

# **Extension and advisory strategies for Agroforestry**

**A report for the  
RIRDC/LWRRDC/FWPRDC Joint  
Venture Agroforestry Program**

by Alan W. Black, Karen Forge and Fionnuala Frost

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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 that publication various impediments to the widespread adoption of commercial farm forestry were identified. These included not only legal, economic, infrastructural and technical impediments but also impediments associated with the lack of a ‘farm forestry culture’ among many farmers, agricultural and forestry professionals and policy makers.

Although various agroforestry extension and advisory programs have been developed to facilitate the wider adoption of agroforestry, there has been little systematic assessment of their scope and effectiveness. This report provides an overview and assessment of current extension and advisory strategies for agroforestry in Australia, together with recommendations for the future.

The report is based on a literature review together with information obtained from interviews and focus group discussions with various stakeholders. The conclusions and recommendations should contribute to the planning of further initiatives in this field.

RIRDC’s involvement in this project and in the Joint Venture Agroforestry Program is part of the Corporation’s Agroforestry and Farm Trees R&D Program which aims to foster integration of sustainable and productive agroforestry within Australian farming systems.

This project was funded by three R&D Corporations — RIRDC, LWRRDC and FWPRDC. These Corporations are funded principally by the Federal Government.

This report, an addition to RIRDC’s diverse range of over 600 research publications, forms part of our Agroforestry and Farm Forestry R&D program, which aims to integrate sustainable and productive agroforestry within Australian farming systems.

Most of our publications are available for viewing, downloading or purchasing online through our website:

- downloads at [www.rirdc.gov.au/reports/Index.htm](http://www.rirdc.gov.au/reports/Index.htm)
- purchases at [www.rirdc.gov.au/eshop](http://www.rirdc.gov.au/eshop)

Peter Core

Managing Director  
Rural Industries Research and Development Corporation

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Appreciation is also expressed to those, too numerous to name, who commented on draft versions of various sections of the report. Their comments provided additional information and helped the authors to check the validity of their conclusions.

Particular mention should be made of the contributions of David Bicknell and Peter Eckersley, who were involved in the design of the study and provided helpful advice at various points in the course of the project. Their knowledge and perceptiveness have been invaluable.

Sandra Sprowson capably provided secretarial services for the project.

Karen Forge undertook most of the fieldwork for the study and made initial drafts of some sections of the report. Fionnuala Frost made initial drafts of some parts of the report and made revisions to others. Alan Black, who was the director for the project, wrote much of the report and accepts ultimate responsibility for it.

An earlier version of some parts of Chapter 1 was presented at the 'Rural Australia: Towards 2000' Conference at Charles Sturt University and subsequently published in A. Robertson and R. Watts, eds, *Preserving Rural Australia*, Collingwood, Vic: CSIRO Publishing, 1999. An earlier version of some parts of Chapter 2 was published in the *Australian Journal of Experimental Agriculture* 40: 493-502.

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# Abbreviations and Acronyms

|        |                                                                      |
|--------|----------------------------------------------------------------------|
| AACM   | Australian Agricultural Consulting and Management Pty Ltd            |
| ABARE  | Australian Bureau of Agricultural and Resource Economics             |
| AFFA   | Agriculture, Fisheries and Forestry Australia                        |
| AFG    | Australian Forest Growers                                            |
| CALM   | Department of Conservation and Land Management (WA)                  |
| COFFI  | Cooperative Farm Forestry Initiative                                 |
| CRDC   | Cotton Research and Development Corporation                          |
| CSIRO  | Commonwealth Scientific and Industrial Research Organisation         |
| DLWC   | Department of Land and Water Conservation (NSW)                      |
| DNR    | Department of Natural Resources (Queensland)                         |
| DPI    | Department of Primary Industries (Queensland)                        |
| DPIE   | Department of Primary Industries and Energy (Commonwealth)           |
| DPIF   | Department of Primary Industries and Fisheries (Northern Territory)  |
| EPA    | Environment Protection Authority (Queensland)                        |
| ESD    | Ecologically Sustainable Development                                 |
| FFAS   | Farm Forestry Advisory Service (WA)                                  |
| FFORNE | Farm Forestry North East (Victoria)                                  |
| FFP    | Farm Forestry Program (Commonwealth)                                 |
| FWPRDC | Forest and Wood Products Research and Development Corporation        |
| GA     | Greening Australia                                                   |
| GANT   | Greening Australia Northern Territory                                |
| GRDC   | Grains Research and Development Corporation                          |
| GST    | Goods and services tax                                               |
| GTTP   | Green Triangle Treefarms Project                                     |
| JVAP   | Joint Venture Agroforestry Program (RIRDC/LWRRDC/FWPRDC)             |
| LWRRDC | Land and Water Resources Research and Development Corporation        |
| MDBC   | Murray Darling Basin Commission                                      |
| MTG    | Master TreeGrower                                                    |
| NAFI   | National Association of Forest Industries                            |
| NHT    | Natural Heritage Trust                                               |
| NRE    | Department of Natural Resources and Environment (Victoria)           |
| NSW    | New South Wales                                                      |
| OMA    | Oil Mallee Association of WA Inc.                                    |
| OMCA   | Oil Mallee Company of Australia                                      |
| PFCV   | Private Forestry Council Victoria                                    |
| PFT    | Private Forests Tasmania                                             |
| PMP    | Property Management Planning                                         |
| PISA   | Primary Industries South Australia (to October 1997)                 |
| PIRSA  | Primary Industries and Resources South Australia (from October 1997) |
| QDPI   | Queensland Department of Primary Industries                          |
| R&D    | Research and development                                             |
| RIRDC  | Rural Industries Research and Development Corporation                |
| RPC    | Regional Plantation Committee                                        |
| SQFDC  | Southern Queensland Farm Forestry Development Committee              |
| TAFE   | Technical and Further Education                                      |
| WA     | Western Australia                                                    |

# Executive Summary

In this report, the terms ‘agroforestry’ and ‘farm forestry’ are used interchangeably. The potential benefits from the adoption of agroforestry are both economic and environmental. Nevertheless, the adoption of agroforestry into Australian farming systems has been constrained. In addition to technical impediments, there are impediments associated with economic uncertainties, distorted markets, particular public policies, and lack of a farm forestry culture in most rural communities and among some agricultural advisers and forestry professionals. Many impediments are progressively being removed. This study examines ways in which extension and advisory strategies can facilitate the successful adoption of agroforestry.

Chapter 1 examines literature on possible reasons for the non-adoption of innovative agricultural technologies or integrated management practices such as agroforestry. Particular attention is given to the following factors: complexity of agroforestry; its trialability; degree of congruence with farm and personal objectives; effects on farmers’ flexibility; likely economic benefits; implementation cost – capital outlay; implementation cost – intellectual outlay; risk and uncertainty; conflicting information; perceptions of the environment; physical infrastructure; social infrastructure; farming subcultures and styles of farming.

Chapter 2 reviews general models of agricultural extension under four main headings: linear ‘top-down’ transfer of technology; participatory ‘bottom-up’ approaches (also termed ‘group empowerment’); one-to-one advice or information exchange; and formal or structured education and training. Attention is then given to the effectiveness of various media and methods, including the present and potential use of new information technology, particularly the Internet, as a medium for extension. This is followed by an examination of criteria to be used in evaluating extension and advisory strategies for agroforestry. It is concluded that no one model of extension is adequate by itself and that the strengths and limitations of various approaches should be borne in mind in planning and evaluating extension and advisory programs.

Chapter 3 reviews the agroforestry extension approaches that have been developed by government agencies and other organisations throughout Australia. As far as possible, the goals and vision of each agency’s various extension strategies are identified. The extension models in use are discussed in relation to the models outlined in Chapter 2. Where information is available, salient points from stakeholder perceptions of the outcomes of these strategies are reported. The degree of coordination between agencies is also examined.

Chapter 4 summarises the conclusions of the study and makes recommendations. The recommendations deal with general principles. Where appropriate, the accompanying text provides evidence or examples from around Australia. The more detailed evidence for these recommendations is contained in earlier chapters of the report.

## **Recommendations**

### **Strategic objective**

1. The strategic objective of extension and advisory programs should be to promote the growth of a culture of continuous learning about agroforestry and related issues, so as to facilitate informed decision-making and successful adoption of agroforestry.

### **Inbuilt evaluative components**

2. From the outset, extension programs for agroforestry should have in-built evaluative components relating to processes, outputs and outcomes, so as to facilitate on-going improvement. These evaluative components should take account of the various levels of analysis identified by Bennett, as outlined in Chapter 2.

### **Collaboration between researchers, extension agents and landholders**

3. To facilitate both research and extension, there should be close collaboration between researchers, extension agents and landholders in the design, conduct and application of research on agroforestry.

### **A whole-of-government approach**

4. To achieve maximum efficiency and effectiveness, a whole-of-government approach should be developed in each State for the design and implementation of publicly funded extension programs. This approach should also take account of the capacity of the private sector and non-government organisations such as Greening Australia to provide extension and advisory services.

### **Dealing with diversity**

5. Extension and advisory strategies should take account of the diverse capacities, experiences, resources and needs of landholders and other people who are, or who could become, involved in agroforestry. Extension program planners should specify the categories of people being targeted in each program, and why.

### **Factors influencing success**

6. Extension strategies for agroforestry should aim to strengthen the capacity of landholders to:
  - deal appropriately with risks;
  - play an active part in research and development;
  - engage in regular exchange of information with fellow tree-growers and experimenters;
  - recognise the link between farm forestry and farm viability;
  - know the potential of their property thoroughly;
  - develop appropriate links with government and/or industry;
  - contribute to long-term community benefits.

### **Identifying economic and other benefits**

7. Case studies providing objective analysis of the economic, environmental and social impact of agroforestry at whole farm level should be used to inform landholders and other stakeholders of its potential benefits. These case studies should include information on outcomes under various scenarios, and on ways of managing risks.

### **‘Best bet’ versus ‘diagnosis and design’**

8. Although a ‘best bet’ approach can provide one source of information relevant to agroforestry, a ‘diagnosis and design’ approach is likely to consider a wider array of options. The ‘diagnosis and design’ approach encourages landholder ownership of decisions and also contributes more effectively to the development of a culture of continuous learning about agroforestry.

### **Targeting additional audiences**

9. Some agroforestry extension programs should be specifically targeted at:
- potential investors, whether institutions, corporations or individuals;
  - agricultural consultants, forestry consultants, and extension agents dealing with other farm enterprises;
  - accountants and other financial advisers;
  - local governments and other land use planning agencies;
  - stock and station or real estate agents;
  - tree nursery operators;
  - equipment operators and contractors;
  - suppliers of other inputs;
  - other members of the rural community.

### **The extension and advisory spectrum**

10. Extension and advisory strategies should include provision for each of the following, though these may not necessarily all emanate from the one agency:
- information access and technology transfer;
  - one-to-one advice or information exchange;
  - formal or structured education and training;
  - group facilitation and empowerment.

### **Information access and technology transfer**

#### *Television, radio and the rural press*

11. Television, radio and the press should each be used to raise awareness of agroforestry.

#### *Information sheets and booklets*

12. Well prepared publications, some of which are regionally specific, should be used as a cost-effective way of making basic information on agroforestry available to large numbers of people.

#### *Specialised periodicals*

13. Specialised periodicals such as *Agroforestry News* and *Australian Forest Grower* should be used for the dissemination of up-to-date information to growers. Of these, *Agroforestry News* currently has the largest circulation.

#### *The Internet*

14. Research findings, government reports, and publications on technical and economic aspects of agroforestry should routinely be made available not only in printed form but also on appropriate World Wide Web sites. For example, the Joint Venture Agroforestry Program publishes most reports on the web- [www.rirdc.gov.au](http://www.rirdc.gov.au). The use of the Internet to

form e-mail newsgroups and other communication networks among agroforesters, extension agents and researchers should also be encouraged.

#### *Computer based decision support tools*

15. Computer based decision support tools relevant to agroforestry should continue to be developed and, as far as possible, made more user-friendly.

#### **One-to-one advice or information exchange**

16. Qualified, independent, one-to-one advisory services on agroforestry should be available. Although some agencies are currently providing personalised services without charge, the trend is toward the provision of one-to-one advice either by private consultants or on a cost recovery / fee for service basis. Nevertheless, because of the public benefits associated with agroforestry, a case can be made for subsidisation of some one-to-one advisory services.

#### **Formal or structured education and training**

17. In addition to events such as field days and Agroforestry Expo, there should be an array of opportunities for formal or structured education and training relevant to agroforestry, including the following:
  - university courses such as Melbourne University's Graduate Certificate in Forest Science (Farm Forestry);
  - short courses such as the Master TreeGrower Program, appropriate modules in Property Management Planning programs, and other local or regional courses;
  - training programs covering relevant 'hands on' skills such as those associated with site preparation (e.g. earth works, ripping, mounding, fencing), silviculture (e.g. planting, monitoring, pruning, thinning, pest control), harvesting (e.g. tree selection, felling, transporting) and plant operation (e.g. tree planters, cherry pickers, chainsaws, harvesters);
  - home study courses.

#### **Group facilitation and empowerment**

18. Participatory methodologies involving group facilitation and empowerment should be major elements in publicly funded extension programs for agroforestry.

#### **Knowledge and skills required by extension agents**

19. In the recruitment and on-going professional development of extension agents, attention should be given to the need for competence in technical and economic aspects of agroforestry and also for skills in communication, teamwork and group facilitation, together with a good understanding of adult learning principles, rural communities, and program planning and evaluation.

#### **Maintaining agroforestry extension and advisory programs**

20. Policy makers should give urgent consideration to maintaining or expanding funding for farm forestry extension and advisory programs, in order to achieve the substantial public benefits associated with an increase in well-informed adoption of agroforestry.

# 1. Introduction

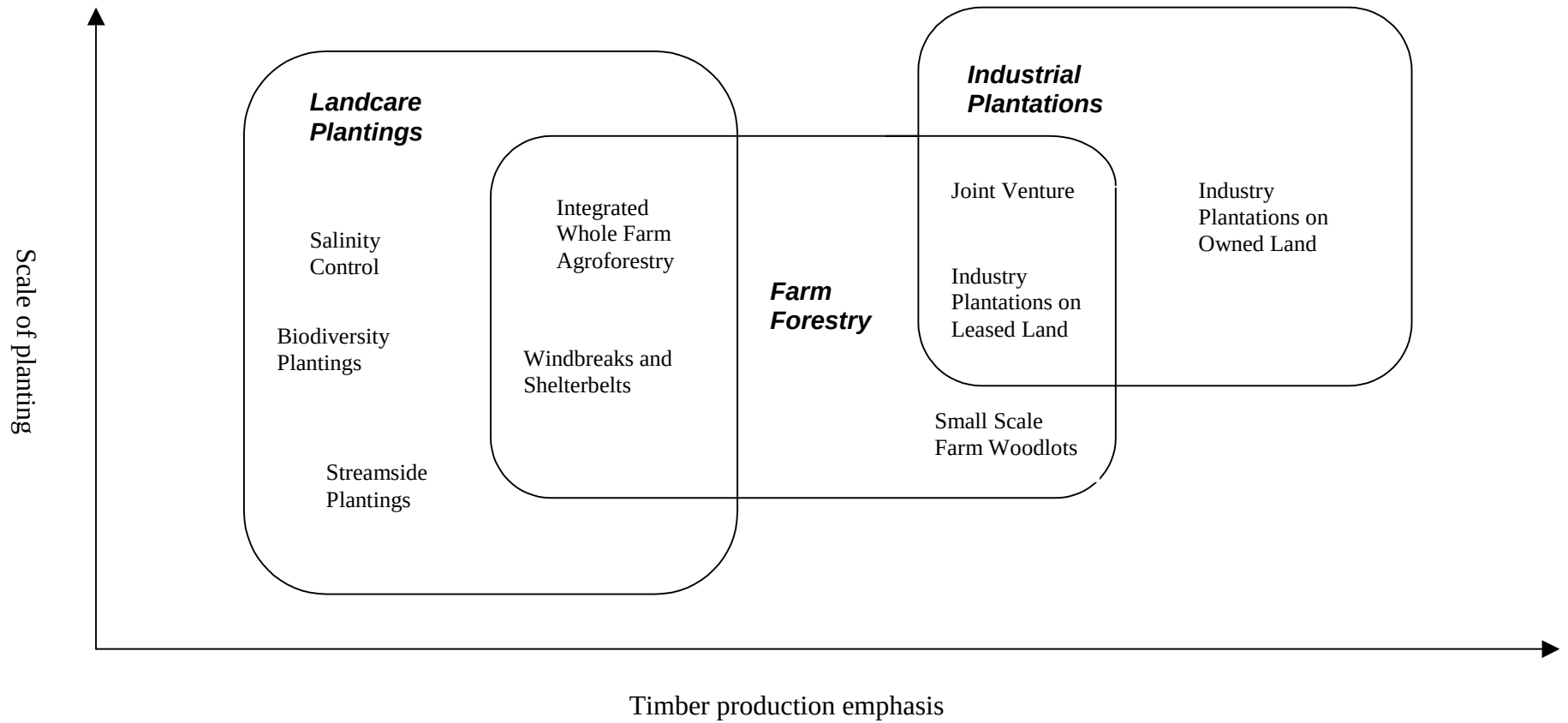
This study deals with extension and advisory strategies for agroforestry. Since the late 1980s, various reports and government policy statements have alluded to the substantial economic and environmental benefits that would accrue to Australia by the more widespread adoption of agroforestry or farm forestry (Commonwealth of Australia 1991, 1992, 1995; Farm Forestry Task Force, 1995; Greening Australia, 1996). After outlining what is meant by the terms ‘agroforestry’ and ‘farm forestry’, this chapter briefly reviews the potential benefits of tree planting on farms, examines the rate of uptake of agroforestry or farm forestry in Australia in recent years, and analyses some of the constraints affecting the adoption process. Once this background has been sketched, details are given of the specific objectives and methodology of the present study, as well as the structure of the rest of the report.

According to the International Council for Research on Agroforestry, ‘Agroforestry is a collective name for land-use systems in which woody perennials (trees, shrubs, etc.) are grown in association with herbaceous plants (crops, pastures) and/or livestock in a spatial arrangement, a rotation or both, in which there are ecological and economic interactions between the tree and the non-tree components of the system’ (quoted in Prinsley, 1991: 9). The term ‘farm forestry’ is sometimes used to refer simply to that component of agroforestry that is concerned with the incorporation of *commercial* tree growing into farming systems; i.e. where the intention is that a product from the trees (e.g. sawlogs, pulpwood, eucalyptus oil) will be harvested and sold. However, the term ‘farm forestry’ is often used in Australia almost synonymously with the term ‘agroforestry’ as defined above (see, for example, Department of Primary Industries and Energy, 1995; Curtis and Race, 1996; Race and Curtis, 1996; Greening Australia, 1996). The national Farm Forestry Program now deals not only with the planting of trees on cleared agricultural land but also with the management of native forest resources on farms.

The predominant form of *industrial* forestry in Australia is on relatively large tracts of land used more or less exclusively for tree growing, although some industrial plantations occur on land that was formerly used for farming. At the other end of the spectrum, some tree planting occurs predominantly for landcare or rivercare purposes, rather than for specifically commercial purposes. Under the definitions adopted by Prosser, Donaldson and Gorrie, as indicated in Figure 1.1 on the following page, farm forestry fits between these two extremes, involving the incorporation of commercial tree growing into farming systems. It can take a variety of forms: plantations on farms; woodlots; timberbelts; alleys; and wide-spaced tree plantings. The scale of planting can range from relatively small, as in windbreaks and shelterbelts, to moderately large, when extensive sections of a property are devoted to tree growing. The motivation for planting can vary from substantially conservationist to primarily commercial, though a commonly used definition requires that commercial considerations, albeit long-term ones, form at least one element of the motivation. As trees can serve more than one purpose, the category ‘farm forestry’ partly overlaps that of landcare plantings on the one hand and industrial plantations on the other (Prosser, 1995; Donaldson and Gorrie, 1996).

Reid and Stephen (1999: 5) contend that ‘It is not the scale, the planting pattern, the species or the purpose of a forest that makes it a “farm forest” – it is its ownership.’ By ‘ownership’ they mean not only the ownership of the land or the trees but also the ownership of the decision-making.

Figure 1.1: Farm Forestry



Source: Donaldson and Gorrie (1996)

As Reid and Stephen (1999: 5) put it:

*Farmers may choose to plant conventional plantations for industrial wood, manage their native forests for farm timber, prune their shelterbelts and wildlife corridors for high value sawlogs, grow oil mallees for salinity control, or even lease their land to forestry companies. If a farmer makes a decision to participate in forestry then, for us, it is “farm forestry”.*

Because there are differences of opinion on the definitions of ‘agroforestry’ and ‘farm forestry’, because in any case there is a substantial overlap in meaning between the two terms, and because frequent use of the phrase ‘agroforestry and farm forestry’ is cumbersome, the terms ‘agroforestry’ and ‘farm forestry’ will be used interchangeably in the present report.

In some later sections of the report, the term ‘private forestry’ is used. Private forestry includes both farm forestry and industrial forestry carried out on privately owned land.

### **1.1 Potential benefits of agroforestry**

The potential benefits of agroforestry include: adding to the national supply of timber, essential oils and other tree-based products; diversification and increase of farm incomes; synergistic effects on crop, pasture and animal production; amelioration and containment of land degradation; conservation of biodiversity; and sequestration of greenhouse gases. Such outcomes are likely to be beneficial not only to individual farmers but also to the wider community; for example, by reducing Australia’s reliance on imports and potentially contributing to Australia’s exports, thus improving our trade balance.

The Centre for International Economics has developed an economic model to estimate the costs and benefits likely to accrue to farmers and to the community at large if the optimal share of farmland is devoted to farm forestry. This model indicated that:

*The optimal shares of farm land to be diverted to farm forestry differs across zones and with traditional land uses – from 1 per cent for all agricultural land other than broadacre and dairy farmland, to 5 per cent in the pastoral and wheat-sheep zones and for all dairy farmland, and to 10 per cent for broadacre farmland in the high rainfall zone.*

(Centre for International Economics, AACM International, and Forestry Technical Services, 1996: 48)

If these proportions of land were appropriately used for farm forestry, the annual value of farm forestry to Australia once a sustainable harvest is reached would be about \$3.1 billion, excluding the value of processed wood products. About 88 per cent of this \$3.1 billion would accrue to farmers, but the wider community would also benefit from cleaner water, reduced land degradation and maintenance of biodiversity. In addition, there would be substantial benefits to wood processing industries, the market value of processed wood products from farm forestry increasing to \$20 billion a year and employment rising by about 40 000 (Centre for International Economics, AACM International, and Forestry Technical Services, 1996: 48).

These estimates are based on assumptions of (a) an absence of impediments to the expansion of farm forestry, (b) competitive markets for wood, and (c) constant real prices for wood and for traditional agricultural products. In the event of an increase in the real price for higher quality wood products, the value of farm forestry would be even greater than the above estimate. Even if not all the stated conditions are met, farm forestry has the potential to make

a substantial contribution to the livelihood of those farmers whose trees have been prudently planted and maintained (Centre for International Economics, AACM International, and Forestry Technical Services, 1996: 48-49).

Farm forestry could also make a substantial contribution to the achievement of various conservation objectives. For example, world demand for structural timber is increasing faster than supply. Various Asian countries have been rapidly depleting their domestic sources of wood. By the year 2000, Pacific Rim countries will be facing an estimated annual timber shortfall of 325 million cubic metres, which is equal to one-fifth of the current world trade in industrial wood (Ryan, 1994, quoted in Curtis and Race, 1996: 5). To help achieve a sustainable supply of wood and wood products for both domestic and export purposes, the timber industry recently set itself the goal of trebling Australia's forest plantation estate by the year 2020. That goal was endorsed by the Australian government in its Wood and Paper Industry Strategy (Commonwealth of Australia, 1995). It was envisaged that a substantial part of the increase would come from new farm forestry plantations. Farm forestry also has the potential to contribute to other conservation objectives, such as: reducing the rate of salinisation by lowering the watertable; reducing greenhouse gases through the sequestration of carbon dioxide; and conserving biodiversity, especially of native flora and fauna.

## **1.2 Uptake of agroforestry in recent years**

Despite the potential benefits of agroforestry and the emergence of several Commonwealth and State tree planting programs during the 1990s, the uptake of agroforestry in Australia has been much slower than would be required if the commercial and conservation benefits are to be optimised. To estimate the extent of planted trees on Australian farms, the Australian Bureau of Agricultural and Resource Economics (ABARE) conducted a survey of 2000 broadacre and dairy farmers across Australia in 1994. Thirty-five per cent of respondents stated that they had tree belts and corridors ('groups of trees planted in a strip with a maximum width of approximately 30 metres for purposes such as shelter and wildlife conservation'); 14 per cent had tree blocks ('trees grown in high density clumps'); 6 per cent had alley belts ('plantings of at least two strips of trees with grazing or cropping between the strips'); and 6 per cent had widely spaced plantings ('separated and scattered trees on farms, with grazing or cropping carried out between the trees'). The term 'planting' was used to refer to 'a group of at least 20 trees planted together and at the same time in one of the above four planting regimes, with the paddock boundary fence marking the maximum area of any one planting' (Wilson *et al.*, 1995: 9-10).

The ABARE study also revealed that the main functions attributed by farmers to the planting of trees on their farms were to provide shelter and shade, to treat or prevent land degradation, and to conserve native vegetation and wildlife. On less than 2 per cent of farms where trees had been planted in the previous three year period was the production of timber or other tree products the main stated function of such trees; in another 4 per cent of cases this was a secondary aim. About a quarter of all broadacre and dairy farmers who had, during the abovementioned period, planted trees received help from some form of assistance scheme for tree planting. Only about 2 per cent participated in a joint venture or share farming agreement for this purpose, reflecting a possible lack of awareness, availability or acceptance of such arrangements (Wilson *et al.*, 1995: 18-20, 23-25).

Among recent participants in the Master TreeGrower program, the most frequently stated primary reason for planting trees was for commercial purposes (23 per cent), followed by shelter (13 per cent) and biodiversity (12 per cent) (Stephen and Reid, personal

communication, 1999). Of course, participants in the Master TreeGrower program are not necessarily a representative sample of all farmers or even of all persons engaged in farm forestry. Nevertheless, these figures do suggest that there is a significant (and gradually expanding) segment of people engaged in farm forestry who are doing so for predominantly commercial reasons.

Over 26 million new seedling trees were planted out on Australian farms during the year ended 31 March 1995 (Australian Bureau of Statistics, 1997: 69), and almost 19 million in the following twelve months (Australian Bureau of Statistics, 1998a: 23-24). At the end of March 1996, established plantings of trees on Australian farms occupied a total of approximately 166,000 hectares, which represents 0.036 per cent of the 465.2 million hectares of land used for agricultural and pastoral purposes. This proportion falls a long way short of the optimal proportions quoted above from the Centre for International Economics, AACM International, and Forestry Technical Services (1996: 48). Of the 166,000 hectares of established plantings of trees on farms, 51 per cent were in Western Australia and 26 per cent were in Victoria. Taking Australia as a whole, one-third of the area devoted to such plantings was for timber or pulp production (Australian Bureau of Statistics, 1998a: 24). Much of that area was for industrial-scale plantings, rather than for forestry integrated with other farming enterprises.

### **1.3 Impediments to the adoption of agroforestry**

Four recent studies (AACM International, Centre for International Economics and Forestry Technical Services, 1996; Alexandra and Hall, 1996 and 1998; Greening Australia, 1996, Curtis and Race, 1996) have examined some of the impediments to farm forestry in Australia. Leaving aside technical impediments that have been addressed elsewhere (e.g. Prinsley, 1991), the study by AACM International, the Centre for International Economics and Forestry Technical Services (1996) listed impediments under four headings: lack of a farm forestry culture; economic uncertainties; public policies; and market impediments.

In a discussion paper produced in 1996, Alexandra and Hall used three very similar headings: lack of a farm forestry culture; public policy impediments; and market impediments (see also their final report, 1998). The 1996 discussion paper was in turn used in a publication by Greening Australia (1996). Curtis and Race (1996) identified the following as major socio-economic factors affecting regional farm forestry development in Australia: uncertainty about the economic and environmental viability of farm forestry; uncertainty about the respective roles of growers, industry and government; inadequate understanding of the likely socio-economic impact of farm forestry upon each region; and life-style, life-cycle and socio-demographic factors affecting decision-making at farm level.

### **1.4 Possible reasons for non-adoption of agroforestry**

Prior to the above mentioned studies, and without focusing specifically on agroforestry or farm forestry, Vanclay and Lawrence (1995) put forward a classification of legitimate reasons for non-adoption of innovative agricultural technologies or integrated management practices, especially those designed to achieve environmentally beneficial effects. This schema is useful for summarising some of the major factors influencing the rate of adoption of agroforestry. Each of Vanclay and Lawrence's factors will be considered in turn.

### ***Complexity of innovation***

It has long been recognised that the rate of adoption of an innovation tends to be negatively related to the perceived complexity of the innovation (Rogers, 1983). Successful implementation of farm forestry requires the integration of a diverse range of skills, knowledge and management practices. Some of these requirements, such as silvicultural knowledge and skills, as well as knowledge of timber harvesting, marketing and processing, together with planning horizons ranging from 10 to 30 years, have not hitherto been core competencies in many farming enterprises. Farm forestry is thus an innovation of considerable complexity. This helps to explain its relatively low rate of adoption so far.

