must be challenged. Considering the rules to make change Box 33 and the first point 'respect', more credible access to landholders is most likely via existing trusted advisors with a current respect base, therefore competent and complete project options should be first provided to the advisors. While this accesses existing information channels, it is also more efficient given that an individual agricultural consultant may have c.100 landholders as clients and visit their farms at least once per month or two months.

Box 33: The Rules To Make Change as applied by AgChallenge Consulting Pty Ltd.[420]

R – Respect must be earned based on reputation, deeds and advice and cannot be demanded.

T – Threat to the enterprise from operating environment which can be identified, tested and mitigated against. This can include identifying false threats (as a reality check) and as defensive strategies.

M – Motivation will depend on the individual and include physical success and prestige as a driver (e.g. the best cows) resulting in the best financial outcome.

C – Crutch for support provided by the advisor which can be leant on and includes skills, analysis (e.g. livestock rations) and as a sounding board for ideas.

A suggested approach to direct incentives

Selection of an appropriate direct incentive must match the state of the sector (see Figure 23 and Figure 27) and based on experience, an incentive regime may create an estate which is then on-sold to another plantation business structure; while MIS created much of the greenfield estate, ownership of the now brownfield estate has passed to TIMO investment structures (see Figure 8). It is important to structure a dynamic direct incentive program including the capacity to change the strategy as an estate or sector evolves with time. For example, a grant provided by a program with a life of 3 years (a term of Government) and targeting a greenfield development is destined to create another stranded resource even if the intent is to seek an investment partner: this has been the *status quo* approach in many cases. A similar grant offer directed at a current resource hub and aimed to produce the same type of logs has a higher chance of success. Figure 27 presents a schematic of a decision making process in developing a direct incentive regime.

[420] Mr Jeff Urie, Partner, AgChallenge Consulting Pty Ltd. pers. com. 01/06/2018.

