ABSTRACT. Commonwealth and State governments in Australia are attempting to increase the adoption of farm forestry to address pressing natural resource management and regional development issues. Farm forestry has the potential to provide substantial benefits to regions, principally by arresting land degradation, but also by diversifying farm incomes and contributing to industry development—particularly if timber processing occurs in a region. However, viable regional farm forestry industries are still to emerge. While some small-scale growers have developed farm forestry independently of industry or government assistance, most growers link with industry prior to harvest. These grower-industry partnerships have established 82,900 ha of forests, representing approximately 8% of Australia's plantation resource. Notwithstanding this success, market linkages between small-scale growers and industry has been identified as an important impediment to farm forestry. In this paper, the authors discuss their recent assessment of links between small-scale growers and industry in three important farm forestry regions in Australia. Linking arrangements are described and refinements suggested. The authors conclude that the extent farm forestry will deliver anticipated benefits to landholders and regional communities will largely
be determined by the structure of markets. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: getinfo@haworthpressinc.com]

KEYWORDS. Farm forestry, Australia, landholder-industry linkages

INTRODUCTION

Importance of Farm Forestry

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. Farm forestry as used in this paper also includes the activities of rural landholders who manage trees and shrubs for multiple benefits while having minor agricultural production.

Farm forestry is increasingly promoted in Australia as a strategy likely to assist the move to more sustainable agriculture, reduce the forest product trade deficit, enhance the viability of regions through industry development and employment, and contribute towards ‘greenhouse’ gas sequestration (Commonwealth of Australia 1992, 1995, 1997; Department of Natural Resources & Environment 1997; Kaniowski 1996). Current research suggests that in higher rainfall (> 800 mm) agricultural areas, perennial pastures alone will be insufficient water users to prevent groundwater recharge, whereas strategically located high density tree plantings (> 300 trees/ha) with perennial pastures will be more effective (Clifton et al. 1993). Integrating trees with agriculture can also increase production due to the positive effects of sheltering livestock, pastures (Bird 1993) and crops (Haines and Burke 1993). Also, AACM et al. (1996, p. 39) concluded ‘Commercial timber production has the potential to be a major new farm industry and thus provide for the diversification of farm income, particularly in areas with rainfall higher than 600 mm, where there is a processing facility close by.’ In Australia, about 1 million hectares of marginal agricultural land is highly suitable for timber production (National Plantations Advisory Committee (NPAC) 1991, p. 9). Further investigation found 286,700 hectares (708,000 acres) of this land is suitable for hardwood plantations and is within a 100 km radius of existing processing facilities (Resource Assessment Commission (RAC) 1992, pp. 263–4), suggesting the development of farm forestry is a realistic option for regional Australia (Industry Commission (IC) 1993). A more recent estimate suggests 350,000 hectares (865,000 acres) of commercial trees could be established in Western Australia alone, representing 20% of the State’s total area suitable for commercial timber production (FETF 1995, p. 1).

Farm forestry also has the potential to be an important timber source contributing to import replacement: Australia currently has a balance of trade deficit of US$1.4 billion of wood and paper products (Commonwealth of Australia 1995, p. 1). Ryan (1994, p. 25) noted that by the year 2001, the rapidly developing economies in the Pacific Rim will be facing an annual timber shortfall of 325 million m³, with an increasing deficit in world industrial timber supplies anticipated to beyond the year 2010. Therefore, the Pacific Rim region is likely to provide Australian producers with considerable export opportunities (Ryan 1994).

Recent calculations by the Centre for International Economics (CIE) et al. (1996, p. 1) indicated ‘The value of farm forestry to Australia could be (US$2.2 billion) a year once a sustainable harvest is reached.’ This calculation excludes the value of processing, which could increase the value of farm forestry to as much as US$14 billion/year, employing 40,000 people (CIE et al. 1996, p. 1).

Farm forestry should also contribute to expanding timber supplies and thereby reducing pressure on native forests in Australia and south-east Asia. Farm forestry using native species could also make an important contribution to the protection of biodiversity by improving the quality of vegetation on farmland and supporting neighbouring high-value conservation areas (e.g., ecological buffer zones) (Sargent 1992).