### ***Divisibility of innovation***

Divisibility refers to whether it is possible to adopt a part of an innovation rather than the whole. Divisibility is closely related to what Rogers (1983) terms 'trialability.' Clearly it is possible to grow a few trees without necessarily engaging in commercial farm forestry. However, the success of commercial farm forestry depends in part on the achievement of a scale of operation sufficient to justify the purchase of specialised equipment or, at the very least, sufficient to make it economic to hire contractors for any tasks the farmer cannot perform. Consequently, farm forestry is not as divisible, nor as trialable on a limited basis, as are some other less complex innovations. Another important issue relevant to trialability is that it takes many years for trees to mature. There is therefore not the same immediacy in judging either the commercial or the conservation benefits of farm forestry. Hence, the speed at which others follow the lead of early adopters is likely to be correspondingly slower than would be the case for innovations whose commercial or conservation benefits are more quickly manifest.

### ***Degree of congruence with farm and personal objectives***

Under this heading, Vanclay and Lawrence refer to the degree of compatibility both with existing farm enterprises and with other personal or family goals. One possible reason for adopting farm forestry is because of its synergistic effects on the production of animals and other plants. Thus, the Centre for International Economics, AACM International and Forestry Technical Services (1996: 48) have calculated that improved yields resulting from shelter belts in the sheep-wheat zone are sufficient to cover the costs of establishing and maintaining such shelterbelts, even if no wood is sold. Nevertheless, the demands of farm forestry in terms of land, labour and capital may not always be compatible with other farming activities or with other personal or family priorities. The availability of family labour for operations such as planting, pruning, spraying and thinning may facilitate the adoption of farm forestry by minimising expenditures on these operations. Conversely, the absence of such labour, coupled with low incomes from existing enterprises whether on or off the farm, is likely to impede the adoption of farm forestry. So, too, may other family priorities such as the education of children. On the other hand, off-farm income may provide resources that enable the adoption of farm forestry even though the economic returns will be delayed. Thus family dynamics, including family size, life-stage, gender, likely inheritance patterns and extent of off-farm employment, may significantly influence the adoption process (Curtis and Race, 1996).

### ***Effects on farmers' flexibility***

Because trees take much longer to reach maturity than most other farm commodities, farm forestry imposes some limitations on farmers' capacity to respond to changing market

conditions. It is obviously much more difficult to change the species of trees one is growing than to switch from producing one variety of grain to another. Likewise, in the event of a downturn in the market for timber, it would generally be more difficult to redeploy the land used for timber production than to switch from one broadacre enterprise to another. Some farmers shy away from farm forestry because of this perceived loss of flexibility. The effect of this deterrent may be reduced through a wider awareness of the synergistic benefits of farm forestry, as well as by more reliable forecasts of future supply of, and demand for, particular species of timber.

### ***Likely economic benefits***

Under this heading, Vanclay and Lawrence note that although economic considerations are not the only factor in adoption decisions, it is reasonable to expect that, everything else being equal, the more economically beneficial an innovation, the greater the rate of adoption; and that practices with more immediate benefits tend to take precedence over those with only long-term benefits. Rogers (1983: 15, 213) uses a broader concept, relative advantage, which he defines as 'the degree to which an innovation is perceived as better than the idea it supersedes.' He observes that although economic benefit is the most common measure of relative advantage, other considerations such as social prestige, convenience or satisfaction may also be important. Of the factors that Cary and Wilkinson (1997) examined in a recent Australian study, perception of long-term profit was the most important determinant of farmers' decision to plant trees. Clearly, perceived economic benefits are major factors, though not the only ones, influencing the likelihood that farmers will adopt farm forestry.

### ***Implementation cost: capital outlay***

Wilson *et al.* (1995: 21-22) found that establishment costs for farm forestry vary between about \$700 and \$1800 per hectare, depending on the planting regime involved; labour (calculated at \$12.50 per hour) and fencing are the main components of these costs. Eckersley, Ellis and George (1993) put the cost of establishing tree blocks as being typically between \$1200 and \$1500 per hectare although they noted that establishment costs might be reduced to \$600 per hectare if existing farm labour and equipment can be used. These establishment costs are much higher than those for perennial pasture, which Francis and Marcar (1993) calculate as ranging from \$200 to \$250 per hectare. High establishment costs, coupled with a long wait for a return on the investment, pose a major problem for many farmers, especially if they must borrow to finance the venture. Whilst there are various solutions to these problems, such as joint-venture, leasing and share-farming arrangements, each of these should be carefully considered before being entered into (Race and Curtis, 1997). Many farmers are very cautious about such arrangements.

### ***Implementation cost: intellectual outlay***

Implementation cost in terms of intellectual outlay refers primarily to the amount of new learning required by the individual farmer. This is closely related to the complexity of the innovation. Many farmers are now aged between fifty and seventy years. Without implying that persons in this age category are necessarily unwilling or unable to learn new competencies, there are obviously limits to the extent to which they are ready to acquire the wide range of skills and knowledge required for successful farm forestry, especially if it is unlikely that the farm will be passed on to a family member. This situation poses a particular challenge for persons who are responsible for designing and implementing farm forestry extension and training programs.

### ***Risk and uncertainty***

There are various risks and uncertainties associated with farm forestry. Some of these relate to contingencies of production such as weather and the prevalence of tree pests or diseases, some relate to markets for logs and for other tree products, and some relate to public policy in areas such as taxation, local government rates, land use planning controls, tree tenure, harvesting rights and export controls. As these issues have been examined in depth elsewhere (e.g. AACM International, Centre for International Economics and Forestry Technical Services, 1996; Alexandra and Hall, 1996; Greening Australia, 1996), they will not be explored in detail here.

In so far as the risks and uncertainties mentioned above continue, they are impediments to the adoption of farm forestry. Fortunately, some of these impediments have recently been removed or reduced by the implementation of the Wood and Paper Industry Strategy of the Commonwealth of Australia (1995). In particular, the federal government has taken steps to remove anomalies and uncertainties about various taxation matters. At its July 1996 meeting, the intergovernmental Ministerial Council on Forestry, Fisheries and Aquaculture affirmed the intention of the various States and Territories to enact legislation that would remove uncertainty over the right to harvest wood grown for commercial purposes and that would provide a sound legal basis for separating the ownership of trees from the ownership of the land on which they grow (Anderson, 1996). Such legislation would eliminate or reduce some of the risks and uncertainties that have been associated with farm forestry hitherto.

### ***Conflicting information***

In Western Australia, the Farm Forestry Task Force (1995: 3) reported that 'It is hard to access good information on a whole farm forestry package from independent sources. There is some evidence of farmers receiving conflicting advice from different sources.' Likewise, Alexandra and Hall (1996: 10) note that the possibility of receiving conflicting information on farm forestry is accentuated because there is inadequate coordination between agriculture and forestry departments or between different divisions of amalgamated departments. These differences of orientation are often reinforced by different emphases in the tertiary curricula for foresters and agriculturalists respectively.

The receipt of conflicting information is clearly an impediment to the adoption of farm forestry. However, it does not follow from this that the receipt of consistent information necessarily increases the rate of adoption. Consistent information about the potential problems of farm forestry might act as a deterrent to adoption, especially if it is not counterbalanced by reliable information about farm forestry's potential benefits.

### ***Perceptions of the environment***

Farm forestry has been promoted not only for its commercial benefits but also for its environmental benefits, especially for its potential to prevent or alleviate problems of dryland salinity. Whilst it is reasonable to expect that the likelihood of the adoption of environmentally beneficial innovations increases when farmers consider that their own farms are at risk from environmental degradation, studies cited by Vanclay and Lawrence (1995: 82-86) indicate that farmers are often unaware of the early warning signs of land degradation and that they usually understate and misperceive the extent to which their own properties are affected by such degradation. Media images of land degradation, whether on television, in newspapers, in conservation organisation publications and in some agricultural extension

literature, tend to focus on the most severe and visually obvious forms of land degradation. As many farmers may not currently be experiencing land degradation of such severity, the media images may unintentionally lull them into a false sense of security rather than prompting them to alleviate existing degradation and prevent further degradation.

Furthermore, in the case of dryland salinity, those farms on which soil salting is most evident, such as those in low lying areas, may not be solely or even primarily responsible for the problem. To deal effectively with the problem, trees may need to be planted not only on the farms where the problem is most evident but also on farms where the problem is not so evident (Vanclay and Lawrence, 1995: 90-91). This need for concerted action poses an additional challenge for those responsible for farm forestry extension programs.

### ***Physical infrastructure***

Physical infrastructure requirements for farm forestry include not only supplies of various inputs but also access to appropriate markets for logs and for other tree products. Because, all other factors being equal, the price achievable at the mill gate is determined by supply and demand, differences in transport costs directly affect the net return to growers. Consequently the availability and efficiency of road, rail and port services, as well as of processing facilities, are important aspects of the physical infrastructure. These facilities in turn require adequate power supply, water and waste disposal services.

Vanclay and Lawrence also regard the availability of contractors or a skilled labour force, of consultants and extension personnel, as well as of other sources of information, as part of the physical infrastructure. Although these things have a physical element to them, they could better be considered as part of the required social infrastructure.

### ***Social infrastructure***

Under this heading, Vanclay and Lawrence refer primarily to the existence of a sufficient degree of interest in an innovation to promote widespread adoption. This is clearly important for the achievement of economies of scale in marketing or processing in any particular region, as well as to maximise conservation benefits. Organisations such as landcare groups, farm forestry networks, grower cooperatives, marketing agencies and the other forms of social infrastructure mentioned in the previous paragraph are also likely to be important for the adoption of farm forestry.

### ***Farming subcultures and styles of farming***

Although most farmers prize their capacity to be independent, they are also influenced by the farming subculture in which they are located. This subculture consists of the prevailing beliefs, attitudes and way of life within the farming community. Some older farmers who were brought up at a time when tracts of land were being cleared for agriculture are averse to the suggestion that some land should now be revegetated with trees. Many farmers are strongly opposed to any moves to turn whole farms in their vicinity into forestry plantations, as they see this as possibly leading to further rural depopulation, with a consequent decline in local social amenities (Rose, 1996). As those purchasing land for industrial forestry are often able to pay higher prices than are nearby farmers, the latter find it difficult to expand their operations in these circumstances. Opposition to industrial forestry on these and other grounds (such as the view that it is wrong to take land out of food production in a world with an expanding population) can colour farmers' attitudes toward the planting of trees on their own farms.

Although some farming subcultures and farming styles militate against the adoption of farm forestry, the potential is also there to work with opinion leaders, using group processes to engender more widespread recognition of the benefits of farm forestry and to encourage more widespread practice of it.

## **1.5 Objectives of this research project**

The objectives of the research project on which this report is based are:

- to produce a comprehensive inventory and assessment of current extension and communication systems for agroforestry in Australia;
- to identify those systems and activities that are perceived by the various stakeholders to have been most successful in fostering the development of agroforestry, and to analyse their strengths, limitations, potential for improvement and potential for wider application;
- to recommend information exchange and advisory strategies that can most effectively and efficiently assist agroforestry to become more widely adopted, profitable and sustainable;
- to publicise the findings and recommendations among policy makers, extension and advisory staff, education providers and other stakeholders.

It is important to note that in current usage the term ‘extension’ does not imply simply a one-way, top-down process of information transfer. As will be argued in Chapter 2, contemporary approaches to agricultural extension see the process of adoption as much more complex than this. The ‘extension and communication systems’ mentioned in Objective 1 include various strategies, models, organisational forms and programs.

‘Stakeholders’ in Objective 2 include:

- farmers involved in agroforestry;
- extension and policy personnel in relevant government and non-government organisations such as departments of primary industries, agriculture or natural resources, producer and industry associations like Australian Forest Growers, and conservation groups like Greening Australia;
- persons involved in property management planning or farm management consultancy;
- agroforestry researchers;
- suppliers of agroforestry inputs, such as nurseries; and
- processors or potential processors of products from agroforestry.

## **1.6 Methodology**

In line with the terms of reference, this project had two main methods of research. The first was a study of relevant literature on agricultural extension and information exchange, adoption of complex technologies and integrated management practices, and farm forestry in Australia.

The second element of the research involved interviews or focus group discussions with stakeholders or potential stakeholders in farm forestry. The field work was conducted during the latter part of 1997 and the first half of 1998.

Sixty-nine individual interviews were conducted, mainly with extension personnel, researchers and policy advisers in government agencies or office bearers in other organisations concerned with agroforestry. Appendix A contains a copy of the interview questions used with extension personnel. These questions were modified slightly for other interviews.

Focus groups were used to gather qualitative data from farmers who either were involved in farm forestry (FF) or not involved in farm forestry (Non-FF). This segmentation was to provide insight into extension methods that serve the needs of individuals and organisations already involved in farm forestry, and methods that will raise awareness and increase the involvement of those not yet involved in the industry. In some cases, it was not possible to arrange separate FF and Non-FF focus groups. In such cases, a combined focus group was held. Where several extension officers were simultaneously available at the one location, a focus group was conducted for them. Appendix B contains details of topics discussed in focus groups. Each focus group was tape-recorded to enable the moderator to amplify or check notes taken during the group discussion.

Selection of the participants for the focus groups varied according to the type of group. Farm forestry group participants were selected by contacting existing farm forestry networks or Landcare groups that contained a farm forestry sub-committee. Non farm forestry group participants were selected using other types of farming enterprise groups or organisations, such as Landcare, Property Management Planning or Dairy Discussion Groups, and Prime Lamb Associations.

Thirty-one focus group discussions were conducted. Table 1.1 gives details of their locations.

**Table 1.1 Location of focus groups involved in this study.**

| <b>State</b> | <b>Farm Forestry Focus Groups</b>                                     | <b>Non Farm Forestry Focus Groups</b> | <b>Mixed Focus Groups</b>                | <b>Extension Officer Focus Groups</b>                                    |
|--------------|-----------------------------------------------------------------------|---------------------------------------|------------------------------------------|--------------------------------------------------------------------------|
| <b>WA</b>    | Busselton<br>Albany<br>Wickepin<br>Bridgetown                         | Darkan                                |                                          |                                                                          |
| <b>VIC</b>   | Bendigo<br>Gippsland MTG<br>Otways<br>Benalla                         | Kergunyah                             |                                          | Bendigo<br>Gippsland Farm Forestry<br>Certificate Course<br>Participants |
| <b>TAS</b>   | Launceston<br>Derwent Valley<br>Landcare<br>Midland Tree<br>Committee | Kindred Landcare<br>(NE)              |                                          | Private Forests Tasmania<br>(Launceston)                                 |
| <b>SA</b>    | Mt Barker                                                             | Goolwa                                | Wattle Range<br>Mt. Gambier              |                                                                          |
| <b>QLD</b>   | Lowood<br>Maleny                                                      | Yandina                               |                                          | Treecare Extension<br>Officers (Department of<br>Natural Resources)      |
| <b>NSW</b>   | Gunning<br>Harnham<br>Old Bonalbo                                     |                                       | Coonabarabran<br>Gunnedah<br>Willow Tree |                                                                          |

A total of 145 individuals participated in focus group discussions. The groups ranged in size from two persons at Goolwa Non Farm Forestry focus group to 13 at both Wattle Range Mixed focus group and Yandina Non Farm Forestry focus group.

Figure 1.2 provides State-by State comparisons of the average age of landholder participants, the average number of years they had been farming as an adult and the average number of years they had been on their farm.

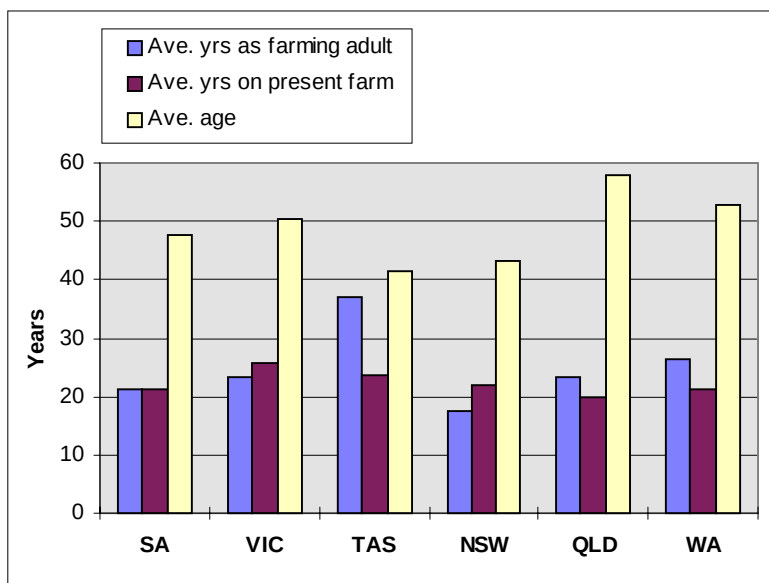


Figure 1.2. Average age, average years as a farming adult and average years on the present farm for participants in the focus groups

There was a spread in the main farm enterprises conducted by those involved in the focus group discussions, with beef or sheep and wool production predominating. Other enterprises included cereal crops, fodder crops, grain legumes, dairy cattle, oil seeds, fruit, vegetables, nuts, dairy goats, goats for meat, goats for fibre, pigs, poultry and horses, as well as commercial farm forestry.

As soon as possible after each interview or focus group, notes of the conversation were typed. The main themes and issues were identified. It was found that there were recurring themes, as well as some issues that were particular to a given State or region. These comments helped to inform the analysis of data from documentary or other sources. Where comments from interviews or focus groups are quoted in the present report, they have been chosen as representative examples of a particular opinion.

## 1.7 Structure of the report

The rest of the report is structured as follows:

Chapter 2 provides a general review of models adopted in agricultural extension. Attention is then given to the effectiveness of various media and methods, including the present and potential use of new information technology, particularly the Internet, as a medium for extension. This is followed by an examination of criteria to be used in evaluating extension and advisory strategies for agroforestry.

Chapter 3 reviews the agroforestry extension approaches that have been developed by government agencies and other organisations throughout Australia. As far as possible, the goals and vision of each agency's various extension strategies are identified. The extension models in use are discussed in relation to the models outlined in Chapter 2. Where

information is available, salient points from stakeholder perceptions of the outcomes of these strategies are reported. The degree of coordination between agencies is also examined.

Chapter 4 draws together the conclusions of the study and makes recommendations. The recommendations deal with general principles that should apply throughout Australia. Where appropriate, the accompanying text provides evidence or examples from around Australia. The more detailed evidence for these recommendations is contained in earlier chapters of the report.

## 2. Extension theory and practice

There is no universally agreed definition of extension. According to van den Ban and Hawkins (1996: 9), a common meaning for the term is that ‘extension involves the conscious use of communication of information to help people form sound opinions and make good decisions.’ The Australasia Pacific Extension Network (1999) states that extension involves ‘the use of communication and adult education processes to help people and communities identify potential improvements to their practices, and then provides them with the skills and resources to effect these improvements.’ Marsh and Pannell (1998a: 2) define agricultural extension broadly to include ‘public and private sector activities relating to technology transfer, education, attitude change, human resource development, and dissemination and collection of information.’

This chapter provides a general review of agricultural extension models under four main headings: linear ‘top-down’ transfer of technology; participatory ‘bottom-up’ approaches (also termed ‘group empowerment’); one-to-one advice or information exchange; and formal or structured education and training. Attention is then given to the effectiveness of various media and methods, including the present and potential use of new information technology, particularly the Internet, as a medium for extension. This is followed by an examination of criteria to be used in evaluating extension and advisory strategies for agroforestry. It is concluded that no one model of extension is adequate by itself and that the strengths and limitations of various approaches should be borne in mind in planning and evaluating extension and advisory programs.

### 2.1 Linear ‘top-down’ strategies

For many years, the dominant model of agricultural extension was based on the assumption that new agricultural technologies and knowledge are typically developed and validated by research scientists, and that the task of extension agencies is to promote the adoption of these technologies by farmers, thereby increasing agricultural productivity. Although various means of communication have been used, the conventional model of extension has focused particularly on the farmers thought most likely to be early adopters—the so called ‘progressive farmer strategy’—in the expectation that once they embrace the new technology, their example will be followed by others. Hence this is sometimes termed the linear adoption/diffusion model. It is also an example of what Oltheten (1995) terms ‘target or blueprint orientated approaches’, where the emphasis is on achieving targets defined by the extension agency.

More recently, this model has been subject to various critiques. For example, writers such as Stockdale (1977), Fliegel and van Es (1983), Buttel *et al.* (1990), Kloppenberg (1991) and Vanclay and Lawrence (1995) have argued that extension strategies based on this model have been insufficiently critical of the technologies they have been designed to promote, as inadequate attention has been given to the long-term economic, environmental and social impacts of those technologies.

Some critics have also questioned the underlying assumption that after the most progressive farmers adopt technological innovations, these practices will inevitably diffuse down to the majority of producers. Russell *et al.* (1989: iii) state that this assumption has been found to be ‘consistently problematical’, a view echoed more recently by Dunn (1997: 162). Nevertheless

there have been many well-documented cases where new technologies have diffused quite widely throughout the farming population (Rogers, 1983; Fliegel, 1993; Ruttan, 1996).

Röling *et al.* (1976) and Röling (1988) have argued that the application of top-down adoption/diffusion theory has tended to reinforce existing social inequalities within the farming population, since the producers benefiting most from the adoption process have generally been those better endowed than others in material, intellectual and social resources.

Most of the early studies of adoption processes in agriculture dealt with technological innovations, such as hybrid-seed corn and artificial insemination, each of which could increase agricultural productivity if adopted singly. Although the application of insights derived from this research has helped to improve the effectiveness of agricultural extension, there is considerable doubt as to whether models based on the adoption of single, relatively simple, innovations are applicable to the adoption of more complex, integrated suites of practices (Reeve and Black, 1998a), such as those involved in agroforestry.

Likewise, there is considerable doubt as to whether models based on technologies whose main merit is that they are, at least in short term, more productive are necessarily applicable to the adoption of technologies whose main merit is that they are more sustainable and environmentally benign (Buttel *et al.*, 1990; Fliegel, 1993). Of course, the ideal is to find technologies which are both more productive and more sustainable—in appropriate circumstances, agroforestry fits into this category—but sometimes there might need to be a tradeoff between these two objectives.

Chambers (1983) argued that the knowledge, skills and adaptive abilities of farmers themselves are systematically and unjustifiably devalued in extension strategies based on the notion of a top-down transfer of technology from scientific experts to farmers. Likewise, in their *Critical Review of Rural Extension Theory and Practice*, Russell *et al.* (1989: v) concluded that:

Farmers have almost universally been sold short as both competent scientific thinkers and researchers. The upshot of this tendency has been to perpetuate the modern myth that research is the exclusive domain of professional researchers and that farmers are inevitably on the receiving end of their work. This review shows that farmers have a strong desire to participate in setting the research agenda and are increasingly willing to be co-researchers with the scientists. The strength of any joint management of research projects is that R&D can become an integrated activity. The adoption of research findings is then a critical issue from day one of the investigation rather than the final and problematic step of agricultural research.

## **2.2 Participatory 'bottom-up' strategies**

Criticisms of the notion of extension as top-down transfer of technology have led to the formulation of alternative models. Listed in Table 2.1 is a selection of participatory methodologies developed in various parts of the world since the late 1970s. In some of these approaches, such as Agroecosystems Analysis, Rapid Assessment Procedures and Rapid Rural Appraisal, rural people's participation tends to be limited to providing information to researchers, whose analysis generates solutions to be offered to farmers. Others, such as Development Education Leadership Teams in Action, Participatory Action Research and Theatre for Development, emphasise community empowerment and are based on the assumption that farmers themselves have the ability to develop economically viable and ecologically sustainable farming systems (Cornwall *et al.*, 1993; Pretty and Chambers, 1993).

Thorough-going participatory approaches are termed by Oltheten (1995) ‘process-orientated approaches’, since their emphasis is on establishing processes whereby communities and individuals engage in on-going learning and development.

| <b>Table 2.1. A selection of participatory methodologies of the 1980s and 1990s<br/>(in alphabetical order)</b> |                                                                                         |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| AEA                                                                                                             | Agroecosystems Analysis                                                                 |
| ARCD                                                                                                            | Action Research for Change and Development                                              |
| BA                                                                                                              | Beneficiary Assessment                                                                  |
| DELTA                                                                                                           | Development Education Leadership Teams in Action                                        |
| D&D                                                                                                             | Diagnosis and Design                                                                    |
| FPR                                                                                                             | Farmer Participatory Research                                                           |
| FSR                                                                                                             | Farming Systems Research                                                                |
| FSR/E                                                                                                           | Farming Systems Research and Extension                                                  |
| LBPAL                                                                                                           | Local Best Practice Action Learning                                                     |
| PALM                                                                                                            | Participatory Analysis and Learning Methods                                             |
| PAR                                                                                                             | Participatory Action Research                                                           |
| PDR                                                                                                             | Process Documentation Research                                                          |
| PLAR                                                                                                            | Participatory Learning and Action Research                                              |
| PPS                                                                                                             | Participatory Problem Solving                                                           |
| PRA                                                                                                             | Participatory Rural Appraisal                                                           |
| PRAP                                                                                                            | Participatory Rural Appraisal and Planning                                              |
| PRM                                                                                                             | Participatory Research Methods                                                          |
| PTD                                                                                                             | Participatory Technology Development                                                    |
| RA                                                                                                              | Rapid Appraisal                                                                         |
| RAAKS                                                                                                           | Rapid Assessment of Agricultural Knowledge Systems                                      |
| RAP                                                                                                             | Rapid Assessment Procedures                                                             |
| RAT                                                                                                             | Rapid Assessment Techniques                                                             |
| RCA                                                                                                             | Rapid Catchment Analysis                                                                |
| REA                                                                                                             | Rapid Ethnographic Assessment                                                           |
| RMA                                                                                                             | Rapid Multi-perspective Appraisal                                                       |
| ROA                                                                                                             | Rapid Organisational Assessment                                                         |
| RRA                                                                                                             | Rapid Rural Appraisal                                                                   |
| TFD                                                                                                             | Theatre for Development                                                                 |
| TFT                                                                                                             | Training for Transformation                                                             |
| ZOPP                                                                                                            | Objectives-Oriented Project Planning [from the German ‘Zielorientierte Projektplanung’] |

Source: Cornwall *et al.*, 1993; Pretty and Chambers, 1993; with additions

Chambers *et al.* (1989) have expounded what they term the ‘farmer first’ approach:

*Instead of starting with the knowledge, problems, analysis and priorities of scientists, it starts with the knowledge, problems, analysis and priorities of farmers and farm families. Instead of the research station as the main locus of action, it is now the farm. Instead of the scientist as the central experimenter, it is now the farmer, whether woman or man, and other members of the farm family.*

(Chambers *et al.*, 1989, quoted in Campbell and Junor, 1992: 19-20)

Although Chambers *et al.* (1989) speak of ‘farmer first’ being *complementary* to the conventional ‘transfer of technology’ approach, some of the more radical advocates of ‘farmer first’ see it as a self-sufficient alternative. Advantages claimed for participative ‘bottom-up’ styles of experimentation, learning and action include the following:

- Participative approaches recognise the importance of local ways of knowing and draw upon the accumulated knowledge and experience of the farming community (Cornwall *et al.*, 1993).

- They ‘support local innovation and adaption, accommodate and augment diversity and complexity, enhance local capabilities, and so are more likely to generate sustainable processes and practices’ (Pretty and Chambers, 1993: 12).
- They are consistent with the ethical principle that there should be stakeholder involvement in any research that is likely to have social and financial impacts on the farming community (Marsh, 1998: 5).
- They provide an environment that allows complex ‘landscape’ problems, such as salinity, to be understood and ‘landscape’ recommendations to be implemented at a ‘farm’ scale (Frost, 1998).
- They acknowledge the value of farmers’ sharing ideas and information among themselves rather than relying simply on direction or advice from government agencies or other professionals (Carr, 1997: 201).
- They encourage producer ‘ownership’ both of problems and of solutions (Marsh and Pannell, 1998b: 148).
- They typically make use of group processes, which have various advantages such as:
  - the pooling of skills, knowledge, experience and other resources;
  - drawing on a wider spectrum of ideas and thus reaching better solutions than individuals;
  - integrating information from various sources, including knowledge from outside the group;
  - economies of scale;
  - risk sharing, and thus the development of potentially more adventurous solutions to problems.

(For a fuller discussion, see Woods *et al.*, 1993; Pretty, 1995a and 1995b; Carr, 1997).

There are, however, critics of some aspects of participatory methodologies, especially when these methodologies are advocated as the only worthwhile approaches. Thus, for example:

- Vanclay and Lawrence (1995: 125-126) argue that:
 

*...reliance on farmers’ local knowledge to solve problems that are new to their experience, such as many environmental problems, is unlikely to be successful. The insidious nature of such problems means that farmers may still not recognise them—even after extensive damage might have occurred. While it is possible that many traditional problems may be solved with new extension methods, new problems, particularly environmental problems, may be best dealt with through a combination of new and traditional extension.*
- Writers such as Cornwall *et al.* (1993), Scoones and Thompson (1993) and Gray *et al.* (1997) point out that the ‘local community’ which is urged to control its own research and develop its own solutions to problems is typically made up of people with diverse interests and with differential access to resources, including biophysical and financial resources, education, interpersonal skills and social support. Consequently, there are competing conceptions of community needs, depending upon which interest groups and individuals are involved or considered. Most of the participatory approaches listed in Table 2.1 tend to ignore or underestimate the significance of these differences. These approaches are frequently weak at recognising and dealing with situations of conflict (Cornwall *et al.*, 1993: 32). Rather than dealing openly and creatively with conflict or differences of opinion, some groups suppress diversity and impose what has been called a ‘tyranny of consensus’, arbitrarily rejecting some potentially good ideas (Carr, 1997:

209). However, there is a growing body of literature dealing with conflict resolution in participatory projects (Pendzich et al., 1994).

