



Links Between Farm Forestry Growers & the Wood Processing Industry

**Lessons From the Green Triangle,
Tasmania and Western Australia**

**A report for the
Rural Industries Research and Development Corporation
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FOREWORD

In 1996 the RIRDC/LWRRDC/FWPRDC Joint Venture Agroforestry Program published a resource kit titled *Commercial Farm Forestry in Australia, Development of a Strategy Framework*. Within this publication a number of impediments to the widespread adoption of commercial farm forestry were identified. In order to address some of these impediments the Joint Venture Agroforestry Program (RIRDC/LWRRDC/FWPRDC) commissioned four projects designed to address key impediments. The four projects were designed to:

- strengthen links between farm forest growers and the forest industry;
- identify policy reforms for farm forestry;
- identify opportunities for harvesting trees on farms; and
- identify opportunities for processing wood products on farms.

This report is the first in the series of four. It identifies and assesses the current status of the linkages between small scale forest growers and industry, and recommends a series of strategies for improvements to the current status quo. The report was developed following a literature review, interviews, consultation and surveys with relevant stakeholders in three major farm forestry areas of Australia, the green triangle region of south east South Australia and south west Victoria; Tasmania; and south west Western Australia. The study demonstrates that there are a range of options available to strengthen links between small scale growers and industry.

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Executive summary

Introduction

This report documents findings from recent assessments of links between small-scale growers and the forest industry in three important farm forestry regions in Australia:

1. Green Triangle region of south east South Australia and south west Victoria;
2. Tasmania; and
3. south west Western Australia.

These regions were selected because of their rich experience in farm/private forestry, substantial forestry activity, relatively rapid expansion of plantations on private land, and apparent potential for further farm forestry development.

Farm forestry is increasingly promoted as a national strategy likely to deliver important benefits in assisting the move to more sustainable agriculture, enhancing the viability of regions through industry development and employment, and reducing the trade deficit in forest products.

Despite its apparent potential for economic, environmental and social gains for individuals and the wider community, viable farm forestry industries are still developing. While some small-scale growers have developed farm forestry independently of industry and government assistance, most choose to link with industry before harvesting. However, grower-industry links have been identified as one of the constraints to farm forestry adoption.

This assessment of the links between small-scale growers and industry will:

- identify current arrangements and their strengths and weaknesses; and
- explore the principles and practices of effective links which could improve the adoption of farm forestry.

Strategies for improvements to the current linking arrangements are summarised in the Tables on p.ix and p.38-39.

Links between small-scale growers and industry

Joint ventures are legal contracts between two or more parties combining land, capital, management, and market opportunities to produce a commercial treecrop. The typical partners in farm forestry joint ventures are landholders (providing land and/or management) and industry or government (providing initial finance/capital, management and market opportunities). Lease payments or profits are typically shared between partners according to their inputs and market value of timber at harvest. Joint venture arrangements have contributed to the establishment of 82,900 ha, or 8% of Australia's plantation estate.

Joint ventures typically offer **small-scale growers** such benefits as:

- financial support with full/part-establishment costs;
- stable, annual income with lease payments;
- guaranteed financial returns;
- reduced market risk with an assured sale;
- silvicultural advice; and
- physical support with tree establishment and management.

Joint ventures typically benefit **industry** by providing:

- increased supply of future resource;
- resource security without the need to purchase land;
- access to productive farmland for treegrowing close to mills;
- diversified sources of supply; and

- shared participation with local communities in timber production (ie. good public relations).

Joint ventures also appeal as a way to expand forest resources in agricultural areas without displacing farming families and losing rateable land for local government (as when purchased by state governments).

Joint venture arrangements include:

- ‘Lease’ joint ventures (also referred to as ‘lease’ schemes) are attractive to landholders as regular payments are made and indexed over an agreed period. This approach overcomes the cash-flow problems associated with farm forestry. However, ‘lease’ joint ventures require on-going investment by industry to fund the regular payments. This option is the most successful of all joint venture arrangements in attracting commercial farmers and small-area landholders. An area of 39,100 ha has been established using ‘lease’ joint ventures (50% of total joint venture area)
- A ‘cropshare’ joint venture is when the landholder and industry/government partners contribute inputs and proportionally share returns throughout the life of the treecrop. Returns for landholder and industry partners are not available until harvest and are based on market price at harvest. Cropshare schemes tend to attract marginal, under-utilised agricultural land, which does not always suit industry needs.
- A ‘market’ joint venture guarantees a sale for the grower, usually based on market price at the time of harvest. The grower is required to offer the industry partner the first option of purchase, however if a better price can be found, the grower may sell to another purchaser.

While joint ventures can offer industry resource security, these arrangements can also reduce industry’s ability to respond to market fluctuations. As a result, vertically integrated processors tend to have low to moderate proportions of their future supplies tied to joint ventures (ie. joint ventures usually comprise 5-40% of total supply).

Cooperatives have formed to aggregate the supplies of small-scale growers and attract better prices. There are 345 members in three cooperatives in Tasmania, with the most active being the North West Treegrowers Cooperative Society Ltd. This cooperative employs three full-time staff to coordinate supplies from 180 members and has been successful in securing regional and export sales, and is acting as a model for other emerging cooperatives around Australia. Access to competitive markets is important if cooperatives are to negotiate good returns for small-scale growers.

Contrary to experiences in New Zealand and USA, **marketing brokers** and consultants are rarely employed to sell timber by small-scale growers in Australia. However, this situation appears to be changing as regional planning groups and grower cooperatives employ specialist marketing expertise to prepare accurate appraisals of regional markets.

On-farm processing is generally poorly developed. While successful on-farm processing requires experience and the investment of capital, it may improve farm forestry viability for small-scale growers by developing alternate products and by value-adding (eg. harvesting, staking, debarking). To some extent, on-farm processing can overcome problems of small discontinuous supply; remote location; and unsuitable resource. The absence of economic options for some aspects of on-farm processing (eg. treating posts with preservatives), and poor awareness of existing options (eg. portable kilns), have contributed to low adoption of on-farm processing.

Improved links between small-scale growers and industry

Research indicates many of the current linking arrangements are not ideal for growers, suggesting farm forestry is not achieving its full potential. The nature and effectiveness of linking arrangements are affected by underlying market structures.

Survey results indicated farm forestry topics of greatest concern to growers were the:

- economic viability of farm forestry (92% rated this issue as ‘important/very important’);
- long term market prospects (84%);
- growers capacity to negotiate fair price with industry (72%);
- fair returns to growers from joint ventures (69%);
- uncertain that trees have the capacity to arrest land and water degradation (65%);
- concern about tax arrangements (61%); and
- uncertainty about the reliability of market information (54%).

These results confirm the extent of concern about farm forestry viability and the importance of grower-industry links as a critical farm forestry issue.

Viability of farm forestry

The key farm forestry issue for growers and industry was their concern about the uncertain economic viability of farm forestry. Before growers and industry are prepared to invest in farm forestry there needs to be clear evidence of farm forestry viability, particularly the existence of long term regional markets. On their own, demonstrations of the biophysical potential of farm forestry will be insufficient to stimulate widespread farm forestry. 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. Appraisals of regional farm forestry will need to include full assessments of the costs of accessing international markets, and the market competitiveness of small-scale growers over time. However, it is often difficult to accurately assess the viability of farm forestry as little timber has been sold by small-scale growers and prices are not disclosed. This situation is compounded by the fact that market prices are heavily influenced by long term contracts between state governments (as growers) and industry.

Nevertheless, there are several examples of farm forestry plantings larger than 10 ha in the Green Triangle, Tasmania and Western Australia - particularly in areas with competitive markets (eg. access to international markets, regional processors), suggesting farm forestry can be a viable enterprise. For example, it is common for bluegums to be established in multi-rowed timberbelts or woodlots under joint venture arrangements for the pulpwood export market. There is also evidence in WA that farm forestry can deliver benefits to growers and regional communities. For instance, competition for farmland to establish eucalypts for pulpwood has resulted in industry offering ‘lease’ joint ventures \$120-200/ha per year. These returns are considerably higher than many grazing enterprises. Subsequent regional analyses in WA predict that well managed farm forestry can have returns with IRR’s between 7-18% for growers. Regions will need to assess the viability of farm forestry and individually tailor strategies to improve long term markets prospects.

Recommendation: That the JVAP link with regional planning groups (eg. RPCs) to commission appraisals of regional farm forestry opportunities. These appraisals should focus on regions where farm forestry viability remains uncertain, such as: greater-ACT; south-east NSW; north-west Victoria (low rainfall). Findings should be widely disseminated to key audiences.

PISA in the Green Triangle intends to attract landholders with a ‘marketing’ joint venture with a base price for stumpage indexed to hardwood chip prices ex-Tasmania. Such prices can be expected to reflect world parity and will be an important assurance for growers at the time of tree establishment.

There is growing landholder interest in establishing small areas of high quality commercial trees on a regular basis (ie. 1-2 ha/year). This approach means the farm forestry enterprise is manageable by a farm family (in terms of time and costs), and is likely to be a more flexible approach to farm forestry. Estimates of the returns for high quality sawlogs suggest they could yield as much as \$22,000/ha at harvest with an IRR of 9.9%.

Market structures

Farm forestry participants indicated small-scale growers believe that as individuals they are not in a position to negotiate with industry, and many doubt present market structures will deliver fair returns. 'Markets dominated by industry' was rated by 77% of respondents as being an 'important/very important' concern. The survey also revealed that if growers were to increase their investment in farm forestry, most would join a marketing cooperative (53% 'definitely/very likely'), and a large minority would contact industry at harvest time (49%), but only 25% would 'definitely/very likely' enter into short or long term arrangements with industry. One interpretation of these results is that growers believe current arrangements are unsatisfactory, even unfair.

These results highlight the importance of addressing structural issues in farm forestry. Overcoming these concerns will require considerable investment by industry, including providing marketing arrangements that provide greater assurance of returns to growers (eg. 'lease' or 'CPI indexed' joint ventures) and by government to improve access to more competitive markets (eg. infrastructure developments to increase export opportunities or to support new industries). Importantly, in regions where there are poor markets structures small-scale growers' best opportunity to negotiate with industry may be prior to tree establishment. If a mutually beneficial position cannot be agreed between the two parties, then farm investment can still be redirected to other opportunities.

Grower cooperatives have emerged in some regions as an important strategy to increase the ability of small-scale growers to negotiate with industry. Long term measures of cooperative success will be the extent they can aggregate a sufficient mass of resource and negotiate better prices than individual growers could achieve. The North East Tasmanian Cooperative achieved improved prices from a local mill (\$45/m³ to \$65/m³ after securing overseas sales). It must be acknowledged that the capacity of cooperatives to negotiate fair returns for growers is largely dependent upon the existence of competitive markets. Improved access to neighbouring regional and international markets will be critical in improving the negotiating position of cooperatives in Australia. It has been reported that cooperatives in Tasmania have on occasion increased returns for small-scale growers by as much as \$20/m³.

Grower cooperatives need to develop strategies, such as having diverse income sources so that they can withstand market fluctuations. Cooperatives with insufficient timber through-put or lack of continuity of sales will need to generate sufficient income to maintain services. Examples of diversification include offering members: planning and silvicultural advice; nursery production; processing; and financial assistance. Several informants suggested that a viable cooperative will require an annual budget of \$150,000-200,000. This would allow for 3 full-time staff (ie. marketing manager, administrator, field officer). So, at a levy rate of 10%, a cooperative would require an annual through-put of timber to the value of \$1.5-2 million (stumpage). This equates to about 100,000 m³ of hardwood pulp at \$20/m³ (about 300 ha/year) or 25,000 m³ of softwood sawlog at \$70/m³ (about 75 ha/year).

The role for market brokers/consultants is limited where industry offers prices to growers based on a fixed formula and there is little interest in negotiating with individuals. This situation reflects regional markets where industry has little demand for forest products beyond existing supplies. It is reasonable to expect that market brokers may have a greater role when regional markets are competitive for forest products. Farm forestry development needs to identify and involve brokers/consultants who offer specialist marketing and forestry expertise, and who can efficiently assemble discrete small-scale growers.

Diverse joint venture arrangements

Growers prefer flexible joint venture arrangements that allow financing and payments options to be negotiated on an individual basis with industry. Yet in many regions there is a limited range of options available to growers. Some informants related positive experiences with small-scale regional processors who were prepared to negotiate with growers who had suitable timber quality and volume in close proximity to a mill. However, industry informants generally felt this would be too time-consuming, and that it was more equitable for landholders to have one set of guidelines for joint

ventures and limit the extent of negotiation with individual growers. Large processors usually offer a price based on a fixed formula (ie. distance from mill, harvesting costs, timber volume and quality).

While many prospective growers would like industry to develop flexible joint venture arrangements that allow financing and payment options to be negotiated on an individual basis, industry prefer joint ventures that give them control of establishment and silvicultural practices to ensure timber quality at harvest. ‘Lease’ joint ventures remain the most popular option for growers. Industry commonly offers ‘crop share’ and ‘marketing’ joint ventures which tend to attract marginal and under-utilised farmland. It should also be noted that joint ventures and other marketing arrangements that link growers and industry over the long term will internalise the expense of insulating growers and/or industry against market risks. This may be reflected in arrangements which have:

- lower lease payments offered to growers;
- ‘take or pay’ requirements of industry;
- lower harvest payments offered to growers;
- little control over time of harvest (and so lower prices for growers/ higher prices for industry);
- reduced flexibility to negotiate individual agreements.

‘Lease’ joint ventures are very popular in WA, and most informants suggested this approach would be popular elsewhere in Australia. Some alternate arrangements suggested include:

- Improved returns from ‘cropshare’ joint ventures by recalculating the shares to partners using ‘actual’ costs (eg. for establishment, silviculture) rather than ‘budgeted’ costs.
- Lower ‘lease’ payments combined with free seedlings and/or an option for the landholder to purchase a share in the treecrop (eg. ‘split-area’ joint venture).
- Joint ventures could include multiple products (eg. pulpwood, sawlogs) and a range of species to attract greater interest from prospective grower and industry partners.
- Joint ventures could allow the landholder to receive a share of the product, rather than a share in the ‘net returns’ after harvest. This may allow the landholder flexibility to join with the industry’s share or seek alternate markets.
- Joint ventures could encourage partners to focus upon improving the value of the product rather than necessarily the percentage share of the arrangement.
- There also appears some scope to develop long term supply arrangements that allow for costs and prices to be reviewed and renegotiated at regular periods (eg. every 5 years). This has the benefit of incorporating more accurate market forecasts.
- ‘Forward marketing’ to minimise the impact of market fluctuations, as developed for producers of commodities such as wool and wheat. This option may prove advantageous for small-scale growers who operate without industry contracts.

The nature of joint venture arrangements offered in a given region is largely determined by market conditions. Uncompetitive markets will reduce the interest by industry in developing flexible joint ventures, and ‘market prices’ will be difficult to determine for ‘crop share’ and ‘market’ joint ventures. Encouraging the emergence of competitive regional markets remains a fundamental task of private forestry/farm forestry development (eg. developing access to world markets). There appears some scope to develop long term supply arrangements that allow for costs and prices to be reviewed and renegotiated at regular periods (eg. every 5 years). Survey respondents indicated they were more likely to enter into short term arrangements (26% ‘definitely/very likely’) and regularly reviewed long term arrangements (25%) rather than fixed long term arrangements (19%). The former have the obvious advantage of incorporating more accurate market forecasts. Presumably, a more accurate appraisal of a region’s farm forestry viability will benefit both growers and industry.

Recommendation: That JVAP work with National Association of Forest Industries and Australian Forest Growers to widely disseminate among industry and grower audiences a summary of joint venture arrangements operating in Australia. This summary should also include key principles and suggestions for refining joint ventures.

Role of government

Informants supported government involvement in research and development that contributes to: regional feasibility studies; developing niche forest products; establishing sawing and drying requirements; and establishing 'best practice' guidelines for sustainable harvesting of native forests. Informants also supported government providing specialist training; facilitating information exchange; and monitoring the impacts of farm forestry. There was less support for government acting as a broker in situations where a private broker could operate competitively.

Assessments of proposals to develop farm forestry need to consider a range of impacts. It cannot be assumed that there will be net positive benefits. For example, if large areas of trees are grown by non-resident landholders or if little processing occurs within the region, then the impact of farm forestry may be considerably less than expected. Developing clear cost sharing arrangements (eg. subsidising farm forestry for land degradation) remain an important task, yet this will be difficult to implement without distorting the commercial positions of competing regions. The mailed survey also revealed a high level of concern about the tax arrangements relating to farm forestry (61% 'important/very important').

Informants suggested government could play an important role in coordinating the efforts of landholders, industry and government at the regional level, for example through the Regional Plantation Committees. Over the last 12 months the Green Triangle Plantation Committee has commissioned a regional forest industries development strategy to identify the region's opportunities and constraints [in draft at May 1997]. Regional planning groups (eg. RPC's) should also be involved in priority setting for government funded research.

Recommendation: That JVAP and other government funding agencies directly involve regional planning groups (eg. RPCs) in establishing farm forestry research and development priorities.

Provision of information

The mailed survey showed farm forestry participants are concerned about the reliability of market information (54% 'important/very important') and that growers do not have sufficient knowledge of industry requirements (50%). A small majority of respondents also indicated they were concerned about industry and government providing conflicting advice on market prospects (51%). Farm forestry market prospects can vary considerably between regions (eg. transport costs to export markets) and growers, industry and government need sound information for informed decision making. Regionally specific investigations are required that will:

- Identify important market specifications;
- Develop a process for obtaining and updating market information;
- Identify suitable joint venture options;
- Assess establishment, management and harvesting costs;
- Develop 'forward marketing' opportunities; and
- Assess the most appropriate medium(s) for disseminating information to stakeholders.

There was some uncertainty about which organisation would be in the best position to collate and deliver this information. Organisations nominated included: government, Regional Plantation Committees, and Australian Forest Growers.

Recommendation: That JVAP negotiate with regional planning groups (eg. RPCs) to develop a methodology for ongoing regional market appraisals.

Prospective joint venture partners, both growers and industry, also need better tools (eg. computer simulation models) to appraise farm forestry arrangements.