Government Support

This information suggests the adoption of farm forestry can be increased and has encouraged Commonwealth and State governments to support the industry (Donaldson and Gorrie 1996). The Commonwealth’s Joint Venture Agroforestry Program (Rural Industries, Land and Water Resources, and Forest and Wood Products Research and Development Corporations) in partnership with the Commonwealth Scientific and Industrial Research Organisation, State agencies, universities, industry, consultants and research cooperatives (e.g., CRC for Sustainable Production Forestry, Trees for Profit, Southern Tree Breeders Association) collectively seek to promote and shape the direction of farm forestry in Australia. These efforts involve considerable research. Research topics include: socio-economic factors affecting adoption; tree selection and management; harvesting, processing and marketing of forest products; interactions between trees and agriculture; environmental rehabilitation and sustainability; insect control; growth modelling; regional and national strategies; and policy analysis. The Commonwealth’s commitment to support farm forestry industries was re-
affirmed in the Wood and Paper Industry Strategy (Commonwealth of Australia 1995) and the Natural Heritage Trust (Commonwealth of Australia 1997), with the value of the Farm Forestry Program (FFP), increasing to nearly $40 million during 1993-2000. To date, the FFP is the largest single program contributing to farm forestry development by the Commonwealth and is largely focused on supporting regional projects to:

- Raise the awareness of farm forestry benefits amongst potential stakeholders;
- Link key farm forestry stakeholders (landholders, industry and government) in the various regions, frequently through the emerging community groups such as landcare; and
- Increase skills and knowledge to enable stakeholders to adopt farm forestry.

There are several other farm forestry initiatives operating in Australia, with most State governments operating farm forestry programs that link the resources of landholders (e.g., labour, land, equipment) with government wood production using joint venture arrangements.

**Concerns with Farm Forestry**

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 (Race and Curtis 1996). Most landholders establish trees for agricultural benefits (i.e., to provide shelter for livestock, crops); to arrest land and water degradation (i.e., 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 (AAAM 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 (i.e., > 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; Bartle 1995; Henderson and Lecch 1994; JAMC 1991; Fears 1994). The absence of competitive regional markets, with processors often insulated purchasing resources in a monopoly situation, in many parts of Australia is also a major disincentive to the adoption of farm forestry (NPAC 1991; Prinsley and Moore 1992). Poor understanding of the socio-economic impacts of farm forestry development at regional and farm scales is also a factor (Curtis and Race 1996).

While some small-scale growers have developed farm forestry independently of industry/government assistance, most growers choose to establish some link (i.e., formal contact) with industry prior to harvest. Many constraints to the widespread adoption of farm forestry have been reported (AAAM et al. 1996; Prinsley and Moore 1992), with several relating to poor market linkages between small-scale growers and industry. Many of the uncertainties that confront growers about farm forestry also confront industry. For example, processors want some degree of certainty about supplies and markets, yet they must trade in competitive and fluctuating global markets. Even small-scale processors (e.g., 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. Minor changes in the economies of China and India have the capacity to alter demand for wood products (de Fegely et al. 1997). 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 costs are discounted in favour of short term economic development. Such developments may reduce the market competitiveness of small-scale growers and processors in Australia with higher cost structures.

**Linking Arrangements**

Joint ventures have been defined as a legal arrangement (i.e., contract) between two or more parties to combine land, capital, management, and market opportunities for commercial tree crop 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) (refer to Table 1: Joint venture benefits). Lease payments or profits are typically shared between partners according to partners' inputs and market value at harvest. Joint ventures developed around Australia have enabled growers and industry/government partnerships to establish an important timber resource of 82,900 hectares (205,000 acres), mostly since 1985. These plantings represent approximately 8% of Australia's 1.043 million hectares (2.6 million acres) plantation resource (BRS 1997).
TABLE 1. Joint venture benefits