- Prejudice, ignorance and the pursuit of short-term goals can be reinforced by groups unless group members consciously embrace critical learning styles (Carr, 1997: 208-209).
- Landholders vary in their propensity to participate in group-based learning activities (Reeve and Black, 1998a). In that their impact is unevenly distributed, participatory strategies have some similarities to top-down adoption/diffusion strategies.
- There is sometimes a tendency for those working with groups to focus almost exclusively on the technical needs and issues of the group and overlook or pay comparatively little attention to group development and the self-development of group members (Frost, 1998: 407).
- Solutions to problems raised within a participatory environment may not be presented in a form whereby individuals are able to perceive the problems or solutions within their own context (Frost and Metcalfe, 1999).
- Although valuable knowledge may be developed within local groups, there may be little documentation and dissemination of that knowledge beyond the group. In that case, the cumulation of knowledge is impeded (Marsh and Pannell, 1998b: 146).
- Widespread use of participatory approaches without a shared recognition of their limitations can result in high levels of frustration when communities or individuals confront problems of great scale and complexity without commensurate resources or policy support (Campbell, 1997: 2).
- With an expansion in the number of different group-based programs for agricultural extension or community development, there is a danger of group overload for some landholders. The costs of participation could outweigh the benefits.

In short, while participatory and group-based approaches to agricultural extension have various advantages when they are well implemented, they should not be regarded as the one and only strategy that can or should be used to facilitate the adoption of sustainable farming systems. Belief in a ‘participation fix’ may be just as naïve as belief in a ‘technology fix’.

### **2.3 Other parts of the extension and advisory spectrum**

It is possible to conceptualise ‘top-down’ technology transfer and ‘bottom-up’ participatory methodologies as two ends of a spectrum of extension strategies. The ellipse in Figure 2.1 represents that spectrum as depicted by Campbell and Junor (1992), following Van Beek and Coutts (1992). The diagram indicates that, as situations become more complex, emphasis should increasingly be placed on empowering people and groups to engage in on-going processes of experimentation, learning and human development. This does not mean that technical know-how and technology transfer are necessarily displaced as situations become more complex; rather, existing technical know-how is built upon – as well as being evaluated and potentially contributed to – as the spectrum moves toward empowerment of individuals and groups to engage in self-directed, creative learning and achievement of goals (Campbell and Junor, 1992: 20). Conversely, participatory approaches are not necessarily limited to situations in which there are high levels of complexity.

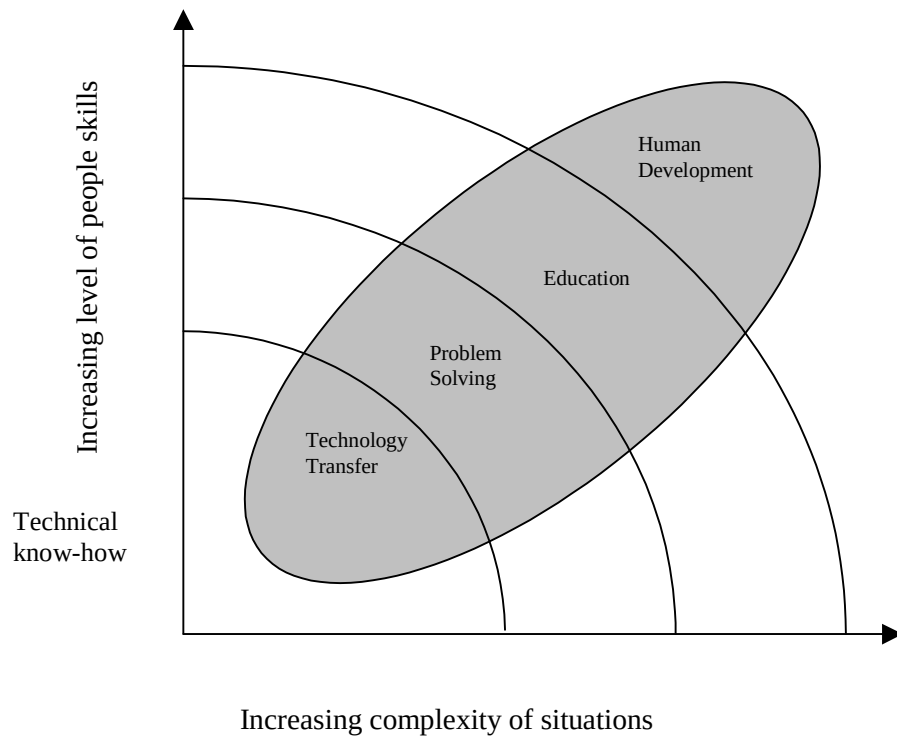


Figure 2.1. The Extension Spectrum

With slight modifications in terminology, one can adapt this spectrum to classify current models, methods and media of extension in Australia. These are set out in Table 2.2. It should be noted that this schema indicates major emphases in these models, methods and media; some particular extension strategies or programs combine elements from more than one cell in the table.

| <b>Table 2.2 Current models, methods and media used for extension in Australia</b> |                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Model</i>                                                                       | <i>Methods and media</i>                                                                                                                                                                                                                                                                                                |
| Technology transfer / information access                                           | Events such as field days to demonstrate new farming technology<br>Meetings to present information to the farming community<br>Print media, including rural newspapers, magazines, newsletters, books, leaflets, etc.<br>Radio, television and videos<br>Computer applications<br>Information centres<br>World Wide Web |
| One-to-one advice or information exchange                                          | One-to-one technical advisory services<br>Farm management consultancy<br>Diagnostic services<br>Rural financial counselling<br>Informal information exchange between farmers                                                                                                                                            |
| Formal or structured education and training                                        | University courses<br>TAFE courses<br>Training modules in Property Management Planning programs<br>Other structured learning programs such as Prograze<br>One-off events based on adult learning principles                                                                                                             |
| Group empowerment                                                                  | Landcare groups<br>Catchment groups<br>Community development workshops<br>Groups using LBPAL, PALM, PAR, PLAR, PPS or PTD from Table 2.1 or similar methodologies                                                                                                                                                       |

In previous sections of this chapter, general commentary has been made on the strategies classified into the top and bottom cells of Table 2.2. Comments will now be made on strategies classified into the intermediate cells.

## **2.4 One-to-one advice or information exchange**

The trend toward group-based approaches in agricultural extension has been prompted partly by the perception that these are more efficient than providing one-to-one technical or financial advice to farmers. Around the world during the last two decades, government agencies that previously offered such one-to-one advice have tended to reduce or withdraw from this role or have adopted the principle of user-pays (Rivera and Gustafson, 1991; Cary, 1993; Farrington, 1995). The reduction or redirection of government-funded agricultural extension services reflects the declining relative importance of agriculture in industrialised economies, the budgetary pressures faced by governments, and the increasing influence—in other words, the adoption/diffusion—of economic rationalism among public policy-makers (Carney, 1995; Marsh and Pannell, 1998b).

From a neoliberal economic perspective, the receipt of one-to-one technical or financial advice is a private good, the cost of which should be borne by the recipient. The situation is less clear-cut in situations where the technical advice relates to problems that have a diffuse environmental impact beyond the individual farm, as is the case where tree-planting contributes to the prevention or amelioration of salinity within a particular water catchment. Recognition of the broader public good inherent in such issues is one of the reasons why governments have allocated resources to the Landcare movement in Australia and why publicly funded agricultural extension programs have given increasing attention in recent years to natural resource management.

The decline in the availability of one-to-one advisory services from public sector extension agencies in Australia has been accompanied by an expansion in the number of private sector agricultural or farm management consultants. The Australian Bureau of Agricultural and Resource Economics (cited in Marsh and Pannell, 1998b: 135) reported in 1994 that 23 per cent of farmers used farm consultancy services. There are now about 350 private consultants who are members of the main association for such professionals—the Australian Association of Agricultural Consultants. These private practitioners provide generalist or specialist consultancy services in areas such as financial, planning, crop and livestock production, risk assessment and risk management, and new farming enterprises.

Some accountants, bankers and lawyers likewise specialise in advising rural clients on issues such as business management, capital raising, taxation and succession planning. In two recent studies in New South Wales, over 70 per cent of farmers rated their accountant as an extremely or fairly important source of advice for their farm business (Reeve and Black, 1998a and 1998b). Other sources of advice regarded as extremely or fairly important by at least 50 per cent of farmers in those studies were:

- retailers, merchandisers and stock and station agents;
- advisers employed by seed, fertiliser or chemical companies;
- Department of Agriculture staff members.

The increasing role played by private consultants, agribusiness, farmer organisations and other non-government bodies in providing information and advice to farmers raises questions about the relationship of these agencies to one another and to public sector organisations engaged in agricultural research and extension. While an information-rich environment is clearly preferable to one that is information-poor, and while one might argue that the market itself will take care of competing sources of information and advice, concern is sometimes expressed over the lack of coordination and cooperation between agencies involved in information generation, validation and exchange. Fragmentation can occur between research organisations and extension/advisory agencies, between different government departments concerned with agriculture and natural resource management, between public and private agencies, and between related industries (Woods *et al.*, 1993: 17; Marsh and Pannell, 1998b).

## **2.5 Formal or structured education and training**

Various studies have shown that, on average, Australian farmers have lower levels of formal education than the rest of the Australian labour force. In May 1998, 34 per cent of those employed in agriculture, forestry and fishing possessed post-school qualifications, compared to 51 per cent for the Australian labour force as a whole (Australian Bureau of Statistics, 1998b). The corresponding figures in 1983 were 23 per cent and 42 per cent (Synapse Consulting, 1998) respectively, indicating that formal educational attainments have been

rising both among farmers and within the workforce as a whole, but with little decrease in the gap between the two. It should be noted, however, that these figures underestimate formal educational attainments in the farming community, as there is evidence that proportionately more farm women than farm men possess post-school qualifications (Prior, 1990) but that some of these women are not classified as farmers in the published statistics even though they take an active part in various farm activities, including decision-making on major issues (Bamberry *et al.* 1997; see also Reeve and Black, 1998a and 1998b).

Although attitudes may be changing, most farmers are reluctant to undertake formal, long-term educational courses such as those offered by universities. Various factors contribute to this reluctance, such as:

- a lack of time, especially when they cannot afford to employ additional farm labour;
- a questioning of the relevance of tertiary courses to farming;
- a belief that the competencies required for farming are essentially practical, whereas formal courses tend to more theoretical in emphasis;
- a lack of awareness of the courses available;
- a lack of confidence by farmers in their ability to undertake the study required, especially when it is many years since they finished their formal education;
- prevailing attitudes in rural communities to the respective roles of men and women.

(Lees and Reeve, 1991; Johnson *et al.*, 1996).

On the other hand, many farmers are willing to undertake planned learning activities that are directly relevant to the farm and that require relatively short blocks of time – from a few hours to a day or two (Johnson *et al.*, 1996). Several recent studies have examined farmers' preferred approaches to learning and the implications of these for the design and conduct of planned learning activities (Napier and Scott, 1994; Rural Training Council of New South Wales, 1995; Johnson *et al.*, 1996; Bamberry *et al.*, 1997). Farmers' preferences as to the content, approach and delivery of such programs have been summarised by Bamberry *et al.* (1997 xi) in these words:

**content** – *meeting specific needs for knowledge and skills relevant to current and future developments, including learning skills;*

**approach** – *short, modularised courses encouraging participation, project-based learning, developing competencies, practical, measurable outcomes;*

**delivery** – *flexibility to accommodate seasonal work demands, home study plus local support where possible, provision for some social interaction.*

In elaboration and commentary on this summary, the following points should be noted:

- The above preferences are closely related to the principles of adult learning as expounded by writers such as Knowles (1984; 1990).
- Farmers generally need to be assured of the relevance and benefits of a program before they will commit themselves to it (Bamberry *et al.*, 1997).
- The learning process is often triggered by the desire to solve problems, pursue opportunities or implement change (Bamberry *et al.*, 1997).
- Modularisation enables farmers to choose only those modules that are of interest or relevance to them (Napier and Scott, 1994).

- The most popular learning methods involve watching, listening, asking questions, and doing. Reading is not the preferred method for many (Johnson et al., 1996; Kilpatrick, 1996).
- Project based/hands on/applied/action learning is preferred by most farmers (Napier and Scott, 1994). This is closely related to what Kolb (1984) terms 'experiential learning.'
- Farmers vary in the extent to which home study suits their learning style and local situation. The same is true of participatory, group-based learning (Reeve and Black, 1998a and 1998b).
- The social interaction associated with group learning can serve as a motivating factor for participation as well as itself being a part of the learning process (Kilpatrick, 1996).
- Outcomes in terms of competencies and subsequent actions and, ultimately, in terms of the achievement of personal and social goals, are key criteria in judging the success of a planned learning program. However, farmers usually do not wish their learning to be assessed in any formal way (Johnson et al., 1996).
- Despite this reluctance, some farmers would probably welcome a system of credentialling that would increase their ability to earn off-farm income or assist in the process of adjusting out of farming where necessary (Synapse Consulting, 1998).

From their review of previous studies, Bamberly *et al.* (1997) concluded that there is little evidence of a strong relationship between farmers' formal education and good farm management. However, Kilpatrick (1996) found a significant relationship between farm profitability (measured in terms of the gross operating surplus of the farm business) and:

- (a) having agricultural qualifications within the farm management team;
- (b) farmers' participation in training events such as field days, seminars, conferences or industry meetings.

Kilpatrick (1996) found, too, that farmers who participate in such training events are more likely than others to make changes in their practice that improve or are expected to improve long-term profitability or viability, but that most changes to practice are influenced by interaction with, and information from, more than one source.

Another conclusion from her study was that:

*There is no one best way of delivering education and training. A variety of delivery methods and training programs should be available.*

*Accredited training which leads to a qualification is important, especially for new entrants. There is a role for discussion groups, workshops and non-accredited courses in upskilling the existing workforce. Informal learning experiences are more attractive to the large group of farmers who feel intimidated by the formal training system of TAFE Institutes and universities. A small group of farmers would like training via distance education.*

(Kilpatrick, 1996: xii)

This conclusion is consistent with the findings of the present study.

## **2.6 Effectiveness of various media and methods**

Woods *et al.* (1993) have reviewed available evidence on the effectiveness of various media and methods of agricultural extension or information exchange. Major conclusions emerging from their study are summarised in the following subsections. Where appropriate, their conclusions are supplemented or updated using studies made by other writers cited in these subsections.

### ***Print media***

- Producers assert that there is too much poorly targeted information which is too technical or contains too much jargon.
- Producers prefer simple readable prose from credible sources.
- Ideally, and where possible, farmers should be consulted during the process of writing. They are keen to be involved.
- Attractive presentation, good layout and the use of colour in books and booklets are important factors in determining whether a publication will be read and its message remembered.
- Printed media can be used to create awareness but, on their own, they rarely lead to changes in behaviour or decision-making.
- When an important message needs to be conveyed, a campaign using both the mass media and local group activities is the most effective.

### ***Radio, television and videos***

- For information relevant to farming, radio is more widely used by farmers and is more highly rated by them than is television.
- Radio is chiefly used for factual routine information, such as weather, market prices and local agricultural news.
- The most popular radio broadcasts are the ABC Country Hour and the Country Breakfast Session.
- Television is viewed mainly for entertainment, though it is also used for weather. (More recent evidence suggests that programs such as Landline on ABC TV also have a significant impact, especially when they deal with emerging industries like farm forestry.)
- Several studies suggest that recall is better from television than from radio.
- Radio and television are not suited to complex messages.
- It is relatively difficult to retain information from these media for future use.
- Both radio and television allow other family members to also acquire information and, where appropriate, to report this information to the main producer decision-maker(s).
- Educational videos appear to have potential and could link with distance education and with computer-based decision support. They could also be used through information centres.
- Videos may be useful for communicating complex messages and for assisting pest identification.

### **Computer applications**

- In the early 1990s, less than 10 per cent of Australian farmers used computers. Usage was higher in some of the more intensive agricultural industries such as cotton and pig production than in broadacre farming.
- Broadacre farmers and dairy farmers are now making increasing use of computers. For example, in the grains industry, computer ownership jumped from 44 per cent of farm households in 1993-94 to 55 per cent in 1996-97. The proportion of grain farms using computers in the farm business rose from 22 per cent to 51 per cent over the same period. Levels of computer ownership and farm business usage were also increasing in the dairy, sheep and beef industries, though they lagged behind the grains industry at the same point in time (Garnaut and Rasheed, 1998).
- At least until recently, those farmers who make use of computers do so mainly for financial records and planning, for word processing and for keeping other farm records.
- Use of computers for electronic communication has increased in recent years but is still confined to a minority of farmers. This issue will be discussed further in Section 2.7.
- To be useful to farmers, computer applications should be practically focused and should be simple to use with minimum keystrokes.

### **Personal contact**

- Personal contact continues to be a major source of information and advice for farmers. It can impact on many stages in the decision-making process.
- The frequently stated reason for preferring personal contact is the opportunity this provides to interact with the source of the information and thus to judge its applicability to the farmer's own situation.
- Farmers use different resources for different types of information or advice. The credibility of an information source is not general but varies with the specific topic being discussed.
- Depending upon the particular issue and the particular farmer, information or advice may be sought on a one-to-one basis from other farmers, family members, accountants, extension agents, agricultural consultants, retailers, stock and station agents, and persons employed by seed, fertiliser or chemical companies (Kilpatrick, 1996; Reeve and Black, 1998a and 1998b).
- Cost is an important limiting factor on the capacity of agencies to provide one-to-one advisory services and on the willingness of farmers to seek 'user pays' professional advice.

### **One-off group meetings**

- Effective one-off group meetings incorporate adult learning principles. These have been briefly outlined in Section 2.5. Woods *et al.* (1993: 53) provide a useful checklist of the characteristics of successful one-off group meetings.
- One-off group meetings can be used as a vehicle for information flows between multiple sources of information, using various information delivery mechanisms. This enables participants to access information in a format that suits their individual learning style.

- Participation in further planned learning activities is more likely once people have had a successful experience with relevant, non-threatening, participatory adult learning (Kilpatrick, 1996).

### ***On-going groups***

- There are various types of groups and group objectives. Some are fairly ‘top-down’ and directed toward the adoption of specific technologies; others have scope to explore a much wider range of issues and are self-directed.
- On-going groups can provide opportunities not only for individual learning but also for addressing community concerns and needs, such as those addressed by Landcare groups.
- On-going groups can enable the evaluation, integration and application of information from a variety of sources, whether these are located within the group or outside it. This can be effective in motivating change and overcoming on-farm constraints. Networks of groups may also have an impact on off-farm constraints (for example, policy).
- The continuity provided by on-going groups should, in principle, enable them to build upon past initiatives and experiences, and to work systematically toward their goals. In practice, their capacity to do this is affected by various factors, including availability of resources, as well as group facilitation and leadership skills of those involved.
- Other strengths and limitations of group-based participatory approaches have been outlined in Section 2.2.

## **2.7 The use of new information technologies**

In recent years, there has been some discussion of the usefulness of new information technologies, especially the Internet, for agricultural education, extension and information exchange in rural communities. Research organisations and extension agencies usually have World Wide Web sites, the amount of information accessible at the website varying from minimal to quite extensive. One immediate constraint to the use of the Web is the lack of a reasonably up-to-date computer in the farm household. In addition, there are constraints arising from the current state of the telecommunications infrastructure in some parts of rural Australia. For about one quarter of the farming population, available line speeds are 9,600 bps or less (Da Rin and Groves, 1998), which is too slow for accessing the multimedia capabilities of the Web. Expenditures from the Regional Telecommunications Infrastructure Fund should lead to substantial improvements in available services in the next few years. At least until such improvements occur, some extension agencies are selling CD-ROMs or diskettes containing selected information that has previously been published in hard copy or is currently available on their website.

The potential of the Internet to serve the purposes of education and information exchange should neither be underestimated nor overestimated. Clearly, the World Wide Web is a poor substitute for face-to-face interaction in the learning of some social skills and some physical skills. Equally clearly, the rapidly expanding information sources accessible through the Web are opening up possibilities undreamed of just a few years ago. They also entail potential problems of information reliability on the one hand and information overload on the other.

The problem of information reliability arises from the fact that material can be placed on the Web without necessarily having passed the peer review required for publication in scientific journals. Nevertheless, the Web itself enables informal scrutiny, which should be sufficient in most cases to deter or detect the promulgation of unreliable information.

Problems of information overload relate both to locating relevant information from within the many potential sources of such information and to using that information as a basis for decision-making. There is a need for further development of search engines focusing particularly on information relevant to farmers.

In addition to giving access to material on the World Wide Web, the Internet allows interaction and information exchange through individual e-mail, e-mail newsgroups, electronic bulletin boards and Internet relay chat sessions. These interactive capacities can be used to develop learning communities based not on locality but upon common interest. Farmers who currently have an Internet connection use it mainly for e-mail, whether for information gathering or for communication purposes. Use of the World Wide Web is the second most popular application at the present time. Other interactive applications, such as newsgroups and chat sessions, are used by only a minority of Internet-connected farmers (Da Rin and Groves, 1998).

At the time of Da Rin and Groves' (1998) study, about 80 per cent of Australian farmers did not have an Internet connection. Of those who did, at least two-thirds were very positive about the value of the Internet. A more recent survey found that over 40 per cent of Kondinin Group members now have an Internet connection. Use of the Internet is likely to expand as the telecommunications infrastructure in rural areas improves, as costs of access fall, as more material becomes available on the Web, and as younger persons with significantly higher education levels become farmers. Nevertheless, a substantial proportion of farmers, possibly a majority, are not currently intending to get an Internet connection. From surveys of farmers, Da Rin and Groves (1998: 17) conclude:

*On current trends, and with the current "model" of technology represented by the Internet, farm business access is likely to plateau at around 50 per cent in a few years time. Significantly greater penetration, such as towards universality, is likely to depend on successful convergence with other communications technologies such as television. This largely reflects [farmers'] judgement about the value of the Internet as a farm management tool, weighing up connection and infrastructure costs, concerns about their ability to use the medium and, perhaps more fundamentally, a basic satisfaction with their existing information sources and hence lack of demand for new information sources.*

Although the Internet has potential for wider use than at present in agricultural extension, it would be a mistake to regard it as a panacea for the limitations of other media. Until farmers learn to use the Internet for day-to-day communication and for accessing routine information, it is unlikely that they will use it for more complex searches. Nevertheless, the more progressive farmers are likely to be among the early adopters of the Internet; and this same group might similarly become early adopters of agroforestry—though this proposition needs to be tested and would be subject to qualification in the light of each farmer's particular priorities and circumstances (see Chapter 1).

## **2.8 Evaluating extension and advisory strategies for agroforestry**

Dart *et al.* (1998) have recently reviewed various frameworks for monitoring or evaluating agricultural extension programs. One of the most useful frameworks is that of Bennett (1975), who describes a chain of events assumed to characterise such programs. From this chain of events, Bennett derives a hierarchy of objectives and evaluative evidence. His framework

originally had seven levels, to which van den Ban and Hawkins (1996) have added an eighth, as in Table 2.3.

**Table 2.3. Bennett’s hierarchy of criteria for assessing agricultural extension programs**

| Level | Objectives and evaluative evidence                                 |
|-------|--------------------------------------------------------------------|
| 1     | Programming of the extension activities                            |
| 2     | Implementation of the program by extension agents                  |
| 3     | Farmers’ participation in extension activities                     |
| 4     | Farmers’ opinion about extension activities                        |
| 5     | Changes in knowledge, attitude, skills, motivation and group norms |
| 6     | Behavioural changes in the target group                            |
| 7     | Consequences for the target group                                  |
| 8     | Consequences for society                                           |

Source: Bennett (1975), modified by van den Ban and Hawkins (1996).

It should be noted that Bennett’s schema was devised at a time when agricultural extension focused mainly upon ‘top-down’ transfer of technology. However, with appropriate modifications in terminology, the schema can be adapted to include ‘bottom-up’ and participatory styles of learning. It should also be noted that it is sometimes difficult to show that phenomena observed at the upper levels in this schema are the outcomes of particular extension/learning activities rather than of other factors.

In this section, brief comments will be made on the significance of Bennett’s hierarchy as a basis for the assessment of agroforestry extension and advisory strategies.

### ***Level 1: Programming of the extension activities***

Here the focus is on the explicit or implicit program logic—the underlying rationale for the various activities. This rationale can be judged in terms of its coherence, comprehensiveness and consistency both with stakeholders’ interests and with well-grounded scientific principles.

### ***Level 2: Implementation of the program***

At this level, attention is given to the extent to which the program is being carried out according to plan, together with the reasons for any deviations.

### ***Level 3: Farmers’ participation in extension activities***

Depending upon the nature of the activities, farmers’ participation can be measured in various ways, such as the number of persons taking part in the activities, their level of active involvement on those occasions, and their use of various sources of information.

#### ***Level 4: Farmers' opinion about extension activities***

One way of assessing whether particular extension programs are meeting farmers' needs is to seek their opinions by means of interviews, focus groups or survey questionnaires.

#### ***Level 5: Changes in knowledge, attitude, skills, motivation and group norms***

Ideally, assessment at this level requires the gathering of data both before and after a particular extension/learning program. Given the complex nature of agroforestry, multiple measures are needed to assess each type of change.

#### ***Level 6: Changes in behaviour***

It is sometimes suggested that the ultimate criterion for the success of agroforestry extension programs is the number of trees appropriately planted and managed. If this criterion is used, the word 'appropriately' should refer not only to biophysical conditions but also to the economic and social circumstances of the landholder. As Rowan Reid, a well-known researcher and educator in this field, puts it (1997: 260): 'For me it is better if a landowner chooses not to plant farm forestry after carefully considering the implications and possibilities than if they impatiently plant large areas only to find that their expectations were false or their resources inadequate to proper management.' Consequently, assessment at this level should take account of the particular reasons why behavioural changes have or have not occurred.

#### ***Level 7: Consequences for participating farmers***

Of interest here are the likely longer-term consequences of the programs for participating farmers, especially the impact on the productivity, profitability and ecological sustainability of their farming enterprises.

#### ***Level 8: Consequences for society***

At this level, the focus is on the likely longer-term consequences for the well-being of society; for example, the impact of increased adoption of agroforestry upon regional and national economies and upon the environment.

## **2.9 Summary**

This chapter has examined major strengths and limitations of various models of agricultural extension. The main conclusion is that no single model is likely to be sufficient by itself. Despite criticisms of linear technology transfer models, there is still a need for access to reliable scientific information, just as there is a need to provide for active participation by farmers in research and development processes. One-to-one exchange of information and advice, whether from farmer to farmer or from professional adviser to farmer (and vice versa), will continue to be important. So too will be the lifting of levels of formal education and training among farmers. New information technologies will facilitate some forms of education, training and information exchange, but will need to be supplemented by other extension strategies. These findings should be borne in mind in planning and evaluating extension and advisory strategies for agroforestry.

### 3. A review of current extension strategies for Agroforestry

This chapter reviews the agroforestry extension approaches that have been developed by government agencies and other organisations throughout Australia. As far as possible, the goals and vision of each agency's various extension strategies are identified. The extension models in use are discussed in relation to the models outlined in Chapter 2. Where information is available, salient points from stakeholder perceptions of the outcomes of these strategies are reported. The degree of coordination between agencies is also examined.

#### 3.1 National

Agencies contributing to agroforestry extension strategies with a nation-wide focus include:

- The RIRDC/LWRRDC/FWPRDC Joint Venture Agroforestry Program;
- The Industry Development Section of Agriculture, Fisheries and Forestry – Australia;
- The Ministerial Council on Forestry, Fisheries and Aquaculture, its Standing Committee on Forestry, and others involved in the development of *Plantations for Australia: the 2020 Vision*;
- The National Farm Forestry Roundtable;
- The Department of Forestry, University of Melbourne;
- Greening Australia; and
- Australian Forest Growers.

These organisations' contributions to agroforestry extension strategies will now be outlined.

#### ***The RIRDC/LWRRDC/FWPRDC Joint Venture Agroforestry Program***

The Joint Venture Agroforestry Program (JVAP) is a partnership between the Rural Industries Research and Development Corporation (RIRDC), the Land and Water Resources Research and Development Corporation (LWRRDC), and the Forest and Wood Products Research and Development Corporation (FWPRDC), with support from the Natural Heritage Trust (NHT) and the Murray-Darling Basin Commission (MDBC). This partnership was established in 1993 to fund research and development activities relevant to agroforestry, including product-oriented, market, economic, policy and social research. Funding for some projects supported by the JVAP has also been provided by the Grains Research and Development Corporation (GRDC), the Cotton Research and Development Corporation (CRDC), and the Farm Forestry Program (FFP) of Agriculture, Fisheries and Forestry - Australia (AFFA).