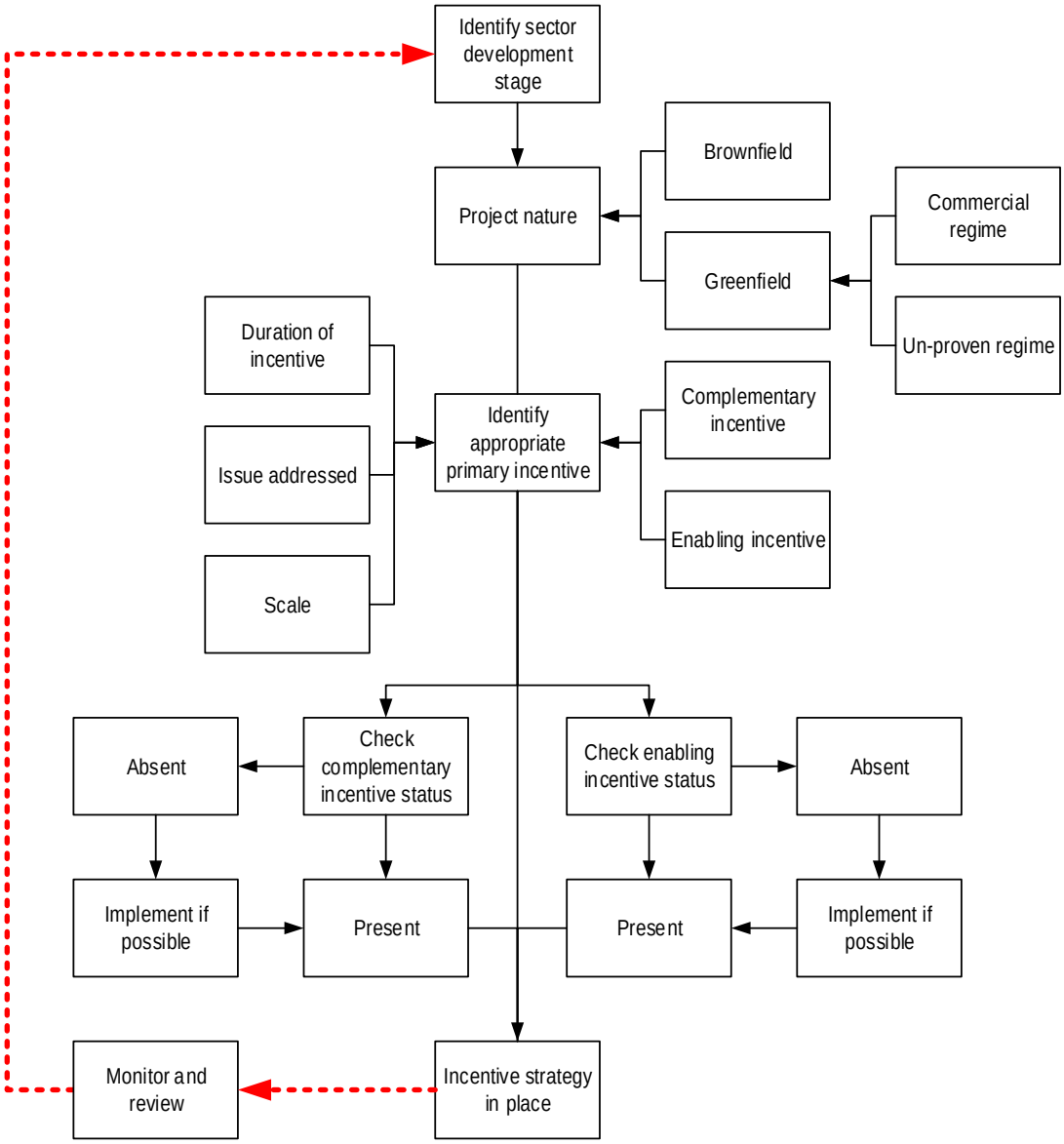


Figure 27: Incentives and plantation development over time.[421]

[421] Based on information in Enters et al. (2004a).

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Appendix 1 Investment asset classes

Table 21: A summary of investment asset classes[422].

Behaviour		Asset class	Inclusions	Behaviour	Volatility	Returns	Minimum suggested time frame	Risk	Potential returns
Defensive	(focus on generating income)	Cash	Includes bank deposits, term deposits, savings and cheque accounts and cash management trusts.	Suitable for investors who have a short term outlook.	Suitable for investors who have a low tolerance to risk, or if market volatility is high.	Provides a stable and low risk income, usually equally in the form of regular interest payments.	No recommended minimum timeframe.	Low	Low
		Fixed interest	Includes government bonds, corporate bonds, mortgages and hybrid securities.	Generally operate in the same way as a loan.	Can be more volatile than cash, but are still relatively stable.	Income return is usually in the form of regular interest payments for an agreed period of time.	1 – 3 years	Low / moderate	Moderate
		Property	Includes direct investments in residential, industrial and commercial property and can also include indirect investment in listed property vehicles such as REITS.	Less liquid than other asset classes resulting in a higher recommended minimum timeframe.	Has a higher risk than fixed interest but less risk than equities.	Entry and exit costs significantly higher.	7+ years	Moderate / high	Moderate / high
Growth	(focus on capital growth and income)	Equities	Includes Australian equities and International equities.	Involves part ownership of a company, enabling investor to share in the profits and future growth.	The most volatile asset class but over long periods of time, on average, has achieved higher investment returns. Currency valuations can affect performance of International equities.	Returns usually include capital growth or loss and income through dividends which may be franked (i.e. the company has already paid tax on the earnings).	5 – 7 years	High	High

[422] Taken from http://www.investors.asn.au/education/investment-basics/asset-classes/ on 17/01/2015.

Table 22: Details of the different products within each asset class presented in Table 21.