<table>
<thead>
<tr>
<th>Joint ventures typically offer small-scale growers one or more of the following benefits:</th>
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<tbody>
<tr>
<td>• Financial support with full or partial government or industry contribution;</td>
</tr>
<tr>
<td>• Stable, annual income with lease payments;</td>
</tr>
<tr>
<td>• Guaranteed financial returns;</td>
</tr>
<tr>
<td>• Reduced market risk with an assured sale;</td>
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<tr>
<td>• Silvicultural advice; and</td>
</tr>
<tr>
<td>• Physical support with tree establishment and management.</td>
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<table>
<thead>
<tr>
<th>Joint ventures typically offer industry benefits by providing:</th>
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<tr>
<td>• Increased supply of future resource;</td>
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<tr>
<td>• Resource security without the need to purchase land;</td>
</tr>
<tr>
<td>• Access to productive farmland and sites for tree growing in close proximity to mills;</td>
</tr>
<tr>
<td>• Diversity of sources of supply; and</td>
</tr>
<tr>
<td>• Shared participation with local community in timber production (i.e., good public relations).</td>
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Joint ventures also appeal as a way to expand forest resources in agricultural areas without displacing farming families and losing rateable (taxable) land for Local government (as when purchased by State governments).

The broad arrangements of joint ventures 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 ongoing 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 hectares (96,500 acres) 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 tree crop. 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 (i.e., joint ventures usually comprise 5-40% of total supply).

Cooperatives have formed in Tasmania and Victoria to aggregate the supplies of small-scale growers and attract better prices. There are 345 members of the 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 its 180 members and has been successful in securing regional and export sales, and is acting as a model for other emerging cooperatives around Australia. The North East Tasmanian Cooperative achieved improved prices from a mill mill (US$31/m$^3$ to US$45/m$^3$ after securing an overseas sales). Nevertheless, 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. As such, access to competitive markets will be important if cooperatives are to secure 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. This situation appears to be changing as regional planning groups and grower cooperatives seek accurate appraisals of regional markets. There appears a need for farm forestry development to identify and involve brokers/consultants who offer specialist marketing and forestry expertise, and who can efficiently assemble discrete small-scale growers.

On-farm processing is generally poorly developed in Australia. 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 (e.g., harvesting, stacking, 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 (e.g., treating posts with preservatives), and poor awareness of existing options (e.g., portable kilns), have contributed to low adoption of on-farm processing.

The authors recently reviewed the nature and extent of farm forestry links between small-scale growers and industry. Three important farm forestry regions in Australia were examined: the Green Triangle region of south east South Australia and south west Victoria; Tasmania; and south west Western Australia (refer to Figure 1). The three regions were selected for detailed investigation of landholder-industry links because of their rich farm/private forestry experience, substantial forestry activity, relatively high rates of plantation expansion on private land, and apparent potential for further farm forestry development.
establish about 50,000 hectares (123,500 acres) of eucalypts for pulpwood within the region over the next 15 years, with half expected to be under ‘lease’ arrangements.

Tasmania’s forest industries developed around large timber supplies from native forests. These forests are typically harvested under long-term contracts between the State government and industry. Market opportunities for small-scale growers have been limited. Today, 30% of Tasmania’s native forest area is on private land and the management of these areas is an important element of farm forestry in Tasmania. This part of the industry has typically involved replanting with eucalypts under ‘cropshare’ joint ventures (7,250 hectares/17,900 acres established). Three grower cooperatives have been active in improving coordinating supplies from small-scale growers and gaining access to international markets.

Western Australia has a high level of farm forestry activity. Expansion in the area planted to eucalypts for the export pulpwood market—largely with ‘lease’ joint ventures; is now being matched by interest in developing softwood sawlog and oil mallee (6,000 hectares/14,800 acres established) industries. Since the late-1980’s, 43,000 hectares (106,000 acres) of eucalypts has been established for the export pulpwood market, with most under ‘lease’ arrangements. Lease payments (paid quarterly) are as high as US$140/hectare per year for productive cleared agricultural land within 50 km of the chipping mill. These payments for farm forestry are highly competitive against beef and sheep enterprises, which are typically in the range of US$42-105/hectare per year. Farm forestry is also an important strategy in the effort to manage dryland salinity which costs the State US$45 million/year. Recent reports suggest 1.25 million hectares (3.09 million acres) of farm forestry needs to be established over the next 30 years.

**Background to Regions**

The Green Triangle derived its name from the high concentration of softwood plantations—150,000 hectares (370,500 acres) in the region. The Green Triangle is also characterised by rapidly expanding eucalypt plantings for the pulpwood export market and a high level of interest in small-scale, quality sawlog production. There are a number of processing facilities within the region. Much of the softwood resource is owned by State governments and large industrial processors.