According to the definition adopted by the JVAP, R&D activity includes 'research projects, feasibility studies, training, dissemination of information, provision of advice or assistance and the publication of reports, periodicals, books or papers on research and development activity' (RIRDC/LWRRDC/FWPRDC Joint Venture Agroforestry Program, 1998). Over 200 projects have been undertaken to date.

Applications for R&D funding from the JVAP are required to include a strategy for communication/adoption/commercialisation. Examination of a sample of successful

applications reveals that the proposed strategies typically include the production of plain English, user-friendly, publications such as books, booklets, pamphlets, or articles in magazines such as *Australian Forest Grower*, *Australian Farm Journal*, *NAFI Newsletter* and *Agroforestry News*. In some cases, the printed material is intended to be launched or promoted at seminars, workshops or field days. It would appear from the cases examined that successful applicants seldom propose to use rural newspapers, radio or television in order to publicise results or make known the availability of printed material. The JVAP has also provided support for projects involving group-based participatory learning and extension strategies such as the Master TreeGrower Program described in a later section of this chapter.

The JVAP generally publishes final reports of projects it has funded. Varying in size from about 30 to 100 or more pages, these reports are usually priced in the range from \$10 and \$25. The reports can usually also be downloaded, without charge, from the RIRDC website on the Internet ([www.rirdc.gov.au](http://www.rirdc.gov.au)). In addition, RIRDC publishes brief summaries of research reports written by science communicators. These short reports are freely available both in leaflet form and on the Internet. Also available on the Internet as well as for purchase in hard copy is the JVAP's widely consulted *Design Principles for Farm Forestry* (Abel *et al.*, 1997). This guide book on tree planting and management is designed to help farmers decide how to maximise shade and shelter effects, the production of timber and fodder, soil and nature conservation and the overall appearance of their farm, and where to plant trees to control dry land salinity and water logging. The book also outlines methods for assessing the economics of particular tree configurations and the interaction between trees and other agricultural activities.

Twice a year the JVAP publishes *Shaping the Future with Farm Forestry*, a newsletter with a current circulation of about 1150. This publication contains brief news and information on the work of the JVAP, usually featuring research projects that have recently been completed or are currently under way, and listing available publications. It is distributed without charge to various stakeholders in farm forestry, including researchers and persons providing extension and advisory services.

### ***The Industry Development Section of Agriculture, Fisheries and Forestry - Australia***

The Industry Development Section of Agriculture, Fisheries and Forestry – Australia (AFFA) administers the Farm Forestry Program whose aim is:

*to encourage the incorporation of commercial tree growing and management on cleared agricultural land into farming systems for the purpose of wood and non-wood production, increasing agricultural productivity and sustainable natural resource management.*

Through this Program, the Commonwealth has been developing a regionally integrated approach to farm forestry, working in partnership with the States, local governments, regional development organisations, industry, non-government organisations, and landcare and community groups. The Program developed out of the National Forest Policy Statement (1992), becoming one element of the Wood and Paper Industry Strategy (1995). More recently, funds from the Natural Heritage Trust have been allocated to projects forming part of the Program. The Farm Forestry Program provides support for activities such as the following:

- establishing regional networks of persons engaged in farm forestry;

- forming regional plantation committees to develop regional farm forestry and industrial forestry plantation strategies;
- developing cooperatives and other marketing arrangements appropriate for farm forestry;
- enhancing national facilitation, communication, information dissemination and networking capacities;
- developing extension, education and training programs relevant to farm forestry, including through Property Management Planning programs.

Because extension is seen primarily as a State rather than a Federal responsibility, the Commonwealth does not generally engage directly in extension and advisory activities independently of the States. Funding from the Farm Forestry Program does, however, support various State and regional projects. This has contributed substantially to the development of farm forestry around Australia in recent years.

A major impetus of the Program has been the formation of 17 Regional Plantation Committees (RPCs). Each Committee has a coordinator, with other members drawn from various stakeholders associated with industrial forestry and agroforestry. The general aim of the RPCs is to promote plantation and farm forestry development in their regions, by addressing planning, infrastructure and coordination issues, undertaking feasibility studies, developing regional plantation and farm forestry strategies, and formulating related marketing, investment and woodflow plans. In some regions it is expected the RPC will also play a role in overseeing the coordination of regional farm forestry projects. RPCs provide an opportunity for farmers, industry and governments to communicate effectively with each other and collaboratively address issues of mutual concern, including issues of education, training and extension for farm forestry within the region. Some RPCs are directly involved in delivering training and extension services.

Under the Farm Forestry Program, AFFA called for tenders to develop a National Farm Forestry Information Service, the objectives of which are to:

- provide landholders, Regional Plantation Committees and other farm forestry managers with ready access to relevant, reliable and up-to-date technical information and research results on commercial farm forestry;
- facilitate the provision of feedback between information users and information providers; and
- document information demand patterns and feedback for use by government policy makers and program managers in decision making.

Three organisations jointly submitted the successful tender for this project: Australian Forest Growers, the Melbourne University Department of Forestry, and Energy Strategies Pty Ltd. The track records of the first two partners are described in more detail later in this chapter. The third partner is a Canberra-based company that specialises in the dissemination of research and technical information ‘at a distance’.

The National Farm Forestry Information Service is not meant to duplicate existing services offered by other non-government and government organisations. Rather, it is intended to be a national ‘clearing house’ and referral service for technical and economic information already available from other sources, as well as a centre for compiling and disseminating the

outcomes of recent farm forestry research in user-friendly forms. Inquirers will be able to access the service by post, phone, fax, email, and an Internet site.

Prior to the inauguration of the service, the project partners will undertake market research to develop an effective communications strategy. They are also required to develop a cost recovery strategy to achieve commercial viability of the information service by the end of two years, as Farm Forestry Program funding will only be available for the initial establishment of the service and its first year of operation.

***The Ministerial Council on Forestry, Fisheries and Aquaculture, its Standing Committee on Forestry, and others involved in the development of 'Plantations for Australia: the 2020 Vision'***

During 1997, the Ministerial Council on Forestry, Fisheries and Aquaculture, its Standing Committee on Forestry, together with Plantations Australia, Australian Forest Growers and the National Association of Forest Industries, developed a national plantations strategy, *Plantations for Australia: the 2020 Vision*.

The target of the 2020 Vision is to 'treble the 1996 effective area of Australia's plantations by the year 2020'. It recognises that involvement of the private sector, including the achievement of a much wider adoption of farm forestry, is a key element in realising this vision. It also anticipates that collaboration between the Australian government and industry will encourage private investment.

Extension-related objectives within the 2020 Vision include:

- developing a communications strategy about the economic and social benefits of plantations in order to engender local government and community support for regional plantation development;
- providing information to improve foreign and local investor confidence, including information on the requirements to be met by potential overseas investors in Australian plantations;
- developing information packs to facilitate the growth of a commercial plantations culture in each region;
- increasing funding for the educational component of the Farm Forestry Program, so as to improve tree growing skills in rural communities;
- continuing to provide regional extension services relevant to farm forestry;
- providing current and potential growers with clear specifications of log requirements and the prices processors are likely to pay; and
- disseminating information on the profitability of plantations relative to competing agricultural enterprises and on the natural resource management benefits of commercial trees, particularly in marginal areas.

The 2020 Vision also identifies the agencies that should be responsible for implementing the various actions outlined in it.

### ***The National Farm Forestry Roundtable***

As a result of a recommendation contained in the Wood and Paper Industry Strategy (Commonwealth of Australia, 1996), the National Farm Forestry Roundtable was established in 1998 for a period of about two years. According to its terms of reference, the Roundtable is to focus on ‘encouraging the incorporation of commercial tree growing and management into farming systems for the production of both wood and non-wood products, increasing agricultural productivity and encouraging sustainable natural resource management.’ More specifically, the Roundtable has been given the following tasks:

- facilitating collaboration amongst regional, state and national stakeholders. These include Commonwealth, State and local governments, industry, the farming community, regional plantation and forestry committees, and community organisations to foster farm forestry development;
- providing better access to information. Examples include enhancing landholder skills and knowledge, and improving planning, infrastructure, research, marketing and coordination arrangements;
- identifying issues and constraints related to farm forestry. These would relate to the development of national and regional farm forestry strategies, including in the areas of education and training, research and development, extension and demonstration, planning and coordination, and monitoring and evaluation;
- providing advice and feedback on farm forestry. Issues for consideration include initiatives under the Wood and Paper Industry Strategy, the Plantations 2020 Vision, the Natural Heritage Trust, the Joint Venture Agroforestry Research and Development Program;
- examining specific issues referred to it by the Minister.

The Roundtable is funded by the Farm Forestry Program. It has 13 members from across Australia, at least one from each State. These have been chosen for their expertise rather than as representatives of particular organisations. A National Farm Forestry Facilitator has been appointed to help drive the Roundtable’s activities.

The Roundtable is an independent think tank for farm forestry in Australia. It aims to complement and build on the activities of others, to address areas where there are gaps and to work with others to plug gaps. Meetings of the Roundtable are generally held in regional locations in order to provide opportunities for dialogue with landholders, growers, processors, industry associations, regional State agency staff and local councils. Its activities include:

- developing ‘Accords’ with stakeholders to help develop farm forestry in Australia;
- contributing to the Federal Minister’s ‘Action Agenda for the Forests and Wood Products Sector’;
- initiating a forum on marketing arrangements for farm forestry;
- developing a ‘Future Directions’ document for farm forestry in Australia.

The Roundtable thus has a very wide agenda, including a consideration of issues relevant to education, training and extension for farm forestry. Although it has not yet addressed these issues in detail, there is a potential for it to do so.

## ***The Department of Forestry, University of Melbourne***

The University of Melbourne offers two main courses in agroforestry. These courses are the *Graduate Certificate in Forest Science (Farm Forestry)*, and the *Master TreeGrower Program*.

The objectives of these courses are outlined below:<sup>1</sup>

### *Graduate Certificate in Forest Science (Farm Forestry)*

The objectives of this course are:

- to provide extension advisers, outstanding landholders and industrial forestry staff involved in agroforestry with the knowledge, skills and facilities to provide advice to those requiring agroforestry services;
- to promote, through the dissemination of reliable information, commercial wood production on cleared agricultural land and the development of regional agroforestry industries to assist rural communities;
- to assist the development of cooperative arrangements and interactions between existing state extension services, landcare programs, farm-based tree-planting groups and the forest industries;
- to assist in the identification and development of possible demonstration farms and to use existing demonstration farms as part of the training program; and
- to facilitate the development of local, regional and national agroforestry networks.

The course was first offered in 1993 and has been presented in five States, attracting more than 150 participants. The total tuition fees are \$2500 per participant, the Farm Forestry Program currently meeting 80 per cent of this cost. Course presenters are drawn from research organisations, industry, practitioners and academic institutions. Course materials are grouped into three subject areas: Farm Planning and Sustainable Land Management; Integrating Commercial Tree Growing with Farming; and a Regional Agroforestry Project.

### *The Master TreeGrower Program*

The Department of Forestry at the University of Melbourne has obtained financial assistance from the Myer Foundation, the JVAP and the Farm Forestry Program to develop and conduct the Master TreeGrower Program, which provides short courses (approximately 42 hours over an 8-week period) at a regional level for leading landowners. Australian Forest Growers is also a joint sponsor of the Program.

The stated aims of the Master TreeGrower Program are:

- to facilitate landowner involvement in the development of agroforestry and farm forestry within their regions by providing education, experience and support to selected experienced tree growers;
- to help landowners recognise the opportunities for commercial tree growing and critically evaluate and design appropriate projects for their own and other farms;

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<sup>1</sup> The website from where much of this course information was drawn is: (<http://www.mtg.unimelb.edu.au/courses>)

- to encourage landowners to prepare their own agroforestry project plans and/or plans for other landowners within their region;
- to encourage landowners to play a more active role in the management of regional agroforestry networks and programs by providing the knowledge that instills confidence;
- to establish a peer group of Master TreeGrowers in each region and nationally, that can support each other and play an active role in regional extension and development programs;
- to support regional farm forestry, agroforestry and landcare programs by providing a program that can be tailored to their requirements; and
- to encourage strong communication links between Master TreeGrowers, extension officers, researchers and industry through the Master TreeGrower program.

The Master TreeGrower Program encourages a participatory learning environment between researchers, forestry professionals and landholders. This is something many stakeholders are requesting. The Program aims to foster in rural communities a culture conducive to farm forestry, by providing participants with relevant knowledge and experience, by developing their confidence in decision-making, and by encouraging the flow of information and experience from Master TreeGrowers to other landholders in their region.

Recognising that a short course such as this cannot cover all the technical issues relevant to agroforestry within a given region, the Master TreeGrower Program aims to provide participants with a framework for developing appropriate agroforestry designs. Thus, a key theme in the Program is the concept of 'diagnosis and design' (Reid, 1996). The Program also encourages the development of a support network amongst participants, together with links to regional experts. By the end of 1999, a total of 22 Master TreeGrower courses had been conducted, with over 400 people having completed the Program. All States except South Australia had hosted at least one course. It is anticipated that South Australia will host a course in the second half of year 2000.

One outgrowth of the Master TreeGrower Program was the inaugural Agroforestry Expo, a series of two-day events held throughout Australia in the latter part of 1999. Starting in Western Australia, the Expo proceeded to various locations in Queensland, New South Wales, Victoria and Tasmania. The objectives of the Expo were:

- to increase the level of confidence of landowners in farm forestry – by showing benefits, including diversification, marketing options for timber, environmental benefits for farms and communities, and as a catchment management tool;
- to raise the profile of farm forestry in the general community and for community development;
- to show farm forestry as part of sustainable farming systems; i.e. meeting economic, environmental and social objectives;
- to further develop communication between Australian farm foresters; and
- to provide a forum for providers of farm forestry services.

The first day in each location was designed to attract a wide audience and was generally devoted to seminar presentations by Master TreeGrowers and others on the benefits of agroforestry. The second day was devoted to field tours, with experts discussing issues and technologies that are relevant to the particular region. The organisers of the Expo hoped that it

would be held every two years. The Western Australian conveners have already decided to hold another Agroforestry Expo in year 2000.

The Master TreeGrower Program maintains a website (<http://www.mtg.unimelb.edu.au>) with a wide range of useful resources and hyperlinks to many other relevant websites.

As noted earlier in this chapter, the Department of Forestry at the University of Melbourne is also one of three partners in the development of the National Farm Forestry Information Service.

### **Greening Australia**

Greening Australia is a non-government organisation with a national on-ground network of vegetation management experts who actively encourage Australians to conserve and plant native trees, shrubs and grasses. One of the projects it has run in recent years was called Forestry for Farms, funded through the Farm Forestry Program.

The goal of Forestry for Farms was:

*that the rural community have the understanding, motivation and capacity to build a sustainable farming future based on the integration of agriculture and forestry for wood and non-wood products.*

This project aimed to develop a knowledge base and support network for the agroforestry industry throughout Australia. It involved three main areas of activity:

- responding to enquiries in regions currently not funded by the Farm Forestry Program and assisting regional stakeholders to develop submissions for more intensive and localised activities;
- responding to enquiries and proactively participating in regions currently funded by the Farm Forestry Program, particularly by encouraging the integration of biodiversity into production systems, the development of non-wood products from trees, and the adoption of sustainable systems of private native forest management; and
- developing an institutional environment that is responsive to, and supportive of, the development of Australia's agroforestry industry.

Greening Australia's Forestry for Farms project ran until 1999. Many of the activities initiated in that project have been continued, and others added, in Greening Australia's Farm Forestry Support project (1999-2002). Funded by \$2.33 million from the Natural Heritage Trust, this project targets landholders and community groups in areas not well served by States or existing Regional Plantation Committees, particularly in low rainfall regions. It aims to facilitate informed decision making by providing:

- comprehensive advice and information about regional farm forestry options, including an assessment of the relative pros and cons of each option; and
- information on how landholders can achieve multiple benefits from commercial forestry.

Greening Australia delivers extension services in farm forestry through its state, territory and regional offices. These services include: conducting site visits and providing one-to-one advice; working with community groups; developing a discussion group facilitation kit; publishing and distributing fact sheets, brochures, booklets and manuals; writing technical articles for magazines, journals and farm forestry newsletters; preparing material for use in

newspapers, TV and radio; arranging or contributing to field days, workshops, seminars and training programs; establishing demonstration sites and conducting native species trials; developing and maintaining a data base and website. Greening Australia also contributes to Master TreeGrower courses in various parts of Australia.

With funding from the Farm Forestry Program and the JVAP, Greening Australia has also recently published a book containing 18 brief case studies of agroforestry on Australian farms (Guijt and Race, 1998).

### ***Australian Forest Growers***

Australian Forest Growers (AFG) is a non-profit organisation dedicated to the advancement and well-being of private forestry and commercial tree growing in Australia. Established in 1969, AFG is represented in every State and has an increasing number of regional branches. Its members range from very large-scale private forest growers to small-scale farm foresters. AFG has been recognised in national forums and most State forums as representing the interests of private forestry in general, and small-scale, non-industrial, farm forestry in particular.

Joint submissions of AFG and Greening Australia influenced the establishment of the Farm Forestry Program and the provision of federal funding for Regional Plantation Committees. AFG's advocacy was a significant factor in the recent recognition of private native forest management as falling within the scope of the Farm Forestry Program. AFG is also listed as a joint-sponsor of the Master TreeGrower Program. In addition, AFG is a joint partner in the development of the National Farm Forestry Information Service.

Agroforestry extension strategies developed by AFG include:

- assembling and communicating technical, financial and marketing information about farm forestry and commercial tree growing for members, potential members and the community at large;
- conducting field days and seminars in various locations;
- publishing the quarterly magazine *Australian Forest Grower*, with articles on technical and economic issues relevant to private forestry; and
- hosting a three-day biennial conference, attended primarily by researchers, extension providers, policy advisers and, to a lesser extent, growers.

In July 1998, a 20 page booklet entitled *Getting Started in Farm Forestry* was published by AFG with support from the Farm Forestry Program. This booklet gives useful introductory information about the key things to consider when deciding on a farm forestry venture. After an initial print run of 6,000 copies, a further 15,000 copies were printed in order to meet the demand from various extension agencies throughout Australia. In addition, 50,000 copies of a brochure about the booklet have been distributed.

AFG recently initiated a national newsletter for treegrowers' cooperatives and published an 80-page *Starter Kit for a Treegrowers Cooperative*.

With input from the Australian Securities and Investments Commission and the Australian Taxation Office, together with financial assistance from the Farm Forestry Program, AFG has been developing:

- A Code of Conduct for Afforestation Investment Companies;
- A Guide to Afforestation Investors.

Drafts of both these documents are expected to be available by April 2000, and the final versions by August 2000.

### ***Extension models in use***

This section summarises the extension strategies that are implicit or explicit in activities undertaken or supported by the various agencies operating at a national level.

The extension approaches adopted in many projects funded by the JVAP and in the Plantations 2020 Vision, as well as in many of the activities undertaken by Australian Forest Growers, focus mainly on information access and technology transfer from researchers and other experts to the end-user. The strengths of such information access and technology transfer models lie in their ability to provide considerable information to large numbers of people and across large areas. Their weaknesses lie in their limited capacity to create an educative and continuous learning environment, as well as their inability to respond to the complexities of local situations.

The formation of Regional Plantation Committees can facilitate collaboration in the development of extension programs appropriate to the needs and circumstances of landholders in each particular agro-ecological zone. The RPCs may also perform a general promotional role for agroforestry. However, the delivery of extension and advisory services for agroforestry tends to fall to agencies represented on the RPCs, rather than being undertaken by the RPCs themselves.

Extension and training approaches such as those provided by the University of Melbourne are founded on the principles of facilitation, empowerment and the learning models of extension. Participatory approaches are applied to encourage community involvement in order to determine the local issues of most concern as well as solutions most likely to work. The strength of this initiative and its approach lies in its capacity to evoke local awareness and amass a pool of local knowledge. There is also generally an on-going flow of information from participants in these programs to others in the local community, both through events such as Agroforestry Expo and through informal contacts.

The Farm Forestry Program, the JVAP and Greening Australia have developed their extension strategies by applying components from a range of extension models. Technology transfer principles are evident through the demonstration sites, booklets and other publications. At the opposite end of the continuum, participatory principles are evidenced in a range of projects or programs that link participants in strong communicative networks.

### ***Stakeholder perceptions***

This section presents the views recorded in focus groups and interviews with various stakeholders.

At the time the fieldwork for this project took place, only a few stakeholders were informed about the Plantations 2020 Vision. Those who were, however, tended to express some doubt as to whether it would be possible to treble the plantation estate, particularly within the proposed time frame.

Landholders' and extension agents' opinions about the success of the Master TreeGrower and Graduate Certificate courses were generally positive. Landholders attending the courses during 1997 attributed the success to the:

- informed discussion generated throughout the program;
- interaction between experts and participants;
- diversity of topics and presentations;
- site visits, particularly the visit to the local saw mills and processing plants;
- hands on approach taken during the programs;
- chance to visit other farm forestry properties and projects during the program; and
- bringing together of a wide range of people with different backgrounds, experiences and knowledge.

(Master TreeGrower Introductory Kit 1998)

An evaluation of the Master TreeGrower Program is currently being undertaken by Dr. Fiona Hill and Dr. Tim O'Meara. Early results of this evaluation have been very positive (see *Agroforestry News* 7(3), September 1998, p. 27).

Landholder perceptions about Greening Australia (GA) were generally positive in those areas where Greening Australia is actively involved in agroforestry extension. In particular, individuals were appreciative of the information GA was making available and the opportunities the GA programs provided for landholders to learn more about agroforestry. There were, however, suggestions as to how GA could strengthen its role. Some participants noted that while skills and knowledge of agroforestry were always improving, the biodiversity and the conservation qualities this industry contributed to local environments were still poorly understood in the community at large. There was also a need for more 'hands on' skills for tree management, especially regarding maintenance. Some suggested that GA should organise more 'hands on' field days on specific topics like managing trees, biodiversity and the like. Individuals interviewed in this study were of the view that if more community members recognised the additional benefits of agroforestry, there would be more community support for the landholders wanting to be involved.

In areas where GA was less involved, landholder awareness of their activities was low. This was certainly the case in Western Australia. Landholders here were generally unaware of the skills and knowledge Greening Australia could bring to their local agroforestry industry.

### ***Coordination between agencies***

There is generally good coordination and communication between the Industry Development Section of AFFA and the relevant State Government agencies. This coordination has strengthened immensely in recent years. New South Wales has been least able to coordinate because of a lack of state government resourcing, although this has improved in the last couple of years. Agency stakeholders know each other and regularly make contact through a variety of forums.

Stakeholders directly involved are generally of the opinion that AFFA and the Joint Venture Agroforestry Program coordinate well and that this coordination has also improved in recent years. Most contact between the two is through RIRDC (as the JVAP manager).

Australian Forest Growers and Greening Australia have worked together in various activities over the years. Because of their expertise, leading members of these two organisations are also involved in the work of other organisations the Private Forestry Consultative Committee and the Farm Forestry Research Working Group of the Standing Committee on Forestry established by the Ministerial Council on Forestry, Fisheries and Aquaculture. The AFG is also involved with the Joint Venture Agroforestry Program Management Committee. These cross-memberships help to coordinate the work of various agencies. Likewise, both Australian Forest Growers and Greening Australia, as well as various State and regional organisations, contribute to the delivery of farm forestry courses conducted around Australia by the University of Melbourne.

### **3.2 Western Australia**

Agencies contributing to agroforestry extension in Western Australia include: the Department of Conservation and Land Management, Agriculture Western Australia, the Farm Forestry Advisory Service, forest companies, Regional Plantation Committees and cooperatives, Green Skills, and Greening Australia (WA).

#### ***The Department of Conservation and Land Management (CALM)***

CALM's Farm Forestry Unit undertakes various extension activities. The Unit, which is separate from the business units that conduct commercial bluegum and pine sharefarming operations, has offices in Como, Busselton and Albany. Its major extension goal is to stimulate the adoption of farm forestry in regions where commercial farm forestry options currently exist, i.e. in the wetter than 600 mm rainfall zone (bluegum being the major commercial species) and in the 400 to 600 mm rainfall zone (*Pinus pinaster* being the major commercial species). In the rainfall zone below 400 mm, the Farm Forestry Unit focuses on commercial development work in contrast to extension; it sees extension as low in priority in the absence of any significant immediate commercial opportunities.

Major extension strategies of CALM's Farm Forestry Unit include:

1. Building working relationships with those who influence farmers' decision making.
2. Increasing landowner confidence and understanding in farm forestry.
3. Raising public awareness of farm forestry.

Examples of activities under strategy 1 include:

- Holding introductory courses in farm forestry. The 3-day courses are held on a regional basis and bring together the range of people working with farmers, such as agribusiness consultants, landcare officers, CALM Sharefarms staff, staff of Agriculture Western Australia and private forestry companies.
- Working with catchment management groups. This involves providing input on farm forestry options to farm and catchment planning.
- Supporting Regional Plantation Committees in their work to promote farm forestry.
- Coordinating the running of the Graduate Certificate Course in Farm Forestry offered by Melbourne University.

Example of activities under strategy 2 include:

- Assisting in the preparation of TreeNotes and Information Kits (a joint CALM/Agriculture Western Australia project). The aim is to provide consistent and up-to-date information in a readily understood and easily available form.
- Setting up demonstration sites of farm forestry in key districts so that farmers can see what farm forestry is and how it works. The Unit provides support and guidance in planning, implementing and management of the demonstrations, with input from various disciplines such as agronomy, hydrology, forestry, ecology and landscape design. Sites become focal points for community learning.
- Supporting the Master TreeGrower Program coordinated by Rowan Reid from Melbourne University.
- Running field days, seminars and practical training sessions on a range of farm forestry topics; e.g. holding field days on growing maritime pine for wood products, and providing 'hands-on' training sessions on pruning trees for high-grade timber production.
- Contributing to field days organised by other agencies such as Agriculture Western Australia, Land Conservation District Committees, and Regional Plantation Committees.
- Preparing articles on farm forestry topics for *Agroforestry News* and other popular publications.

Examples of activities under strategy 3 include:

- Supporting Agroforestry Expo '99, details of which were given earlier in this chapter. In Western Australia, this event attracted nearly 800 visitors to the main Expo day and about 600 visitors to the district field tours. It also resulted in substantial coverage of farm forestry in the rural media.
- Providing articles on farm forestry for local newspapers and radio.

CALM is also a joint participant, with Agriculture WA and the Water and Rivers Commission, in a large new project partly funded by the Natural Heritage Trust, entitled 'State Agency Contributions to Land Conservation/Biodiversity Revegetation' and focusing on low to medium rainfall areas. One component of this will concentrate on developing revegetation designs, configurations and species mixes, developing decision support systems for land managers and their advisers, and working with other agencies such as Greening Australia (WA) to communicate information and advice on revegetation.

At the beginning of July 2000, CALM was divided into two separate agencies: a Department of Conservation and a Forest Products Commission. It is anticipated that CALM's Farm Forestry Unit will be transferred to the former, whereas the business units that conduct commercial bluegum and pine sharefarming operations will be transferred to the Forest Products Commission.

### ***Agriculture Western Australia (Agriculture WA)***

In addition to its joint sponsorship of the Farm Forestry Advisory Service, Agriculture WA's involvement in extension for farm forestry has two main elements that are directed at higher rainfall and drier areas respectively.

The objective of the Farm Forestry Development Project has been to increase the rate of establishment of farm forestry in the greater than 600 mm annual rainfall zone in the south-

west of Western Australia, in order to supply markets with high quality wood fibre. An initiative taken by Agriculture WA in 1996-97 was the provision of skills training to its extension staff, particularly in the areas of extension methodology and group development. The intention of this approach was that the skills learnt would be applied in the design of education and training programs for landholders, contractors and agency personnel. During 1997-98, many of the messages the Farm Forestry Development Project aimed to relay to the various target audiences were communicated by media stories, newsletter articles, field days, field tours, the production of videos, booklets and information sheets on research findings and by presentations to agency staff and other key groups. In 1998-9, the project designed a marketing campaign to shift opinions of the farming community toward an acceptance of agroforestry as an integral part of farming systems.

The Revegetation on Farms Project is targeted at areas of the State with less than 600 mm annual rainfall. The project covers all revegetation options, including agroforestry where appropriate. Information kits have recently been produced on eucalyptus oil mallees, southern sandalwood, olives, jojoba, and direct seeding. A kit on maritime pine is due for publication soon. Some information from these kits is available on the Agriculture WA website at: <http://www.agric.wa.gov.au/progserv/natural/trees>. Staff associated with Agriculture WA's Trees in Agriculture group have also produced other publications such as *Selecting Plants for Revegetation*, *Trees and Shrubs for Saltland* and *Alley Farming*, as well as a series of one page 'Factsheets' on olives, jojoba, oil mallees, wandoo, flat topped yate, brown mallet, sugar gum, rock sheoak, river red gum, sandalwood, maritime pine, paulownia, broombush, banksias and tagasaste. More publications in this series are planned.

Agroforestry information is extended through Agriculture WA project officers as part of their goal to increase water use in agricultural catchments, to extend profitable farming systems and to control erosion. These activities are part of Agriculture WA's Sustainable Rural Development Program. They reflect a change of emphasis that has occurred in many Agriculture WA activities in recent years. Whereas previously the emphasis tended to be on promoting particular technological solutions to problems, now the emphasis is on group and community facilitation so that communities take responsibility to develop and implement appropriate solutions for problems occurring in their area.