Key principles for effective links

This research suggests the key principles for effective (ie. mutually beneficial) links between small-scale growers and industry include:

- identifying/developing competitive regional farm forestry markets;
- establishing processes that identify and effectively communicate credible information so that stakeholders can make informed decisions;
- industry demonstrating that it is acting in ‘good faith’, with growers receiving a fair share of farm forestry profits;
- industry demonstrating a long term commitment to farm forestry within regions (either with infrastructure for processing and/or funding of field staff); and
- farm forestry stakeholders able to negotiate (or choose) from a range of grower-industry arrangements.

Summary of key issues and strategies to improve farm forestry links between small-scale growers and industry

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 (eg. 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 cropshare 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 committees'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.

1. Introduction

1.1 The project

This research report discusses recent assessments of links between small-scale growers and industry, using three important Australian farm forestry regions as case studies: the Green Triangle region of south east South Australia and south west Victoria; Tasmania; and south west Western Australia.

These regions have a rich farm/private forestry experience, substantial forestry activity, relatively rapid expansion of plantations on private land, and apparent potential for further farm forestry development.

Study of links in these regions can:

- identify current arrangements and their strengths and weaknesses; and
- explore the principles and practices of effective links which are likely to facilitate increased adoption of farm forestry.

Information presented in this report was obtained from a review of existing literature; interviews with 58 key regional stakeholders (ie. people who have expressed a strong interest in farm forestry development); 3 regional workshops with a total of 40 participants; and a mailed survey. Most interviews were conducted during August 1996 and February 1997. The three regional workshops were conducted during March to May 1997, with one workshop held in each region. The mailed survey was posted to 170 people in the three regions who had previously expressed interest in farm forestry (mainly growers and prospective growers).

The authors have adopted a broad definition of farm forestry as *a design concept that optimises the management of trees and shrubs integrated with agricultural systems for multiple products and benefits*. Farm forestry therefore includes those private forestry activities related to the management of remnant native vegetation, particularly in Tasmania. Farm forestry as used in this report also includes the activities of rural landholders who manage trees and shrubs for multiple benefits while having minor agricultural production.

1.2 Background

Farm forestry is increasingly promoted as a national strategy likely to deliver important benefits in terms of assisting the move to more sustainable agriculture, reducing the forest product trade deficit, and enhancing the viability of regions through industry development and employment (Commonwealth 1992; Commonwealth 1995; Kanowski 1996; DNRE 1997; MCFFA *et al.* 1997). Despite its apparent potential to achieve gains in economic, environmental and social terms for individuals and the wider community (Robins *et al.* 1996), viable farm forestry industries are still emerging (Race and Curtis 1996). Many constraints to the widespread adoption of farm forestry have been reported (Prinsley and Moore 1992; AACM *et al.* 1996), with several relating to poor linkages between small-scale growers and industry.

Effective links between small-scale growers and industry require both parties to negotiate arrangements to achieve mutual benefits.

While some small-scale growers have developed farm forestry independent of industry/government assistance, most growers choose to establish some link (ie. formal contact) with industry prior to harvest. Effective links between small-scale growers and industry require both parties to be able to negotiate arrangements to achieve mutual benefits. This research

focuses upon the existing and potential links between small-scale growers (also referred to as landholders) and industry (those who 'on-sell' unprocessed forest products or are industrial processors).

1.3 Research approach

The purpose of this research was to make an appraisal of existing links between small-scale growers and industry in Australia's farm forestry sector, and identify ways of achieving better outcomes for all stakeholders. It was therefore essential to identify key stakeholders and obtain their views. Informants were selected [refer to Appendix 1: List of informants] who were likely to provide important information due to their experience with:

- management of industry/government joint venture programs;
- coordination of forest grower cooperatives; or
- private commercial treegrowing and revegetation.

After a literature review, the researchers conducted interviews, held workshops, and mailed a survey to 170 people.

Interviews with key informants took the form of semi-structured interviews (ranging from 0.5-2 hours) conducted face-to-face or by telephone. Semi-structured interviews are guided by the researchers' questioning, yet are sufficiently open-ended to allow the informant to discuss the topic in-depth and raise related issues (Bailey 1987; Minichiello *et al.* 1990; Patton 1990). Several informants sent additional written information to the researchers to clarify and develop these ideas. The few people who could not be contacted in person or by telephone were asked to provide written reports. Most interviews were conducted during August 1996 and February 1997. All informants were given the opportunity to review at least part of their interview notes and provide comments on an earlier draft of this report.

Three workshops were held as a way of exploring important issues emerging from the interviews. A workshop was held in each region, with a total of 40 participants representing 25 organisations. The purpose of the workshops was to explore stakeholders' views about how links between small-scale growers and industry can be improved. Each workshop was organised to provide an overview of the project before breaking into small discussion groups. Before the workshops participants were mailed information about the project and the topics to be discussed. Topics discussed included: joint ventures, grower cooperatives, market brokers, and the role of government. Workshops were structured to provide maximum input from participants. After a 20 minute introduction (including background to the research, and workshop objectives) participants formed small discussion groups, with four to six members. Each group discussed two of the four topics, with groups having a mix of topics. Groups had 40-50 minutes to discuss the two topics they selected and make notes of their discussion. To conclude the workshop, groups came together and presented a summary of key points on each topic. Information from the workshops has been included within relevant sections rather than as a separate chapter.

A mailed survey appealed as a cost effective method of gathering the views of a large number of regionally dispersed stakeholders about:

- Relative importance of grower-industry links as a farm forestry issue;
- Grower concern about specific aspects of grower-industry links;
- Industry concerns about grower-industry links; and
- Arrangements growers would adopt if increasing their investment in farm forestry.

The survey was mailed to randomly selected people (170) identified from state agency farm forestry mailing lists (60 for Tasmania and south west WA, and 50 for the Green Triangle). These mailing lists had been developed by agency staff over a number of years and comprised people interested in receiving farm forestry literature. As anticipated, most people on the mailing

lists were growers or prospective growers. This approach was adopted (as opposed to a random sample of landholders) to target people who were likely to have an understanding of farm forestry issues (ie. purposeful sampling). Survey design was consistent with Dillman's Total Design Method (Dillman 1978). A response rate of 73% was gained.

The Project's Steering Committee (including representatives of the Joint Venture Agroforestry Program) met in September (Melbourne) to discuss preliminary findings from this research and share information with other farm forestry research efforts. A draft project report was submitted to Project Steering Committee in May 1997, with subsequent amendments made.

2. Regional reviews

2.1 The Green Triangle

2.1.1 The regional setting

The Green Triangle region gained its name from the high concentration of industrial plantation forestry (ie. approximately 150,000 ha of forest plantations). The region includes some of the most productive rural land in South Australia and extends to include the fine wool growing district of south west Victoria. Fine wool and prime lamb production is the dominant landuse activity around Hamilton, with a mixture of wool/lamb, beef and dairy production around Mount Gambier. The deep sandy soils coupled with rainfall between 600-800 mm/year provide biophysical conditions suitable for commercial tree growing. Timber processing is centred on Mount Gambier in South Australia and Portland in Victoria (export pulpwood). Plantation forestry provides much of the raw material for these industries, with most plantation expansion expected to occur on cleared agricultural land owned by individual private landholders (eg. commercial farmers): highlighting the relevance of farm forestry in this region.

2.1.2 Farm forestry industry

With 150,000 ha of plantations (primarily *Pinus radiata*) the Green Triangle is one of the major softwood regions in Australia. Sixty percent of plantations in the region are owned and managed by the respective state governments (ie. Primary Industries SA (PISA); Victorian Plantations Corporation). Auspine (40,000 ha) and CSR Softwoods (25,000 ha) also manage large *P. radiata* plantations in the region. The Green Triangle has a high concentration of forest industries compared to many other regions in Australia (Margules Groome Pöyry (MGP) 1995). The major industries include CSR Timber (sawmill and particleboard), Auspine (sawn timber and wood chips), Kimberly-Clark APCEL (KCA) (tissue paper), and Carter Holt Harvey (CHH) (sawmills and LVL). The annual requirements of the forest industries in the region for sawmilling, plywood, particle board, pulp and paper, and export chips can be as high as 3.5 million m³ (Stelling and O'Hara 1995, p.1). KCA processes 80-85,000 m³/year of hardwood from public native forests to produce 24,000 t. of eucalypt pulp (Clark 1995, p.214), currently sourced from outside the region (mostly from the Otway and central Victoria regions).

While timber processing is well established in the region, it is estimated that Auspine, CSR/PISA, and CHH export '... 1 million m³ of woodchips ... each year from the Green Triangle which could be used by domestic industry' (MGP 1995, p.22). Speculation continues as to whether another processor will be established to utilise the exported softwood fibre, although no commitment has been announced.

The emerging farm forestry sector in the Green Triangle has increased the number of stakeholders and the nature of their interest in forest industries. In an effort to coordinate development, the Commonwealth, via DPIE's Farm Forestry Program, has provided funds to support a Regional Plantation Committee. In 1996 the Green Triangle Plantation Committee commissioned a regional forest industries development strategy to identify the region's opportunities and constraints [in draft at May 1997]. While still in its infancy, the group's diverse and informed membership is likely to be a useful mechanism for aligning efforts of landholders, industry and government.

Farm forestry in the Green Triangle has tended to involve plantations or woodlots established under a range of joint ventures offered by the local forest industries. There is also growing

interest among small-scale growers in growing high quality sawlogs independent of industry. For example:

- Since 1989, 4,000 ha of short-rotation eucalypts have been established by 38 properties under joint ventures with KCA. Most joint ventures are established with industrial/investment companies (approximately 3,500 ha) within 100 km of the KCA mill at Millicent in South Australia. The state department of Primary Industries South Australia (PISA) is contracted by KCA to initiate, oversee and manage the joint ventures with landholders.
- CSR have offered a 'marketing' agreement for softwood sawlogs since the early-1970's. In exchange for discounted planting stock and silvicultural advice, growers agree to offer CSR softwood sawlogs at the time of harvest. This scheme has led to approximately 5,000 ha being established in blocks ranging from 4-180 ha.
- Around Hamilton in Victoria there is growing interest amongst private landholders in establishing 1-2 ha/year of high quality sawlog tree crops (eg. *Pinus radiata*, *Eucalyptus maculata*) and specialty timber (eg. *Cupressus* spp., *Casuarina* spp.) (Bird and Jowett 1996). These small lots will be managed primarily for high quality clearwood, with sawlogs produced in 25-35 years.

Nevertheless, it is difficult to assess the current viability of farm forestry in the Green Triangle as there has been little timber sold by small-scale growers and prices are not disclosed. Several processors regularly thin private woodlots with growers receiving prices comparable with government royalties. In an effort to make some predictions, Loane (1994, p.1) explained 'Woolgrowers in the past have earned an average of about 5% pa. (in real prices), but to include a premium for risk and match returns on industrial shares, a return nearer 10%' would be required from farm forestry if primarily a commercial venture. Therefore, depending on volume, quality, ease of harvesting, distance from mill (costs typically in the range of 10-17 cents/tonne/km), growers would probably need stumpage prices of \$80-120/m³ for large pruned logs to attain a 10% Internal Rate of Return (IRR). However, several informants felt a 7-8% IRR was a more reasonable expectation from farm forestry, based on average stumpage prices of \$65-80/m³. Typically, a range of products can be produced (eg. pulpwood, roundwood) when farm forests are managed for sawlogs giving growers an alternate strategy to develop a viable enterprise. With the recent expansion in area of eucalypts for pulpwood, greater attention will be given to comparing the value of a lease joint venture (as offered by Green Triangle Plantation Forest Company (GPFL)) with a marketing joint venture (as offered by PISA). Recent stumpage prices paid for eucalypt pulpwood are between \$20-22/m³ within a 150 km haulage zone (equating to approximately \$45/m³ at mill door).

Growers within haulage distance of an existing mill might assume that they will be able to supply the mill when their timber is ready, especially if 'piggy-backing' on existing industry transport routes. In other areas, such as the lower rainfall (<600 mm/year) and more remote areas (eg. >150 km from Millicent, Mt Gambier, Portland), there may be no obvious market unless certain minimum supplies can be generated. Some informants commented:

"... growers will be best placed if they don't plant a long way from the mill."

"... if farmers want to get into farm forestry as a commercial venture, then they'll have to understand more than just how to grow trees ... they'll need to understand how the markets work and how industry thinks."

If the mill door prices return considerably less than 7% IRR, many prospective growers will seek alternate markets and potential small-scale growers will not enter farm forestry.

In their assessment of eucalypt pulpwood, Townsend and Mahendrarajah (1996) suggested that land users be encouraged to plant plantations on higher quality areas of their farms to minimise the costs and maximise after-tax income.' There is growing landholder interest in establishing

small areas of high quality commercial trees on a regular basis (ie. 1-2 ha/year). This approach means that a farm forestry enterprise is manageable by a farm family (in terms of time and costs) (Bird and Jowett 1996). For example, a DPIE-sponsored project assisted 82 farmers establish 112 ha of trees during 1993-95.

Areas of high quality sawlog timber could be regionally significant in terms of addressing land and water degradation, improving farm profitability, and stimulating regional employment [refer to farm forestry scenarios on p.46-49]. The higher returns for high quality sawlogs could yield as much as \$22,000/ha at harvest with an IRR of 9.9% (Bird *et al.* 1996, p.71). If such returns are realised by growers there would be greater flexibility in the 'economies of scale' with haulage zones and processor requirements.

There is growing interest by Japanese companies in establishing joint ventures with landholders to grow eucalypts for pulpwood. This timber will be chipped and exported from Portland. Recent announcements indicate the GPFL aims to enter into ventures with landholders within 150 kms of Portland to establish 20,000 ha of eucalypts for pulpwood over the next 10 years. GPFL will offer a 'lease' joint venture with regular payments. PISA also has been contracted by Japanese interests to coordinate the establishment of 10,000 ha of eucalypts for pulpwood within 150 kms of Portland over the next 10 years. PISA intends to attract landholders with a 'marketing' joint venture, with a base price for stumpage (indexed to hardwood chip prices ex-Tasmania) fixed at the time of signing the contract. Timber 2000 (a grouping of local landholders) and other unaligned investors have expressed interest in growing eucalypt pulpwood plantations without the initial need for market contracts.

Farm forestry in the Green Triangle is characterised by the growing and processing of softwood, rapidly expanding bluegum plantings for the pulpwood export market, and interest in small-scale high quality sawlog production.

2.2 Tasmania

2.2.1 The regional setting

Much of the timber from private land in Tasmania comes from harvesting native forests. Small-scale forestry on private land in Tasmania is simply described as 'private forestry', rather than farm forestry where trees are established on cleared agricultural land. In this report the term farm forestry covers the activities of private rural landholders managing plantation or remnant native vegetation.

Previous generations cleared much of Tasmania's most fertile and accessible country, leaving forestry to occupy the marginal country. Today, 30% of Tasmania's native forest area is on private land and the management of these areas of native forests is an important element of farm forestry in Tasmania. Very little of this native forest is being cleared for agriculture. The majority of eucalypt plantations are established following logging of native forest. Exporters must establish 1 ha of plantation and regenerate 4 ha of native forest for every 1,000 t harvested from private land. Forest management of areas with better quality timber usually involves thinning for pulpwood and the retention of higher quality trees for later harvesting as sawlogs.

Tasmania has traditionally been seen to have three key forestry regions: the north west, north east, and south east. However, as markets emerge and transport systems improve, the boundaries between regions are becoming less important. Some informants suggested there are now simply

northern and southern forestry regions, with prospects for farm forestry in both regions strongly linked to the established forest industries.

2.2.2 Farm forestry industry

The northern region appears to have the most viable forest industry. This region has good biophysical conditions for tree growing (ie. 800-1300 mm rainfall/year, fertile soils), reasonable land available on farms, and several existing and emerging markets. However, in some areas of the northern region there are high opportunity costs associated with establishing farm forestry on cleared agricultural land due to the profitability of alternatives such as horticulture, dairying, cropping potatoes, and the attractive returns from rural subdivision. Where these alternatives exist, farm forestry tends to be established on marginally productive sites which are likely to be less attractive to industry (eg. further from mill, higher harvesting costs, low quality timber).

Over recent decades the forest industries in Tasmania have been dominated by the pricing set by state governments and large processors such as North Forest Products (NFP), Boral Timber Resources (BTR), and Australian Newsprint Mills (ANM). The large demand from these organisations (up to 3 million m³/year) has set timber prices for both the large and small growers. As Tasmania has extensive public and private native forests, there has historically been an over supply of timber and processors have had little interest in purchasing from small-scale growers in remote locations, or with poor quality timber. Poor coordination also prevented small suppliers from combining their resources to attract larger timber companies or nearby hardwood sawmills.

To counter declining sawlog supplies from Tasmania's native forests, public softwood plantations were established during the 1940's. Various Commonwealth and Tasmanian government schemes attempted to establish small (<10 ha) and large (>40 ha) plantations on private land during the 1970's. However, less than 1,000 ha was established through these schemes. Industry also offered assistance to landholders in the 1970's, with Forest Resources (now BTR) and APPM (now ANM) stimulating 20,000 ha of forestry development. Given the large native hardwood resource and an emerging demand for softwood pulp and sawlogs, these schemes focussed upon *Pinus radiata*. The operations of French Enterprises at Scottsdale in the north-east and ANM in the south-east region created a state-wide demand for softwood pulp. Tasmania now has a softwood plantation area of 72,000 ha (Kohl and Clark 1995, p.252), which currently produces 5,700 m³ of saw and veneer logs and 700,000 m³ of pulpwood per annum from private land (King 1996, p.191). The volume of softwood sawlogs available will increase considerably as new softwood plantations mature.

Eucalypt plantation establishment for the hardwood pulp market began in the early-1980's. The hardwood plantation area of 57,000 ha (Kohl and Clark 1995, p.254), combined with the developing softwood plantations, has started the shift away from total dependence on native hardwood forests. Nevertheless, plantations are only beginning to come on-stream and native forests still supply almost all of the State's hardwood timber: 245,000 m³ of saw/veneer log and 1.4 million m³ of pulpwood (King 1996, p.191).