Asset class	Product	Description
Cash[423]	Cash	Legal tender or coins that can be used in exchange goods, debt, or services. Sometimes also including the value of assets that can be converted into cash immediately, as reported by a company.
	Bank deposits	Money placed into a banking institution for safekeeping. Bank deposits are made to deposit accounts at a banking institution, such as savings accounts, checking accounts and money market accounts. The account holder has the right to withdraw any deposited funds, as set forth in the terms and conditions of the account. The "deposit" itself is a liability owed by the bank to the depositor (the person or entity that made the deposit), and refers to this liability rather than to the actual funds that are deposited.
	Term deposits	A deposit held at a financial institution that has a fixed term. These are generally short-term with maturities ranging anywhere from a month to a few years. When a term deposit is purchased, the lender (the customer) understands that the money can only be withdrawn after the term has ended or by giving a predetermined number of days' notice.
	Savings and cheque accounts	A deposit account held at a bank or other financial institution that provides principal security and a modest interest rate. Depending on the specific type of savings account, the account holder may not be able to write checks from the account (without incurring extra fees or expenses) and the account is likely to have a limited number of free transfers/transactions. Savings account funds are considered one of the most liquid investments outside of demand accounts and cash. In contrast to savings accounts, checking accounts allow you to write checks and use electronic debit to access your funds inside the account. Savings accounts are generally for money that you don't intend to use for daily expenses. To open a savings account, simply go down to your local bank with proper identification and ask to open an account.
	Cash management trusts.	A Cash Management Trust account is an investment product rather than a straightforward bank account so it has a few different characteristics when compared to a cash management account or a savings account. A managed investment where the funds of individual unit holders are pooled; The primary investment is in cash securities; The value of each unit does not change, it always remains at $1; A relatively low risk investment product.
Fixed interest[424]	Bonds	A form of debt security, usually with a fixed rate of interest, issued by a corporate or public body as an investment product; the principal is repaid on maturity, while the interest is paid in the form of a coupon.

[423] Downloaded from http://www.investopedia.com/terms/c/cash.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/b/bank-deposits.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/t/termdeposit.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/s/savingsaccount.asp on 21/01/2015; Downloaded fromhttp://www.investors.asn.au/education/fixed-interest/cash-management-trusts/ on 21/01/2015.

[424] CSI (2013); Downloaded from http://www.investopedia.com/terms/g/government-bond.asp on 21/01/2015; ASIC (2009: p.6); Downloaded from http://www.investopedia.com/terms/m/mortgage.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/h/hybridsecurity.asp on 21/01/2015.

Table 23: Details of the different products within each asset class presented in Table 21.

Asset class	Product	Description
Cash[425]	Cash	Legal tender or coins that can be used in exchange goods, debt, or services. Sometimes also including the value of assets that can be converted into cash immediately, as reported by a company.
	Bank deposits	Money placed into a banking institution for safekeeping. Bank deposits are made to deposit accounts at a banking institution, such as savings accounts, checking accounts and money market accounts. The account holder has the right to withdraw any deposited funds, as set forth in the terms and conditions of the account. The "deposit" itself is a liability owed by the bank to the depositor (the person or entity that made the deposit), and refers to this liability rather than to the actual funds that are deposited.
	Term deposits	A deposit held at a financial institution that has a fixed term. These are generally short-term with maturities ranging anywhere from a month to a few years. When a term deposit is purchased, the lender (the customer) understands that the money can only be withdrawn after the term has ended or by giving a predetermined number of days' notice.
	Savings and cheque accounts	A deposit account held at a bank or other financial institution that provides principal security and a modest interest rate. Depending on the specific type of savings account, the account holder may not be able to write checks from the account (without incurring extra fees or expenses) and the account is likely to have a limited number of free transfers/transactions. Savings account funds are considered one of the most liquid investments outside of demand accounts and cash. In contrast to savings accounts, checking accounts allow you to write checks and use electronic debit to access your funds inside the account. Savings accounts are generally for money that you don't intend to use for daily expenses. To open a savings account, simply go down to your local bank with proper identification and ask to open an account.
	Cash management trusts.	A Cash Management Trust account is an investment product rather than a straightforward bank account so it has a few different characteristics when compared to a cash management account or a savings account. A managed investment where the funds of individual unit holders are pooled; The primary investment is in cash securities; The value of each unit does not change, it always remains at $1; A relatively low risk investment product.
Fixed interest[426]	Bonds	A form of debt security, usually with a fixed rate of interest, issued by a corporate or public body as an investment product; the principal is repaid on maturity, while the interest is paid in the form of a coupon.
	Government bonds	A debt security issued by a government to support government spending, most often issued in the country's domestic currency. Government debt is money owed by any level of government and is backed by the full faith of the government. Federal government bonds in the United States include: the savings bond, Treasury bond, Treasury inflation-protected securities (TIPS), and others. Before investing in government bonds, investors need to assess several risks associated with the country such as: country risk, political risk, inflation risk, and interest rate risk.