To assist landholders and their advisers, Agriculture WA has developed various decision support tools. The latest of these is Agroforestry Calculator, which was developed with support from the Joint Venture Agroforestry Program. Agroforestry Calculator enables computations to be made of the likely financial outcomes at project level, under various assumptions, of using land for farm forestry rather than other agricultural purposes. The most useful of these decision support tools can be downloaded over the Internet from the following site: <http://www.agric.wa.gov.au/progserv/agromodels/>

Like their counterparts in CALM, various Agriculture WA staff are involved in agroforestry research, in the presentation of courses conducted in Western Australia by the Melbourne University Department of Forestry, and in events such as Agroforestry Expo. Additionally, staff of Agriculture WA have coordinated Western Australian contributions to *Agroforestry News* and have arranged the distribution of this publication to 550 Western Australian readers.

Agriculture WA works with several agroforestry community groups including Trees South West (Bunbury), Timber 2002 (Albany), the South East Forest Foundation, the South-East Agroforestry Cooperative, Western Timber Cooperative Limited, and latterly the Master

TreeGrower network. The approach to agroforestry development is based on landholder and community empowerment and consultative processes.

### ***The Farm Forestry Advisory Service (FFAS)***

The Farm Forestry Advisory Service was established in 1997 as a result of a recommendation of the Farm Forestry Task Force (1995). It is a coordinated effort by Agriculture WA and CALM, with a substantial proportion of its initial funding coming from the Farm Forestry Program. At the time of its inception, the stated aims of the FFAS were to:

- publicise agroforestry and encourage landholders to learn about its potential as a farming enterprise and demonstrate ways of integrating tree crops with other agricultural enterprises;
- provide up-to-date, accurate and useful information to enable landholders decide whether agroforestry is suitable for their farms and farming goals;
- help landholders implement agroforestry systems, by enabling them to learn what is involved in designing layouts and establishing tree crops;
- provide farm foresters with management and marketing information for tree crops; and
- provide information to the many other individuals and groups that landholders use in making decisions about farm management, e.g. agribusiness consultants.

It was envisaged that initially the FFAS would focus on the commercial timber zone from Dandaragan to Esperance, primarily areas with a rainfall of at least 600 mm per year.

In its first two years of operation, the main activity of the FFAS was the preparation, publication and distribution of a series of information sheets entitled TreeNotes. These cover topics ranging from preparing sites for tree planting to growing eucalypts for high grade sawlogs, from equipment for pruning to the benefits of farm forestry. At the time of writing this report, there were 29 titles in the series, including several that deal specifically with particular farmers' experiences of farm forestry. TreeNotes are available, too, on a website: <http://www.agric.wa.gov.au/programs/srd/farmforestry>. This website also contains information on some other publications, available courses, forthcoming events, and links to various Internet sites.

Initial funding for the FFAS continued until late 1999. It remains to be seen whether, and in what form, its activities will be continued in the future. At least among middle-level CALM and Agriculture WA officers with an interest in farm forestry, there is a desire for the FFAS to continue in some form. However, unless adequate funds are specifically committed by CALM and Agriculture WA for the work of the FFAS, it could languish. On the other hand, it is possible that FFAS could be called upon to play a greater role than hitherto in facilitating the adoption of appropriate forms of farm forestry in medium and low rainfall regions, in order to meet the targets set in the Salinity Action Plan.

### ***Farm forestry companies***

Large forestry organisations providing farm forestry advice include: CALM Bluegum and Maritime Pine Sharefarming (business units that are quite separate from CALM's Farm Forestry Unit); Bunnings Treefarms; and Integrated Tree Cropping. These organisations focus mainly on communicating with landholders in order to acquire land for leasing or joint

ventures, rather than providing advice for the general farming population on establishing and managing agroforestry systems.

However, with partial funding from the Natural Heritage Trust, Bunnings also employs an agroforestry extension officer who works with landcare groups and schools and is available to give one-to-one advice to landholders intending to plant less than 20 hectares of trees (such areas being smaller than are practicable for farmers to lease to Bunnings for tree growing). This advice covers issues such as species selection, site preparation, planting layout, fertilisers, tree maintenance, pest and weed control. No fee is charged for this service. Bunnings hopes that farmers will give them first option when the trees are ready to harvest.

### **Regional Plantation Committees and cooperatives**

There are three Regional Plantation Committees in Western Australia: Timber 2002, based in Albany; Trees South West, based in Bunbury; and the South East Forest Foundation Inc, based in Esperance. These Regional Plantation Committees provide a forum for various stakeholders (including timber companies, landowners, local government and State agencies) to address and coordinate local and regional issues related to planning, tree growing, processing and marketing. The RPCs also support local field days, workshops, seminars and training courses, and handle public enquiries about plantation forestry and agroforestry within the region. They are supported by Commonwealth funding through the Farm Forestry Program, but raise some of their funds from members.

There are two Agroforestry Cooperatives: the South-East Agroforestry Cooperative (Esperance) and the Western Timber Cooperative Limited (in the South West). The cooperatives are commercial entities mainly involved in assisting landholders to market their farm forest products.

### **The Oil Mallee Association of Western Australia and the Oil Mallee Company of Australia**

The Oil Mallee Association and the Oil Mallee Company of Australia provide advice and support to landholders interested in establishing oil mallees on their properties, as well as exploring and developing market opportunities for the product. The following extract from an internal report summarises the purpose and objectives of these organisations:

*“The oil mallee project is being developed as a means of obtaining cineole as a bulk industrial product from selected eucalypt species across a range of edaphic and climatic conditions. It is designed to be an attractive landcare option for landholders, including those who may not otherwise develop an interest in tree farming. The return may be less per hectare than other dedicated commercial plantings but it is a low management option that can sustain levels of planting sufficient enough to impact on land degradation problems before markets become limiting.*

*Although the program is for mallee eucalypts, it defines a pathway through species search processes, various stages of industry feasibility and investigation studies, promotion and adoption strategies, hopefully to commercialisation. Once completed this process can be used as a model for the investigation of other potentially commercial plants, for example acacias, melaleucas or eremophilas, with the long term aim of being able to offer landholders in the Wheatbelt a suite of commercial species suited to their area, allowing them to diversify their production.*

*The oil mallee project is a model for co-operation between Government and non Government organisations, and landholders. The early plantings of oil mallees were heavily subsidised by the Department of Conservation and Land Management (CALM), in a share farming agreement, and contracts remain in place with individual landholders to cover that investment. CALM now has a close working relationship with the landholder growers who, keen to be masters of their own destiny, have formed first an incorporated association, The Oil Mallee Association (OMA), and now a limited liability company, The Oil Mallee Company of Australia (OMCA), to manage the development of the industry.*

In addition to having a central structure with elected office bearers, the OMA has six regional committees. There are also regional managers who are employed to develop and coordinate activities within a given region. These managerial positions are funded partly by the Commonwealth (formerly the Farm Forestry Program and now Bushcare) and partly by a levy on each seedling supplied through the Association. Current Bushcare funding also provides a rebate on seedling cost.

### **Green Skills**

Green Skills is a non-profit community organisation that specialises in environmental training and employment. It has established demonstration plantings of commercial farm forestry species on 17 farms in the south coast and south west regions of Western Australia, conducted an eight-week farm planning and integrated farm forestry course and week-long silviculture courses, and held field days on both pine and hardwood pruning and silvicultural techniques.

### **Greening Australia (WA)**

Greening Australia (WA) employs a Farm Forestry Officer, whose work was initially funded by the Farm Forestry Program. He concentrates on farm forestry options for areas with an annual rainfall of less than 400 mm, working with landcare and other community groups and providing one-to-one advice to farmers. At the time of writing, Greening Australia (WA) was about to publish a kit entitled *Farm Forestry in Low Rainfall Western Australia*, containing information on ten native species of trees or bushes suitable for these regions. With National Heritage Trust funding, Greening Australia (WA) also employs ten regional Bushcare Support Officers, who help to distribute information about trees, especially native trees, and who collaborate with the Farm Forestry Officer and with various other agencies and community groups in conducting field days, seminars or workshops. Greening Australia (WA) emphasises the importance of biodiversity and the development of non-wood as well as wood products from trees.

### **Extension models in use**

Singly or jointly, CALM and Agriculture WA use a range of extension models and methodologies. In their joint activities through the Farm Forestry Advisory Service, as well in the Revegetation on Farms information kits, the emphasis is on information access and technology transfer. This element is generally present in field days, field tours, workshops, seminars and structured courses such as the Master TreeGrower Program, but these events also involve the creation of a more active learning environment. Within the limits of its resources, CALM's Farm Forestry Unit once offered some individualised, site-based, advice on farm forestry options, it does not now have sufficient staff to do this. Instead, both Agriculture WA and CALM try to work with landcare groups, Land Conservation District

Committees, Regional Plantation Committees, grower cooperatives, and bodies such as the Oil Mallee Association, as well as supporting and contributing to the Master TreeGrower Program and Agroforestry Expo. In Western Australia, the inaugural Agroforestry Expo was so successful that it is planned to hold another Agroforestry Expo in August 2000.

The Regional Plantation Committees, especially Timber 2002 in Albany, have taken the initiative in pushing for the development of training courses in various skills needed for agroforestry.

The Oil Mallee Association and the Oil Mallee Company of Australia are involved in technology transfer, in giving one-to-one advice, and in participative research, development and extension. The OMA concentrates on grower issues such as the performance of particular eucalypt species. The OMCA has been developing a mobile harvester and more efficient methods of oil extraction, and seeking market opportunities for the oil.

### ***Stakeholder perceptions***

#### *Landholders*

The skills, knowledge and other extension requirements landholders in Western Australia feel are lacking for at least some regions include:

- advice on planning and site assessment, and thinning regimes for different species and different sites – such advice is dependent on locality and rainfall;
- better information on the economic and marketing aspects of farm forestry;
- species and provenance trials (e.g. for York gum and quandongs) in the medium to low rainfall areas, saline and waterlogged areas, and hilly/high country areas;
- information on effects of trees on district hydrology;
- more freely available information for small-scale nurseries on soil mixes, diseases, spraying, etc.

#### *Research personnel*

Like the landholders, researchers saw a need for more trial and demonstration sites for alternative species in the drier areas. According to them, there has been insufficient consideration of what trees require in order to grow and where they should be placed in order to have maximum impact on the State's salinity problem. A better understanding of the biophysical processes is required in order to achieve this.

Researchers felt that there is a need for further research on the following issues, especially in the wheatbelt, to provide information required for extension programs:

- tree water use on the sands compared with on the clay soils (this is important information for the salinity debate);
- adaptability to poor water quality (saline water);
- growth potential for different landscapes, i.e. finding the right plant for the niche, and matching plants and sites.

### *Extension personnel*

Extension personnel perceived a lack of information and products to help disseminate information on markets, growth rates, and the relationship between growth and site characteristics such as rainfall, soil, and proximity to markets. Further information is also required about financial aspects of the integration of trees into farming enterprises. Simulation models and decision support tools for agroforestry design are also required, and steps toward achieving these have recently been made with the development of the Agroforestry Calculator.

Gaps identified in the Great Southern region include information on farm safety, species selection for niche and alternative markets, and the management of native trees. Trees South West perceived a need for extension on marketing for the products, as well as for general promotion of agroforestry among potential participants. Trees South West also saw a need for a technical officer who could perform site assessments so as to give advice to those people who prefer not to be involved in the CALM or Bunnings Joint Venture options.

Once again there was a perception that one of the major gaps in agroforestry information is in the area of real returns in 10 or more years, as well as a lack of good statistical data for sawlogs, pulpwood and various value-added products. As one person put it:

*Because the industry is so young, we don't have ten years of information to look back on and because farmers are so conservative they want to know all the figures and they want to see some success stories.*

There is a perception among extension personnel that there is a good level of technical information on growing, managing, pruning and thinning for agroforestry, as well as about local pests and diseases and how to manage them. Extension workers in the Great Southern region considered that there was plenty of information to enable landholders to develop the skills and knowledge they needed for success. However, in the opinion of Timber 2002, more coordination is necessary to bring all the information together and make it readily accessible.

### ***Coordination between and within agencies***

The level of coordination and cooperation for agroforestry extension among Western Australian agencies has increased substantially in recent years. The emergence of the Farm Forestry Advisory Service was a breakthrough in what was previously perceived as poor cooperation and coordination between CALM and Agriculture WA. In the first two years of its operation, the FFAS has concentrated mainly on the higher rainfall areas in the southern parts of the State.

CALM and Agriculture WA are also now in the process of working together, as well as with agencies such as Greening Australia (WA), on the delivery of agroforestry information for low to medium rainfall areas.

Within Agriculture WA there is a perception among some extension personnel that extension programs for farm forestry are insufficiently coordinated with those for other farming enterprises such as wheat and wool.

Within CALM, there are questions surrounding coordination and information sharing between the business and other units. For example, when research is undertaken, the question arises as

to whether the findings belong to the business unit (in which case they would be confidential) or whether they belong to the public domain. The impending break-up of CALM into two agencies is likely to reinforce this division.

For several years, coordination between the various agroforestry extension programs was facilitated by an informal Western Australian Agroforestry Working Group, which included the key personnel from agencies involved in agroforestry research or extension. Meetings of this group lapsed during 1998 and 1999, but it was reconvened in 2000. Members of the Working Group also interact at other events such as the Master TreeGrower Program and the Agroforestry Expo. A calendar of forthcoming events is compiled by the Farm Forestry Advisory Service and periodically circulated to members of the Working Group and other interested people. A coming events page will soon be established on the Internet. Various agencies also cooperate in specific extension-related projects funded by the Farm Forestry Program or the JVAP.

### **3.3 Victoria**

Agencies contributing to agroforestry extension in Victoria include: the Department of Natural Resources and Environment; the Private Forestry Council; Greening Australia Victoria; the Department of Forestry, University of Melbourne; Regional Plantation Committees; agroforestry networks; and growers' cooperatives.

#### ***Department of Natural Resources and Environment (NRE)***

During the past two decades, there has been a gradual expansion of agroforestry in Victoria under the impetus of various research, extension and incentive programs. The Department of Natural Resources and Environment (and its predecessors), working with other organisations and individuals, has helped to stimulate this growth by establishing demonstration sites; by conducting research, by producing various publications, and by using a wide variety of methods to inform farmers about technical and economic aspects of agroforestry.

NRE was formed in 1996 by a merger of the former Department of Agriculture and the former Department of Conservation and Natural Resources. Within NRE, the Private Forestry Unit, which is based in Melbourne, provides coordination of agroforestry extension services. At a local or regional level, the Catchment and Agricultural Services division of NRE delivers all NRE's extension services, including agroforestry extension. Publications on agroforestry are available from NRE's Information Centre in Melbourne, as well as from regional offices.

Extension activities undertaken by NRE include:

- development and publication of a *Farm Forestry Extension Kit*, initially for use by extension officers but later as a manual for landholders;
- compilation, editing and publication of *Agroforestry News*, a quarterly newsletter with a national circulation of over 5000 and containing technical and other information;
- development of a set of 10 information packages to answer key farm forestry enquiries;
- preparation of a series of 50 *Agriculture Notes* intended to cover various aspects of farm forestry, available both in printed form and on the NRE Internet site;
- production of a video entitled *Producing Timber from Farms*, dealing with planning, establishment, management and harvesting of trees;

- contributing to newspaper, radio and television coverage of issues relevant to agroforestry;
- supporting the activities of agroforestry networks and cooperatives, Regional Plantation Committees, and the Master TreeGrower Program; and
- conducting field days, demonstrations, workshops and seminars.

These and other activities undertaken within NRE are designed to assist in the accomplishment of the goals outlined in Victoria's Private Forestry Strategy, details of which are given in the next section.

### ***Private Forestry Council Victoria (PFCV)***

PFCV is composed of Ministerial appointments from State and local government and from other key stakeholders in private forestry in Victoria. The Council provides advice to the Minister for Agriculture and Resources and has developed a joint industry-government strategic document entitled *Private Forestry in Victoria: Strategy towards 2020* (Private Forestry Council Victoria, 1998). This draws extensively on the national strategy *Plantations for Australia: the 2020 Vision* (Ministerial Council on Forestry, Fisheries and Aquaculture *et al.*, 1997). Included in the Victorian document are six strategic elements, together with 15 goals and 34 actions to accomplish these.

The extension and communication components of the Private Forest Strategy include the following:

- achieve broad public support for private forestry, by developing a communication strategy and information packages, and by promoting the natural resource management benefits of private forestry;
- expand the roles of Regional Plantation Committees to include information dissemination on issues such as government regulations, suitability of species and identified markets;
- encourage landowners to make land available for private forestry development, e.g. by making state government funding available to support site assessment and whole farm planning;
- encourage investment in private forestry, by identifying and documenting appropriate investment options and mechanisms, and by making information readily available on tree-growing, markets, and profitability compared to that of other land use options; and
- improve rural communities' skills and knowledge pertinent to management, harvesting and marketing for private forestry, through education programs, regional extension services, and training modules for farm operators and contractors.

Whilst PFCV provides general oversight for the implementation of the Private Forestry Strategy, much of the day-to-day activity is carried out by staff of NRE or other stakeholder agencies. In May 1999, the Private Forestry Unit of NRE compiled a comprehensive inventory of private forestry achievements over the period June 1996 to December 1998, as related to the various items contained in the Private Forestry Strategy. The inventory is very extensive, with over 400 items, some of which are single events or outcomes, others of which are on-going activities.

To encourage the wider adoption of farm forestry, PFCV offers two types of assistance that have specific advisory or educational components. These are:

- whole farm planning/site evaluation; and
- training subsidies for approved courses.

The first of these is being offered to selected landholders through the Farm Tree\$ Planning Service. Applicants must own properties that receive at least 600 mm annual rainfall, have soils and topography suited to commercial tree production, and have at least 10 ha available for planting. Preference is given to landowners who are willing to join a farm forestry network and/or have completed a property management planning course. Successful applicants each receive a professionally prepared management plan, recommendations on species and sites, and information on anticipated costs and indicative returns. This allows landholders to make better informed decisions. The service is worth up to \$2000 per property, successful applicants being required to contribute \$200 towards this. There is no obligation to invest in commercial tree growing after the plan is prepared. In 1998-99, there were sufficient funds to provide this service to all eligible applicants (114 landholders, of whom 95 took up the offer). The scheme is being offered again during 1999-2000. It remains to be seen whether this program will be funded thereafter.

At the time of writing this report, the training subsidies scheme was being developed. The subsidy will be aimed at landowners who are interested in either smaller scale timber production (less than 10 ha) or the specialty timber market.

### **Greening Australia Victoria**

Greening Australia Victoria concentrates its agroforestry extension efforts on the drier regions of the State, using integrated whole farm planning approaches. During 1998 and 1999, Greening Australia Victoria has offered the following extension services for the agroforestry industry:

- advice and support for the development of farm forestry that integrates commercial and conservation/landcare benefits;
- assistance and support for existing regional agroforestry networks e.g. help with organising and resourcing field days, demonstrations, workshops and bus tours;
- assistance with the development of agroforestry networks in new areas;
- coordination and support for the Alley Farming Network in the Wimmera, Southern Mallee and North Central regions, including production of *Alley Farming Network Update*, a quarterly newsletter sent to over 400 people in four States and the ACT;
- demonstration of efficient large scale revegetation techniques using a range of portable and mechanical planters and direct seeding equipment;
- assistance in the establishment of agroforestry demonstration sites through the Alcoa Revegetation Assistance Program;
- advice and support for the establishment of native plant product industries, including timber and also a range of non-timber crops, e.g. broombush, bush foods, fodder crops, essential oils, wild flowers and foliage, tannins, medicines and pharmaceuticals (particularly in lower rainfall areas with long timber rotations);
- demonstrations of, and training in, the latest plant nursery technologies, e.g. cell systems and nursery hygiene;

- advice, information and assistance on sustainable harvesting of products from remnant bush on private land, particularly in the Gippsland, Box Ironbark and Red Gum country;
- assistance and support for the four Regional Plantation Committees and, as appropriate, the implementation of the Private Forestry Strategy; and
- facilitation of links between industry, government and the community.

### ***The Department of Forestry, University of Melbourne***

The Department of Forestry, University of Melbourne, contributes to agroforestry extension both in Victoria and other parts of Australia through the Graduate Certificate in Forest Science (Farm Forestry), and the Master TreeGrower Program. Details of these programs have been given in an earlier part of this chapter.

### ***Regional Plantation Committees***

There are four Regional Plantation Committees (RPCs) in Victoria: Gippsland Farm Plantations Inc.; Green Triangle Regional Plantation Committee (jointly with South Australia); Plantations North East Inc.; and Central Victorian Farm Plantations. The RPCs address a range of regional and local issues relating to planning, tree growing, processing and marketing. RPCs have contributed to the development and distribution of fact sheets and information packages, as well as supporting field days, workshops, seminars and training courses within their region.

### ***Agroforestry networks***

There are 11 agroforestry networks in Victoria, some having started about 10 years ago whereas others commenced much more recently. They are: Otway Agroforestry Network; Corangamite Farm Forestry Project; Gippsland Agroforestry Network of Australian Forest Growers; South-West Agroforestry Network; Mallee Agroforestry Network; Box Ironbark Farm Forestry Network; North-East Victoria Branch of Australian Forest Growers; Wimmera Agroforestry Network; Northern Irrigation Farm Forestry Network; Shepparton Irrigation Region Farm Forestry Network; and Port Phillip Farm Forestry Network. These networks play an important role in enabling landholders to learn from one another, as well as arranging field days, seminars, workshops and training courses pertinent to their needs. Some of the networks have obtained Natural Heritage Trust funding to employ development officers or to conduct specific local projects.

### ***Cooperatives***

Agroforestry cooperatives in Victoria include North-East Victoria Forest Growers Cooperative (which runs the Cooperative Farm Forestry Initiative – COFFI project), the Gippsland Wood Producers Cooperative and the FFORNE Hardwood Cooperative.

The COFFI project covers some 1.5 million hectares of closely settled land, offering a one-to-one extension program as well as group-based activities. The FFORNE Hardwood Cooperative conducts field days periodically and is exploring the possibility of offering a fee-for-service annual visit by a qualified person to advise members on management of their farm forest and to provide consistency in assessment of this resource.

### ***Extension models in use***

The extension models in use in Victoria show a healthy diversity. Much of the work of the NRE is based on information access/technology transfer models on the one hand and group facilitation/empowerment models on the other. NRE does not generally provide personalised advice to landholders, but planning advice is currently available at minimal cost to selected landholders in high rainfall areas through the State government sponsored Farm Tree\$ Planning Service. One-to-one advice is also available for drier areas through Greening Australia Victoria. The COFFI project of the North-East Victoria Forest Growers Cooperative provides one-to-one advice for landholders in the north-east of the State.

The agroforestry networks, growers' cooperatives and Regional Plantation Committees each play a significant role in encouraging landholder participation in field days, seminars, workshops and training programs, including the Master TreeGrower Program and Agroforestry Expo. Agroforestry Expo was held in three Victorian locations in September 1999.

Jim Scott (1998a and 1998b) recently conducted a survey of 115 farm foresters across north-eastern Victoria, obtaining usable responses from 76 of these. Analysis of the responses revealed that these early adopters of farm forestry had one or both of the following characteristics:

- they had owned their land for either less than 5 years or more than 10 years;
- they or their partners had off-farm income from work in one of the professions.

Scott found that those who plant trees soon after acquiring their land:

- generally have small holdings (less than 100 ha) and see their properties as too small for conventional farming operations;
- regard their plantations as a form of superannuation;
- are not usually members of landcare groups;
- could be targeted at the point of purchase by various means (e.g. through pamphlets placed in the offices of real estate agents who sell land that is likely to be suitable for farm forestry).

Those farm foresters who have owned their land for longer than 10 years are more likely than those in the previous category to:

- have farms of a commercial size;
- be full-time farmers;
- consider a range of farm forestry options, including those that utilise outside capital;
- be members of a landcare group, which could thus be used to target other potential adopters of farm forestry.

Those with professional off-farm employment could be targeted through accountants or tax agents, or through presentations at service clubs such as Rotary.

These findings provide insights that could be applicable elsewhere, though it should be noted that strategies that target potential early adopters will not necessarily succeed in reaching landholders less inclined to be early adopters of new enterprises or technologies (see Rölíng,

1988). As Jim Scott is developing extension programs based on his findings, it will be useful to have an assessment of these programs in due course.

### ***Stakeholder perceptions***

Landholders and extension service providers saw a need for the following in order to give confidence to those already establishing plantations and those contemplating doing so:

- more technical information on growth rates, especially in areas with stringent environmental constraints, so that extension information for those areas could be improved;
- economic comparisons between traditional farming enterprises and farm forestry;
- general agroforestry information applied to the drier areas of the state, e.g. more work on harvesting of water;
- information on the landcare benefits of agroforestry; and
- information on markets and likely financial returns.

### ***Landholders***

Many of the landholders who participated in focus groups in Victoria strongly favoured having more one-to-one extension, similar to that seen in the COFFI project. They also expressed a wish for experienced extension staff, who were willing and able to remain working in a particular region for several years, thereby gaining the skills and knowledge needed to maximise effectiveness. The short-term nature of projects, staff turnover, and lack of consistency of staff are sources of uncertainty and frustration for landholders. There was a view that NRE had cut back on services, leaving landholders more dependent on private consultants, and that no one within the organisation was available to advise them on agroforestry for their specific situation.

Some farmers stated that stronger market demand and steady market signals for timber products are also needed before they will consider adopting farm forestry. These landholders are waiting to see and assess local and regional success stories. They consider that agroforestry extension systems must help potential adopters to assess and alleviate some personal risk by providing reliable technical and market information. Landholders also see a need for closer integration between farm forestry extension and other extension and advisory services.

### ***Extension personnel***

Victorian extension personnel perceive that the Government has a role in information provision and facilitating the activities of the three major players: landholders, wood users and investors. They are also of the view that there is a need for a quality assurance strategy for extension staff, to ensure that reliable information or advice is given across the State. Given the need for locally specific advice, however, care would need to be taken not to promote a narrowly defined 'recipe book' approach to agroforestry.

Again there was a perception that to improve landholder confidence in the viability of agroforestry, more success stories, ideally using local landholders and knowledge, are needed to accompany the general technical and economic information provided by extension agencies. Risk management strategies for agroforestry are also required, as well as strategies to deal with poorly managed and hard-to-market pines from previous failed schemes. There is

currently little NRE effort to provide information on specific companies and their schemes. One suggestion was that NRE should provide a checklist for those landholders thinking of investing in schemes.

It was also suggested that education for landholders involved in agroforestry should include training on silvicultural techniques, and more use of Property Management Planning that integrates agroforestry into existing systems. This aligns well with the Master TreeGrower concept of Diagnosis and Design.

### ***Coordination within and between agencies***

According to many departmental staff, the formation of NRE has facilitated greater coordination and cooperation than previously occurred between staff involved in research or extension for agricultural and pastoral industries, forestry and other rural land uses. However, the corporatisation of government plantations in Victoria has added a new dimension to the situation.

Coordination between NRE and the agroforestry networks seems adequate, although there is an issue in various regions where networks with strong abilities to attract Commonwealth funding tend to compete directly with NRE for such funding. The way in which this situation is handled is a measure both of the maturity of the various organisations involved and of the extent to which there is a common commitment to the development of a culture of continuous local experimentation and learning. Extension personnel are of the view that a greater involvement with Regional Plantation Committees and agroforestry networks would facilitate more effective extension. They suggested their role could include assisting the development of further cooperatives and possibly providing information on how to go about this.

The information sharing that occurs within the Private Forestry Council and the Regional Plantation Committees has reduced some of the tensions between NRE and forest companies. Likewise, Australian Forest Growers provides a forum where various agencies are able to exchange information and develop cooperative relationships.

The cooperation between agroforestry networks and Melbourne University is high, especially where the network has hosted a Master TreeGrower Program.

Although in the past there was relatively little interaction between Greening Australia Victoria and other agroforestry extension agencies, this situation is gradually changing as a result of Greening Australia's involvement with various agroforestry networks and because of the role now being played by its Bushcare support officers.

## **3.4 Tasmania**

Agencies contributing to farm forestry extension in Tasmania include: Private Forests Tasmania; Greening Australia Tasmania; major forest companies; the Farmwood Tasmania Cooperative Society; and the forestry commodity group of the Tasmanian Farmers and Graziers Association.

### ***Private Forests Tasmania (PFT)***

PFT is the State government authority established to assist the private forest sector to manage nature forests sustainably and to encourage the expansion of plantations. PFT also has a commitment to foster the use of trees in land management.

Issues on which PFT provides information and advice to landholders and investors include:

- tree establishment (site preparation, weed control, cultivation, site and species selection, planting or direct seeding, fertilising, erosion control);
- tree growth and management (pruning, thinning, pest control, pruned stand certification, harvesting, and marketing);
- other relevant issues (planning, market and product development, forest practices code, commercial viability, visual management, water quality, biodiversity, conservation, landcare, financial analysis).

Information or advice is made available by a variety of means, including a comprehensive series of Farm Forestry information sheets, a quarterly newsletter, training courses, field days, workshops, demonstration and trial plantings, site visits and networking with other organisations such as the Tasmanian Farmers and Graziers Association, the Department of Primary Industries, Water and Environment, private forest companies, Forestry Tasmania (the agency managing the publicly owned forests), Australian Forest Growers, Greening Australia Tasmania, the Farmwood Tasmania Cooperative Society, the Cooperative Research Centre for Sustainable Production Forestry, and the Tasmania Fire Service. If detailed site-specific advice or farm forestry design is required by a landholder, PFT charges a fee for this service as would a consultant.