The State's Forest Practices Act (1985) allows landholders to declare on their land title on areas of native forest for perpetual commercial timber production. These areas are called Private Timber Reserves (PTR). Once the process of review, appeal and registration has been satisfactorily completed, the landholder has an incontestable landuse right for commercial forestry. An important aspect of the PTR's is the development of an approved Timber Harvesting Plan before to harvesting. Harvesting plans must be prepared and approved by a Forest Planning Officer (often a professional forester) and harvesting must be undertaken according to the Code of Forest Practices.

Several informants commented that the prospects for farm forestry in the northern region have improved due to: increased mill door prices offered to landholders under joint ventures; increased prices paid as a result of sales by cooperatives; more reliable demand for a range of forest products (eg. thinnings for posts/pulp, sawlogs and veneerlogs); improved cost-efficiencies of establishment, silviculture, harvesting small areas, and transporting (eg. 'back loading' opportunities) for commodity species (ie. *P. radiata*, *Eucalyptus globulus*, *E. nitens*); and continued export opportunities. Timber exports from Tasmania are largely as hardwood and softwood chips to Japan and South Korea. Much of Tasmania is well serviced by deep-sea ports (which is required for timber exports).

Kohl and Clark (1995, pp.259-72) reported the major processors in the northern region included:

- Auspine (sawmill input 180,000 m³/year of softwood);
- French Enterprises (sawmill 95,000 m³/year of softwood);
- North Forest Products (chip export 1.8 million m³/year - mostly hardwood);
- Boral Forest Resources (log and chip exporting 900,000 m³/year of hardwood);
- AMCOR Plantations (pulping 50,000 m³/year of softwood and 370,000 m³/year of hardwood);
- ANM (pulping 380,000 m³/year of softwood and 175,000 m³/year of hardwood);
- Tasmanian Resource Export Corporation (TREC) (log exporting 95,000 m³/year of softwood);
- Wood Panels (particleboard requiring 31,500 m³/year of softwood).

Most softwood (84% of 72,000 ha) and hardwood (83% of 57,000 ha) plantings in the northern region are established by forest companies or as joint ventures with landholders (King 1996). The remaining plantation areas have been established by the State. The granting of three export wood licences by the Commonwealth in 1996 has given the northern region a heightened level of competition (another export licence was granted for the south east region). For instance, two export shipments of *P. radiata* by the North West Treegrowers Cooperative Society Ltd. appear to have benefited small-scale growers [refer to Figure 1: North West Treegrowers Cooperative Society Ltd., p.32].

Some informants commented on the likely prospect of a medium (100-150,000 m³/year) to large (>300,000 m³/year) vertically integrated processor (ie. processing pulpwood, sawlogs and veneer logs) establishing in the northern region of Tasmania. Clark (1995) also noted the possibility of Auspine spending \$30 million to upgrade the Scottsdale sawmill. This would further increase competition and underpin prices in the region, and possibly across the state. Increased market competition has meant the large operators have had to compete on price and service (eg. flexibility of joint venture contracts, regular personal contact, contribution to local community).

By comparison, the southern region appears less dynamic, although improved access to neighbouring regional markets with 'back loading' is offering some scope for inter-regional trading. There is less competition in the south east region because native forests on private land provide a continuous hardwood resource. ANM provides the only market for softwood, and NFP and ANM dominate the market for hardwood pulpwood. There is little demand for softwood sawlogs as the nearest processor is at Scottsdale in northern Tasmania, despite most of the softwood plantations being managed on a sawlog regime with pulpwood thinnings. The first ANM softwood plantations were estimated to be about 5 years away from producing sawlogs. This will produce a continuous volume of 100,000-200,000 m³/year.

Farm forestry in Tasmania has been developed as an opportunity for commercial treegrowing to be integrated with agriculture (eg. timberbelts), or as woodlots on underutilised land. However, commercial trees perform better when established on more fertile country. As the long-term prospects for small-scale growers improve, larger areas of commercial trees are likely to be established on fertile farmland which is accessible for harvesting and trucking equipment.

Farm forestry will continue to be attractive to the small number of landholders exploring niche markets. Small volumes of specialty timber (ie. craft/furniture timber) (eg. 5,700 m³/year from private land; King 1996, p.191) are primarily sourced from native forests, processed and then sold on domestic and international markets.

Coordination of information exchange, particularly for growers, is performed by Private Forests Tasmania (PFT), Tasmanian Farmers and Graziers Association, and the Australian Forest Growers. Industry and the three grower cooperatives also provide technical information to their joint venture partners and members. Coordination of farm forestry development has been initiated by PFT, and this has increased with DPIE-funding.

The long term prospects for small-scale growers in Tasmania appear to be improving due to:

- **Increasing competition for a range of softwood and hardwood products;**
- **Good access to domestic and international markets;**
- **Better tree performance with advances in treebreeding and site-specific information;**
- **State legislation supporting ‘right to manage and harvest’ declared areas of private forestry (ie. Private Timber Reserves); and**
- **Improving coordination amongst small-scale growers through cooperatives.**

2.3 Western Australia

2.3.1 The regional setting

The major commercial tree growing opportunities in Western Australia (WA) occur in the south west of the state, where there is adequate rainfall and fertile soils. The potential for commercial tree growing corresponds to agricultural opportunity, with available land a limiting factor in some high rainfall districts. There are five distinct regions for farm forestry development in WA. Three of these regions are within the **high rainfall zone** (>600 mm rainfall/year), which includes the coastal areas south of Perth and east to Esperance, namely:

- Bunbury/Manjimup;
- Albany; and
- Esperance.

Farm forestry in the high rainfall zone competes with dairy and beef production, and urban development. The **medium rainfall zone** (400-600 mm rainfall/year) is the main wool production region; and the **low rainfall zone** (<400 mm rainfall/year) is the main area for cereal cropping and is also known as the ‘wheatbelt’.

Salinisation of land and water is a critical environmental problem in south west Western Australia. Agriculture Western Australia *et al.* (1996a p.1) reported that:

Western Australia has over 70 percent of Australia’s reported dryland salinity. An estimated 1.8 million hectares of farmland are already salt-affected to some extent and this area could double again in the next 15 to 25 years and then double again before reaching an equilibrium.

The cost of land lost to salinity has been estimated as \$1,445 million, with a continuing loss of \$64 million/year until it is fully addressed (AgWA *et al.* 1996a, p.11). The fundamental cause of salinity has been the replacement of perennial, deep-rooted native vegetation with the annual

crops and pastures used in agriculture (AgWA *et al.* 1996a). Farm forestry has emerged as a major strategy to address salinity in Western Australia, with an indicative target of 1.25 million ha to be established over the next 30 years (AgWA *et al.* 1996b, p.7). Farm forestry has also been established as a purely commercial venture in the high rainfall regions, principally with bluegum (*Eucalyptus globulus*) for the pulpwood export trade with Japan and South Korea.

2.3.2 Farm forestry industry

As with other major Australian forest industry regions, the timber industry in WA has evolved from converting native forests into merchantable timber (Dargavel 1995). The Department of Conservation and Land Management (CALM) is the state's largest forest manager and broker of log supplies to industry, with hardwood for the state's sawmill industries coming largely from the public forests (98%) in the south west region (CALM 1996). The volume of hardwood used for timber production has decreased considerably since 1970. At the same time, the use of plantation softwood (*P. radiata*, *P. pinaster*) has increased and now accounts for 30% of commercial timber volume in WA (state total volume of sawn softwood was 124,070 m³ in 1995) (CALM 1996, p.84). Of the 692,000 m³ of hardwood logs sawn in 1995-96, 98% came from crown land-native forests (with hardwood plantations yielding less than 1%). During the same period, 811,000 m³ of non-sawlog material from crown native forests was processed, with 82% as chiplogs (CALM 1996, p.25). While the proportion of private ownership of forest resources remains small, private ownership of softwood resources has increased considerably over the last 25 years (CALM 1996).

The major species harvested from native forests are jarrah (*E. marginata*), karri (*E. diversicola*) and marri or redgum (*E. calophylla*). While jarrah and karri are the preferred species for sawing and pulping, marri is also used for pulping (Dargavel 1995). The area of jarrah forest harvested each year has halved over the last 20 years, with 17,830 ha harvested for 450,000 m³ of sawlog in 1995 (CALM 1996, p.25 and 79). There is a trend for increased volumes of hardwood chiplogs from private land, with 15% of the state's total 667,000 m³ from private sources in 1996 (CALM 1996, p.83). Softwood (*P. radiata*, *P. pinaster*) is increasingly being utilised for sawing and pulping, as is plantation grown bluegum for pulpwood.

Lancefield (1993, p.30) reported 'The export chip industry has traditionally been very profitable' for processors, with industry continuing to develop a substantial bluegum resource for woodchip export. This private timber resource is largely organised through industry/CALM joint ventures with farmers and small-scale landholders. Recent estimates indicate that 15,000 ha of bluegum have been established through CALM (7,500 ha) and private initiatives for the pulpwood industry (CALM 1996, p.82).

Large scale investment in WA forestry is made by a few companies. Bunnings Ltd. are the major hardwood sawmillers and chip exporters in WA, with sawmilling at Manjimup and chip exporting from Bunbury. Bunnings Ltd. have an integrated operation with hardwood and softwood afforestation, processing, manufacturing, retailing throughout Australia and overseas (Lancefield 1993). To illustrate the scale of operations, Bunnings Ltd. held an export licence for 750,000 t/year (Lancefield 1993, p.42).

Wesfi Ltd. is a major integrated softwood company in WA. It focuses on reconstituted wood panels and resin/adhesive production, and has developed a joint investment in softwood sawmilling with Bunnings Ltd. at Dardanup. Whittakers Ltd. is another important operation, largely based upon a hardwood sawmill at Greenbushes, with some exporting of hardwood chips from the sawmill residues. Whittakers Ltd. also process a limited volume of softwood for sawn timber.

Farm forestry in WA is developing with strong prospects in the three main agricultural regions.

- Over the last 10 years in the high rainfall region landholders and industry/government have established about 50,000 ha of bluegums for pulpwood.
- CALM plans to spend \$18 million per year to establish a commercial farm forestry program in the medium rainfall region using maritime pine (*P. pinaster*) (AgWA *et al.* 1996b).
- CALM recently invested \$3 million over 4 years to develop a eucalypt oil industry in the 'wheatbelt' or low rainfall region. AgWA *et al.* (1996b, p.13) reported 'Nearly 6,000 ha have been planted by 300 farmers, enough for the development of harvest and processing operations.'

As discussed above, most farm forestry development in WA is based on exporting eucalypt pulpwood. The two major centres for this activity are at Bunbury/Manjimup and Albany. 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 Ltd. or CALM. In these areas, 'lease' joint ventures - where landholders are paid annual (or quarterly) lease payments - can be as high as \$200/ha per year for cleared agricultural land with a commercial timber growth index of 20-25 MAI (mean annual increment: rate of commercial timber growth expressed in terms of m³/ha/year). These lease payments for farm forestry are highly competitive against beef and sheep enterprises, which are typically in the range of \$60-150/ha per year. Lease joint ventures are usually contracted over a two-rotation period (eg. 25 years), with the initial lease payment indexed to the CPI.

Farm forestry in south west WA is largely based upon the bluegum pulpwood industry for export and the softwood sawlog industry. The market for bluegum pulpwood has emerged rapidly since the early-1980's with commercial interest from Japan and South Korea. The market for softwood sawlogs is largely driven by Australian demand and has been developing for many decades. The immediate economic prospects for farm forestry are strongest for bluegum pulpwood grown within 100 km of a chipping mill and close to export facilities. With growing confidence in the future of pulpwood export markets, more growers are independently establishing short rotation bluegums. City-based Australian groups have also invested in bluegums for the growing trade in export woodchips. Softwood sawlogs appear to have positive long term prospects, particularly for high grade timber.

Alternate farm forestry industries are also emerging. For example, WA's increasing salinity problem has stimulated efforts, particularly by CALM, to develop commercial treecrops for low-medium rainfall regions. Two industries showing promising results on farms and regionally are:

- In the low rainfall region, the eucalypt oil project involves growing mallee eucalypts in hedgerows with cereal cropping between rows. The eucalypt hedges are harvested every 2-4 years, with foliage distilled to produce eucalypt oil for use in industrial solvents. Researchers are investigating the potential of using the residues for generating electricity. Over 6,000 ha have been established in six wheatbelt districts since the project commenced in 1993.
- Areas in the medium rainfall region are suitable for growing maritime pine for sawlogs over a 30-40 year period. Joint ventures are being developed by CALM to establish 15,000 ha/year of softwood to supply sawmills.

Small areas of specialty species are also grown throughout WA's farming regions, although there appears to be no systematic approach to achieving a critical mass of supply in any area. Native forests managed by CALM produce much of the specialty timber for appearance and furniture manufacturing (CALM 1996).

In Western Australia, the high level of activity in growing bluegums for the pulpwood export market, largely with 'lease' joint ventures, is increasingly matched by the interest in developing softwood sawlog and oil mallee industries in the low-moderate rainfall agricultural areas.

Several reviews of the potential of farm forestry in WA have been conducted for regions (Lancefield 1993; Burnage 1996) and the State (FFTF 1995) during recent years. Given WA is self-sufficient in timber, much of the expansion in plantation and farm forestry is focussed on export markets. In a review of the Albany area, Lancefield (1993, p.2) reported that bluegum pulpwood for export would be a sound financial investment and represented a '... marvellous breakthrough and quantum leap forward for the Region's forest industry'. The review estimated 50,000 ha could be established as a dispersed, integrated plantation estate, which would employ over 400 people without reducing employment in agriculture (Lancefield 1993, p.63). The formation of a 'tree growing cooperative' was proposed to coordinate and manage the emerging bluegum farm forestry independent of industry and investor interests. Lancefield (1993, p.129-130) estimated an initial formation cost of \$155,000 and annual operating cost of \$358,000 would be required by a cooperative to coordinate the planting of 2,000 ha/year over 10-12 years.

There are few long term case studies on which to assess the viability of various farm forestry enterprises. Analyses by Eckersley *et al.* (1993), Lancefield (1993; 1995) and Burnage (1996) indicate that the bluegum pulpwood and softwood sawlog industries are more profitable than current grazing enterprises with IRR's ranging between 7-18%. While the bluegum sawlog (Moore *et al.* 1996), maritime pine sawlog (AgWA *et al.* 1996b), and eucalypt oil (Bartle *et al.* 1996) industries are still developing, there are indications that these treecrops could be profitable at farm and regional levels.

In the absence of an established timber industry, recent farm forestry initiatives in the Esperance area have explored tree performance, processing opportunities and capacity to access export markets. In a review of farm forestry potential there, Burnage (1996) reported the bluegum pulpwood export market coupled with the longer term maritime pine sawlog market offered considerable opportunities. Burnage (1996) concluded that the Esperance community would benefit most if a forest industry was integrated with current farming practices. This review also supported the South East Agroforestry Cooperative which formed in 1993.

FFTF (1995, p.1) reported that 350,000 ha could be established across WA, creating 2,600 new jobs and adding \$538 million of annual economic activity. Key areas for improvement identified by the FFTF (1995) included:

- better coordination of state and regional farm forestry activities;
- value-adding to timber products at the regional level;
- improved taxation arrangements;
- separating CALM's commercial activities from its traditional agency functions; and
- legislative reform to allow 'right to harvest' trees established for farm forestry purposes, and 'forestry rights' to separate ownership of trees and land.

In an effort to improve the statewide coordination of key stakeholders and resolve some of these issues, the Farm Forestry Development Group (FFDG) was formed in 1996. This group now employs a part-time executive officer. Regional farm forestry coordinating groups have also been formed to improve cooperation between a range of organisations. Groups have emerged at Esperance (South East Forest Foundation), Albany (Timber 2002 Development Group), Manjimup/Bunbury (Trees South West), and low rainfall/wheatbelt (Oil Mallee Association of WA). All groups link with the Farm Forestry Development Group. These groups are recognised as the leading regional and state farm forestry planning groups in WA.

3. Links between small-scale growers and industry

3.1 Constraints affecting farm forestry

Most landholders establishing trees do so to achieve agricultural benefits (ie. to provide shelter for livestock, crops); to arrest land and water degradation (ie. reduce salinity, soil erosion); and to provide wildlife habitat (Prinsley 1991; Wilson *et al.* 1995). Few landholders grow trees primarily for commercial forest products (Wilson *et al.* 1995). Growing trees for commercial timber production requires a relatively long-term commitment, from the landholder, industry and/or government. There are many economic factors likely to constrain the development of farm forestry, including: high establishment costs; long investment periods; lack of landholder liquidity; uncertain long-term market demands (AACM *et al.* 1996); markets heavily influenced by low prices for native forest timber in Australia (IC 1993); and the profitability of alternative enterprises in high rainfall areas which raise opportunity costs (CIE *et al.* 1996).

The economic limitations of investing in long term projects (ie. >10 years) with poor 'cash flow' and producing a small, discontinuous supply of timber in remote locations has been noted as a particular disincentive to farmers (ACIL 1984; JAMC 1991; Henderson and Leech 1994; Pearse 1994; Bartle 1995). The absence of competitive regional markets in many parts of Australia is also a major disincentive to the adoption farm forestry (NPAC 1991; Prinsley and Moore 1992). Poor understanding of the socio-economic dimensions of farm forestry development at regional and farm scales is also a factor (Curtis and Race 1996). Increased demand may not necessarily mean higher prices for growers, particularly small-scale growers in Australia. It is likely that increased demand will stimulate an expansion in the supply of forest products - potentially from countries with low labour and operating costs, and where environmental values are discounted in favour of short term economic development.

Many uncertainties confronting growers in farm forestry also confront industry. For example, processors want some certainty about supplies and markets, yet they must trade in competitive, fluctuating global markets. Even small-scale processors (eg. small hardwood sawmill) trading in regional markets can be affected by global issues. For example, world consumption of industrial timber is expected to increase over the next two decades, but this demand may not translate into timber sales given the political instability in many countries (Ferguson 1997).

Minor changes in the economies of China and India have the capacity to alter demand for wood products (de Fégely *et al.* 1997). De Fégely *et al.* (1997) noted that industry faces uncertainty because increased demand for timber may lead to technological developments which will allow:

- Processing of low-grade timber for high value products;
- Substitution with non-wood products; and
- Recycling (eg. old plywood into particleboard).