[425] Downloaded from http://www.investopedia.com/terms/c/cash.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/b/bank-deposits.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/t/termdeposit.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/s/savingsaccount.asp on 21/01/2015; Downloaded fromhttp://www.investors.asn.au/education/fixed-interest/cash-management-trusts/ on 21/01/2015.

[426] CSI (2013); Downloaded from http://www.investopedia.com/terms/g/government-bond.asp on 21/01/2015; ASIC (2009: p.6); Downloaded from http://www.investopedia.com/terms/m/mortgage.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/h/hybridsecurity.asp on 21/01/2015.

Asset class	Product	Description
	Corporate bonds	A corporate bond is one way for a company to raise money from investors to finance its business activities. In return for your money, the company issuing the bonds (the issuer) promises to: pay you interest, pay back the money you've invested (your principal) on a certain date. By investing in corporate bonds, you are lending your money to a company, with all the risks that this involves. For example, you may not get your money back if the company issuing the bonds goes out of business. Corporate bonds generally may or may not be secured against property.
	Debenture	A debenture is a type of corporate bond. To be called a debenture, a corporate bond must be secured against property. A debenture is also always a fixed rate investment, while corporate bonds may be fixed interest or floating rate investments. This means that the interest rate on the money you lend is either set in advance (fixed) or linked to a variable interest rate (floating).
	Mortgages	A debt instrument, secured by the collateral of specified real estate property, that the borrower is obliged to pay back with a predetermined set of payments. Mortgages are used by individuals and businesses to make large real estate purchases without paying the entire value of the purchase up front. Over a period of many years, the borrower repays the loan, plus interest, until he/she eventually owns the property free and clear. Mortgages are also known as "liens against property" or "claims on property." If the borrower stops paying the mortgage, the bank can foreclose.
	Hybrid securities.	A single financial security that combines two or more different financial instruments. Hybrid securities, often referred to as "hybrids," generally combine both debt and equity characteristics. The most common type of hybrid security is a convertible bond that has features of an ordinary bond but is heavily influenced by the price movements of the stock into which it is convertible.
Property[427]	Property	Anything over which a person or business has legal title. Property may be tangible or intangible, but it is owned by an entity and is therefore considered an asset or a liability attributable to that entity. Another way of saying real property, real estate or land.
	Direct property	A direct investment in real property where the investor owns the asset: it may be a residential, industrial or commercial property
	Indirect investment (REITS)	A security that sells like a stock on the major exchanges and invests in real estate directly, either through properties or mortgages. REITs receive special tax considerations and typically offer investors high yields, as well as a highly liquid method of investing in real estate.
		Equity REITs: Equity REITs invest in and own properties (thus responsible for the equity or value of their real estate assets). Their revenues come principally from their properties' rents.
		Mortgage REITs: Mortgage REITs deal in investment and ownership of property mortgages. These REITs loan money for mortgages to owners of real estate, or purchase existing mortgages or mortgage-backed securities. Their revenues are generated primarily by the interest that they earn on the mortgage loans.
		Hybrid REITs: Hybrid REITs combine the investment strategies of equity REITs and mortgage REITs by investing in both properties and mortgages.
Equities[428]	Equity	A stock or any other security representing an ownership interest.
	Australian equities	Shares in a company listed on the Australian Stock Exchange
	International equities.	Shares in a company listed on the stock exchanges of another country.

[427] Downloaded from http://www.investopedia.com/terms/p/property.asp on 21/01/2015; Downloaded from http://www.investopedia.com/terms/r/reit.asp on 21/01/2015.
[428] Downloaded from http://www.investopedia.com/terms/e/equity.asp on 21/01/2015.