PFT has a confidential database of farm forestry contacts, services and organisations in Tasmania.

Funding from the Farm Forestry Program and the farm forestry component of the Natural Heritage Trust has played a very important role in the delivery of farm forestry extension throughout the State in both high and low rainfall areas since July 1996. With funding from the Natural Heritage Trust, PFT has recently developed 'The Farm Forestry Toolbox', a computer package that is available, by CD-ROM, for farmers and their advisers. Amongst other things, this package enables users to estimate likely site productivity for selected tree species in Tasmanian locations.

In February 1998, a two-day workshop initiated by Private Forests Tasmania and attended by representatives of all agencies and stakeholder groups led to the development of a *Strategic Plan for the Tasmanian Farm Forestry Sector* (Tilbury, Steele & Farley, 1998). The Plan developed a vision for farm forestry by 2005. Major barriers to be overcome by 2005 include:

- the community's understanding of, and attitudes to, farm forestry;
- the difficulty of finding the best way to communicate to attract greater participation and understanding;
- the entrenched position of the education and training sector.

The strategy identified projects to deal with these, and other, issues. The extension elements of this plan include field days, demonstrations, workshops and whole farm planning programs, as well as the production of various publications targeted at farmers and investors. These were seen as activities for possible Natural Heritage Trust funding.

### **Greening Australia Tasmania**

Greening Australia Tasmania is actively involved in promoting general revegetation strategies, including farm forestry, as well as the conservation of remnant native vegetation.

During 1998, Greening Australia coordinated the first Dryland Farm Forestry Expo in Tasmania and also collaborated with Private Forests Tasmania and the Cooperative Research Centre for Sustainable Production Forestry in the conduct of six seminars designed to communicate research findings to landholders in various parts of the State. Staff of Greening Australia host field days, as well as attending field days and workshops hosted by other agencies. During 1999, Greening Australia convened the first Master TreeGrower Program in Tasmania.

### ***Major forest companies***

Major forest companies involved in joint ventures or leasing arrangements with farmers include North Forest Products, Tamar Tree Farms, Forestry Tasmania, Forest Enterprises (Tasmania) Pty Ltd, and Boral Timber Tasmania Ltd.

These companies' interest in farm forestry relates mainly to larger scale plantations of pines or eucalypts on farms, which in some cases means converting an entire farm to plantation forestry. Often these companies require a minimum area of land (about 20 ha) before they will consider a contract under a joint venture or lease agreement. Extension strategies used by these companies are primarily one-to-one, with area foresters delivering the advice.

### ***Farmwood Tasmania Cooperative Society***

Until recently, there were three cooperatives in operation: the North West Tree Growers Cooperative Society Ltd; the North-East Timber Growers Cooperative Ltd; and the Southern Tasmanian Timber Growers Cooperative Ltd. These cooperatives operated a joint marketing arm named Farmwood. From July 1999, the three cooperatives and the marketing arm have amalgamated into a single organisation: Farmwood Tasmania Cooperative Society Ltd. The core business of this organisation is selling logs. Membership is limited to landholders and investment foresters, i.e. only those who own the land and the trees.

The cooperative provides market information and technical advice through newsletters to members. It also maintains a register of contractors who can undertake harvesting and other tasks.

### ***TFGA – Forestry***

TFGA Forestry is the forestry commodity group of the Tasmanian Farmers and Graziers Association. Although it is mainly concerned with achieving a strong public policy framework for forest-based enterprises, it disseminates policy-related information (e.g. information on taxation or forest policy) to members by means of a quarterly newsletter. It also distributes the national publication *Agroforestry News* in Tasmania.

### ***Extension models in use***

Most farm forestry extension programs conducted by Private Forests Tasmania are based on a technology transfer or information access model, using publications, demonstration plantings, field days, seminars and the like. Most one-to-one on-farm advice about farm forestry is provided by forest companies, grower cooperatives, Greening Australia or private consultants. When requested, Private Forests Tasmania has contributed to the core program for Farmwi\$e (the Property Management Planning program in Tasmania). Some steps have been taken toward the preparation of a formalised farm forestry module for inclusion in the standard Farmwi\$e program or for use as a stand alone unit. The conduct of a Master TreeGrower

Program in Tasmania has recently added a further element to farm forestry extension in that State.

### ***Stakeholder perceptions***

#### *Landholders*

At about the same time as the fieldwork for the present project was being undertaken, Schirmer (1998 and 1999) made a study into factors affecting adoption of commercial farm forestry in north-east Tasmania. In addition to interviewing 10 professionals from farm forestry extension agencies, private consulting firms and the forest industry, she interviewed a total of 21 landowners falling into three categories:

- those who had adopted farm forestry;
- those who had considered but not yet adopted farm forestry;
- those who had not seriously considered adopting farm forestry.

From her analysis, together with the information gathered from interviews and focus groups in the present project, one can conclude that perception of economic viability is the single most important factor influencing landowners in the decision as to whether they should adopt commercial farm forestry. Notions of economic viability vary from farmer to farmer. Some require that the enterprise returns more than other possible enterprises on that land. Others take account of a wider range of considerations such as the land improvement potential of farm forestry. Perceptions of potential returns from farm forestry are currently often formed on the basis of what farmers hear by word-of-mouth – from neighbours, friends, relatives, agricultural or forestry service providers and the media. Schirmer (1998: 17) found that landowners usually only seek information from extension agencies once they have already developed a high level of interest in adoption. She suggested four main strategies to increase adoption:

- *better promotion of farm forestry in the rural community.* The use of targeted personal contact with landowners, supported by widespread media advertising, is recommended by Schirmer. So, too, are programs to educate intermediary agents, so that they can give landowners accurate information about farm forestry.
- *regular publishing of financial information relevant to farm forestry.* Currently, landowners have little access to information on market trends for wood products and royalties paid for wood products. Regular publishing of this information in rural media would provide landowners with a basis for evaluating whether markets are secure, and for estimating likely returns from farm forestry.
- *better communication between landowners and the forestry industry* to avoid misconceptions and unfavourable perceptions of farm forestry, particularly on issues such as plantation spread in rural areas and game management problems.
- *expanding the range of farm forestry systems and planting designs available to landowners*, although within fairly limited parameters, with an aim of making farm forestry more congruent with farmers' property management considerations.

Landholders participating in our focus group discussions likewise expressed a desire for more readily available information on market prospects for farm forest products. Apart from this, they generally considered that the knowledge required for successful agroforestry is available within the existing agencies. There was some disappointment and indeed concern among

landholders about the reduction of one-to-one extension and a corresponding move toward group activities. One reason for this view may be that some extension personnel have not acquired the skills needed to run effective groups, even though they are highly skilled in forest technology. There is also the fact that no longer will advice be tailored to individual situations.

#### *Extension personnel*

Private Forests Tasmania sees itself as being able to provide information and advice on all aspects of farm forestry, though its staff recognise that there are limitations in their capacity to provide forecasts on likely future markets. They acknowledge that the forest industry has some of this information, but that it is not readily accessible to others.

While most Private Forests Tasmania personnel who were interviewed in the course of this study believed their organisation had a broad ‘systems’ focus, able to provide consistent, quality information.

#### **Coordination between agencies**

For most of the time the various agencies involved in agroforestry extension in Tasmania fulfil complementary rather than conflicting functions. In recent years there has been an increase in active collaboration between these agencies in specific programs. There is scope for further developments in this direction, such as in coordination between PFT and the Department of Primary Industries, Water and Environment. There is no Regional Plantation Committee in Tasmania, but PFT has recently received funding from the Natural Heritage Trust for a project that will essentially establish a Regional Plantation Committee in that State.

### **3.5 South Australia**

Agencies contributing to agroforestry extension in South Australia include: ForestrySA; Primary Industries and Resources South Australia; Regional Plantation Committees; and Greening Australia (South Australia).

#### **ForestrySA**

Whereas Victoria has in recent years combined forestry and agriculture into a single department, South Australia has moved somewhat in the opposite direction. In 1997, ForestrySA was separated from Primary Industries South Australia (PISA) and continued as a commercial entity within the Department for Administrative and Information Services. The rest of PISA was combined with the Department of Mines and Energy and some smaller agencies to form Primary Industries and Resources South Australia (PIRSA). Both ForestrySA and PIRSA have an interest in farm forestry.

The two high rainfall areas of the State are in the South-East and in the Mount Lofty Ranges. ForestrySA’s activities are focused mainly on the South-East, where large-scale plantation forestry is found. Though both agencies are interested in the development of farm forestry in the Mount Lofty Ranges, the predominance of small holdings there means that the scale of an individual forestry planting will generally be relatively small. Consequently, ForestrySA is not as heavily involved in that region as it is in the South-East. The converse is true for PIRSA.

The Green Triangle Treefarm Project (GTTP) is a major part of the activities of ForestrySA in the lower South-East and extends into the South-West of Victoria. ForestrySA, together with three joint venturers, has negotiated an agreement whereby ForestrySA promotes and manages a program to produce hardwood for export as woodchip to Nippon Paper Industries Co. Ltd. in Japan. Under this scheme, growers establish plantations of at least 20 hectares of bluegum. The joint venturers guarantee to buy the timber at the end of the rotation (9-12 years) and the growers guarantee to sell the timber to the joint venturers at a price specified in the agreement. ForestrySA provides technical advice to the landholders and will probably organise harvesting. Advice is given on a one-to-one basis, as well as at field days, through a newsletter to growers in the project, and by a local insert placed in *Agroforestry News*.

ForestrySA is also undertaking three projects funded through the Natural Heritage Trust. These projects concentrate mainly on regions with a rainfall between 450 mm and 600 mm per annum, especially in the mid and upper South-East. One project includes the provision of on-site assessment and advice, as well as a seedling subsidy to encourage new growers to plant trees in blocks of up to 20 hectares. Another involves the establishment of demonstration plots to show landholders a range of options on how to manage their trees. A third involves provenance trials for radiata and several other species, to improve species selection and identify superior genetic stock.

### ***Primary Industries and Resources South Australia***

PIRSA is interested in integrated agroforestry, not only in the Mount Lofty Ranges but also in other parts of the State such as the hilly cropping areas of the Northern Agricultural Districts, the Yorke Peninsula and the lower Eyre Peninsula. The PIRSA *Farm Forestry Industry Development Plan* (1998) summarised the role to be played by PIRSA in the development of a viable farm forestry industry in the Mount Lofty Ranges as follows:

- *supporting* the Mount Lofty Ranges Forestry Industry Development Group and *independent* network;
- providing *technical support* to existing and new growers;
- *developing and promoting* flexible multiple-use planting options that will fulfil landholders' objectives;
- promoting the development of a marketable size *resource* (complementary to industry 'commodity' markets);
- assisting landholders with existing woodlots to obtain *markets*;
- improving staff and industry *expertise*.

The Natural Heritage Trust has recently provided funding to PIRSA for:

- a project to stimulate major investment in farm forestry in the Mount Lofty Ranges by: fostering commitment from major players in the market place; evaluating the prospects of planting enough suitable land to establish a bluegum industry; assisting the harvesting and marketing of wood from private woodlots; and supporting the Mount Lofty Ranges Farm Forestry Group.
- a project to develop greater self-reliance in farm forestry through a more formal and independent regional farm forestry network, as well as through technical advice and publications on 'best practice' management of established demonstration sites.

- a project to review Western Australia's lower rainfall agroforestry strategy and examine the potential for similar action to be implemented in parts of South Australia.

One of PIRSA's staff has written a substantial handbook on agroforestry for the Mount Lofty Ranges (Bulman, 1995) and has developed the Reval computer package, a relatively simple spreadsheet. Another has compiled an information pack on farm forestry for the Adelaide Hills/Fleurieu Peninsula (England *et al.*, 1998). He works closely with the Mount Lofty Ranges Farm Forestry Group, whose activities are described below. In addition to organising field days, workshops, skills training and other group activities, he handles telephone enquiries and is available to give one-to-one on-site advice to landholders.

PIRSA has also recently developed a methodology to assist landholders in considering agroforestry and revegetation options (see Bulman and Dalton, 2000). The methodology involves a consideration of the costs and benefits of various *single-purpose options* prior to the formulation of a revegetation design that best combines desired aspects of these options so as to meet the landholder's overall goals and values. This approach enables the landholder to see what is being traded off in a multiple-purpose option compared to a single-purpose one. The landholder may need technical assistance at various points in making these comparisons. This approach to decision making was initially piloted and evaluated in the Mount Lofty Ranges. Following its successful use there, it is being adapted for use in other regions of South Australia. Though not quite the same as the 'diagnosis and design' approach of the Master TreeGrower Program, the methodology is consistent with that approach. Bulman and Dalton's methodology can be used as a component of Property Management Planning programs or independently.

### ***Regional Plantation Committees***

There are two Regional Plantation Committees: the Green Triangle Regional Plantation Committee (which covers the South-East of South Australia and the South-West of Victoria), and the Mount Lofty Ranges Farm Forestry Group.

#### ***Green Triangle Regional Plantation Committee***

The Green Triangle Regional Plantation Committee brings together representatives of forest growers, processors, municipalities, State government, conservation groups and other interest groups.

The Committee has the following key roles:

- informing the regional community about the issues associated with the development of a substantial timber resource, involving farm forestry and plantations;
- encouraging the active participation of interest groups, especially landholders;
- preparing and updating a plan for the development of timber resource for the maximum economic benefit of the region;
- identifying and overcoming obstacles to the development of the industry;
- acting as a focal point for the industry;
- coordinating and facilitating projects; and
- ensuring that environmental values are recognised and objectives are achieved.

Apart from releasing an information package to encourage planting by farmers and a prospectus to encourage individual and institutional investment, the Committee does not itself provide an extension service for landholders. Rather, it directs them to services provided by other agencies such as ForestrySA, the Department of Natural Resources and Environment in Victoria, and relevant non-government organisations.

#### *Mt Lofty Ranges Farm Forestry Group*

The Mount Lofty Ranges Farm Forestry Group was formed under the aegis of the Adelaide Hills Regional Development Board and brings together landholders and other key players, including State and local government representatives, who are interested in the development of farm forestry in the Adelaide Hills. In 1997, it used funding from the Farm Forestry Program to conduct a feasibility study and develop a strategic plan. This plan was designed to address various impediments to farm forestry such as those identified by Alexandra and Hall (1996), as well as specific impediments in the Mount Lofty Region. Extension or promotional elements of the plan include the conduct of field days dealing with site selection, site preparation, weed control, pruning techniques and harvesting procedures, as well as initiatives to attract and inform potential agroforestry investors.

#### ***Greening Australia South Australia***

Greening Australia has supported agroforestry development in South Australia through involvement in the Mount Lofty Ranges Farm Forestry Group and the Green Triangle Regional Plantation Committee. Greening Australia is also involved with biodiversity issues, alternatives to pines and bluegum, and work in the drier, 'less productive' areas of the State. Greening Australia wishes to extend its expertise and knowledge regarding alternative tree species in order to provide a broader range of agroforestry options, and to promote native species industries in State-wide forums. It has published *Economic native trees and shrubs for South Australia* (Bonney, 1997). This substantial book provides information on 300 species, as well as on the different soil zones of the State, rainfall, economic considerations and plant management techniques. Greening Australia is conducting field trials on species that have the potential to provide commercial returns for landholders as well as to deliver landcare benefits.

#### ***Extension models in use***

The main extension models used in South Australia are those of technology transfer and information access, together with one-to-one advisory services. In addition to distributing publications and conducting field days, there is a notable emphasis on providing on-site assessments for landholders. In the South-East, this is partly due to the desire to set up contracts between growers and ForestrySA.

One difficulty with this system is that extension staff have found themselves 'stretched to the limit or a bit thin on the ground'. Questions arise as to how sustainable this system of extension can be in the long term, as well as its capacity to encourage a learning and support network among those involved in agroforestry. Some moves in the direction of group facilitation have been made by encouraging growers to join Australian Forest Growers in order to learn from experts, from the *Australian Forest Grower* magazine, and from each other. Group facilitation and empowerment could be further advanced by the conduct of Master TreeGrower Programs in South Australia.

## **Stakeholder perceptions**

### *Landholders*

When landholders were asked about what kinds of gaps were present in the skills and knowledge available for successful agroforestry, they felt that most of the required information was available. In the words of two landholders:

*If you are fair dinkum and you target PIRSA, they will look after you as well as you chase or push them and do what they recommend... If you push and still can't find the answers, then that is where the gaps are, but this hasn't happened for me yet.*

*The assistance from ForestrySA now is quantum leaps ahead of the assistance I got both three and six years ago.*

It was also evident that many landholders regarded PIRSA or ForestrySA as *the* source of information on agroforestry. Greening Australia's profile, for example, was noticeably lower in the farming community.

Financial and marketing information seemed to be lacking in some areas. Although there is some financial and marketing information available for pines in the lower South-East, some landholders perceive that similar information is not so readily available for *E. globulus*. The situation in the upper South-East is apparently even more difficult. Landholders want information that relates to the local area in order to inspire more confidence in the industry and alleviate personal risk to some degree.

Landholders harbour some doubt about the quality of available joint venture schemes, especially since many were caught out with some of the pine schemes of 30 years ago. Some participants in our focus groups were uncertain about the stability of the paper and pulp market, in both the short and longer-term. One of them was worried that faster growing alternative crops for paper production, e.g. hemp, may significantly reduce the demand for timber.

### *Extension personnel*

Extension personnel also felt that most of the information for the provision of skills and knowledge for landholders is available within the various agencies, although there are some obvious gaps in certain areas.

In the Adelaide Hills, extension personnel noted that skills training in the areas such as product identification, marking for harvesting, and chainsaw operating are required. Because landholders need to be 'jacks of all trades', extension personnel felt that other specialists are needed to input specific kinds of information. The fact that landholders in the Adelaide Hills are not pruning and thinning is explained, they say, not by the lack of extension, but by the fact that there is no market for the thinnings. PIRSA's *Farm Forestry Industry Development Plan* (1998) identifies other knowledge gaps relevant to farm forestry in the Mount Lofty Ranges. These gaps are progressively being addressed.

Extension personnel in South Australia would like to see more on-ground officers to enable further areas and landholders to be reached. The role of the four or five Revegetation Officers in PIRSA could be expanded to give fuller attention to farm forestry options.

Extension personnel feel that ForestrySA is now able to offer quite comprehensive technical advice about *E. globulus* in the South-East, but that they still lack some of the necessary economic information. This coincides with what landholders perceive. ForestrySA is currently working on information about returns for investments. Skills like general establishment practice, weed control, pruning, and marking for harvesting are somewhat lacking among landholders in the South-East.

### ***Coordination between agencies***

Both PIRSA and ForestrySA coordinate well with the Mount Lofty Ranges Farm Forestry Group, PIRSA having the strongest involvement. ForestrySA coordinates well with the Green Triangle Regional Plantation Committee. Greening Australia has representation on both these Regional Plantation Committees, as well as on the Farm Forestry Management Committee in the South-East.

On a day-to-day basis, PIRSA and ForestrySA operate largely independently of one another, with ForestrySA's agroforestry activities being concentrated in the South-East and PIRSA's elsewhere. In two particular projects in the South-East, ForestrySA provides technical advice to PIRSA's programs where farm forestry is involved. At a policy level, the work of the two agencies is coordinated by an interdepartmental Farm Forestry Coordinating Group that meets or holds teleconferences every 6-8 weeks. Greening Australia is not involved in these meetings but a standard item on the agenda relates to coordination with Greening Australia's activities.

ForestrySA and PIRSA see Greening Australia as focusing mostly on local native species and biodiversity issues. The two government agencies tend to favour the best tree species for the desired function, rather than necessarily favouring the use of local native species. This has sometimes put their recommendations into conflict with those being made by Greening Australia or by the Department of Environment, Heritage and Aboriginal Affairs. At the base of such conflicts are the tensions between competing concerns such as those of production, land rehabilitation, and biodiversity.

## **3.6 New South Wales**

Agencies contributing to agroforestry extension in New South Wales include: Greening Australia (New South Wales); Regional Plantation Committees and farm forestry networks; State Forests of New South Wales; New South Wales Agriculture; the Department of Land and Water Conservation; and ACT Forests.

### ***Greening Australia New South Wales***

Greening Australia has a considerable role in many parts of New South Wales in encouraging and assisting landholders interested in agroforestry. Greening Australia NSW uses various methods to disseminate information. For example, the north-west regional office provides one-to-one on-farm advice, conducts field days and workshops, and maintains various demonstration sites for interested landholders to visit. Greening Australia staff also respond to numerous mail and telephone enquiries for agroforestry information. They produce publications such as newsletters, field notes, booklets and books, as well as writing articles for a regular column in local and regional newspapers. The regional office also houses a bookshop where relevant publications can be bought or consulted.

Greening Australia manages a large-scale agroforestry project under the Farm Forestry Program in the Eden area and has well-established contacts with landholders, community groups, industry and government agencies throughout the ACT and south-east New South Wales. Greening Australia NSW has six nurseries and seven seedbanks. The Dorrigo regional centre has been managing a large-scale agroforestry project under the Farm Forestry Program, undertaking trials and research, and developing knowledge and skills among local landholders.

The Deniliquin regional centre is actively involved in the Murray-Riverina Farm Forestry project, participating in strategic planning, providing information and advice, and working on the integration of biodiversity and production in agroforestry systems. In the central-west regional centre at Molong, Greening Australia participates in the delivery of the agroforestry component of the Farming for the Future (Property Management Planning) workshop series. Greening Australia coordinated the delivery of the Master TreeGrower Program in the Hunter region and initiated the development of the Hunter Region Farm Forestry Strategy.

### ***Regional Plantation Committees and farm forestry networks***

There are currently six Regional Plantation Committees (RPCs) in New South Wales. These are: the Southern Tablelands Farm Forestry Network; the South East NSW Regional Plantation Committee Inc.; the Central Tablelands Regional Plantation Committee; the New England Regional Plantation Committee; the Mid North Coast and Lower Hunter Regional Plantation Committee; and the Northern Rivers Regional Plantation Committee. Each of these RPCs has received funding from the Farm Forestry Program for activities which typically include: developing regional strategies to encourage both plantation and farm forestry; addressing impediments; working to create a favourable investment environment for private forestry; and strengthening networks among the various stakeholders.

The Murray Regional Development Board and the Riverina Regional Development Board have received Farm Forestry Program funding for Murray-Riverina Farm Forestry, which is hoping to develop into a seventh Regional Plantation Committee.

In addition to the RPCs, various farm forestry networks or associations have been undertaking projects funded by the Farm Forestry Program. These include: the Subtropical Farm Forestry Association; the Upper Clarence Farm Forestry Network and the Hunter Valley Farm Forestry Network.

The degree to which RPCs and farm forestry networks are directly involved in extension or advisory activities depends upon factors such as:

- the existence of reliable information on treegrowing, marketing, etc. for that region;
- the extent to which other agencies are already providing information and advice on such matters or are willing to do so;
- the interests and orientations of members;
- the extent to which these organisations have staff or members who are able to fulfil extension or advisory roles.

Murray-Riverina Farm Forestry, for example, currently has four staff involved in extension. These staff organise about 12 field days per year, as well as various workshops and seminars, and bus trips focusing on farm forestry. They have also produced 20 Timber Notes on

establishment and management of farm forestry. In addition to answering telephone and mail enquiries, the extension staff provide one-to-one on-farm advice, each conducting 40 or more such visits per year. One staff member is involved in the development and presentation of one-day courses at the Murrumbidgee College of Agriculture on irrigated farm forestry.

To take another example: the Subtropical Farm Forestry Association (SFFA) of the Northern Rivers of New South Wales conducts extension by means of field days, demonstration sites, a newsletter, a promotional video, a farm forestry manual, and an introductory course in farm forestry, consisting of six one-day modules over a six month period. It also works closely with the Northern Rivers Regional Plantation Committee and the Upper Clarence Farm Forestry Network.

There appears to be an emerging consensus that although Regional Plantation Committees should be clearing houses for information, their core business should be that of regional policy development rather than directly providing extension and advisory services.

### ***State Forests of New South Wales***

State Forests of New South Wales is the government forestry department. It operates joint venture programs for softwood and hardwood plantations of 20 hectares or more, as well as managing native forests. Each of these activities operates as a business enterprise. State Forests of NSW also has a Research and Development Division.

The Softwood Plantations Division has received funding from the Farm Forestry Program for a project to use Property Management Planning (PMP) methodology to promote the establishment of softwood joint venture plantations integrated with agricultural enterprises on the South-West Slopes of New South Wales. The main activities undertaken have been the development of the draft PMP manual, the promotion of the softwood joint venture concept through media releases, circulation of pamphlets, the conduct of six field days dealing with integrated softwood farm forestry, and the production of a booklet that gives an outline of physical property management planning guidelines for softwood farm forestry. Despite these activities, there has been little positive response from the farming community. The project manager sees this as being partly due to the fact the project is promoting only one option (large blocks of radiata in joint ventures) rather than offering a range of smaller-scale softwood and hardwood options. Furthermore, some farmers consider the time and cost associated with PMP workshops to be too great.

The Research and Development Division of State Forests has received Natural Heritage Trust funding for the development of a demonstration trial, technical information support and extension program to promote and facilitate farm forestry in the low rainfall regions of the southern Murray-Darling Basin. Extension activities will include: the publication of one page leaflets about each of the six demonstration sites; the conduct of workshops and site inspections for researchers, extension agents and members of the public; and dissemination of the results of the project by means of a booklet and articles in the popular press.

The Library at the Research and Development Division of State Forests is happy to provide information to members of the public via telephone or counter enquiry. The Division answers more than 2,000 enquiries a year about forest management, the properties of different timbers and the identification of wood diseases and pests.

In November 1998, Cabinet approved funding of \$1.9 million over five years to establish a Private Forest Unit within State Forests with the objective of ‘improving the sustainability of private forest management.’ Within State Forests, it was envisaged that this Unit would, *inter alia*, provide farm forestry advice on a fee-for-service basis. However, subsequent events that will be described in the next section have resulted in a deferral of the establishment of this proposed consultancy service.

### **New South Wales Agriculture**

Until recently, New South Wales Agriculture has shown relatively little interest in farm forestry, partly because forestry was not seen as being a major agricultural enterprise, and partly because of the view that reliable information about farm forestry was not available for communication to landholders, especially in the wheat and sheep belt. In the early 1990s, New South Wales Agriculture produced a series of leaflets about Trees on Farms, but these leaflets are now out of print. It had a Trees on Farms Coordinator but no other staff specifically involved in farm forestry extension.

In December 1998, the Minister for Agriculture announced that NSW Agriculture would develop, in conjunction with State Forests, a Farm Forestry Advisory Unit, ‘to assist farmers determine how farm forestry might best fit into their farm’s business plan.’ It was stated that the Unit would ‘prepare information kits which provide agronomic, production, business and marketing information in a format that is familiar to farmers.’

Also towards the end of 1998, a NSW Farm Forestry Working Group consisting of representatives from NSW Agriculture, State Forests of NSW, the Department of Land and Water Conservation, Greening Australia NSW and Australian Forest Growers received funds from the National Heritage Trust to develop a more coordinated and strategic approach to farm forestry in New South Wales. The Working Group subsequently co-opted one representative of the Regional Plantation Committees, plus representatives from the NSW Farmers Association, Plantations Australia, and Boral.

In April 1999, the Director General of NSW Agriculture and the Chief Executive of State Forests signed a Memorandum of Understanding concerning farm forestry. This document contained the following commitments:

1. State Forests and NSW Agriculture recognise and acknowledge their roles in encouraging farm forestry. In particular, State Forests has an interest in the development of coordinated commercial planted forests on private land, NSW Agriculture is interested in farm forestry as an integrated enterprise in whole farm management, providing diversity and synergism to other farm enterprises. Both State Forests and NSW Agriculture agree that forestry provides an opportunity to address land degradation and other current environmental concerns to many rural communities of NSW.
2. State Forests and NSW Agriculture agree to continue to facilitate the development of the Strategy for Farm Forestry in New South Wales as a framework to guide State and regional farm forestry activities.
3. State Forests and NSW Agriculture agree that their farm forestry activities should be coordinated on a State and regional scale to provide maximum benefit to landholders.

4. State Forests and NSW Agriculture agree to cooperate to establish a Farm Forestry Advisory Unit within NSW Agriculture to assist farmers who wish to invest in farm forestry.
5. State Forests and NSW Agriculture agree to interact with other agencies and community groups to provide a sound basis for identifying gaps in current knowledge and for developing projects to address those gaps.

The following joint activities were proposed in the Memorandum of Understanding: economic research, field research, extension, information, training programs, pilot regional projects and demonstrations.

In October 1999, the Minister for Forestry and the Minister for Agriculture/ Minister for Land and Water Conservation signed a Memorandum of Understanding concerning the need for a coordinated approach for the expansion of new planted forests in the efforts to help manage dryland salinity. This document included agreements to:

- work collaboratively with NSW Agriculture in providing advisory, extension, education and commercial consultancy services to ensure take-up by private landowners of tree planting in target zones;
- continue farmer extension and education programs directed at highlighting the causes, symptoms and impacts of salinity and management of salinity through tree planting;
- work jointly with the Farm Forestry Advisory Unit to assist landholders and industry to take advantage of the economic and environmental benefits of forestry particularly relating to salinity management.