In summary, Cummine (1996, p.39) reported:

When sourcing their wood, the timber industries need 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.

This research asked survey respondents to indicate the extent they perceived 17 listed farm forestry issues were of concern to growers [refer to Table 1, below]. These topics were identified from an earlier literature search, previous research by the authors, discussions with farm forestry stakeholders as part of this research, and from work pretesting the survey. Respondents were asked to indicate the extent they felt growers were concerned about each issue by selecting from:

‘very important’, ‘important’, ‘some importance’, ‘minimal importance’ and ‘no importance’. High response rates were obtained for each issue (from 116-120 of a possible 124). Responses were collapsed into three categories for analysis purposes (ie. ‘important/very important’, ‘some importance’, ‘minimal/no importance’).

The issues of highest importance to growers were the economic viability of farm forestry (92% rated this issue as ‘important/very important’); long term market prospects (84%); growers lack capacity to negotiate fair price with industry (72%); fair returns to growers from joint ventures (69%); capacity of trees to arrest land and water degradation (65%); concern about tax arrangements (61%); and uncertainty about the reliability of market information (54%).

Table 1: Extent of grower concern about farm forestry issues

(N=124)

Survey of farm forestry grower-industry links

(Green Triangle, Tasmania, south west WA; 1997)

Topic	n=	Level of grower concern		
		Important/ very important	Some importance	Minimal/no importance
Economic viability of farm forestry	119	92%	6%	2%
Long term market prospects	120	84%	13%	3%
Growers lack capacity to negotiate price with industry	118	72%	17%	11%
Joint ventures will provide fair returns to growers	118	69%	20%	11%
Capacity of trees to arrest land and water degradation	119	65%	18%	17%
Concern about tax arrangements	118	61%	25%	14%
Uncertain about reliability of market information	119	54%	32%	14%
Uncertain about industry requirements for products	119	50%	32%	18%
Poor knowledge about market prospects	119	50%	30%	20%
Insufficient household income to invest in new farm enterprise	119	47%	24%	29%
Farmer at a stage in life where farm forestry is too long term	120	43%	25%	32%
Concern about local government planning laws	120	37%	31%	32%
Insufficient knowledge of tree crop management	119	35%	35%	30%
Don't consider land/soil type suited to growing commercial tree crops	118	35%	21%	44%
Insufficient time to manage new enterprise	119	31%	39%	30%
Lack of access to grower cooperative	116	28%	28%	44%
Previous bad experience with tree crops	119	17%	17%	66%

Several concerns related directly to the nature of the links between growers and industry, highlighting the importance of this issue in farm forestry development. These issues were ‘Joint ventures will provide fair returns to growers’, ‘Growers lack capacity to negotiate prices with industry’, ‘Lack of access to grower cooperative’. There is a strong perception that small-scale

growers will not be in a position to negotiate prices with industry and joint ventures may not provide fair returns to growers.

Survey respondents, mainly growers, reported that small-scale growers are generally not in a position to negotiate prices with industry, and that joint ventures may not offer fair returns to growers.

The high level of concern that trees had the capacity to arrest land and water degradation (65%) was surprising given the emphasis of revegetation in regional and national strategies. Survey results also revealed concerns about tax arrangements relating to farm forestry (61%), supporting the position of the Australian Forest Growers who have proposed a review of this situation by the Australian Taxation Office (ATO). Recent amendments by the ATO relating to the status of primary production and forestry (TR 95/6; TR 97/D1) are considered to be generally supportive of farm forestry (Cummine 1997). Further amendments relating to capital gains taxation are expected shortly. These changes need to be clearly communicated to growers/prospective growers if they are to have a positive impact on farm forestry.

Socio-economic issues at the farm level were also rated highly. For example, insufficient household income (47%), stage of life of farmers (43%), and insufficient time to manage new enterprise (31%) were considered 'important/very important' concerns for large minorities of growers. Generally, respondents from the different regions had very similar perceptions of grower concerns about farm forestry issues.

3.2 Joint ventures

In this research, a joint venture is defined as a *legal arrangement (ie. contract) between two or more parties to combine land, capital, management, and market opportunities for commercial treecrop production*. The typical partners involved in farm forestry joint ventures are landholders (providing land, and/or management) and industry/government (providing initial finance/capital, management and market opportunities), with base payments or profits shared between partners according to relative inputs and market value.

Both growers and industry have sought to minimise market uncertainties by developing arrangements that link small-scale growers and industry. An outline of typical arrangements is provided in Table 2, below.

Joint ventures between tree growers and timber processors logically share the burden of establishment costs and commercial risk, while maintaining part-ownership for both parties. As AACM *et al.* (1996, p.74) explained, landholders tend to be 'asset rich' yet 'cash poor', requiring '... loans, joint venture investments or other cost sharing arrangements to enable them to adopt commercial farm forestry.' In a recent review of impediments to farm forestry development Alexandra and Hall (1997) noted that grower-industry joint ventures could reduce the long-term uncertainty, particularly for small-scale growers with little bargaining power. The Department of Primary Industries (Qld.) (1995, p.9) concluded it '... generally favoured the creation of commercial partnerships for timber plantings.' Several authors have suggested that a variety of joint ventures was likely to be important in encouraging farm forestry adoption (Byron and Boutland 1987; Boutland *et al.* 1990; Prinsley 1991; Lyons 1993a; Lyons 1994; Furrer 1994; Dunchue and Sinclair 1995; AACM *et al.* 1996).

Table 2: Outline of market linkages

Arrangement	Characteristics	Primary stakeholders
'Lease' joint venture	Regular payments to landholders. Industry own trees.	Landholders and industry/govt.
'Cropshare' joint venture	Growers and industry share costs and returns proportionally.	Growers and industry/govt.
'Marketing' joint venture	Growers own trees, industry offers sale at market price.	Growers and industry/govt.
'Cost recovery' joint venture	Government initiates farm forestry development and seeks part/full-repayment when viable.	Government and growers.
'Subsidy' joint venture	Growers' establishment costs subsidised by government.	Government and growers.
Grower cooperatives	Aggregation of growers' supplies. Efficient purchasing for industry.	Growers.
Market brokers	Negotiate link (sales) between growers and industry.	Growers and/or industry.
On-farm processing	Exploiting niche markets and value adding may improve viability for growers.	Growers.

Joint ventures typically offer **small-scale growers** one or more of the following benefits:

- financial support with full/part-establishment costs;
- stable, annual income with lease payments;
- guaranteed financial returns;
- reduced market risk with an assured sale;
- silvicultural advice; and
- physical support with tree establishment and management.

Joint ventures typically benefit **industry** by providing:

- increased supply of future timber resource;
- resource security without purchasing land;
- access to productive farmland for treegrowing close to mills;
- diversified sources of supply; and
- shared participation with local communities in timber production (ie. good public relations).

Large timber processors in Australia tend to be vertically integrated, that is, processors strive to improve their resource security, efficiency and profits by controlling all stages of timber production, from tree planting through to processing and marketing of a range of complementary products (eg. veneer, sawn timber, particle board) (IC 1993). Many of these companies operate as regional monopolies (AACM *et al.* 1996), insulated from competition by product specialisation and high transport costs to neighbouring processors, suggesting competitive markets for farm forestry products may not develop in Australia. The view that farm forestry joint ventures will produce equitable rewards to all parties has been challenged by Trainer (1989) and Vanclay and Lawrence (1995) who have emphasised the need to examine the 'dependent' relationship between the small-scale grower and industry. AACM *et al.* (1996, p.76) concluded 'Lease and share farming arrangements do little to strengthen the market position of landholders in the farm forestry sector.' Burch *et al.* (1992, p.259) argued that contract farming (ie. joint ventures) may link farmers into '... a subordinate and dependent role as a production unit in a movement toward the so-called "industrialisation of agriculture".'

The value of joint ventures will be limited when either the grower or industry is restricted in their ability to negotiate linkage arrangements.

If negotiations are limited in farm forestry, growers may become ‘price takers’ and have their profit margin reduced. This research indicated growers are concerned about receiving fair returns in farm forestry, so it is not surprising that most growers have a strong desire to maintain at least part-ownership of forest resources when establishing commercial ventures (Bourke and Luloff 1994).

In this research survey respondents were also asked to indicate the extent they perceived 10 listed issues relating to grower-industry links were of concern to growers [refer to Table 3, below]. Respondents were asked to indicate the extent they felt growers were concerned about each issue by selecting from: ‘very important’, ‘important’, ‘some importance’, ‘minimal importance’ and ‘no importance’. High response rates were obtained for each issue (from 101-115 from a possible 124). Responses were collapsed into three categories for analysis purposes (ie. ‘important/very important’, ‘some importance’, ‘minimal/no importance’).

Table 3: Extent of grower concern about grower-industry links in farm forestry
(N=124)

Survey of farm forestry grower-industry links

(Green Triangle, Tasmania, south west WA; 1997)

Topic	n=	Import./ Very import.	Some importance	Minimal/No importance
Markets dominated by industry	115	77%	14%	9%
Long term nature of joint venture contracts	112	63%	20%	17%
Range of joint venture options offered is too narrow	109	51%	25%	24%
Industry and government provide conflicting advice on market prospects	114	51%	29%	20%
Joint ventures with industry lack flexibility (eg. renegotiate after 5 yrs.)	110	47%	33%	20%
No grower cooperative in region	113	37%	23%	40%
Existing co-operative is ineffective	101	26%	21%	53%
Unable to find brokers to commission	105	29%	29%	42%
High cost of commissioning marketing brokers	106	37%	32%	31%
Existing brokers lack sufficient knowledge or skills to negotiate with industry	107	30%	31%	39%

The most important issues concerning grower-industry links were: ‘Markets dominated by industry’ (77%); ‘Long term nature of joint venture contracts’ (63%); ‘Range of joint ventures offered is too narrow’ (51%); and ‘Industry and government provide conflicting advice on market prospects’ (51%). By comparison, issues related to access to grower cooperatives and brokers were rated as an ‘important/very important’ concern by <38% of respondents. Given that there are some grower cooperatives operating in parts of Tasmania, the 37% of respondents indicating ‘No grower cooperative in region’ as an ‘important/very important’ concern suggests this issue is more important for the other regions. Comparison of responses by region and respondent type revealed few differences for these issues.

A high proportion of ‘growers’ perceive that they have little prospect of negotiating fair returns within current markets. This highlights the importance of addressing structural issues in farm forestry. Overcoming grower concerns will require considerable investment by industry including providing marketing arrangements that provide greater assurance of returns to growers (eg. ‘lease’ or ‘CPI indexed’ joint ventures) and by government to improve access to more competitive markets (eg. infrastructure developments to increase export opportunities or to support new industries).

A summary of joint ventures currently offered in Australia is presented in Table 4: Overview of joint venture arrangements, p.29.

3.2.1 Nature of joint venture arrangements

Joint ventures developed around Australia have enabled growers and industry/government partnerships to establish an important timber resource of 82,900 ha (mostly since 1985). At an approximate cost of \$1,000/ha for establishment alone, joint ventures have contributed \$83 million to regional forest industries. These plantings represent approximately 8% of Australia’s 1.043 million ha plantation resource (BRS 1997).

Joint venture arrangements have established 82,900 ha, comprising 8% of Australia’s plantation estate.

‘Lease’ joint ventures involve the industry/government partner paying a lease (ie. annual rent) to the landholder. Trees are established and managed by industry, with the landholder contributing the land and maintaining the site (eg. fire breaks, weeds). This option is the most popular of all joint venture arrangements with commercial farmers and small-area landholders. An area of 39,100 ha has been established using ‘lease’ joint ventures (50% of total joint venture area) [refer to Table 4, p.29].

Lease payments satisfy a range of socio-economic interests of landholders. For instance, retiring farmers are able to remain on their property and earn a reliable income without the daily physical demands of managing livestock and annual crops. Alternatively, non-viable farms can earn a stable income from lease arrangements, giving landholders a greater capacity to earn off-farm income. As one industry informant commented:

“... at first I was surprised at who was inquiring about our (lease) scheme, but then I realised it freed a lot of farmers from some of their day-to-day workload.”

‘Lease’ arrangements allow farm forestry to satisfy a range of socio-economic objectives for landholders.

Despite the regular cost of lease payments, lease joint ventures give industry more control over the quality and quantity of timber produced. Some industry personnel doubted the ability of most small-scale growers to reliably produce sufficient quantities of good quality forest products. While industry can bring their silvicultural skills to the partnership, landholders can receive the benefits of a lease payment without the pressure to develop silvicultural expertise. This is illustrated by the comment made by an industry informant:

“... when I drive around the country, I see a really ‘mixed bag’ of farm trees, which doesn’t give me any confidence that farmers have the know-how to grow quality trees. After all, why should they, its just a minor part of their business ... probably best left to professionals.”

- Lease joint ventures have been applied in south-west Western Australia, where 33,000 ha of eucalypts for pulpwood have been established since 1988. The two organisations offering lease joint ventures, Bunnings Treefarms and Department of Conservation and Land Management (CALM), generally offer lease payments between \$160-220/ha depending on site quality, distance from processor, and area planted. CALM's scheme offers a contract for two pulpwood rotations (up to a maximum of 28 years), with management aimed at producing two treecrops over 20 years.
- In 1995, Midway Wood Products in south-west Victoria established a lease scheme for eucalypt pulpwood.
- A lease scheme has recently been announced for the Green Triangle region, with Green Triangle Plantation Forest Company (GPFL), based at Hamilton, Victoria, seeking to establish partnerships with landholders within 150 km of Portland. GPFL aims to establish 20,000 ha of eucalypts for pulpwood over the next 10 years (AFG 1997).
- Until recently, Carter Holt Harvey in north-east Victoria also offered a lease scheme for eucalypt pulpwood (scheme suspended due to company restructuring).
- State Forests NSW offers a lease scheme for long rotation sawlogs (ie. 20-40 years) to increase softwood production (scheme launched in early-1997).
- A softwood sawlog scheme offered by the Victorian government (Plantation Sharefarming Scheme) operated briefly during the late-1980's, but was suspended because arrangements generally favoured landholders at excessive cost to the government.

Although not offered in Australia, 'split-area' joint ventures are used by Carter Holt Harvey in New Zealand. Under this arrangement, the industry partner leases land for timber production under their ownership. An additional area is established by the industry with full ownership given to the landholder (ie. 'split-area'). The landholder receives a lease payment for the leased area (reflecting the establishment costs) and ownership of the additional area planted. Under this arrangement, the industry partner avoids the otherwise higher ongoing cost of 'lease' joint ventures.

'Cropshare' joint ventures are where the landholder and industry/government partner proportionally share inputs and returns throughout the life of the treecrop. Landholders may contribute the land only, although there is an opportunity to be involved in the establishment and management of the trees. The cost of all inputs to the partnership are recorded so that when financial returns occur (eg. thinnings, final harvest), payment is divided proportionally among the partners. Until recently, the crop share and marketing joint ventures offered by industry in the Green Triangle and Tasmania have attracted sufficient interest from landholders. It is important to note that cropshare arrangements have seen landholders establish 10 ha or greater in several regions. For example:

- North Forests Products in Tasmania believe their cropshare scheme, established in 1985, has been effective in attracting areas of 10 ha and larger for plantings of eucalypts for pulpwood.
- Boral Timber Tasmania's cropshare scheme has been effective in establishing about 5,000 ha, fulfilling the company's target of securing 25-30% of its future supply from joint ventures.
- Australian Newsprint Mills (ANM) in Hobart has established 200 ha of eucalypt for pulpwood using a cropshare joint venture with 5 landholders.
- ANM in Albury (NSW) and Hobart offer a cropshare joint venture for softwood production. The 5,100 ha of trees established under this scheme, involving 45 properties, are managed and sold for sawlogs, with thinnings supplying pulpwood for ANM's paper production.
- State Forests NSW use a cropshare joint venture with landholders to produce hardwood sawlogs. This is part of the government's restructuring package for the hardwood timber industry, in which processors will increasingly source plantation timber. The government's intention is for the scheme to be phased out, with industry/landholder interest becoming sufficient to sustain the desired plantation establishment rate.

- The part-lease part-cropshare schemes offered by CALM in WA are less popular (20% of agreements) than the full-lease arrangements (70%), discussed above. The full-cropshare joint ventures offered by CALM are less popular again (10%).

However, the land planted under these joint ventures is often of marginal productivity and long distances from mills. An informant commented that:

“... the current joint ventures will continue even if farm forestry is not highly profitable, ... if growers use under-utilised land and/or they pursue opportunistic one-off sales from their private native forest.”

Referring to another cropshare joint venture, a government informant commented:

“... most who choose our cropshare option see it as bit of a bonus for their rough country, as they weren't doing anything with the land they offer anyway.”

ANM (south east Tasmania region) believe that to get the joint venture forests performing better they will have to access good quality farmland, preferably closer to the mill. ANM are considering offering a 'lease' joint venture to achieve this objective.

'Cropshare' arrangements allow growers and industry to share the establishment, management and market risks associated with farm forestry. Returns are shared in proportion to contributions to the costs of inputs and management.

'Marketing' joint ventures guarantee a sale for the grower, usually based on market price at the time of harvest. Contracts of this nature generally require landholders to offer their industry partner the first option of purchase. However, if a better price can be found, the grower may sell to another purchaser. Important examples of marketing joint ventures include:

- AMCOR Plantations (formerly Australian Paper Manufacturers) in Morwell (Victoria) offered a marketing joint venture for 14 years (1978-92). AMCOR established about 2,000 ha of softwood plantations on about 60 properties. AMCOR Plantations' marketing scheme gave growers free genetically-selected seedlings and silvicultural advice, in exchange for growers giving AMCOR Plantations the first option of purchasing thinnings. This pulpwood was priced at government royalty rates at the time of harvest. AMCOR Plantations based its marketing scheme on the assumption there would be a substantial increase in demand for softwood. Instead, in the early 1990's the company chose to develop its processing of hardwood pulp requiring eucalypts. An oversupply of softwood pulp in Gippsland reduced the prospect of commercial thinning operations in *Pinus radiata* plantations and the long-term sawlog potential of the region.

'Marketing' arrangements provide growers with the assurance of a sale at harvest, and industry with the first option to purchase.