Since the late-1980’s there has been growing interest in eucalypts for pulpwood, with most established on farmland. ‘Marketing’ joint ventures have been used to link landholders and processors, with a ‘lease’ arrangement recently announced for the export market. Current interests aim to

**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. It was therefore essential to identify key stakeholders and obtain their views. After a literature review, the authors conducted interviews and held workshops to identify key issues that could be explored with a larger population using a mailed survey. Informants were selected on the basis of their experience with:

- Management of industry/government joint venture programs,
- Coordination of forest grower cooperatives; or
- Private commercial tree growing and revegetation.
Interviews with 58 informants took the form of semi-structured interviews (ranging from 1/2 to 2 hours) conducted face-to-face or by telephone (Bailey 1987; Minichiello et al. 1990). Three workshops were held to explore stakeholder views about how links between small-scale growers and industry could be improved. A workshop was held in each region, with a total of 40 participants representing 25 organisations.

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 and industry concerns about specific aspects of 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. 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 (i.e., purposeful sampling). A survey response rate of 73% was gained.

**FINDINGS AND DISCUSSION**

**Improving Links Between Small-Scale Growers and Industry**

While some small-scale growers have developed farm forestry independently of industry, most growers choose to establish some link with industry prior to harvest. Many of the current linking arrangements are not ideal for growers, suggesting farm forestry is not achieving its full potential. This research suggested the nature and effectiveness of linking arrangements are affected by underlying market structures.

Survey results indicated farm forestry topics of greatest importance 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%); capacity of trees to arrest land and water degradation (63%); concern about tax arrangements (61%); and uncertainty about the reliability of market information (54%) (refer to Table 2). 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 (smaller than 5 hectares/12.3 acres) of trees for agricultural, environmental or conservation benefits, few will invest in medium to large scale farm forestry (larger than 10 hectares/25 acres) if forestry is not considered viable compared to alternate land uses. Appraisals of regional farm forestry will need to include full assessments of the costs of accessing international markets, and the competitiveness of small-scale growers over time. There are examples of farm forestry plantings larger than 10 hectares (25 acres) in the Green Triangle, Tasmania and Western Australia—particularly in areas with competitive markets (e.g., access to international markets, regional processors). 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.

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 and industry. Nevertheless, there is evidence in WA that farm forestry can deliver benefits to growers and regional communities. For example, competition for farmland to establish eucalypts for pulpwood has resulted in industry offering ‘lease’ joint ventures of US$85-140/hectare (US$35-57/acre) 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 Internal Rate of Returns (IRR) 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 in each region.

The Government agency—Primary Industries South Australia (PISA), in the Green Triangle intends to attract landholders with a ‘marketing’ joint venture with a base price for stumpage indexed to other prices from hardwood chip exported from Australia. Prices obtained 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 (i.e., 1-2 hectares/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 US$15,500/hectare (US$6,275/acre) at harvest with an IRR of 9.9%.

Market Structures

Survey respondents indicated 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. Survey respondents who were growers or prospective growers were also asked to indicate the likelihood they would adopt different arrangements if increasing their investment in farm forestry (refer to Table 3). The survey revealed that if growers were to increase their investment in farm forestry, most would join a marketing cooperative (53% ‘definitely/very likely’), and a majority 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 this information is that growers believe current arrangements are unsatisfactory, even unfair. This information highlights 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 (e.g., ‘lease’ or ‘CPI indexed’ joint ventures) and by government to improve access to more competitive markets.

TABLE 3. Arrangements growers would adopt when increasing farm forestry investment