It had been decided that the Farm Forestry Advisory Unit would be located at Tamworth, which is in the medium rainfall zone. The job description for the Coordinator of the Unit stated that the appointee would be assisted by an economist (farm forestry) and by two advisory foresters from State Forests. Although the positions of Coordinator and Economist (Farm Forestry) have been filled, no State Forests staff have been appointed. Thus, this Unit currently resides wholly within NSW Agriculture. With only two staff, the initial focus of its activities is on establishing a database of reliable information, developing a training and resource package for each region of the State, increasing NSW Agriculture extension officers' awareness, knowledge and skills relevant to farm forestry, and encouraging them to work with existing farm forestry or landcare networks, Regional Plantation Committees, and the Master TreeGrower Program, as well as with staff from State Forests, the Department of Land and Water Conservation, and Greening Australia.

At the time of writing this report, the Farm Forestry Strategy being developed by consultants for the NSW Farm Forestry Working Group had not been finalised. Following five workshops with stakeholders in various parts of the State, first and second drafts were prepared and circulated for comment. It is anticipated that the Strategy will, *inter alia*, include recommendations on program management arrangements designed to achieve efficiencies in the delivery of extension and advisory services for farm forestry. After any modifications thought desirable by the State Catchment Management Coordinating Committee have been made, the Strategy will be presented for approval by relevant natural resource Ministers.

### ***The Department of Land and Water Conservation***

Until recently, the main form of involvement of the Department of Land and Water Conservation (DLWC) in agroforestry extension was on the north coast of NSW, where it employs an agroforestry resource officer. He has written booklets entitled *Planning for farm forestry – a practical guide* (Cole-Clark, 1999) and *What wood where* (Cole-Clark, 1997). The latter booklet gives information on twenty tree species suitable for commercial timber production on the north coast of NSW. The agroforestry resource officer is involved in field days, seminars, Property Management Planning and other workshops, short courses, demonstration sites, investigations sites, school group demonstrations, and Regional Plantation Committee activities.

Under the Plantations and Reafforestation Act 1999, the DLWC has the lead role in a streamlined regulatory regime. It is developing a code of practice that will apply to farm forestry beyond 30 hectares. Supporting the code of practice will be a technical guide on best management practices. To communicate this information to landholders, the DLWC plans to work with other extension agencies such as NSW Agriculture and Greening Australia.

The DLWC also supports the work of the Coombell Farm Forestry Centre near Casino. Every couple of months, this on-farm, privately owned, Centre conducts two-day courses for about a dozen people on 'Practical management of regrowth and plantation forests on farms.' Classroom and practical sessions deal with farm forest design, establishment, management, silvicultural and harvesting practices. Participants receive a professionally written manual together with a copy of the booklet by Cole-Clark (1999). The Coombell Centre is also involved in Pruned Stand Certification Workshops, demonstrations and DLWC grazing trials.

### ***ACT Forests***

ACT Forests is a branch within the Australian Capital Territory Department of Urban Services. For the past six years, ACT Forests has assisted private growers in the marketing of their timber and establishing plantations in the Southern Tablelands region. The Management Plan offered by ACT Forests to people establishing plantations is site specific and developed to ensure that the plantation is managed throughout the full rotation to produce a high value product. In return, the owner/grower enters into a 'first right of refusal' agreement with ACT Forests. The owner/grower has free access to recent research and technology as well as high quality and well priced seedlings. From this, the owner gains confidence and assistance in managing the plantation and marketing its produce.

### ***Extension models in use***

Greening Australia NSW uses a wide variety of approaches to extension for agroforestry, including:

- information access and technology transfer through publications, field days, demonstration sites, nurseries and seedbanks;
- one-to-one advisory services, both through their offices and on-farm;
- contributing to structured learning and group facilitation programs such as the Master TreeGrower Program and Farming for the Future;
- participating in Regional Plantation Committees and farm forestry networks.

In its Softwood Plantations Division and Hardwood Plantations Division, State Forests offers one-to-one advice and technology transfer for its joint venture clients. For the extension component of State Forests projects funded by the Farm Forestry Program or the Natural Heritage Trust, the main emphasis is on information access and technology transfer, although in one project an unsuccessful attempt was made to develop a Property Management Planning workshop approach.

It appears that the initial emphasis of the Farm Forestry Advisory Unit within NSW Agriculture will be on information access. If it succeeds in expanding its size or in encouraging other extension officers to incorporate farm forestry into their agenda, there is the potential for NSW Agriculture to develop a wider spectrum of farm forestry extension strategies.

The one agroforestry resource officer of the Department of Land and Water Conservation is involved in a wide spectrum of agroforestry extension approaches on the north coast of NSW. There will be an extension element in the DLWC's regulatory role under the Plantations and Reafforestation Act 1999. In addition to producing and disseminating a code of practice and a technical guide, there will be opportunities for extension activities in conjunction with other agencies and for one-to-one advice during visits to assess applications under that Act.

In its agroforestry extension activities, ACT Forests mainly provides one-to-one advice and technology transfer.

### ***Stakeholder perceptions***

The workshops recently conducted to assist in the development of a Farm Forestry Strategy for New South Wales confirmed many of the comments made in the focus groups for the present study.

In most parts of New South Wales, landholders find that there is no government agency from which they can readily obtain reliable information and advice for agroforestry in their region. In some areas this void has been partly filled by non-government agencies such as Greening Australia or by agroforestry networks funded by the Farm Forestry Program. Because of the diversity of agro-ecological zones in New South Wales, regionally specific information and recommendations are required on: what species to plant; costs and returns; silvicultural management; environmental benefits; interactions with other agricultural enterprises; and likely markets. In some cases this information might be held within agencies such as State Forests of NSW, but is regarded as commercial-in-confidence. In other cases, such as medium or lower rainfall areas, the information might not have been compiled.

Emtage and Specht (1998) recently completed a study of landholders' perceptions of farm forestry in the Northern Rivers region of New South Wales. That study revealed that both existing farm foresters and landholders not engaged in farm forestry fall into various categories and that different approaches or emphases may be required to meet the needs of people in these different categories. This in turn may require separate extension programs or else a highly coordinated and multi-focused program. In the next chapter, further reference will be made to Emtage and Specht's study.

### ***Coordination between agencies***

When this study began, there was only a very limited involvement of State agencies in agroforestry extension in New South Wales. Partly because of this, non-government

organisations such as Greening Australia and various farm forestry networks have played leading roles in agroforestry extension in this State. Much of the funding to New South Wales from the Farm Forestry Program has gone to Greening Australia, farm forestry networks or, more recently, Regional Plantation Committees. Relatively little has gone to State agencies. This contrasts with the situation in most other States.

Prompted perhaps by the prospect of funding from the National Heritage Trust or perhaps simply by a belated recognition that agroforestry could offer both commercial and conservation benefits to farmers, NSW Agriculture has recently begun to take a more active interest in this field. The establishment of the Farm Forestry Advisory Unit is the most tangible evidence of this. Although State Forests and NSW Agriculture have made a commitment to work together in relation to farm forestry, the fruits of that agreement have yet to be seen. The same is largely true of the October 1999 Memorandum of Understanding between the Minister for Forestry and the Minister for Agriculture/ Minister for Land and Water Conservation concerning the need for a coordinated approach for the expansion of new planted forests in the efforts to help manage dryland salinity. However, at the time of writing the present report, it was still relatively early days since the latter agreement was signed.

It remains to be seen what will emerge in the final form of the Farm Forestry Strategy being developed by the NSW Farm Forestry Working Group, which has representatives from the three State agencies, together with Greening Australia, Australian Forest Growers, and other stakeholders. It is to be hoped that the Strategy will result in a forward step in the resourcing, coordination and effectiveness of extension for agroforestry in New South Wales.

### **3.7 Queensland**

Agencies contributing to agroforestry extension in Queensland include: the Department of Natural Resources; the Department of Primary Industries; the Queensland Forestry Research Institute; Greening Australia Queensland; the Southern Queensland Farm Forestry Development Committee and other farm forestry networks; and treegrower cooperatives.

Prior to 1996, extension services relating to agriculture and farm forestry in Queensland were provided by the Department of Primary Industries (DPI). Following a change of government in that year, the DPI was split into two agencies: a newly created Department of Natural Resources (DNR) became responsible for forest, land and water conservation, whilst the DPI became a rural economic development agency. These two departments defined their respective roles in relation to farm forestry as follows:

- DNR has primary responsibility for *resource management farm forestry*, i.e. plantings with potential for timber production but where the main purpose is land, riverine and vegetation management;
- DPI has primary responsibility for *production farm forestry*, i.e. plantings for timber production as the primary land use – small to moderate size plantings on farms and medium to large scale plantings by joint ventures or investment companies in greater than 10 ha blocks.

Another Department whose responsibilities may affect farm forestry is the Environment Protection Authority (EPA), which recently replaced the former Department of Environment and Heritage. The Bushcare program comes under the EPA, which has the same Minister as the DNR.

### ***The Department of Natural Resources (DNR)***

As noted above, DNR initially had responsibility for farm forestry for resource management purposes, whereas DPI had responsibility for production farm forestry. However, in 1997-98, a Service Delivery Agreement was established between DNR and DPI whereby DNR also provided extension and advisory services for production farm forestry. These services were delivered primarily by 12 Treecare Extension Officers located throughout the State. DNR Treecare Extension Officers' duties included responsibility for:

- extension activities that provide technical advice on species selection, establishment, growth information and management advice associated with farm forestry;
- programs aimed at promoting adoption of farm forestry as part of a viable farm enterprise;
- demonstration sites on best practice for farm forestry;
- preparation and presentation of modules on farm forestry for Property Management Planning workshops (this program operates in Queensland under the title Future Profit); and
- collaboration on research activities to support effective and improved application and implementation of farm forestry.

Although there was an increasing emphasis on using group processes, some Treecare Extension Officers made themselves available to give one-to-one on-farm advice. During 1999, the roles of Treecare Extension Officers were reviewed and they were redesignated as Vegetation Management Officers, with responsibility for the assessment of tree clearing applications as well as for encouraging and educating landholders to manage remnant native vegetation appropriately. However, the Service Delivery agreement with the DPI continues until the end of June 2000. At the time of writing the present report, subsequent arrangements for extension for farm forestry with a predominantly commercial purpose had not been decided.

Hitherto, DNR's extension activities have included field days and publication of a series of 50 *Tree Facts* information sheets which are also available on the Internet. These fact sheets provide practical information on selection, propagation, establishment, management, and uses of trees. In line with DNR's current mandate, these sheets are progressively being retitled *Vegetation Facts*.

The Forestry in Queensland website ([www.forests.qld.gov.au](http://www.forests.qld.gov.au)), hosted by DNR, is a collaboration between DNR and DPI and includes a lot of information of relevance to farm forestry. Its aims are:

- to provide information on forestry in Queensland and access to a comprehensive range of resources and services managed by the two Departments;
- to provide a forum for the exchange of information and ideas for organisations and industries that have an interest in forestry in Queensland.

Available both on this website and by CD-ROM is *The Queensland Tree Selector*, a computer based tree selection system that allows the user to enter details about the planting site and planting purpose and then obtain a 'best bet' list of plants for the site. *Treedat* is a tree performance database that records the growth performance of trees on different sites

throughout the State, thus providing reliable information to help with species selection. It is currently being upgraded to enable public access to the database through the Internet.

With funding from the Natural Heritage Trust, DNR has been developing a series of modules on farm forestry for use in Future Profit (Property Management Planning) workshops. These modules will include a short introductory session lasting 30-40 minutes, an overview module for use in a half-day or one-day workshop, and further modules dealing in more detail with various aspects of farm forestry.

DNR is the lead agency for the Community Rainforest Reforestation Program (CRRP). CRRP, which has been operating since 1993, is an initiative of three tiers of government and has four objectives: timber production, land conservation, water and waterway improvement, and training for employment. A significant portion of its budget and strategy is devoted to farm forestry extension services. The North Queensland region in which it operates is about three times the area of Victoria, extending from Bowen in the south to Cape York in the north and into the semi-dry areas in the west.

CRRP has planted around 2000 hectares of mixed and single species farm forestry demonstration plantings. To date, it has had over 600 landholders involved in farm forestry, some of whom are now carrying out their own plantings and maintenance programs. CRRP has been progressively phasing out of subsidised plantings.

CRRP's extension program has been extensive, ranging from individual tuition and demonstration plantings in all the major environments across the region, to editorials in rural newspapers and magazines. CRRP has run its own Timber Expo in Cairns which attracted 15,000 people. Other CRRP activities include field days, seminars, and preparation of publications on topics such as: species to site selections; plantation design, establishment and management; and genetic material for farm forestry. This combination of extension approaches demonstrates the extent of CRRP's involvement in developing a farm forestry culture in north Queensland.

DNR staff are heavily involved with CRRP. As one part of its activities, CRRP promotes farm forestry as the best land use bordering World Heritage Areas and has gained support from the Wet Tropics Management Agency for the establishment of wildlife corridors (as multiple use plantings) on the Atherton Tableland. CRRP has also been directly involved in the development of the North Queensland Timber Cooperative.

### ***The Department of Primary Industries (DPI)***

As noted above, DPI has the responsibility for farm forestry with a predominantly commercial purpose. Although DNR has received Natural Heritage Trust funding to develop a series of modules on farm forestry for use in Future Profit (Property Management Planning) workshops, DPI is the lead agency in the Future Profit program. An officer within DPI has developed two PMP modules on farm forestry in South-East Queensland. These are:

- *Planning for farm forestry*: a two day workshop designed to give participants the understanding, skills and information sources to set about developing their own farm forest management plan, based on an appreciation of land resource and management factors. The Kit comprises notes, handouts and presentation materials for workshop facilitators. Where possible, the information is available in electronic format to facilitate reproduction and modification to meet local needs as required.

- *Managing your native forests for timber production*: a series of up to five sessions, this course is designed to give participants an appreciation of the opportunities and general approach to sustainable management of native forests for timber production. The Kit provides facilitators with the information base, handouts and presentation materials for delivery of the workshops. Again the materials are available in electronic format.

These modules have not yet been widely used. It is anticipated that they will become part of the series being developed by DNR.

Since 1996, DPI Forestry (a commercial arm of the DPI) has been entering into joint venture arrangements with participating landholders for the establishment of native species plantations on private land. The scheme has operated in the higher rainfall zones of South East Queensland and Far North Queensland. DPI Forestry's involvement in these joint ventures was said to be primarily for the purpose of showing the viability of farm forestry as a commercial enterprise. DPI Forestry staff engaged in promoting joint ventures provide one-to-one advice to participating landholders, as well as providing input into group activities such as field days and Future Profit (Property Management Planning) workshops.

In addition, DPI operates a Call Centre that handles telephone inquiries relating to primary production and rural economic development. Each month, the Call Centre receives hundreds of enquiries relating to private forestry, plantations, native forests, vegetation management and wood technology. The Call Centre operator who specialises in forestry issues deals with these enquiries or refers the enquirer to an appropriate person within or outside the DPI.

During 1998-99, DPI initiated a review of its extension strategy for private forestry, including farm forestry. As part of that process, DPI (1998) issued a Discussion Paper that outlined the roles played by various agencies and programs, also identifying various issues to be resolved. After receipt of comments on the Discussion Paper, the Review Officer prepared a Draft Extension Strategy which stated that 'The purpose of private forestry extension is to support the economic development of a number of separate, yet related, forest industries towards self-reliance.' These forest industries include both wood and non-wood industries that derive their raw materials from private native forests or plantations, whether on farms or other private landholdings. Thus the scope of the Draft Strategy included, but was not limited to, farm forestry. The Draft Strategy proposed that extension for private forestry should be based on the following key principles:

- supporting current and emerging local, state, national and international forest policies that adhere to ecologically sustainable forest management principles;
- adopting a whole of government approach in which extension programs are delivered in an integrated fashion through regional forest extension teams comprising DPI, DNR and EPA staff in conjunction with non-government organisations;
- building each forest industry's capacity for self-reliance;
- developing farm forestry industries as an integral part of sustainable agricultural and rural landscapes;
- implementing a State-wide, regionally relevant, strategy that takes account of bioregional, climatic, economic, land tenure and socio-cultural factors;
- ensuring that extension strategies reflect the needs of different forest industries and different client groups;

- providing a strategic interface to communicate information on public policies, regulations, programs, resources and market intelligence, as well as the results of research;
- integrating forest industry research, development and extension processes;
- providing for a diversity of delivery mechanisms integrated within an overarching and coherent strategy that includes both group based, adult education, processes (a major focus of government agencies) and personalised, fee-for-service, advice (from either or both of the private and public sectors);
- respecting the conservation status of native forests;
- building in evaluation to facilitate on-going improvement.

### ***The Queensland Forestry Research Institute (QFRI)***

Also within DPI, the Queensland Forestry Research Institute is involved in research, development and some extension relating to wood production. The extension components in projects it has undertaken with Natural Heritage Trust funding have included:

- establishing demonstration plantings of silvicultural systems for farm forestry;
- educating landowners and harvesting contractors in sustainable native forest management in the wet tropics, through the development of silvicultural manuals, field days and training courses;
- compiling information needed to provide consistent, efficient and reliable advice on the selection of native hardwoods for commercial wood production in farm-based plantations throughout Queensland;
- disseminating information on eucalypt hybrids suitable for commercial wood production on cleared agricultural land in marginal zones of South-East Queensland.

In addition, QFRI provides fee-for-service consultancy services on plantation tree-growing and on utilising wood.

### ***Greening Australia Queensland***

Greening Australia in Queensland is very active in farm forestry and is involved in the Southern Queensland Farm Forestry Development Committee. In Toowoomba, for example, Greening Australia tends to focus on landholders with smaller parcels of land, for whom they run bus trips, field days, discussion seminars and workshops. Greening Australia in Toowoomba also promotes farm forestry through newspaper articles and has demonstration sites on various landholders' properties.

Staff of Greening Australia in Brisbane and the Sunshine Coast deal with many telephone and written enquiries, prepare magazine and other press articles, have appeared on *Totally Wild* (children's television show) and ABC's *Landline*, participate in field days alongside DNR and DPI, conduct farm walks and were heavily involved in organising the Master TreeGrower courses at Nambour in 1997 and Beaudesert in 1999.

During 1998-99, Greening Australia Queensland has received funding from the Natural Heritage Trust for:

- the Upper Logan, Albert and Bremer Farm Forestry Development project, which aims to: increase community participation in farm forestry as an economically and environmentally sound management option; demonstrate best practice farm forestry design at sites representing major land types in the region; and demonstrate the use of commercially attractive native plants as a component of land protection and biodiversity management practices;
- a project to develop reliable information for a sustainable forest industry in arid to semi-arid areas of northern Australia.

Greening Australia in Queensland is accredited to deliver a certificate course on bush regeneration.

### ***The Southern Queensland Farm Forestry Development Committee and other networks***

There is one Regional Plantation Committee in Queensland: the Southern Queensland Farm Forestry Development Committee.

Moves are under way to establish a Regional Plantation Committee in North Queensland. Other farm forestry networks include: the Mary Valley Sunshine Coast Farm Forestry Association; the Scenic Rim Farm Forestry Association; and the Lockyer West Moreton Farm Forestry Network.

The Southern Queensland Farm Forestry Development Committee (SQFDC) comprises representatives of the suite of industry sub-sectors that have an interest in farm forestry industry development, including growers, wood processors, industry support groups and government agencies. In addressing industry development and coordination issues, the Committee recognises the important need for integration of research, extension and training efforts. The SQFDC also publishes a statewide newsletter, mailed to over 1,600 subscribers, that disseminates industry development news and extension information. It is designed to serve as a communication channel for the Queensland farm forestry and associated industry sectors.

The Mary Valley Sunshine Coast Farm Forestry Association uses regular media releases in local newspapers and community magazines. It has found that positioning an advertisement near the TV guide is a successful way to make initial contact with people. The Association has produced a Tree Talk Information Kit on farm forestry (a series of information sheets) and advertises its services using flyers and posters on shop windows and pub walls.

The Sunshine Coast has five landcare groups, two of which have agroforestry components. These are the Noosa and Barung groups. Barung Landcare at Maleny hosts an annual Fine Furniture Expo which charged exhibitors a fee, the profits being used for further farm forestry initiatives. Noosa Landcare holds an annual TimberFest, which is primarily a farm forestry extension event.

### ***Cooperatives***

There are two registered cooperatives for treegrowers: the North Queensland Timber Cooperative, located at Babinda, and the Cooloola Forest Growers Cooperative, located at Gympie. Steps have been taken toward the formation of treegrower cooperatives in the Noosa Hinterland and the Dawson Valley. The Noosa Hinterland group has run courses in chainsaw

use and portable milling. In addition to undertaking their core business of marketing, both the registered cooperatives have plans to provide professional advisory services to members.

### ***Extension models in use***

There is a spectrum of extension approaches for farm forestry in Queensland, with the mix varying from one agency or region to another. Most agencies provide various forms of information access and technology transfer, including some or all of the following: publications, websites, demonstration sites, field days, and answers to telephone enquiries.

Although staff of the various government agencies are officially encouraged to use group-based methods of extension as far as possible, some staff in each of these agencies are, in fact, also providing extensive one-to-one advice. The two registered timber cooperatives also hope to develop personalised advisory services.

Queensland has gone further than most other States in developing modules on farm forestry for use in Property Management Planning workshops. By December 1999 it had held three Master TreeGrower courses.

Processes of group facilitation and empowerment are also evident in the activities of various farm forestry networks and cooperatives. Many of the farm forestry extension officers have undertaken formal training in extension and adult education methods, primarily through the DPI–University of Queensland Rural Extension Centre at Gatton.

### ***Stakeholder perceptions***

Farm foresters in the more traditional tree growing areas of south-east Queensland perceive that sufficient information about species, soils and site suitability is generally available, but would like to see more information on growth rates and species selection for specialty timbers. Stakeholders in the drier areas are still working on identifying suitable species and assessing their production potential.

A need to increase emphasis on alternatives to the application of the industrial model of forestry to the farm level was also identified. It was felt that, most foresters tend to focus on wood production and do not give sufficient attention to the other reasons why people may want to grow trees.

A number of other major deficiencies in the extent to which current extension for farm forestry provides the skills and knowledge required for success, were identified. To address these deficiencies the following parts require attention:

- more human resources, to support farm foresters' information and skill development needs for the next five years;
- information on appropriate silvicultural techniques for native forest stands and mixed species plantations;
- regionally specific advice on species suitability;
- more training courses for landholders and technical people, e.g. on portable sawmilling, forest management, tree marking and inventory, and supervision of harvesting;
- more economic information on farm forestry at the whole farm level;
- economic case studies to help convince people of the benefits of farm forestry;

- more attention to issues such as harvesting and marketing of timber so that growers get the maximum benefit;
- work on a timber marketing database for farm foresters and timber users;
- improved and regular reporting of timber prices and supplies, e.g. on a farm forestry web site;
- greater coverage across the industry: more extension to the investment sector, both corporate and small scale investors; more interfacing between processors and farm foresters; more work with local governments on land use planning and regulation of farm forestry; more extension toward larger scale forestry investment and management companies, since they have a large role in assisting industrial and farm forestry to achieve a symbiotic relationship; and
- development of a service provider sector, e.g. contractors, through training courses and accreditation.

### ***Coordination between agencies***

Whilst there must have been some justification for the 1996 decision to split the DPI into two separate departments, that decision had awkward consequences for the delivery of farm forestry extension programs, especially if farm forestry is adopted for multiple benefits. To overcome this problem, DPI and DNR entered into a Service Delivery Agreement whereby DNR would provide extension and advisory services for production farm forestry as well as for resource management farm forestry. Both departments are currently reviewing their roles and strategies in relation to farm forestry extension.

The situation is further complicated by the fact that, despite the Service Delivery Agreement, DPI has continued to provide some extension services through its Private Forestry Development Officers, whose role includes establishing commercially viable joint venture arrangements between the DPI and landholders. Furthermore, both DPI and DNR have been involved in the development of modules on farm forestry for Future Profit (PMP) workshops, but it is difficult to discern a consistent basis for the current division of labour in relation to PMP.

In the south-east of the State, coordination between all agencies, both government and non-government, has recently been facilitated by the establishment of the Southern Queensland Farm Forestry Development Committee. Both there and elsewhere, the degree of coordination between agencies has depended in part on the attitudes, experience and interpersonal skills of the local officers. This will probably still be the case even after the current reviews within DNR and DPI have been completed. However, the structural decisions taken within each agency could either facilitate coordination or make it more difficult. The Draft Extension Strategy prepared for the DPI argues for a whole-of-government approach that includes the establishment of regionally based, multi-disciplinary, multi-agency teams working in conjunction with local industry and interest groups.

### **3.8 The Northern Territory**

Agencies contributing to agroforestry extension in the Northern Territory include: Greening Australia Northern Territory; the Department of Primary Industries and Fisheries; the Farm Forestry Technical Working Group; and the Northern Territory Forestry and Timber Products Network.

### ***Greening Australia Northern Territory (GANT)***

GANT was a major catalyst for farm forestry development in the Northern Territory. GANT helped initiate, and is a member of, the Northern Territory Forestry and Timber Products Network. In 1996, these two organisations received funding from the Farm Forestry Program for a Regional Tropical Hardwood Forestry Project. They commissioned Margules Poyry Pty Ltd to investigate the potential for farm forestry in the Top End of the Northern Territory and to prepare a strategic plan for the development of farm forestry.

The feasibility study involved visits by the consultants to the major agricultural regions of the Top End, liaising with landholders and holding public forums in Katherine, Humpty Doo and Berry Springs. Another meeting was held in Darwin to present the draft feasibility report and draft strategy, after which these were widely distributed for comment. This generated a lot of community input which was then incorporated into the final reports. These reports, prepared by experienced forestry consultants, were influential in generating both government and community commitment to the development of farm forestry in the Northern Territory.

GANT has also been actively involved in the Farm Forestry Technical Working Group, details of which are given below, as well as in extension activities such as field days, workshops, and the establishment of farm forestry trials and demonstration sites. Many of these activities are undertaken jointly with the Department of Primary Industries and Fisheries and landholder groups.

### ***Department of Primary Industries and Fisheries (DPIF)***

The Department of Primary Industries and Fisheries has two staff who are heavily involved in the development of farm forestry. DPIF instigated the formation of the Farm Forestry Technical Working Group, which has prepared a Draft Action Plan for farm forestry development. In conjunction with the Department of Lands, Planning and Environment, DPIF has recently been developing codes of practice for forestry in the Northern Territory.

As already noted, DPIF collaborates with Greening Australia and the Northern Territory Forestry and Timber Products Network in various extension activities. These organisations are currently working with landholders to establish six demonstration plantings in each of the four agricultural sub-regions of the Top End, including two sited on Aboriginal land. These sites will be used for future field days and training workshops, as well as for research and development.

DPIF has published two *Agnotes* on aspects of farm forestry. Two more are due to appear soon. DPIF hopes to derive further useful information from the records of the former Forest Bureau, disbanded some years ago. DPIF also wishes to work with relevant agencies in north Queensland and Western Australia on suitable tree species for northern Australia.

### ***The Farm Forestry Technical Working Group***

The Farm Forestry Technical Working Group comprises representatives from the Department of Lands, Planning and Environment, DPIF, the Parks and Wildlife Commission of the Northern Territory, Greening Australia and the Northern Territory Forestry and Timber Products Network. The immediate agenda of this group was to prepare a Regional Action Plan for the development of farm forestry.

The Draft Action Plan lists as Strategy 4 the development of agroforestry research and extension, with the objectives of improving the information base for sustainable development of farm forestry and creating awareness of farm forestry among the general population.

In order to develop the knowledge and skills of extension staff and landholders, the Draft Action Plan proposes that: extension staff should attend a farm forestry technical training course; landholders and extension staff should attend a Master TreeGrower Program course; links should be made with Property Management Planning in order to develop training workshops for landholders; and existing relevant information should be collated and disseminated.

To create awareness of farm forestry within the community, the Draft Action Plan proposes that: farm forestry field days be conducted; regular articles be placed in the *Top Paddock Newsletter*; *Agnotes* on farm forestry be produced; and a series of media presentations on the benefits of farm forestry be undertaken.

The Draft Action Plan envisages that DPIF and Greening Australia Northern Territory will have primary responsibility for implementing these extension strategies.

### ***The Northern Territory Forestry and Timber Products Network***

The Northern Territory Forestry and Timber Products Network is mainly a lobby group. It includes representation from government agencies, Greening Australia, timber industry, landholders, tree growers, forestry professionals, researchers and community organisations. It has worked with Greening Australia and DPIF on submissions for funding under the Farm Forestry Program. It is represented on the Farm Forestry Technical Working Group and is involved in field days. It also disseminates information through its *Top Paddock* newsletter, as well as distributing *Agroforestry News*.

### ***Extension models in use***

Agroforestry extension in the Northern Territory is currently based mainly on various forms of technology transfer and one-to-one advice provided by staff of DPIF or Greening Australia. In its reference to the Master TreeGrower Program and Property Management Planning, the Draft Action Plan recognises the value of opportunities for structured learning and for group facilitation and empowerment. As more experience is accumulated, and as the number of people involved in farm forestry increases, the potential and necessity for group-based participatory approaches will increase.