- Marketing joint ventures are also offered for eucalypt pulpwood by Primary Industries South Australia (PISA) (Mt. Gambier), on behalf of Kimberly-Clark Australia and more recently, Mitsui Plantation Development Pty Ltd and associates. PISA's eucalypt pulpwood scheme has attracted consistent interest from landholders with about 4,000 ha established since 1989 (averaging 600 ha/year). PISA offer growers a full advisory service and organise contractors to establish plantings. PISA recently announced another marketing joint venture with the aim of establishing 10,000 ha of eucalypts for pulpwood over the next 10-12 years. This timber will be chipped and exported from Portland by Japanese companies.

- Since the early-1970's, CSR Forest Products have offered a 'marketing' agreement for softwood sawlogs in the Green Triangle region. CSR has been able to establish about 5,000 ha.
- ACT Forests began offering a marketing joint venture for softwood in 1994. ACT Forests provide landholders with a forest management plan, discount prices for genetically-selected trees, and organise contractors for establishment work. In exchange, growers give ACT Forests the first option to purchase thinnings, at around year 15.
- Carter Holt Harvey in north-east Victoria offered a marketing scheme for eucalypt pulpwood during 1993-95.

Joint ventures must be regionally competitive compared to other landuse options to attract interest from landholders and industry. Additionally, an oversupply of timber in a region will discourage landholders from considering commercial timber production, and will discourage industry from committing to purchase.

There are numerous '**cost recovery**' **joint ventures**, such as the 'Oil Mallee' joint venture operated by CALM in the cereal cropping districts of south-west WA. It differs from other schemes in that it is operated on a 'cost recovery' basis by a government agency. However, the low rainfall (300-450 mm/year) cropping region of south-west WA is not suitable for existing farm forestry industries (eg. sawlog, pulpwood) and at this stage farm forestry remains a somewhat speculative industry. It is hoped that a viable eucalypt oil industry will emerge and act as a catalyst for widespread tree establishment integrated with cereal cropping to arrest increasing land degradation (principally rising saline groundwater). The scheme has attracted considerable interest since it began in 1992, with over 6,000 ha established by 250 landholders.

A '**grant**' **joint venture** is operated by the Department of Natural Resources and Environment (DNRE) to support landholders establishing commercial farm forestry in north-east/north-central Victoria. This project subsidises tree establishment. Approved landholders must contribute \$500/ha (cash) to the partnership, with DNRE organising the establishment of selected eucalypts for future hardwood sawlogs. DNRE is directly involved with the treecrop management for the first 18 months. Participating landholders have a clause added to their Land Title outlining their intention to grow a hardwood sawlog resource. DNRE does not retain a formal interest in the treecrop, nor a share of any financial returns. The intention of the scheme is to create sufficient resource (ie. 800 ha/year for 20 years = 16,000 ha) to attract a hardwood sawlog processor to the region. In the scheme's first year of planting (1996-97) an area of 340 ha was established, and an additional 600 ha established in the second year. Although the scheme has been initiated by government, it is intended that industry interests will emerge to continue the partnership with prospective growers.

A landholder-government development project, the Community Rainforest Reforestation Project (CRRP), is operating in the wet tropic areas of north Queensland. The CRRP commenced in 1993 and has attracted approximately 600 small-scale growers to establish a wide range of high value cabinet timber species.

To stimulate interest in private/farm forestry, 'fixed-interest loans' to establish softwood for sawlogs and 'establishment grants' for specialty species, were offered during 1978-1991 by the Tasmanian government through what is now Private Forests Tasmania (PFT). The Tasmanian government believes this task has largely been achieved, and public financial assistance is no longer warranted. However, trees established under these schemes are still being administered by PFT.

While joint ventures can offer industry considerable opportunities to secure future resource supplies, arrangements can also reduce industry's long-term ability to respond to market fluctuations in an increasingly internationalised trade in forest products. Consequently, vertically

integrated processors intend to have only low to moderate proportions of future supplies tied into joint ventures (ie. 5-40%).

3.2.2 Landholders involved with joint ventures

Most joint venture program managers took considerable time to describe the diverse stakeholders involved in their projects, who included:

- semi-retired and retired farmers;
- commercial farmers;
- small-area landholders with off-farm income;
- semi-commercial farmers with off-farm income;
- prospectus companies on behalf of urban investors;
- investor syndicates;
- corporations with underutilised land;
- local government with underutilised land; and
- state government with underutilised land.

The type of land offered for joint ventures varied considerably, depending on the region and the joint venture arrangements. Evidence from Western Australia indicated that lease schemes with competitive lease payments attracted better quality agricultural land closer to regional centres. Some informants suggested these schemes have directly contributed to higher land prices. Joint ventures with delayed or speculative financial returns tend to attract marginal farming land in more remote locations. However, experience suggests that commercial farm forestry may be unable to compete as land prices rise within 25 minutes drive of regional centres (ie. >50,000 people) and within 50 minutes drive of a large city (ie. >300,000 people). Notwithstanding this point, some of the land within these areas may be available for farm forestry depending upon landholder intentions, time, and relative returns from other land uses. The type of land offered for the State Forests NSW hardwood cropshare tends to be of marginal to low quality, and land which is difficult to manage (eg. poor access, hilly, infertile) with the scheme not particularly competitive for land which is producing an 'annual cash flow' (ie. better quality land). For joint ventures without lease payments, full-time commercial farmers tend to offer marginal land for farm forestry, while small-scale off-farm income landholders closer to regional centres are less likely to be deterred by planting trees on more productive land.

Initially the ANM (Albury, NSW) cropshare scheme attracted landholders with underutilised land and land of low productivity. Now the scheme tends to attract landholders with degraded land (eg. waterlogging, rising saline groundwater) and those viewing the scheme as a prudent business opportunity. Some growers have established farm forestry primarily to address land degradation and so are able to apply for tax concessions consistent with landcare activities (eg. tax deductions for fencing).

Lease schemes in WA tended to attract landholders wanting to plant woodlots or whole paddocks, which has included retiring/semi-retiring farmers; farmers with separate farm blocks (to ease management); and prospectus companies looking for a suitable investment.

Importantly for novice small-scale growers, joint ventures allow risk, establishment and management costs to be shared with an industry/government partner. 'Lease' and 'cropshare' joint ventures allow small-scale growers to become involved with forestry, without having to develop a high level of silvicultural expertise. 'Marketing' joint ventures generally offer a baseline market price and so act as a part-guarantee for hesitant growers, or those wanting a high degree of ownership. However, landholders and industry should conduct in-depth appraisals of the anticipated costs and returns prior to signing joint venture contracts so arrangements reflect the actual investment made by both partners.

Lease schemes with lease payments may offer retiring and semi-retiring farmers a viable transition from the day-to-day demands of managing intensive enterprises such as livestock and annual cropping, yet allow them to remain on the property receiving a reliable income. Lease payments also offer landholders an opportunity to seek increased off-farm employment, thereby potentially increasing their net household income.

Growers in the 300-450 mm/year rainfall area of WA involved in the 'Oil Mallee' scheme are primarily involved for land protection reasons. The need to address land degradation also underpins CALM's recent initiative to establish 15,000 ha/year of maritime pine (*P. pinaster*) in partnership with landholders in the moderate rainfall area (ie. 600-400 mm/year). Planting under this program is expected to begin in 1997-98.

In regions where non-competitive markets exist, non-lease joint ventures may disadvantage growers in favour of the industry partner, particularly when industry tends to create the 'market price' and can decide when to purchase the resource, rather than the grower being able to choose when to sell. Alternatively, joint ventures may penalise the industry partner when it is contracted to purchase timber at fixed royalty rates when consumer demand moves away from its secured resource or a depressed economy creates an oversupply situation.

3.2.3 Joint venture benefits to industry

Joint ventures allow industry or government partners a way of expanding and securing future timber supplies without the high cost of purchasing land. Joint ventures allow the industry partner to monitor tree performance and advise the grower of silvicultural requirements. Direct industry involvement through joint ventures allows more efficient coordination of harvesting opportunities throughout a region, rather than responding to one-off sales. Joint ventures also offer an opportunity for processors to access the high proportion of cleared agricultural land surrounding processing facilities, thereby reducing harvesting and transport costs. This approach would also encourage forestry to be integrated within a catchment, rather than confined to large, remote plantations.

In an open-ended question format, survey recipients were given a page to outline their views about industry's main concerns about grower-industry links. While only a small proportion (21%) of respondents were non-growers (ie. including those from industry), comments were provided by 90 respondents (73%). Responses were grouped into themes to allow important trends to be identified. The most common theme identified was industry's concern about poor information exchange between growers and industry (n=28). There was a high degree of similarity in the responses of the different respondent types.

This research highlighted the difficulty facing small-scale growers relying upon their ability to negotiate prices with industry after trees have been established. The best time for small-scale growers to negotiate with industry may be prior to tree establishment. At this time farm investment (eg. land, labour) can still be redirected to other opportunities.

The best time for small-scale growers to negotiate with industry may be prior to tree establishment. If a mutually beneficial position cannot be agreed between the two parties, then farm investment can still be redirected to other opportunities.

These findings also have important implications for farm forestry that is driven more by the need to establish trees for land and water degradation than by expectations of exploiting a realistic market opportunity. Farm forestry that aims for opportunistic sales to industry at the time of harvest remains a risky venture, unless growers can access markets that are considerably different to those currently operating. In regions where widespread tree establishment is desirable yet

competitive markets are unlikely to emerge, there may be a place for establishing long term cost sharing arrangements between landholders and government. However, developing cost sharing arrangements that do not distort the market realities for farm forestry in neighbouring regions is likely to be difficult.

Industry's (typically large-scale timber processors) main concerns about grower-industry links were on the poor information exchange between growers and industry.

ACT Forests aim to consolidate a softwood resource that will sustain a regional processing industry (ie. 30,000 ha). Currently, there is little regional demand for softwood pulp, causing many small-scale growers to abandon thinning operations, which will reduce the potential for sawlogs to be harvested in the future. ACT Forests' 'marketing' agreement provides growers with support for establishing and managing trees for sawlog production. The agreement provides industry with an assurance that softwood sawlogs are likely to be available to support a regional processing industry in the long-term, with ACT Forests having the 'first right' to purchase the sawlogs.

Comments from informants indicated lease schemes (with prices competitive against most other farm products) are likely to be the most popular in attracting landholders to farm forestry. The three regional reviews indicated that for industry, the extent lease schemes are developed will depend on:

- need to own supply resource;
- need to increase future supplies;
- availability of sufficient capital to fund schemes many years prior to harvest;
- popularity of alternate forestry joint ventures (eg. 'marketing' schemes) within region; and
- popularity of alternate landuse options.

Industry prefers to have timber supplies from a range of sources (eg. industry-owned plantations, public plantations, crop share/marketing joint ventures, lease joint ventures) to spread the 'risks' associated with the quantity and quality of supplies. As such, joint ventures are unlikely to be the only, nor necessarily the major, supply source for large timber processors. Some industry informants also noted that joint ventures can be expensive for industry to operate. For instance, lease schemes require substantial capital investment by industry many years before timber is available for processing. An industry informant commented:

"... there's a lot of work involved in getting a good joint venture going ... which costs us a lot of time to answer the initial enquiries, inspect the sites, develop site plans, supervise tree establishment, monitor tree performance ... all just for 10 ha. So in some respects, joint ventures can be an expensive way for us to do business."

Growers prefer flexible joint venture arrangements that allow financing and payments options to be negotiated on an individual basis with industry. However, industry informants generally felt this would be too time-consuming to operate, and that it was more equitable for landholders to have one set of guidelines for joint ventures so that individual negotiation was minimised. Large processors tend to offer a price based on a fixed formula (ie. distance from mill, harvesting costs, timber volume and quality), with the price not negotiable on an individual basis. One industry informant explained:

"... we offer a price based on a set formula, so there's no real negotiation about the price. Anyway, we'd prefer to deal directly with the grower to establish a sense of trust between us and local growers."

Alternatively, some informants related experiences with small-scale regional processors who were prepared to negotiate with growers who had suitable timber quality and volume in close proximity.

3.2.4 Future possibilities for joint ventures

Joint ventures play an important role in the marketing links between small-scale growers and industry. However, joint ventures are not the only, nor necessarily the most popular, linking arrangement for growers and industry [refer to Table 5, p.30]. Much of the nature and extent of joint venture arrangements offered within a given region will be determined by the market. Poor markets will reduce the interest by industry in developing flexible joint ventures, and landholders will choose to invest in more profitable enterprises. Poor markets also make it difficult to determine 'market prices' in 'crop share' and 'market' joint ventures. Encouraging the emergence of competitive regional markets therefore remains a fundamental task of private forestry/farm forestry development (eg. developing access to world markets).

Poor forest product markets will reduce the interest by industry in developing flexible joint ventures, and landholders will choose to invest in more profitable enterprises.

Several informants noted that prospective joint venture partners need better tools (eg. computer simulation models) and market information to appraise arrangements. Information most useful would be that relating to market prospects, joint venture options, costs (establishment, management and harvest), and opportunities for speculative 'forward marketing'. There was some uncertainty about which organisation would be in the best position to collate and deliver this information. Organisations suggested included: government, Regional Plantation Committees, and Australian Forest Growers.

Prospective joint venture partners need better tools (eg. computer simulation models) and market information to appraise arrangements.

- Informants suggested joint ventures could allow the landholder to receive a share of the product, rather than a share in the 'net returns' after harvest. This may allow the landholder flexibility to join with the industry's share or seek alternate markets.
- Joint ventures should also encourage partners to focus upon improving the value of the product rather than necessarily the percentage share of the arrangement.
- It was also suggested that joint ventures should aim to include multiple products (eg. pulpwood, sawlogs) and a range of species to attract greater interest from prospective grower and industry partners.
- While long term joint ventures provided some market security for growers and resource security for industry partners, problems arise when contracts are for more than 20 years. Long term contracts prevent joint ventures adapting to market changes. This degree of inflexibility can disadvantage both landholders and industry. One option to overcome this problem is to recalculate the shares to partners using 'actual' costs (eg. for establishment, silviculture) rather than 'budgeted' costs. Using the budgeted costs approach may penalise partners for any efficiencies they could achieve. If a large proportion of a region's timber supply is controlled under joint ventures, this situation may constrain market forces.

An option to improve the returns from 'cropshare' joint ventures is to recalculate the shares to partners using 'actual' costs (eg. for establishment, silviculture) rather than 'budgeted' costs.

- Use ‘forward marketing’, as developed for producers of commodities such as wool and wheat, to minimise the impact of market fluctuations. This option may prove advantageous for small-scale growers who operate without industry contracts, however may require marketing expertise (eg. market broker).
- There also appears some scope to develop long term supply arrangements that allow for costs and prices to be reviewed and renegotiated at regular periods (eg. every 5 years). This has the benefit of incorporating more accurate market forecasts.
- Some informants suggested one option should be for industry to offer lower lease payments combined with free seedlings and/or an option to purchase a share in the treecrop (eg. ‘split-area’ joint venture).

More diverse joint ventures may extend the attractiveness of lease schemes to landholders and make such arrangements more affordable for industry. It was also noted that ‘cropshare’ joint ventures should concentrate on premium products for established markets. While there are no current joint ventures between growers and processors for specialty timber, this may attract new players to farm forestry.

There may be a role for industry to offer lower lease payments combined with a quantity of free seedlings and/or an option for the landholder to purchase a share in the treecrop.

Most informants felt the popular ‘lease’ joint ventures would be popular elsewhere in Australia. Industry informants mentioned a preference for joint ventures that allow them to control establishment and silvicultural practices to ensure adequate timber quality.

It should also be noted that joint ventures and other marketing arrangements that link growers and industry over the long term will internalise the expense of insulating growers and/or industry against market risks. This may be reflected in arrangements which have:

- lower lease payments offered to growers;
- ‘take or pay’ requirements of industry;
- lower harvest payments offered to growers;
- little control over time of harvest (and so lower prices for growers/ higher prices for industry); and
- reduced flexibility to negotiate individual agreements.

Joint ventures that link growers and industry over the long term will internalise the expense of insulating growers and/or industry against the market risks.

3.2.5 Future possibilities for other arrangements

In the mailed survey, only those respondents who were growers or prospective growers were asked to indicate the likelihood they would adopt different arrangements if increasing their investment in farm forestry. 'Grower' respondents were asked to indicate the likelihood they would adopt each arrangement by selecting from: 'definitely', 'very likely', 'likely', 'possibly', and 'no'. There were very high response rates for each topic (95-98, n=98). Responses were collapsed into three categories for analysis purposes (ie. 'definitely/very likely', 'likely', 'possibly/no') [refer to Table 5, below].

The most popular options selected by growers were to: join a marketing cooperative (53%); and to contact industry at harvest time (49%). These results may indicate that 'growers' perceive grower cooperatives and point-of-sale negotiations with industry will provide reasonable returns. It is also possible that 'growers' are reasonably confident the nature of regional markets will change, giving small-scale growers an improved capacity to negotiate fair returns with industry. These changes may be due to an increasing effectiveness of grower cooperatives and increased demand by industry for growers' resource. However, another valid interpretation of these results may be that 'growers' perceive they have few options that will deliver any real change to their ability to negotiate with industry. Respondents also indicated that they were less likely to enter into long term arrangements with industry (40% 'possibly/no') compared to short term arrangements (24%).

Table 5: Arrangements growers would adopt when increasing farm forestry investment

('Growers' only, N=98)

Survey of farm forestry grower-industry links

(Green Triangle, Tasmania, south west WA; 1997)

Arrangement	n=	Extent likely to pursue		
		Definitely/ Very likely	Likely	Possibly/ No
Join a marketing cooperative	98	53%	38%	10%
Contact industry when treecrop is ready for sale	95	49%	27%	24%
Use government agency to assess market prospects	96	32%	49%	19%
Enter a short term joint venture with industry	97	26%	50%	24%
Enter a long term joint venture with industry with regular contract reviews	97	25%	52%	23%
Enter a long term joint venture with industry	96	19%	41%	40%
Use a broker/private consultant to negotiate sales	95	20%	58%	22%

Even joint ventures which offer regular payments (ie. 'lease' arrangements) may not convince growers/prospective growers that they would receive 'value-for-money'. Particularly if they sense market prospects are changing in favour of growers, which may encourage growers to hold off investment for a time to negotiate better rates.