<table>
<thead>
<tr>
<th>Arrangement</th>
<th>n</th>
<th>Definitely/Very Likely</th>
<th>Likely</th>
<th>Possibly/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Join a marketing cooperative</td>
<td>96</td>
<td>33%</td>
<td>38%</td>
<td>19%</td>
</tr>
<tr>
<td>Contract industry when treecrop is ready for sale</td>
<td>96</td>
<td>40%</td>
<td>27%</td>
<td>24%</td>
</tr>
<tr>
<td>Use government agency to assess market prospects</td>
<td>96</td>
<td>32%</td>
<td>40%</td>
<td>28%</td>
</tr>
<tr>
<td>Enter a short term joint venture with industry</td>
<td>97</td>
<td>22%</td>
<td>50%</td>
<td>24%</td>
</tr>
<tr>
<td>Enter a long term joint venture with industry with regular contract reviews</td>
<td>97</td>
<td>22%</td>
<td>52%</td>
<td>23%</td>
</tr>
<tr>
<td>Enter a long term joint venture with industry</td>
<td>96</td>
<td>19%</td>
<td>41%</td>
<td>40%</td>
</tr>
<tr>
<td>Use a timber/private consultant to negotiate sales</td>
<td>95</td>
<td>20%</td>
<td>58%</td>
<td>22%</td>
</tr>
</tbody>
</table>
(e.g., infrastructure developments to increase export opportunities or to support new industries). 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.

The capacity of grower 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 US$14/m³.

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.

**Diverse Joint Venture Arrangements**

When asked to report the extent of grower concern related to grower-industry links, a small majority (51% ‘important/very important’) of survey respondents indicated the range of joint venture arrangements in their region was too narrow. Survey results also highlighted the extent different groups of landholders have different needs which should be reflected in the types of arrangements offered to growers, before farm forestry is likely to be widely adopted. For example, large minorities of respondents noted insufficient household income (47%), stage of life of farmers (43%), and insufficient time to manage new enterprise (31%) were ‘important/very important’ concerns about farm forestry (refer to Table 2).

Industry prefers joint ventures that give them control of establishment and silvicultural practices to ensure timber quality at harvest. While 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. 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 so limit negotiation with individual growers. Large processors usually offer a price based on a fixed formula (i.e., distance from mill, harvesting costs, timber volume and quality).

If farm forestry is to be widely adopted, it would appear that industry partners need to develop flexible joint venture arrangements that allow financing and payments options to be negotiated on an individual basis. While ‘lease’ joint ventures remain the most popular option for growers, industry commonly offers ‘crop share’ and ‘marketing’ joint ventures. These arrangements tend to attract marginal and under-utilised farmland.

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

- Improved returns from ‘crop share’ joint ventures by recalculating the shares to partners using ‘actual’ costs (e.g., 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 tree crop (e.g., ‘split-area’ joint venture).
- ‘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.

**CONCLUSION**

**Influence of Market Structures**

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 ‘marketing’ joint ventures. Encouraging the emergence of competitive regional markets remains a fundamental task of private forestry/farm forestry development (e.g., 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 (e.g., 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%) (refer to Table 3). This has the benefit of incorporating more accurate market forecasts. Presumably, a more accurate appraisal of a region’s farm forestry viability will benefit both growers and industry.

This information highlights 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 (e.g., 'lease' or 'CPI indexed' joint ventures) and by government to improve access to more competitive markets (e.g., infrastructure developments to increase export opportunities or to support new industries). 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.

**Provision of Information**

The mail 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 (e.g., 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.

**Role of Government**

Inconsistencies in the roles of Australia’s Commonwealth, State and Local governments in farm forestry need to be removed. For instance, while Federal and State governments fund strategic research and development, regional markets are largely influenced by State governments meeting their long term commercial contracts with industry. Even as some State forest agencies have been corporatised, and have embraced competition, they retain market influence through their role as market regulators. If State governments sell public plantations, there will be few benefits for small-scale growers unless the competitiveness of regional markets is improved.

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 (Todd and Loane 1995). Developing clear cost sharing arrangements (e.g., government contributing on the basis of defined community benefits flowing from farm forestry) remain an important task, yet this will be difficult to implement without distorting the commercial positions of competing regions.

**Key Principles for Effective Links**

This research suggests the key principles for effective (i.e., mutually beneficial) market 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 market 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 (e.g., through joint ventures). The very nature of emerging and innovative
forest practices, such as farm forestry, will require consideration of how best to engage the diverse range of forest industries.

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 its viability. The viability of regional farm forestry industries is dependent on optimising a range of socio-economic and biophysical factors. Nevertheless, the extent regions are able to foster the emergence of competitive markets which give rise to mutually beneficial links between growers and processors will be of considerable importance in determining the value of farm forestry for regional Australia.

REFERENCES


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