There were some trends suggesting regional differences in the action growers may take when increasing their investment in farm forestry. Notably, there appears less enthusiasm within Tasmania (mean 15% for 'definitely/very likely') for growers to enter into any joint venture

arrangement with industry compared to the Green Triangle and WA (mean 26%). This difference may reflect a perception by ‘growers’ in Tasmania that: the current joint ventures in Tasmania offer little advantage to growers; growers have the option to join a marketing cooperative; or that they can make time-of-harvest sales. Enthusiasm for joining a marketing cooperative was also high in WA (70%).

Recommendation: That JVAP work with National Association of Forest Industries and Australian Forest Growers to widely disseminate among industry and grower audiences a summary of joint venture arrangements operating in Australia. This summary should also include key principles and suggestions for refining joint ventures.

3.3 Grower cooperatives

Henderson and Leech (1994) highlighted the important role grower cooperatives can play for small-scale growers by coordinating silvicultural management, scheduling wood supplies, and negotiating sales with processors. For example, the NCT Forestry Cooperative Ltd. in South Africa (Brown 1996) was established in 1948 by a group of farmers experiencing difficulty in marketing their *Acacia* spp. timber. This cooperative now has 1,400 members. It is a vertically integrated organisation offering a wide range of services to its members, including: treebreeding research; nursery production; advisory service; financial assistance; establishment; silvicultural services; marketing; and processing (hardwood chipping only).

Long-term success for grower cooperatives will depend on the extent they can efficiently aggregate a critical mass of timber and negotiate better prices than individual small-scale growers could achieve. If grower cooperatives are unable to negotiate with processors in competitive markets their success will be limited. Improved access to neighbouring regional markets and access to international markets will be critical to the negotiating ability of cooperatives in Australia.

3.3.1 Treegrower cooperatives in Australia

Small-scale grower cooperatives have been established since the mid-1980’s in north-east Victoria, south-east Victoria and Tasmania, with several emerging in other states. These cooperatives are designed to better coordinate disparate timber supplies and increase regional competition (Henderson and Leech 1994; Speedy 1996). Interest in grower cooperatives has steadily increased and the cooperatives in Tasmania and Victoria have a membership of 426 people. The most active cooperative is through the combined efforts of 3 timber grower cooperatives in Tasmania, which include: North West (180 members), North East (140 members) and South (25 members). The 3 cooperatives combined to form a parent body, ‘TFGA Farmwood Pty Ltd’ to negotiate large contracts. The logistics of coordination and harvesting are still handled by the regional cooperatives. The Tasmanian cooperatives charge one share to join (\$100), then 10% of stumpage value (ie. price paid to the grower) of timber sold.

Existing cooperatives have been successful in securing regional and overseas contracts for members. The case study presented in Figure 1 is based upon experience with the North West Treegrowers Cooperative Society Ltd. in Tasmania. Kohl and Clark (1995, p.275) reported the North East Cooperative achieved higher returns for growers by making export sales:

Before these shipments, the North East Cooperative were only receiving \$45 per m³ mill door delivered to the French Enterprises sawmill in Scottsdale for those logs deemed acceptable quality. Their export shipment brought \$55 per m³ from an intermediate buyer. Following this French Enterprises agreed to pay 'world parity price' of \$65 per tonne for the logs.

A grower informant added:

"... having the Cooperative here makes me feel like someone's in there batting for the grower, whereas before, it was difficult to tell if you were getting a fair deal."

Many informants believed cooperatives have a vital role to play in building a critical mass among small-scale growers. Furthermore, grower cooperatives are considerably limited in value if unable to attain a sufficient resource to negotiate beyond regional monopolies. An industry stakeholder commented:

"... many small growers don't appreciate how disadvantaged they are if they're not part of a continuous, large resource."

Assembling timber from discrete small-scale growers will require greater resources than if supplies were sourced from larger industrial plantations. An informant commented:

"... typically, grower cooperatives tend to attract small-scale supplies that are not attractive to industry in isolation (eg. low quality, low yield, remote location)."

Figure 1: North West Treegrowers Cooperative Society Ltd.

The North West Treegrowers Cooperative Society Ltd. is Australia's most active forest cooperative (now has 3 full-time staff), and is providing an important model for existing and emerging cooperatives around Australia. While the cooperative has had early success with export shipments of *P. radiata* sawlogs, staff appreciate that cooperative members (ie. growers) will ultimately judge the organisation's performance against alternate market opportunities over the long term.

The Cooperative is fully funded through a 10% levy on stumpage prices paid on members' timber sales. The levy pricing system appears a popular method of payment amongst members, as there is a strong financial incentive for the cooperative to maximise its revenue, and in doing so, maximise returns to growers. One member commented:

"... I feel like the Coop. is working for me whereas the timber companies are working for themselves and their shareholders"

Recently, the Cooperative has developed marketing links with other cooperatives, in Tasmania and inter-state, to create a larger critical mass for added market value.

Several informants suggested that to be effective over a long period a cooperative will require an annual budget of \$150,000-200,000. This would allow for 3 full-time staff (ie. marketing manager, administrator, field officer). At a levy rate of 10%, a cooperative would require an annual through-put of timber to the value of \$1.5-2 million (stumpage). This equates to about 100,000 m³ of hardwood pulp at \$20/m³ (about 300 ha/year) or 25,000m³ of softwood sawlog at \$70/m³ (about 75 ha/year).

The North East Forest Growers Cooperative was established in 1984 to cater for small-scale growers in north-east Victoria. The cooperative has 40 members with an aggregate of 1,500 ha of trees. The cooperative has negotiated the sale of thinnings to a regional processor, with an initial harvest of sawlogs being sold in Melbourne. At this stage, the cooperative's resource is *Pinus radiata*, although it was suggested by some informants that it is simply a matter of time before other species are added to the cooperative's inventory. For instance, growers involved in the joint venture offered by DNRE in the region have turned to the cooperative for marketing assistance with their future hardwood sawlog resource.

Gippsland Wood Producers Cooperative was established in 1994 and has 41 members with an aggregate of 4,500 ha of trees. Most of this resource is *P. radiata* of various age classes. Members pay an annual fee of \$30, with a 10% levy on all timber sold through the cooperative.

The 'Oil Mallee' joint venture program has established the Oil Mallee Association of WA, which includes growers, processors and researchers. Although not specifically a grower cooperative, the association is designed to improve coordination among the principal stakeholders.

Cooperatives face considerable challenges. Experience from Tasmania suggests that an effective grower cooperative needs substantial financial resources (eg. \$150,000/year) to initiate, develop and maintain markets that provide better returns for members. Existing forest grower cooperatives in Australia have relied heavily upon the voluntary efforts of members until timber sales generated sufficient income to employ staff. The North West Treegrowers Cooperative Society Ltd. is the only cooperative in Australia that employs full-time staff. Small-scale growers with a good quality, high yielding 10-40 ha resource located close to industry will be highly marketable to industry and a grower cooperative may not provide any advantage for these suppliers compared to direct negotiation with industry, or negotiation by a commissioned broker. Cooperatives will also need to minimise cross-subsidising areas and activities that are not viable. For example, administrative costs for areas with low returns are likely to be proportionally higher than for areas with high returns, yet a cooperative will usually impose levies at a constant rate.

Effective grower cooperatives in Australia and overseas have diversified their income away from reliance upon timber sales. Aggregate supplies from two or more cooperatives can improve market returns by increasing the volume and/or continuity of the members' resource. This is particularly important for cooperatives with low timber through-put or discontinuous timber sales.

Other features of an effective grower cooperative noted by informants included:

- Well scheduled planning, establishment, silvicultural, and harvesting operations;
- Staffing flexibility (so can respond to fluctuating demands of members and markets); and
- Good leadership with management expertise.

Despite the potential advantages of grower cooperatives, they have not been a dominant feature in New Zealand farm forestry. Dunchue and Sinclair's (1995, p.35) survey of 96 Victoria landholders found only 8% of respondents preferred a grower cooperative as a marketing partner if they were to invest in farm forestry, compared to 83% who preferred the forest industry. Results from our mailed survey indicated a majority of respondents (53% 'definitely/very likely') indicated that they were very likely to explore grower cooperatives when increasing their investment in farm forestry. There is considerable discussion among small-scale growers about ways to overcome the disadvantage of producing small, discontinuous farm forestry supplies in remote areas. It is expected that more grower cooperatives will form and be an important element of farm forestry development in Australia.

3.4 Market brokers and consultants

In New Zealand there are approximately 150 farm forestry consultants advising growers and others. Most are employed on an hourly rate (Race 1994). Small-scale growers in New Zealand (Race 1994) and the United States (AACM *et al.* 1996) regularly commission consultants/brokers to negotiate prices with processors. In the US small-scale growers (ie. <40 ha of commercial timber production) supply approximately 15% of the nation's commercial timber (Birch 1996). Munn (1996) reported the benefit of brokers was that they were able to increase the sale price of timber for small-scale growers by an average of 20%, compared to growers negotiating their own sales.

In Australia, farm forestry information for landholders has tended to be developed and distributed by government agencies (eg. Garland *et al.* 1984; Race 1993; Bulman 1995; Bird *et al.* 1996) and government-sponsored projects (Reid and Stewart 1995; Washusen and Reid 1996). Agencies have largely internalised these costs on the basis that these services are part of the agency's natural resource management responsibilities.

Informants indicated that brokers/consultants are infrequently employed by small-scale growers for landuse designs and marketing advice. However, consultants are increasingly employed by regional coordinating committees (eg. Regional Plantation Committees), cooperatives, industry and government for planning of regional timber supplies and demands (existing and future). Some informants suggested small-scale growers without the option of a viable grower cooperative may welcome the opportunity to commission a broker/consultant to market their timber, especially if they lacked the confidence to negotiate with large companies. This view is supported by the results from the mailed survey, which indicated a high proportion of respondents (78%; comprised of 20% 'definitely/very likely' and 58% 'likely') were likely to explore the potential of using market brokers/consultants when increasing their investment in farm forestry. Presumably the enthusiasm for employing brokers/consultants would be greater if government agencies operated on a user-pays basis.

Consultants are increasingly employed by Regional Plantation Committees, cooperatives, industry and government for planning regional timber supplies. Presumably the enthusiasm for employing brokers and consultants would be greater if government agencies operated on a user-pays basis.

Some informants mentioned an important role for brokers/consultants in organising and supervising timber harvesting on behalf of growers, as there can be a wide variety of performance between harvesting and carting contractors. One private grower commented:

"... I've seen some really bad operations, where the growers have been naive and the contractor has come in, made a huge mess, taken the best timber and not paid the grower a cent! The contractor told them that by getting rid of it for them, he was doing them a favour."

In Tasmania when growers apply for a Private Timber Reserve [refer to earlier discussion on PTR, p.7-8] they will often commission a forest consultant to prepare the Timber Harvesting Plan, negotiate a timber sale, supervise harvesting, and occasionally supervise replanting. Brokers are paid either by the hour (usually \$35-100/hour depending on level of expertise) or a percentage of the commercial timber value when sold (usually 1.5-3%).

Brokers and consultants could be commissioned to negotiate the sale, harvesting, haulage, and replanting, and so increase growers' ability to achieve efficiencies beyond harvesting and improve their returns from farm forestry.

From industry's perspective, brokers have played a small role in linking industry with growers. This is because a few growers (usually state agencies) supply most of the forest resource and there tends to be few purchasers within a region. Industry has typically relied upon established relationships and purchasing agreements with these major growers. If as expected, industry begins sourcing timber from a range of growers, then brokers could be expected to play a useful role in identifying likely supplies. Also, it is likely growers will consider 'forward selling' part or all of their forest resource to minimise the impact of market fluctuations on returns. This is common with many agricultural commodities (eg. grain, wool). Brokers could then play an important role in resource assessment and market negotiations on behalf of growers. One grower noted the value of a broker with the comment:

"... I'm glad I hired a professional ... I felt he was on my side, so I could trust his advice ... as it turned out I'm sure I got a better price than if I'd gone to sell it to the big companies."

Another useful example of growers hiring professional assistance is the 'Oil Mallee' joint venture program in south-west WA, which employs district advisors (ie. consultants) to organise the establishment and ongoing management of trees. Six districts have been established, all with locals advisors. These positions were initially part-funded by CALM, the Commonwealth Farm Forestry Program and the National Landcare Program, with an additional levy on seedlings paid by the grower. Increasingly, participating growers are paying for the services of the district advisor.

Some informants envisaged that as happens in New Zealand, even small discrete timber supplies, too small to sustain a cooperative, could be effectively linked to industry through brokers (Race 1994). It is likely both the growers and the regional buyer would benefit. Discrete small-scale growers would benefit in terms of better timber prices (by being part of a more saleable aggregate of timber and sold with a broker's expertise), and the regional industry would benefit by being given long term security with contracted supplies. An industry informant commented:

"... the possibilities of brokers are tremendous ... especially if they can deal with the many small growers that are likely with farm forestry. I'd much prefer to pay a little bit more and deal with one person."

'Forward marketing' options are being increasingly considered by growers of wool and wheat to minimise the impact of fluctuating markets. This approach may prove advantageous for small-scale growers who currently operate without industry contracts.

There are a few brokers and consultants operating in the major timber growing/processing regions of Australia. These brokers would not have to rely upon farm forestry for all of their work and may be capable of handling occasional sales by small-scale growers. Specialist education (eg. Farm Forestry Graduate Certificate) could introduce regional brokers to the complexities of farm forestry (eg. diversity amongst stakeholders).

Brokers may form an effective link with cooperatives, in that they could develop complementary skills and expertise within a region. Cooperatives could also commission brokers for specialist tasks required by members rather than relying upon the skills of cooperative staff. However, some participants felt that an active cooperative would limit the need/demand for individual marketing brokers.

Brokers will need to demonstrate that their advice and skills are credible and of value to private forestry. Some noted the need to distinguish between ‘brokers’ who simply buy wood from growers cheaply and on-sell, and genuine brokers acting on behalf of growers to maximise returns. Effective marketing arrangements may involve individual brokers/consultants linked to grower cooperatives, creating a larger resource to improve the efficiency of brokers and providing staff flexibility for cooperatives.

Effective marketing arrangements may have individual brokers/consultants linked to grower cooperatives; creating a larger resource to improve the efficiency of brokers and providing staff flexibility for cooperatives.

Given that the viability of farm forestry remains uncertain in many regions, it is not surprising that prospective small-scale growers are generally unwilling to pay private consultants for technical advice. However, there are signs that this situation is changing. More stakeholders are becoming involved in the generation and delivery of farm forestry information (eg. quarterly magazine of the Australian Forest Growers), and state agency extension services are moving away from one-to-one consultation towards group learning (with groups more able to purchase services). Also, there are more effective networks that link regional stakeholders for information exchange (Curtis and Race 1995). Private forestry consultants are gaining expertise in farm forestry and so have an increasing capacity to meet grower needs.

3.5 On-farm processing

Most farms in Australia have accessed remnant native vegetation as a timber resource for fence posts and building construction. Technological advances in the 1990’s (eg. cost-efficient portable mills) has created opportunities for on-farm processing of forest products, with innovative individuals selling into niche markets (Boutland *et al.* 1991). Apart from a few individuals, on-farm processing for commercial products has tended to be regionally insignificant, opportunistic and poorly developed. On-farm processing generally requires individuals to invest substantial amounts of time and/or finance to trial and develop harvesting (Kerruish and Reed 1996) and processing techniques, together with the risk of sourcing a profitable market. On-farm processors also need to take care to ensure safety (eg. Occupational Health and Safety standards) and environmental (eg. EPA standards) requirements are met.

Hanson and Stewart (1997) suggested recent technological developments including improved portable sawmills, mobile debarkers and chippers, and portable drying kilns have improved the prospects for on-farm processing of farm forest timber. On-farm processing may improve farm forestry viability for small-scale growers by developing alternate products and markets, or through value-adding (eg. harvesting, stacking, debarking). The option of on-farm processing can alleviate the difficulty of attracting commercial opportunities to regions with small discontinuous supply, remote location, unsuitable resource, and poor demand. Hanson and Stewart (1997, p.viii) concluded that there ‘... appears to be an opportunity for the replacement of Australia’s substantial sawn timber imports with domestically produced sawn timber, including that produced by farm foresters utilising small-scale processing equipment.’

On-farm processing requires growers to invest capital and time to develop experience, which can add considerable risk to a business venture. However, on-farm processing can improve farm forestry opportunities in regions with otherwise poor market prospects.

Although on-farm processing remains small compared to industrial processing, it is likely to grow in importance for individual growers and regions not suited to trading in commodity forest

products. There are numerous local examples of on-farm processing, for example:

- The lag in demand for *Pinus radiata* thinnings there is growing interest in north-east Victoria in producing treated softwood posts for the viticulture industry;
- Growers in southern NSW are sawing and drying specialty timber for furniture manufacturing in Melbourne; and
- In WA, small-scale distilling is being developed as a pilot project under the ‘Oil Mallee’ joint venture program.

Several informants believed the lack of a ‘critical mass’ of interest in regions undermined the extent research and development funds were committed to on-farm processing. In turn, inadequate research and development of on-farm processing options discourages small-scale growers. The lack of economical options for some aspects of on-farm processing (eg. treating posts with preservatives) and poor awareness of existing options (eg. portable kilns) have contributed to the low adoption of on-farm processing options.

Table 6: Summary of market linkage strengths, weaknesses and improvements

Link arrangement	Strengths	Weaknesses	Improvements
Contractual joint ventures:			
• <i>'lease'</i>	• Regular fixed income for landholder; • Supply security for industry (ie. volume and quality); • Established and managed by industry (may suit inexperienced landholders).	• Little landholder involvement in establishment and management (disadvantage for landholders wishing to contribute expertise); • Requires industry to cover all financial costs and risks.	• Landholders and industry require accurate appraisals of regional commercial opportunities - thereby lease payments will reflect realistic potential; • Allow negotiation of part-lease part-cropshare arrangements; • Combine lower lease payments with free seedlings (eg. 'split-area' arrangement); • Renegotiate 'lease' rates periodically (say every 5 years) to reflect market realities.
• <i>'cropshare'</i>	• Landholder and industry negotiate to share costs and returns proportionally; • Commercial and environmental risks shared; • Combines expertise of landholders and industry.	• No income for landholders until harvest.	• Recalculate shares to partners using 'actual' costs rather than 'budgeted' costs; • Allow negotiation of part-lease part-cropshare arrangements; • Option for landholders to take their share as standing trees, rather than financial returns; • Develop flexible farm forestry designs that allow for multiple products.
• <i>'marketing'</i>	• Landholder/grower has maximum investment (may suit experienced grower); • Industry partner has 1st option to purchase at market price.	• Grower retains most of the commercial risk.	• Grower needs to develop access to competitive markets to ensure optimum market price.
• <i>'cost recovery' and 'grants'</i>	• Cost-sharing between government and landholder to address natural resource management issues and/or to stimulate industry in the long-term; • Can assist to achieve critical mass with	• Can undermine previous farm forestry efforts that were established without government support, or current efforts in neighbouring regions.	• Accurate appraisals of regional opportunities to inform cost-sharing approach to achieve natural resource management and regional development.

Grower cooperative	previous farm forestry efforts to improve market returns. • Aggregates supplies from small-scale growers to form larger volume and greater continuity of resource for sale - this in turn attracts greater market interest; • Cost-efficient method for small-scale growers to access marketing expertise; • Grower maintains ownership of resource; • Efficient purchasing for industry from numerous small-scale growers.	• Requires minimum financial turnover to maintain effectiveness (ie. continuous supplies); • Better supplies from one member (eg. due to volume, quality, access, location) may tend to cross-subsidise poor supplies.	• Small cooperatives may benefit from hiring specialist expertise (eg. marketing) when required; • Develop diverse income base to maintain financial turnover (eg. silvicultural, harvesting, marketing advice); • Aggregation between several cooperatives will improve volume and/or continuity of supplies - so will improve market opportunities.
Market broker and consultant	• Allows access to specialist expertise for inexperienced growers; • Can negotiate on behalf of growers with industry; • Allows numerous dispersed growers to be aggregated on behalf of industry; • Assist regional planning teams to conduct appraisals and develop strategic plans.	• Requires time to develop to build expertise; • Alternate market linking arrangements with a region may satisfy most growers and industries - leaving no role for a broker; • Brokers may simply reduce margins for growers and industry.	• Regional planning teams should contract experienced brokers when conducting market appraisals and developing strategic plans; • Develop 'forward marketing' options for growers and industry; • Remove government when performing services that could be provided satisfactorily by brokers; • Involve brokers in regional training opportunities.
On-farm processing	• May improve commercial opportunities by value-adding for existing markets, or developing alternate products and markets.	• Poor 'economies of scale' can limit the value of on-farm processing; • Requires growers to invest capital and time, with the risk of a costly 'trial and error' phase.	• Increase information exchange about on-farm processing options to enable growers to better assess the real value of such options, and minimise the 'trial and error' phase.

4. Other lessons

The regional reviews confirmed the importance of issues raised by the interviews, in particular, grower and industry concerns about:

- economic viability of farm forestry;
- long term market prospects;
- little capacity to negotiate within current markets [discussed in Section 3]; and
- uncertain returns from, and inflexible nature of long term joint ventures [discussed in Section 3].

4.1 Economic viability and long term market prospects

Economic viability of farm forestry

The extent of integration between forestry and agriculture is highly dependent upon the comparative viability of forestry and the landuse options at the regional scale (Curtis and Race 1995). Experience in WA indicates that if forestry is considerably more viable than the current landuse (eg. beef, wool production), then development is likely to be as woodlots and small plantations. Alternatively, if forestry is less viable than current landuse (eg. dairy, horticulture, urban subdivision), then development is likely to be as timberbelts and planting on marginal areas. CIE *et al.* (1996) used direct and indirect costs to predict the optimal extent of integration between commercial timber production and a range of agricultural enterprises. Using average commodity prices, their calculations suggested the optimal proportion of arable farmland planted to trees, when well integrated as shelterbelts/timberbelts, is 5% on broadacre farms in the pastoral zone and the wheat-sheep zone that is not irrigated, 10% on broadacre farms in other zones and on dairy farms, and 1% on intensive agricultural farms (eg. cotton, rice) (CIE *et al.* 1996).

Integration between forestry and agriculture depends on the comparative returns from forestry and other landuse options, and the extent positive interactions can be derived when combining the two landuses.

Developing effective links between small-scale growers and industry will be dependent upon clear evidence of the viability of farm forestry within a region. Demonstration of the biophysical potential of farm forestry alone will be insufficient to stimulate widespread establishment, as illustrated by a Tasmanian grower's comment:

"... we know we can grow trees, but we're still yet to see farm forestry develop into a viable business ... we still can't give farmers the "green light" to invest in forestry. It is still nothing more than the occasional sale by some and blind faith by others ... but its improving."

It is difficult to accurately assess the viability of farm forestry in all situations as there has been little timber sold by small-scale growers and often prices are not disclosed. Nevertheless, there is some room for optimism with the growing evidence in WA that farm forestry can deliver multiple benefits to farm families and regional communities. The growing competition for farmland on which to establish eucalypts for pulpwood has led to 'lease' joint ventures paying \$120-200/ha/year, which is higher than many grazing enterprises. Recent analyses predict that well managed farm forestry can have returns with IRR's between 7-18% for growers. While these returns are not available in all regions, farm forestry also appears to have strong prospects in the Green Triangle and Tasmania.

Recommendation: That the JVAP link with regional planning groups (eg. RPCs) to commission appraisals of regional farm forestry opportunities. These appraisals should focus on regions where farm forestry viability remains uncertain, such as: greater-ACT; south-east NSW; north-west Victoria (low rainfall). Findings should be widely disseminated to key audiences.

Uncertain long term market prospects

The eucalypt pulpwood market is reasonably transparent, allowing most growers to make decisions based upon the offered lease rates or current 'mill door' prices. FFTF (1995, p.35) reported '... annual lease payments, indexed for inflation, range from \$200 to \$120 per hectare ... These figures far exceed returns from grazing sheep or beef cattle and are only bettered by dairy production or horticultural pursuits.' However, some prospective growers are still suspicious that they will receive fair returns.

Market mechanisms for sawlogs and specialty timbers are rarely transparent, and it is difficult for growers to determine:

- What are fair prices?;
- What are the long term market prospects?;
- Is the advice independent?; and
- How reliable is the available information?

Market mechanisms for sawlogs and specialty timbers are rarely transparent and it is difficult for growers to determine:

- **What are fair prices?;**
- **What are the long term market prospects?;**
- **Is the advice independent?; and**
- **How reliable is the available information?**

Stakeholders would benefit from being more informed of market prospects. As Cummine (1996, p.39) noted 'The corporatisation of the State forest services has not helped, as they can now justify treating all market-related information as commercial-in-confidence.' Converting much of the current interest in regional forest development - both farm forestry and plantations - relies upon improving the understanding of and confidence in the long term market prospects. Regional plantation and farm forestry development needs to:

- Identify the important market specifications;
- Develop a process for obtaining and updating market information; and
- Assess the most appropriate medium(s) for disseminating information to stakeholders.

Farm forestry development projects will need to engage the processing industry (eg. via Regional Plantation Committees) in making realistic appraisals of a region's viability, and in contributing to an open exchange of technical and pricing information.

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- **identify important market specifications;**
- **develop a process for obtaining and updating market information; and**

- assess the most appropriate mediums for disseminating information to stakeholders.

Recommendation: That JVAP negotiate with regional planning groups (eg. RPCs) to develop a methodology for ongoing regional market appraisals.

Experience in WA suggests that landholders are willing to enter partnerships with industry to establish considerable areas of farm forestry for the export woodchip industry (18,000 ha) and with government (28,000 ha established with CALM). In the same region individuals have established 3,500 ha independent of joint ventures. With no local demand for eucalypt pulpwood, access to the pulpmills of Asia, particularly Japan and South Korea, is underpinning the current enthusiasm for farm forestry. Abolition of Commonwealth export licences for plantation timber will be a positive and significant step in fostering regional farm forestry development. Such a move signals the Commonwealth's determination to move beyond the monopolistic tendencies of Australia's regional forest markets by allowing growers and processors greater freedom to access international markets. The opportunity for timber growers and processors to develop in world markets unhindered by government quota regulations has long been viewed as an important element of New Zealand's prosperous forest industry.

Notwithstanding this encouraging legislative reform by the Commonwealth, improved access to world markets for small-scale growers will be constrained if chipping and port loading facilities are not available. Restrictions - whether prohibitive pricing of port facilities, limited processing capacity, inefficient harvesting and transport services - will undermine the value of 'open' access to international markets. Regions need to assess market realities relating to the accessibility and costs of chipping and port loading facilities. As small-scale growers are exposed to international market forces, particularly with joint ventures financed by multinationals, it will be important to provide accurate assessments of their market competitiveness over time. WA joint ventures with industry (eg. Bunnings) and with government (eg. CALM) alleviate some of these concerns as export processing and delivery arrangements are already in place.

Appraisals of regional farm forestry should include assessments of the capacity of small-scale growers and costs of accessing international markets, and their market competitiveness over time.

Some growers are confident of the long term market prospects for eucalypt pulpwood, using the increasing lease payments offered by industry as a guide to future market prospects. For example, one WA grower said:

"... if industry wasn't confident in the long term markets then they wouldn't be offering the high lease payments."

'Lease' joint ventures have proved effective in attracting large areas of farm land for the establishment of bluegum pulpwood, with approximately 50,000 ha established in WA and plans to establish 20,000 ha in the Green Triangle. However, both industry and landholders are exploring options for a more diverse range of approaches to link small-scale growers and industry. At regional forums, local government and landholders have expressed concerns that lease joint ventures may satisfy the needs of individual landholders, but efforts need to be made to integrate forestry with agriculture to provide a wider range of benefits.

4.2 Role of government

Arguments about the future role of government in developing forest industries are complex. Governments in Australia have encouraged the forest industries by providing access to public forests and supporting the establishment of plantations (Dargavel 1995; Donaldson and Gorrie 1996). Governments have sought to balance their responsibilities for industry development, natural resource management and community service provision. Most state governments have established plantations on public land to provide a sustained yield of sawlogs to the processing industry. State governments also manage and allocate resources from public native forests (Forestry Tasmania manages 60% of the state's native forest area). With Australia's plantation area now over 1.1 million ha. (ABARE 1996, p.116), several informants commented that it is time for state government to sell their plantations, preferably to a number of different private owners. For example, one grower said:

"... there doesn't appear any reason to me why the government should still be involved in establishing plantations ... government has too many advantages as a large grower over small private growers ... if forestry is a profitable business then government should stand aside and allow the private growers to get involved."

Another grower mentioned:

"... the large volume of timber owned by government and their long term contracts with industry, make it very difficult for the private grower to break in and get a fair price ... government should help by making farm forestry a good investment by improving the legislation and funding the research that's needed."

Most informants focussed on ways state governments can assist farm forestry. For example, with legislative reform to give 'forestry rights' (separate ownership of trees from land) and 'harvest security' for trees managed as a commercial crop (eg. Private Timber Reserves in Tasmania). Some informants spoke of state and federal governments coordinating efforts to fund strategic research and development. Informants were very supportive of research and development that had the potential to improve the competitiveness of regional markets (eg. contributing to: regional feasibility studies, facilitating industry development plans, specialist training and education, information exchange, developing niche timber products, identifying sawing and drying requirements). There was also support for the Federal government removing export restrictions and tax disincentives.

Several informants felt there were inconsistencies in the approaches of federal, state and local government in relation to farm forestry. For instance, while the federal and state governments fund strategic research and development (eg. through DPIE's Farm Forestry Program, RIRDC's Joint Venture Agroforestry Program, WA State Government's Salinity Action Plan), regional markets are largely influenced by state governments meeting long term contracts with industry. Many local governments also feel penalised by providing the road infrastructure for large state plantations (which do not incur rate charges) with much of the processing, and therefore value-adding and employment, occurring in a neighbouring shire.

Participatory farm forestry planning

Experiences in WA suggest Regional Plantation Committees (RPC) can be an effective mechanism for involving a range of organisations and interests in regional planning (eg. Trees South West). These fora can resolve many issues at the regional level. A peak statewide farm forestry organisation should also be an effective mechanism for addressing statewide issues (eg. state legislation) and forging inter-regional cooperation (eg. Farm Forestry Development Group).

Regional Forest Agreements (RFA) being developed by the Commonwealth, state governments and regional interest groups will provide long term management plans for the multiple use of native forests (Kanowski 1997). The formation of RPC's and development of RFA's represents the emergence of participatory forest management in Australia. For the first time, a range of organisations with interests in production, conservation, resource management, and regional development are formally involved in forest policy and management. While these new forums are unlikely to develop enduring solutions to all forestry issues in the first instance, it represents an important step by governments in recognising that forestry has to provide a range of socio-economic and environmental benefits for stakeholders.

As regional planning groups (eg. RPC's) develop, they should be involved in allocating government research and development support.

Recommendation: That JVAP and other government funding agencies directly involve regional planning groups (eg. RPCs) in establishing farm forestry research and development priorities.

Role of state government

Informants suggested State governments should develop guidelines for local planning schemes to improve the consistency between regions.

States need to clearly demonstrate a long term commitment to forest industries by agreeing to improve regional markets (eg. auction harvest rights, reduce the extent long-term contracts dominate timber markets). Even if state governments sell public plantations, there will be few benefits for small-scale growers unless the competitiveness of regional farm forestry markets, and world markets, is improved (ie. increased number of traders).

If a large proportion of regional timber remains under long term arrangements buyers will be insulated from market changes. For small-scale growers this would mean that prices for commodity forest products will be largely influenced by the long term contracts of the larger growers operating with lower cost structures due to economies of large-scale production.

A grower suggested that:

*"... for a market to work properly, we need about six genuine buyers in a region
... at the moment we're lucky to have two buyers for a given product!"*

PISA provides an interesting example of a government department involved in farm forestry. PISA are contracted by KCA to initiate and manage joint ventures with landholders. In this role, PISA have facilitated the establishment of 4,000 ha of short-rotation eucalypts on 38 properties since 1989. PISA staff record the time and expenses of work on KCA joint ventures, which is then reimbursed (PISA is developing a similar arrangement with Mitsui). Some informants raised concerns about the level of independence of advice provided by PISA staff working for KCA (as the commercial interests of KCA would take precedence) and the extent government could internalise some of the costs of this arrangement. Others noted the benefits for the government agency of having a close working relationship with industry. These included being able to:

- maintain a multidisciplinary team of staff;
- share resources to conduct additional research;
- maintain plantation management skills; and

- allow government policies to influence industry operations (eg. property management planning used in joint venture plans).

The relationship between KCA and PISA appears to be mutually beneficial, with the planting targets of 600-700 ha/year being met. Nevertheless, government should not act as brokers in situations where a private broker could operate competitively, as this would further discourage private brokers from servicing farm forestry.

Role of local government

Local governments vary in the level of their support for private forestry development. Part of the explanation for this appears to be that local government employees are poorly informed about the nature and potential of forestry development. For example, in Tasmania some local government employees do not understand the process for establishing Private Timber Reserves.

While the framework is established through state planning acts local governments often have authority to affect local land use, including farm forestry. When a Private Timber Reserve (PTR) is granted in Tasmania (under the state's Forest Practices Act 1985) local government ceases to have any planning power over farm forestry. However, in the Green Triangle and WA local government can have a substantial impact on whether farm forestry is permitted (Parsons 1997). Even though some local governments have been cautious, even resistant to, farm forestry (FORTECH 1996) others are developing policies that assist farm forestry. Parsons (1997) noted that some local governments in Tasmania were considering accepting approved Timber Harvesting Plans as development applications for areas outside a PTR.

In WA, local government landuse policies are guided by the State's Town Planning and Development Act 1928. However, Parsons (1997, p.164) noted '... policies towards tree growing are not clearly stated and are therefore subject to interpretation.' Some informants in WA suggested shires could not afford to ignore the economic potential of farm forestry (eg. by improving farm viability). While growers have tended to avoid confrontation with local government (eg. on contributions to roading, fire protection), there are recent cases where the Town Planning Appeal Tribunal has overturned council restrictions (Parsons 1997).

Local government policy on farm forestry in the Green Triangle is guided by the Planning and Environment Act - Amendment S13 1993 in Victoria, and the Planning Act 1982 in South Australia. However, these state guidelines are not entirely clear, with variations in their interpretation by local government. The complexity of Victorian local government policies toward farm forestry is compounded by the proposed new framework for rural planning (FORTECH 1996). In some instances in Victoria, establishment of up to 40 ha of farm forestry on cleared agricultural land is deemed 'as of right'. In other cases it would appear farm forestry development would be 'subject to a permit' being granted. Most farmland in SA is zoned for 'general farming' which excludes forestry as an 'as of right' development. However, in practice a permit for farm forestry development is readily granted from local government in SA (Parsons 1997). Given the full impact of farm forestry is yet to be determined, it would seem reasonable that some shires have been cautious about endorsing farm forestry.

4.3 Scenarios of farm forestry industries

The nature of farm forestry can be complex and development efforts need to recognise the diversity within forest industries (eg. vertically integrated processors, exporters, small regional hardwood sawmills, portable mills and kilns, local specialty timber retailers). To be viable at a regional scale, forest industries need to be competitive in purchasing a range of forest products (eg. pulpwood, sawlogs, veneerlogs, speciality timber) from a range of scales of forestry operations (eg. industrial forestry, farm forestry). Large vertically integrated industries dominate the price of commodity forest products because of the large volume of their demand and their long term supply contracts (with public and private growers). It is also important that the smaller scale local/regional sawmills and specialty timber processors (eg. furniture manufacturers) are a part of regional farm forestry development.

Using the biophysical, industry capacity and market structures of the Green Triangle, Tasmania and Western Australia, it has been possible to develop a number of hypothetical scenarios of farm forestry industries. We have suggested the type of landholder who might be attracted to each industry type and some of the grower-industry linkages that may suit each scenario.

The scenarios are based upon the considerable experience of utilising *Pinus radiata* for sawlogs and pulpwood (Borough 1993; Lyons 1993b; Maclaren 1993; Knowles 1996); and the growing confidence in plantation eucalypts for sawlogs (Waugh and Yang 1994; Moore *et al.* 1996; Waugh 1996) and pulpwood (Cromer 1996). There is also growing understanding of the performance of specialty timber species (Bird *et al.* 1996).

The characteristics of farm forestry industries will change as technology evolves, creating new and more efficient operations of harvesting, haulage and processing.

Readers need to appreciate the scenarios presented will not cover all situations. Rather they are an indication of what viable industry options might be given existing technology, markets and arrangements. An important assumption in developing the scenarios was that softwoods (eg. *P. radiata*) and hardwoods (eg. eucalypts) can be grown as sawlogs with a final stocking of 220 trees/ha after 30 years with a yield of commercial timber of 350 m³/ha (ie. 1.6 m³/tree).

Scenario 1: Small hardwood specialty timber sawmill

Small hardwood specialty timber sawmill

Input volume:	5,000 - 10,000 m ³ /year.
Area for sustained harvest:	15 - 30 ha/year, total 450 - 900 ha.
Supply zone:	300 km radius (average 100 km).
Resource specification:	Pruned, hardwood logs, 30 - 60 cm. diameter-under-bark.
Price of resource:	\$120 - 150/m ³ for 'A' sawlogs (mill door price).
Saleable product:	Appearance grade kiln-dried timber at \$1,500/m ³ ; Structural grade kiln-dried timber at \$750/m ³ ; Chips at \$30/t (mill door).
Market region:	Regional and city markets: 1,000 - 2,000 m ³ appearance grade timber/year; 1,000 - 2,000 m ³ structural grade timber/year; 2,500 - 5,000 t chips/year.
Sawmill turnover:	\$2.3 - 4.6 million/year.
Employment number:	Sawmill 10 - 20 people; Harvesting and haulage 4 - 6 people.
Capital costs:	Sawmill \$3 - 5 million; Harvesting and haulage \$1 million.
Type of landholder:	

Commercial farmers who have relied on 1-2 major enterprises in the past (eg. wool and lambs) and are now interested in developing another farm-based enterprise. These potential growers would probably begin with 5-20 ha under a joint venture arrangement to 'look and learn' from forest industry operations. Based on good tree performance, they may plant more of the farm to trees. Again, these would be small areas 1-5 ha and be managed for high quality clearwood timber using commodity product species (eg. *P. radiata*, *Eucalyptus* spp.) or specialty species. Small-scale non-commercial landholders with little dependence on farm income might also take this option. While some effort is made to develop an economic farm-based enterprise, it is rural lifestyle that motivates these landholders. Property size tends to be less than 40 ha, reducing the prospect of large plantations. Given the lack of dependence on farm income, small-scale semi-commercial farmers may accept a higher financial risk associated with growing non-commodity forest products. A variety of farm forestry options may see these landholders becoming important contributors to regional industry.

Principal landholder-industry link:

Unlikely to adopt joint ventures which share establishment and silvicultural costs given the long investment period for a small-scale industry. As the tree crop matures and quality and quantity can be reliably assessed, growers or industry may initiate a formal agreement for future sales. Likely that market brokers/cooperatives will be important in aggregating resource and undertaking market negotiations.

Principal farm forestry design:

Given adequate access to design approaches, these growers will establish timberbelts, irregular plantings and woodlots on a small scale (1-5 ha), which will be well integrated with existing agricultural enterprises. May be used to provide some land protection and conservation benefits.

Scenario 2: Medium hardwood/softwood sawmill

Medium hardwood/softwood sawmill

Input volume:	50,000 m ³ /year.
Area for sustained harvest:	145 ha/year, total 4,350 ha.
Supply zone:	200 km radius (average 100 km).
Resource specification:	Pruned & unpruned hardwood logs, 30 - 60 cm. diameter-under-bark.
Price of resource:	\$120/m ³ average (mill door price).
Saleable product:	Appearance grade kiln-dried timber at \$1,500/m ³ ; Structural grade kiln-dried timber at \$750/m ³ ; Chips at \$30/t (mill door).
Market region:	Regional, national and some export markets: 7,000 m ³ appearance grade timber/year; 13,000 m ³ structural grade timber/year; 25,000 t chips/year.
Sawmill turnover:	\$21 million/year.
Employment number:	Sawmill 60 people; Harvesting and haulage 6 - 8 people.
Capital costs:	Sawmill \$20 million; Harvesting and haulage \$2 - 3 million.
Type of landholder:	

Commercial landholders with considerable forestry experience, interested in developing another farm-based enterprise, receiving on-going support from neighbours, forestry and farming industries. Based on good tree performance under initial joint venture or trial plantings, they may plant other areas to trees. Probably smaller areas of 2-10 ha to be managed for high quality clearwood timber using commodity product species (eg. *P. radiata*, *Eucalyptus* spp.). As they learn more about farm forestry (presuming they are confident it is viable), they will be prepared to establish tree crops, mostly independent of forest industries. It is likely these people have planned/will be planning for intergenerational transfer of part/all of the farming property. Some small-scale urban investors might be attracted to this industry and could commission a part-time forest manager to establish and manage 10-40 ha. These plantings may not be part of an integrated farm enterprise.

Principal landholder-industry link:

The scale of this operation would be sufficient to maintain an active grower cooperative or forest management team. This team could coordinate the sale, harvesting and transport of timber. Industry may enter into long-term formal agreements with the cooperative forest management. Unlikely to have joint ventures which share establishment and silvicultural costs. As the tree crop matures and quality and quantity can be reliably assessed, growers or industry may initiate formal agreements for future sales.

Principal farm forestry design:

Wide timberbelts and woodlots on small-medium scale (2-10 ha). May be used to provide significant livestock shelter, land protection and conservation benefits. Small-medium woodlots (10-40 ha).

Scenario 3: Large integrated softwood sawmill and medium-density fibreboard (MDF) plant

Large integrated softwood sawmill and MDF plant

Input volume:	500,000 m ³ /year.
Area for sustained harvest:	1,450 ha/year, total 43,500 ha.
Supply zone:	100 km radius (average 50 km).
Resource specification:	Softwood sawlogs 18 - 50 cm diameter-under-bark & pulpwood.
Price of resource:	\$70/m ³ for sawlogs, \$50/m ³ for pulpwood (mill door).
Saleable product:	Kiln-dried appearance & structural grade softwood at \$380/m ³ ; MDF panels at \$400/m ³ .
Market region:	National sawn timber market (80,000 m ³ /year). Export MDF market (140,000 t/year).
Employment number:	Sawmill 100 people; MDF plant 80 people; Harvesting and haulage 80 people.
Business turnover:	Sawmill \$30 million/year; MDF plant \$56 million/year.
Capital costs:	Sawmill \$40 million; MDF plant \$100 million; Harvesting and haulage \$20 million.

Type of landholder:

Commercial farmers with under-utilised land who are not keen to develop another major farm enterprise (due to the financial risks, high establishment costs, time required to learn a new enterprise). Growers with little forestry expertise, but would consider joint ventures where the forest industry establish and manage treecrops. Regular payments with 'lease' joint ventures would be particularly attractive to this group. It is likely these landholders would establish relatively large areas (10-40 ha) suited to the needs of industrial forestry operations (eg. pulpwood, traditional high-stocking forestry). It is likely these people have planned/will be planning for intergenerational transfer of part/all of the farming property. Some small-scale urban investors might be attracted to this industry and could commission a part-time forest manager to establish and manage 10-40 ha. These plantings may not be part of an integrated farm enterprise.

Principal landholder-industry link:

May establish joint ventures where establishment and silvicultural costs are shared, with returns from thinnings and sawlogs shared proportional to inputs. Industry partner to provide much of the forest management advice.

Principal farm forestry design:

Woodlots and small plantations on a medium-large scale (10-40 ha). Landholders may establish tree crop on a considerable proportion of property.

Scenario 4: Short-rotation eucalypt pulpwood for export

Short-rotation eucalypt pulpwood for export

Input volume:	1 million m ³ /year.
Area for sustained harvest:	2,900 ha/year for 12 years, total 34,800 ha.
Resource specification:	12-year old eucalypt (eg. <i>E. globulus</i>).
Price of resource:	\$50/m ³ for pulpwood (mill door).
Supply zone:	150 km (average 75 km).
Saleable product:	Hardwood chips at \$80/green t. FOB (ie. loaded).
Market region:	Export market (although could be redirected to domestic processor at similar price).
Business turnover:	\$70 million/year.
Employment number:	Chipping facility 15 people; Harvesting and haulage 150 people; Haulage to port 50 people.
Capital costs:	Chipping facility \$10 million; Harvesting and haulage \$40 million; Haulage to port \$15 million.
Type of landholder:	

Commercial and retiring broadacre farmers whose farming business is not viable and they are moving to off-farm work, or retiring farmers wanting to remain on the property but wish to reduce the physical and financial demands on themselves. Typically, these people would have large farm areas that need to be managed by an 'off-farm' interest and are likely to be interested in joint ventures (particularly lease schemes) with the industry/government partner managing the tree crop. Provided good tree performance and continuing industry investment, they may be willing to establish farm forestry on a medium-large scale (ie. 10-100 ha). Local government and semi-government organisations (eg. district water boards) may be interested in this option and there are opportunities for irrigated woodlots using municipal effluent (eg. Hamilton Water Board). Urban investors may pool their resources and commission a part-time forest manager to establish and manage 40-100 ha with little interest in integrating forestry with agriculture. Individual private investors are buying farmland to establish broadacre commercial forestry ventures.

Principal landholder-industry link:

Developed as a joint venture (eg. lease scheme) between individual landholders and industry; and by aggregation of private investors with commissioned forest manager/broker.

Principal farm forestry design:

Medium-large scale plantings (10-100 ha) as woodlots and wide timberbelts (eg. 10 rows).

5. Conclusion

Farm forestry is increasingly promoted as a national strategy likely to deliver important benefits in terms of assisting the move to more sustainable agriculture, reducing the forest product trade deficit, and enhancing the viability of regions through industry development and employment. Despite its apparent potential to achieve gains in economic, environmental and social terms for individuals and the wider community, viable farm forestry industries are still developing. Many factors constraining the widespread adoption of farm forestry have been reported, with several relating to poor linkages between small-scale growers and industry. While some small-scale growers have developed farm forestry independent of industry/government assistance, most choose to establish some link with industry prior to harvest.

Viability of farm forestry

The key issue on farm forestry for growers and industry was their **concern about the uncertain economic viability of farm forestry**. Before growers and industry are prepared to invest in farm forestry there needs to be clear evidence of farm forestry viability, particularly the existence of long term regional markets. On their own, demonstrations of the biophysical potential of farm forestry will be insufficient to stimulate widespread farm forestry. 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. Appraisals of regional farm forestry will need to include full assessments of the costs of accessing international markets, and the market competitiveness of small-scale growers over time. However, it is often difficult to accurately assess the viability of farm forestry as little timber has been sold by small-scale growers and prices are not disclosed. This situation is compounded by the fact that market prices are heavily influenced by long term contracts between State governments (as growers) and industry.

Nevertheless, there are examples of farm forestry plantings larger than 10 ha in the Green Triangle, Tasmania and Western Australia - in areas with competitive markets (eg. access to international markets, regional processors). For example, in WA it is common for bluegums to be established in multi-rowed timberbelts or woodlots under joint venture arrangements for the pulpwood export market. Competition for farmland to establish eucalypts for pulpwood in WA has resulted in industry offering 'lease' joint ventures \$120-200/ha per year. These returns are considerably higher than many grazing enterprises. Subsequent regional analyses in WA predict that well managed farm forestry can have returns with IRR's between 7-18% for growers. Regions will need to assess the viability of farm forestry and individually tailor strategies to improve long term markets prospects.

PISA in the Green Triangle intends to attract landholders with a 'marketing' joint venture with a base price for stumpage indexed to hardwood chip prices ex-Tasmania. Prices offered are expected to reflect world parity prices and this will be an important assurance for growers at the time of tree establishment.

There is growing landholder interest in establishing small areas of high quality commercial trees on a regular basis (ie. 1-2 ha/year). This approach means the farm forestry enterprise is manageable by a farm family (in terms of time and costs), and is likely to be a more flexible approach to farm forestry. Estimates of the returns for high quality sawlogs suggest yields as high as \$22,000/ha at harvest with an IRR of 9.9%.

Market structures

The mailed survey of farm forestry participants indicated many **small-scale growers believe they are not in a position to negotiate with industry, and doubt present market structures will deliver fair returns.** ‘Markets dominated by industry’ was rated by 77% of respondents as being an ‘important/very important’ concern. The survey also revealed that if growers were to increase their investment in farm forestry, most would join a marketing cooperative (53% ‘definitely/very likely’), and a large minority would contact industry at harvest time (49%), but only 25% would ‘definitely/very likely’ enter into short or long term arrangements with industry. One interpretation of these results is that growers believe current arrangements are unsatisfactory, even unfair.

These results highlight the importance of addressing structural issues in farm forestry. Overcoming these concerns will require considerable investment by industry, including developing marketing arrangements that provide greater assurance of returns to growers (eg. ‘lease’ or ‘CPI indexed’ joint ventures). Governments will need to improve access to more competitive markets (eg. infrastructure developments to increase export opportunities or to support new industries). In regions where there is little competition small-scale growers’ best opportunity to negotiate with industry may be prior to tree establishment. If a mutually beneficial position cannot be agreed between the two parties, then farm investment can be redirected to other opportunities.

Provision of information

The mailed survey showed farm forestry participants are concerned about the reliability of market information (54% ‘important/very important’) and that growers do not have sufficient knowledge of industry requirements (50%). A small majority of respondents also indicated they were concerned about industry and government providing conflicting advice on market prospects (51%). Farm forestry market prospects can vary considerably between regions (eg. transport costs to export markets) and growers, industry and government need sound information for informed decision making. Regionally specific investigations are required that will:

- identify important market specifications;
- develop a process for obtaining and updating market information;
- identify suitable joint venture options;
- assess establishment, management and harvesting costs;
- develop ‘forward marketing’ opportunities; and
- assess the most appropriate mediums for disseminating information to stakeholders.

Prospective joint venture partners, both growers and industry, also need better tools (eg. computer simulation models) to appraise farm forestry arrangements.

There was some uncertainty about which organisation would be in the best position to collate and deliver this information. Organisations nominated included: government, Regional Plantation Committees, and Australian Forest Growers.

Key principles for effective links

This research suggests the key principles for effective (ie. mutually beneficial) links between small-scale growers and industry include:

- identifying/developing competitive regional farm forestry markets;
- establishing processes that identify and effectively communicate credible information so that stakeholders can make informed decisions;
- industry demonstrating that it is acting in ‘good faith’, with growers receiving a fair share of farm forestry profits;

- industry demonstrating a long term commitment to farm forestry within regions (either with infrastructure for processing and/or funding of field staff); and
- farm forestry stakeholders able to negotiate (or choose) from a range of grower-industry arrangements.

Farm forestry is still in its infancy in Australia, and agriculture and forestry in general are undergoing great change, so it is understandable that links between small-scale growers and forest industries are still being refined. An important aspect of farm forestry development will be increasing the understanding of the diversity amongst landholders and within the forest industries. To date, much of the discussion of farm forestry has tended to focus on the large vertically integrated industry processors, due to their scale of operation and ability to provide financial capital for establishing tree crops (eg. through joint ventures).

While the nature and extent of links between small-scale growers and industry impacts upon the popularity, and in turn viability, of farm forestry within a region, it is not the only factor determining industry viability. The viability of regional farm forestry industries also depends on optimising a range of socio-economic and biophysical factors.

6. References

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Table 4: Overview of joint venture arrangements

LOCATION	ORGANIZATION	SCHEME	TYPE OF INDUSTRY
North Coast - NSW	State Forests NSW	Cropshare	Hardwood sawlog
SW. NSW/NE. Vic	ANM-Albury	Cropshare	Softwood pulp and sawlog
ACT	ACT Forests	Marketing	Softwood sawlog
NE./NC. Vic	Dept. Natural Resources and Environment	Establishment subsidy	Hardwood sawlog
NE. Vic	CHH-Myrtleford (under review)	Marketing and Lease	Hardwood pulp
SE. Vic	APM-Morwell	Marketing	Softwood pulp
Vic	Midway	Lease	Hardwood pulp
SE. SA/SW. Vic	GPFL	Lease	Hardwood pulp
SE. SA/SW. Vic	Mitsui and co. with PISA	Marketing	Hardwood pulp
SE. SA/SW. Vic.	CSR Forest Products	Marketing	Softwood sawlog
SE. South Aust.	Kimberley Clark with PISA	Marketing	Hardwood pulp
SE. Tasmania	ANM-Boyer/Hobart	Cropshare	Pine pulp and sawlog; Euc. pulp
Tasmania	Boral Timber Tas.	Cropshare	Hardwood pulp
Tasmania	North Forest Products	Cropshare	Hardwood pulp
Tasmania	Private Forests Tasmania	Establishment subsidy	Softwood
SW. West. Australia	CALM WA	Cropshare	Softwood pulp and sawlog
SW. West Australia	Bunnings Tree Farms Pty Ltd	Lease	Hardwood pulp
SW. West Australia	CALM WA	Lease/Marketing Cropshare Part-lease/cropshare	Hardwood pulp
SW. West Australia	CALM WA	Establishment loan	Eucalypt oil

Note: Data collected from telephone interviews with industry and government contacts; November 1996.

YEAR ESTABLISHED	NUMBER OF AGREEMENTS	AREA ESTABLISHED (approximately)	PERCENTAGE OF ORGANISATION'S RESOURCE
1995	120	3,500 ha	-
1985	30	1,600 ha	20%
1994	6	150 ha	<2%
1995	70	940 ha	-
1993-1995	9	200 ha	-
1978-1992	60	2,000 ha	3%
1995	16	210 ha	-
1997	-	-	-
1997	-	-	-
early-1970's	-	5,000 ha	-
1989	38	4,000 ha	-
1985	20	pine 3,500 ha eucalypt 200 ha	-
-	200	5,000 ha	25-30%
1985	110	2,250 ha	-
1978-1991	-	1,550 ha	-
1987-1993	-	3,800 ha	-
1990	-	15,000 ha	-
1988	270	28,000 ha	-
1992	250	6,000 ha	-