### ***Stakeholder perceptions***

Extension personnel noted that very few publications cover agroforestry in the tropical north of Australia. Because of environmental differences, most material from elsewhere in Australia is not appropriate for the Northern Territory. Available technical information comes from old trials and evaluation, together with technical papers from DPI in Queensland. Economic information is very limited.

Extension officers expressed the hope that a Master TreeGrower course could be held in the Northern Territory in the near future.

There is a recognition that the usefulness of a link with the Property Management Planning program will depend on how well that program is regarded by landholders.

***Coordination between agencies***

Through telephone discussions and written responses, it is clear that there is considerable coordination between DPIF and Greening Australia in farm forestry extension programs.

## 4. Conclusions and Recommendations

This chapter draws together the results of this national study and makes recommendations. The recommendations deal with general principles. Where appropriate, the accompanying text provides evidence or examples from around Australia. The more detailed evidence for these conclusions and recommendations is contained in earlier chapters of the report.

### 4.1 Strategic objective

As discussed in Chapter 1, the potential benefits from the adoption of agroforestry are both economic and environmental. Nevertheless, adoption of agroforestry into Australian farming systems has been constrained. In addition to technical impediments, there are impediments associated with economic uncertainties, distorted markets, particular public policies, and lack of a farm forestry culture in most rural communities. Many impediments are progressively being removed. One of the tasks of extension is to disseminate reliable information and to support the development of a culture of continuous learning, so as to facilitate successful adoption of agroforestry.

Measuring the success of agroforestry extension programs is problematic because of the long rotation involved in tree growing. For various reasons, the rate of tree planting is, by itself, not an adequate measure of the success of these programs. First, rates of planting are influenced by various factors such as economic incentives, government regulations and infrastructural development, as well as by extension programs. Secondly, unless appropriate species of trees are appropriately planted and appropriately managed, the mere planting of trees is of doubtful benefit. Thirdly, unless landholders are aware of the risks as well as the potential benefits of agroforestry, they cannot be said to have made adequately informed decisions. Fourthly, in some particular cases, reliable information may indicate that agroforestry is not the best farm management option. Fifthly, successful management is an on-going process with different sets of decisions to be taken at different stages of the production cycle. Sixthly, agroforesters should take account of emerging scientific findings, technological developments and market trends.

Consequently the development of a culture of continuous learning about agroforestry and related issues should be a key objective of agroforestry extension strategies. This should enable landholders to:

- structure and progressively add to their existing knowledge;
- review past performance and consider future options;
- make appropriate choices;
- acquire and improve the skills needed to implement their choices.

**Recommendation 1. The strategic objective of extension and advisory programs should be to promote the growth of a culture of continuous learning about agroforestry and related issues, so as to facilitate informed decision-making and successful adoption of agroforestry.**

## 4.2 Inbuilt evaluative components

In addition to engendering continuous learning among landholders and others involved in agroforestry, extension programs should themselves exemplify continuous learning in both their design and their delivery. This is important to meet formal requirements for extension agencies to show that they are using their resources effectively and efficiently, and also to facilitate on-going improvement in extension programs.

Evaluative components should ideally be built into extension programs from the outset, rather than being an add-on. Making evaluation an intrinsic part of the extension program is likely to ensure that there is a careful definition of aims and that relevant data are gathered at appropriate times.

A review of approaches to evaluation in agricultural extension has recently been published by RIRDC (Dart *et al.*, 1998). Evaluation should deal with processes, outputs and outcomes. It should take account of the various levels of analysis identified by Bennett (1975), recognising that some processes, outputs and outcomes may be intermediate steps on the way to the ultimate objective named in Recommendation 1.

**Recommendation 2. From the outset, extension programs for agroforestry should have in-built evaluative components relating to processes, outputs and outcomes, so as to facilitate on-going improvement. These evaluative components should take account of the various levels of analysis identified by Bennett, as outlined in Chapter 2.**

## 4.3 Collaboration between researchers, extension agents and landholders

Results in Chapter 3 highlighted the concern expressed by both agroforesters and potential agroforesters about the lack of adequate information to guide decision-making about agroforestry. Both technical and economic information is needed. Landholders would like more say regarding research priorities, and they wish to be heard and taken seriously rather than listened to in a token way. Furthermore, the conduct of research would be enhanced by drawing on the experience that agroforesters have been accumulating. Involving landholders and extension agents in the design and conduct of research would help to improve both the relevance of the research and the wider uptake of its results.

Research priorities at a national level have been identified in recent publications (ACCM International, 1998; Race and Robins, 1998). Major information gaps at State level were noted in Chapter 3 above. The JVAP was documented to research program through the Five Year Strategic Plan. The plan was developed in consultation with a wide range of stakeholders. The program has also recently held a 'Stakeholder Consultation and Information Exchange Meeting' to facilitate exchange of information between researchers, extension agents and landholders.

**Recommendation 3. To facilitate both research and extension, there should be close collaboration between researchers, extension agents and landholders in the design, conduct and application of research on agroforestry.**

#### **4.4 A whole-of-government approach**

Because agroforestry involves ecological and economic interactions between the tree and non-tree components of the farming system and can have ecological impacts at catchment and wider levels, agroforestry extension must take account of contextual issues. While agroforestry extension has its own primary focus, it should coordinate appropriately with other forms of agricultural extension. There should be a whole-of-government approach within each State and region to the design and implementation of publicly funded extension programs in general and agroforestry extension programs in particular.

There are variations from State to State in the extent to which this already occurs. Victoria comes closest to this ideal through the Catchment and Agricultural Services division of the Department of Natural Resources and Environment. This provides a framework for the delivery of integrated extension services at a regional level. Statewide coordination of policy for agroforestry extension is achieved through a small Private Forestry Unit, located in Melbourne. In other States, there are varying degrees of separation and coordination between two or more government agencies providing extension services for agriculture and/or agroforestry.

A whole-of-government approach does not necessarily imply that all extension activities should be undertaken within the one agency. It does imply that agencies, and sections of agencies, should work cooperatively to reach extension goals. Whole-of-government extension for agroforestry typically requires active collaboration between forestry professionals and agricultural professionals – or else it needs professionals that are sufficiently familiar with both fields to be able to transcend the barriers that often separate them. To be effective, it also requires that adequate resources be devoted specifically to agroforestry, because the time scales, technologies and management requirements for treegrowing are distinctly different from those of most other agricultural commodities.

Because the structural separations take different forms in different States, the application of a whole-of-government approach will have different specific implications from one State to another.

In Western Australia, the main challenges are to achieve effective coordination between Agriculture Western Australia (Agriculture WA) and the Department of Conservation and Land Management (CALM), as well as within each of these agencies. While considerable advances in these respects have been made in recent years, there is a need for on-going attention to these issues. The relationship between the agencies is complicated by the internal structures of each of them. Within CALM, there is a structural division between the Farm Forestry Unit on the one hand and CALM Bluegum and Maritime Pine Sharefarming on the other. Valuable technical and economic information held by CALM's commercial arm is not necessarily available to CALM's Farm Forestry Unit, and thus cannot be shared with Agriculture WA. Within Agriculture WA, farm forestry extension is one form of extension among many; staff engaged in extension for more traditional agricultural enterprises are not necessarily convinced of the merits of farm forestry.

Because ForestrySA has a predominantly commercial focus, there is an appropriate structural separation between Primary Industries and Resources South Australia (PIRSA) and ForestrySA. Nevertheless, ForestrySA also delivers some farm forestry extension or advisory services. PIRSA does the latter too. There is thus an on-going issue as to the way in which

these two organisations should relate to each other in farm forestry extension. Within PIRSA, there is the further issue of coordination between farm forestry extension and other extension programs.

Private Forests Tasmania is the main agency for farm forestry extension in that State. A key issue is its coordination with the Department of Primary Industries, Water and Environment, which deals with other forms of agricultural extension, including the Farmwi\$e (Property Management Planning) program.

Until recently, no State agency in New South Wales was much involved in farm forestry extension. A Farm Forestry Advisory Unit has now been established within NSW Agriculture and a Private Forestry Unit has been set up within State Forests of NSW. The CEOs of these two departments have signed a Memorandum of Understanding committing their agencies to coordinate their farm forestry activities on a State and regional scale. The Minister for Forestry and the Minister for Agriculture/ Minister for Land and Water Conservation have also signed a Memorandum of Understanding concerning the need for a coordinated approach for the expansion of new planted forests to help manage dryland salinity. Meanwhile, a NSW Farm Forestry Working Group, consisting of representatives from NSW Agriculture, State Forests of NSW, the Department of Land and Water Conservation, Greening Australia NSW and Australian Forest Growers, together with coopted members from the NSW Farmers Association, Plantations Australia, and Boral, plus one representative of the Regional Plantation Committees, has been working on a plan to develop a more coordinated and strategic approach to farm forestry in New South Wales. It remains to be seen whether a comprehensive whole-of-government approach will emerge from this exercise.

Compared to New South Wales, Queensland has a longer record of State agency involvement in farm forestry extension. Activities have, however, been fragmented by the separation of the Department of Natural Resources (DNR) from the Department of Primary Industries (DPI) in 1996. The Environment Protection Authority (the very recently established successor to the Department of Environment and Heritage) is another government agency with an interest in farm forestry, but mainly for regulatory reasons. DNR and DPI have recently been reviewing their roles in farm forestry. Again, it remains to be seen whether a comprehensive whole-of-government approach will result from these reviews.

As the structure of government is smaller and less complex in the Northern Territory than in most of the States, problems of achieving a whole-of-government approach to farm forestry are not likely to be so difficult. The Department of Primary Industries and Fisheries (DPIF) is the primary government agency involved in extension both for farm forestry and for agriculture more generally. DPIF is already working with other relevant departments to formulate a code of practice for forestry, including farm forestry.

In developing and implementing a whole-of-government approach, unnecessary duplication or overlap with the work of non-government agencies and the private sector should be avoided. This decision will not always be straightforward, as some non-government organisations such as Greening Australia depend heavily on Commonwealth government funding for their activities in agroforestry, and some commercial organisations (including commercial arms of government agencies) might have vested interests rather than offering unbiased advice.

Likewise, the development of a whole-of-government approach should be seen in the context of the other recommendations of this report. For example, institutional changes may be

needed in some agencies to ensure that they foster a culture of continuous learning both within the agency and within the farming communities that they serve. Similarly, it is important that government advisory services be established in such a way that they are perceived to be completely independent of any commercial interest that the government agency may have.

**Recommendation 4. To achieve maximum efficiency and effectiveness, a whole-of-government approach should be developed in each State for the design and implementation of publicly funded extension programs. This approach should also take account of the capacity of the private sector and non-government organisations such as Greening Australia to provide extension and advisory services.**

#### **4.5 Dealing with diversity**

Recent research by Scott (1998a and 1998b), Schirmer (1998 and 1999) and Emtage and Specht (1998), as well as evidence from participants in our focus groups, confirms that landholders fall into various categories in relation to agroforestry. Some are early adopters, some have considered the possibility but have not yet adopted, some have not thought about the possibility, others have specifically rejected it. Landholders also vary in characteristics such as age, formal educational attainments, size of landholding, length of ownership, level of equity in the land, types of agricultural enterprises, farming styles, attitudes towards risk, orientation towards conservation, and off-farm income.

Available evidence suggests that some of these characteristics are more likely than others to be associated with early adoption of agroforestry. For example, substantial off-farm income tends to be positively associated with adoption (Scott, 1998a; Emtage and Specht, 1998). So, too, does a greater than average interest in conservation issues (Emtage and Specht, 1998).

Other characteristics have a more complex relationship with adoption. For example, Emtage and Specht (1998) found that although younger landholders are more likely than older landholders to adopt agroforestry, some older landholders do so in order to reduce the workload of managing their properties. Scott (1998a) found that early adopters of farm forestry had generally owned their land for either less than 5 years or more than 10 years. Those in the former category generally had small holdings (less than 100 hectares) and saw their properties as too small for conventional farming operations. Those who had owned their land for more than 10 years were more likely than those in the former category to have farms of a commercial size, to be full-time farmers, and to consider a full range of agroforestry options, including those that utilise outside capital.

Whilst one must be cautious about assuming that what applies in one region will necessarily apply in another, findings such as these suggest various ways in which potential early adopters can be identified and targeted in extension programs. There is a need for further investigation and experimentation on ways in which programs can best be targeted to reach other segments of the farming population. For example, as noted below, some approaches will be more useful in serving the learning needs of established growers than in attracting potential new ones. Likewise, different approaches or emphases may be necessary in different agro-ecological zones. Consequently, a wide range of activities is needed to meet the needs of different categories of people.

**Recommendation 5. Extension and advisory strategies should take account of the diverse capacities, experiences, resources and needs of landholders and other people who are, or who could become, involved in agroforestry. Extension program planners should specify the categories of people being targeted in each program, and why.**

#### **4.6 Factors influencing success**

Guijt and Race (1998) identified seven common factors critical to the success of farm forestry in 18 cases they studied around Australia. In each of these cases, the landholders had the following characteristics:

- *They were willing and able to take and manage risks.* They committed sufficient time, labour, finances and/or natural resources to develop farm forestry. They managed risks by seeking diverse outputs/benefits from farm forestry and, in some cases, by sharing costs/returns with industry or government partners.
- *They played an active part in research and development.* They engaged in continual learning, adaptation and experimentation to identify and grow a high quality product.
- *They engaged in regular exchange of information with fellow tree-growers and experimenters,* through active participation in farm forestry networks and other entrepreneurial groups, training courses, and the like.
- *They recognised the link between farm forestry and farm viability.* Although some did not invest in farm forestry primarily for economic returns, all expected it to improve overall property viability for economic, environmental or social reasons.
- *They know the potential of their property thoroughly.* To make informed decisions, they sought to understand soil types, drainage, climate patterns, existing vegetation and species performance.
- *They developed links with government and/or industry,* for advice, research findings, funding and/or markets.
- *They sought to contribute to long-term community benefits,* such as better rural landscapes, improved water quality and increased biodiversity.

It is reasonable to assume that the greater the capacity of extension programs to facilitate the above behaviours, the greater the likelihood that farm forestry will be successfully adopted.

**Recommendation 6. Extension strategies for agroforestry should aim to strengthen the capacity of landholders to:**

- **deal appropriately with risks;**
- **play an active part in research and development;**
- **engage in regular exchange of information with fellow tree-growers and experimenters;**
- **recognise the link between farm forestry and farm viability;**
- **know the potential of their property thoroughly;**
- **develop appropriate links with government and/or industry;**
- **contribute to long-term community benefits.**

## 4.7 Identifying economic and other benefits

Whilst various factors such as those discussed in Chapter 1 can influence the speed with which landholders adopt innovations, the final level of uptake depends primarily on the extent to which the innovation serves landholders' objectives. As already noted, these objectives can be quite diverse. They may include environmental and social goals as well as economic ones. Although individual landholders may differ in the extent to which they accord primacy to economic considerations, there is good reason to believe that the rate of adoption is closely related to the level of perceived economic benefits. Of the factors that Cary and Wilkinson (1997) examined in a recent Australian study, perception of long-term profit was the most important determinant of farmers' decisions to plant trees.

It is important, therefore, that extension agencies present credible economic information in such a way that landholders and other potential investors in agroforestry can make informed decisions. The same applies to information on likely environmental and social impacts. Campbell White & Associates and Black (1999) have undertaken detailed economic analysis for ten case studies in various parts of Australia. For each property, they estimated net farm income over an extended period with and without the forestry enterprises, taking account of the income earning capacity of the trees and the income earning capacity of whatever they displace from the land. If trees can earn more income than an alternative enterprise on the same piece of land, then it makes sense to plant trees. If, however, trees would earn less income than an alternative enterprise on the same piece of land, then the landholder may need to consider whether the return from trees would be adequate and whether environmental and social benefits would counterbalance the income forgone.

Additional economic considerations arise from the long-term nature of the investment. Agroforestry is usually characterised by high establishment costs, some relatively small annual management costs, and often 10 years or more before any income is derived. Establishment costs, coupled with loss of immediate income from land taken out of other production to plant trees, can significantly reduce farm cashflow from the time of establishment until harvesting begins. Various ways of dealing with this cashflow problem should be considered by landholders. At harvest, income averaging for tax purposes may be necessary to deal with large lump sums of income.

Issues such as these should be addressed in extension and advisory programs. One way in which specific segments of the farming population could be targeted is by preparing and disseminating further case studies of the economic, environmental and social impacts at whole farm level of agroforestry projects undertaken by specific landholders in a particular industry or region. Such analyses would depend upon the availability of adequate farm records and the willingness of landholders to participate. Extension agencies should encourage landholders to maintain such records, not only to monitor the biophysical progress of their agroforestry enterprises but also to enable adequate financial projections and analyses.

**Recommendation 7. Case studies providing objective analysis of the economic, environmental and social impact of agroforestry at whole farm level should be used to inform landholders and other stakeholders of its potential benefits. These case studies should include information on outcomes under various scenarios, and on ways of managing risks.**

#### 4.8 'Best bet' versus 'diagnosis and design'

There is a fairly fundamental cleavage between two approaches to agroforestry extension. One approach, which tends to be favoured by many professional foresters, is to identify one or two preferred tree species for a particular region and present these as 'best bets' for landholders to adopt. This approach is consistent with the prevailing emphasis in industrial forestry on monocultural plantations for wood production. If the 'best bet' recommendations are generally adopted in a particular region, economies of scale may be achieved in the production, harvesting and marketing of the wood. If, however, the market situation for that particular type of wood deteriorates, those who have adopted the 'best bet' could lose out in the long run.

An alternative approach, which is adopted in the Master TreeGrower Program, is to involve landholders much more actively in choosing agroforestry designs that suit their diverse goals and circumstances. Consequently, emphasis is placed on providing landholders with a broadly based framework for understanding issues relevant to agroforestry design. Implicit in this 'diagnosis and design' approach is a much wider array of options than those presented in 'best bet' approaches. Wood production is not the only goal considered. The Program also allows for the possibility that a landholder might decide to target a niche market, such as the market for high grade specialty cabinet timbers.

Both these approaches have advantages and limitations. The narrow range of options presented in the 'best bet' approach may simplify decision-making and, under favourable circumstances, enable economies of scale to be achieved. However, the 'best bet' options may not include some possibilities that would better suit the needs, aspirations and resources of particular landholders. The 'diagnosis and design' approach does better in this respect but may use 'best bet' options as one source of information. It tends to require a greater time commitment than some landholders are willing to give. Insofar as it actively involves landholders in understanding and applying basic principles, the 'diagnosis and design' approach contributes more effectively to the development of a culture of continuous learning about agroforestry.

**Recommendation 8. Although a 'best bet' approach can provide one source of information relevant to agroforestry, a 'diagnosis and design' approach is likely to consider a wider array of options. The 'diagnosis and design' approach encourages landholder ownership of decisions and also contributes more effectively to the development of a culture of continuous learning about agroforestry.**

#### 4.9 Targeting additional audiences

Landholders are not the only people who may have an actual or potential involvement in agroforestry or who may influence landholders' decision-making. Other individuals and organisations that may need to be targeted by extension agencies include:

- potential investors, whether institutions, corporations or individuals;
- agricultural consultants, forestry consultants, and extension agents dealing with other farm enterprises;
- accountants and other financial advisers;
- local governments and other land use planning agencies;
- stock and station or real estate agents;

- tree nursery operators;
- equipment operators and contractors;
- suppliers of other inputs;
- other members of the local community.

Because landholders' decision-making is influenced both by specific information and advice they receive from professional and other sources and by the general climate of opinion within the community, it is important that these sources of information and influence be well-informed rather than ill-informed. Consequently one of the challenges confronting extension agencies is to ensure that there is an adequate understanding of agroforestry within each of these segments of the community.

Lifting the general level of understanding of agroforestry within the community can probably best be achieved using various mass media and public events such as Agroforestry Expo. This is a task that Regional Plantation Committees could undertake in conjunction with other agencies.

Other extension programs should be designed to target specific audiences. For example, seminars for investors, accountants, real estate agents and financial advisers should focus primarily on economic aspects of agroforestry. By contrast, workshops for small-scale nurseries could deal with the latest nursery technologies, nursery hygiene, plant diseases, and the like. Training programs for earthworks contractors, planting contractors or harvesting contractors would be different again.

Because not all agricultural consultants, forestry consultants, and extension agents dealing with other farm enterprises are knowledgeable of, and sympathetic to, agroforestry, a concerted effort is needed to disseminate relevant information to them. The same is true of local government and other land use planning agencies.

**Recommendation 9. Some agroforestry extension programs should be specifically targeted at:**

- **potential investors, whether institutions, corporations or individuals;**
- **agricultural consultants, forestry consultants, and extension agents dealing with other farm enterprises;**
- **accountants and other financial advisers;**
- **local governments and other land use planning agencies;**
- **stock and station or real estate agents;**
- **tree nursery operators;**
- **equipment operators and contractors;**
- **suppliers of other inputs;**
- **other members of the rural community.**

#### **4.10 The extension and advisory spectrum**

Chapter 2 examined the literature on various models of agricultural extension, identifying major strengths and limitations in each of these. It was argued that no single model is likely to be sufficient by itself. This conclusion has been amplified in subsequent chapters, which have dealt more specifically with extension and advisory strategies for agroforestry.

**Recommendation 10. Extension and advisory strategies should include provision for each of the following, though these may not necessarily all emanate from the one agency:**

- **information access and technology transfer;**
- **one-to-one advice or information exchange;**
- **formal or structured education and training;**
- **group facilitation and empowerment.**

More detailed recommendations on each of these are provided below.

#### **4.11 Information access and technology transfer**

A recurring theme emerging in this study was that although information relevant to agroforestry is held by various agencies and individuals, this information is not always readily accessible. There was also a recognition that there are significant gaps in available information and that these gaps need to be addressed in research.

Our recommendations are based on the assumption that an ‘information rich’ environment is preferable to one that is ‘information poor’, despite the fact that the former can sometimes involve problems of information overload or conflicting information. An issue for agroforestry extension will be to foster a learning environment that helps to impart skills and understanding needed to locate, evaluate, integrate and apply information from diverse sources.

##### ***Television, radio and the rural press***

Raising awareness is an important first step in the hierarchy of information provision. Producers of the Landline television program, with a weekly audience ranging from 250,000 to 450,000, have discovered that there is considerable interest in stories that deal with new forms of farming enterprise, such as agroforestry. There are also opportunities to raise the profile of agroforestry by means of rural radio and country newspapers, as well as by articles in specialised farm periodicals such as *Stock and Land*, *The Weekly Times*, *The Land*, *Queensland Country Life*, *The Stock Journal*, *Elders Weekly*, *The Countryman*, *The Tasmanian Country*, *Farming Ahead*, *Australian Landcare* and *Australian Farm Journal*.

Regular reporting in the media of market trends for wood and non-wood commodities derived from trees would likewise contribute to wider awareness of the economic potential of agroforestry.

**Recommendation 11. Television, radio and the press should each be used to raise awareness of agroforestry.**

### ***Information sheets and booklets***

Television, radio and newspapers have very limited usefulness in dealing with the more detailed information required for successful agroforestry. A commonly used method of providing such information is through information sheets or booklets dealing with specific subjects such as species selection, planting configurations, site preparation, planting techniques, pruning, thinning, pest management, log specifications, harvesting, and marketing. Provided that they are carefully prepared and well designed, such publications have the advantage that they can convey reliable information relatively inexpensively and they can be consulted by the grower as occasion requires. However, they need to be reviewed regularly to ensure that the information they contain is as up-to-date as possible. Print media design characteristics preferred by farmers were outlined in Chapter 2.

**Recommendation 12. Well prepared publications, some of which are regionally specific, should be used as a cost-effective way of making basic information on agroforestry available to large numbers of people.**

### ***Specialised periodicals***

*Agroforestry News* is a good source of information on recent research and publications relevant to farm forestry, as well as on forthcoming events. With a quarterly circulation of 5500, this periodical reaches most persons associated with one or other of the 27 or so regional agroforestry networks in Australia, as well as farm forestry extension agents and researchers. A recent analysis indicated that the distribution was approximately as follows: Victoria 50%, New South Wales 20%, South Australia 15%, Western Australia 10%, Queensland 2%, Tasmania 2%, Northern Territory 1%.

Other periodicals containing useful information include *Australian Forest Grower* (circulation: 1500) and *Shaping the Future with Farm Forestry* (circulation: 1150). Some extension agencies or agroforestry networks have a local insert that is distributed with *Agroforestry News* or a newsletter that is distributed independently. Most notably, a newsletter produced by the Southern Queensland Farm Forestry Development Committee has a statewide circulation of 1600. Although not comparable in scope, this newsletter makes up to some extent for the relatively small circulation of *Agroforestry News* in Queensland.

**Recommendation 13. Specialised periodicals such as *Agroforestry News* and *Australian Forest Grower* should continue to be used for the dissemination of up-to-date information to growers. Of these, *Agroforestry News* currently has the largest circulation.**

### ***The Internet***

The Internet is an increasingly utilised communication tool in agricultural extension. This technology provides considerable flexibility to landholders in that individuals are able to seek information at their convenience. As noted in Chapter 2, the Internet is currently accessible only to those who have adequate phone lines and appropriate computer equipment. Both these requirements are increasingly being met. Da Rin and Groves (1998) have estimated that about half the farming population will have an Internet connection within the next few years. In the focus groups for the present study, many farmers suggested that the Internet should not be used extensively as a tool for communication of information about agroforestry. However, as technology used in the Internet continues to improve, as costs of access stabilise or decrease,

and as the range of information accessible via the Internet increases, so will there be increased usage of this tool by farmers. The challenge to research and extension agencies is to expand the range of information available through the Internet and to update it regularly.

Almost all final reports of R&D projects funded in recent years by the Joint Venture Agroforestry Program are now available on the RIRDC website. Of the State government agencies, those in Queensland and Western Australia have currently gone furthest in placing farm forestry material on their websites. Brief details of these were given in Chapter 3. The Master TreeGrower website at the University of Melbourne contains a wide range of relevant material and has hyperlinks with many other useful sites. Electronic versions of publications such as *Agroforestry News* and *Australian Forest* are not currently available on the Internet. For over two years, information has been lacking for New South Wales, Western Australia and the Northern Territory in the 'Who's Who Directory' of people, organisations and networks relevant to farm forestry, as listed on the AFFA website.

**Recommendation 14. Research findings, government reports, and publications on technical and economic aspects of agroforestry should routinely be made available not only in printed form but also on appropriate World Wide Web sites. There should be hyperlinks to other relevant sites. The use of the Internet to form e-mail newsgroups and other communication networks among agroforesters, extension agents and researchers should also be encouraged.**

#### ***Computer based decision support tools***

Because agroforestry is a complex enterprise with various possibilities and lengthy time horizons, adoption and management decisions are sometimes difficult. In Chapter 3, reference was made to computer based decision support tools that have been developed to assist in this process. Only a small minority of farmers currently make direct use of such tools. Uptake is likely to increase as these tools become more powerful and more user friendly and as farmers become more computer literate. In the meantime, professional advisers and extension agents will be the main users.

**Recommendation 15. Computer based decision support tools relevant to agroforestry should continue to be developed and, as far as possible, made more user-friendly.**

#### **4.12 One-to-one advice or information exchange**

Despite the development of group-based methods of extension, there is a continuing demand for one-to-one advice or information exchange on agroforestry. The results presented in Chapter 3 indicate that landholders would generally like to have greater access (preferably free) to one-to-one advice. This form of extension provides an opportunity for landholders to secure information tailored to their own particular situations.

Agencies engaged in agroforestry extension vary in the extent to which they provide such advice. Most provide brief individual advice in response to telephone calls or over-the-counter enquiries. Often this will involve directing the enquirer to available literature or other relevant information sources. The Call Centre of the Queensland Department of Primary Industries has an operator who can deal with some routine enquiries on forestry issues or who refers enquirers to designated contacts in or outside that Department. In some States, Agriculture Departments or their equivalents offer an Agfax enquiry service. Such services

could, in principle, be expanded to include agroforestry. The proposed National Farm Forestry Information Service may fulfil a similar role.

Some agencies, such as Primary Industries and Resources South Australia, CALM in Western Australia, and Greening Australia in various parts of the country, employ extension or advisory officers who are available to offer one-to-one on-farm advice. So, too, do some farm forestry networks such as the Oil Mallee Association in Western Australia, the North-East Forest Growers Cooperative in Victoria and Murray-Riverina Farm Forestry in New South Wales. Government business enterprises or private organisations offering joint venture schemes are also involved in providing one-to-one advice to landholders.

In Chapter 2 there was a discussion of the reasons why, in many parts of the world, extension agencies that previously offered one-to-one advice have tended to reduce or withdraw from this role or have adopted the principle of user pays. Agroforestry extension in Australia has not been exempt from this trend, although the impact has been softened in some places because of the recognition that treegrowing can serve conservation objectives at catchment and wider levels as well as being profitable for growers. That is, public and private benefits are being achieved. This is justification, in specific areas, for delivery of one-to-one advice by publicly funded services.

There is a valid concern that advice provided by organisations that have vested interests, such as forest companies or government business enterprises, may not necessarily be in the best interests of landholders. For example, forest companies or government business enterprises offering annuity schemes might recommend tree-growing on land that is highly productive for other enterprises, whereas the interests of landholders might be better served if they were to plant trees on land that is less productive for other enterprises. It is important, therefore, that independent and unbiased advice be available from extension agencies or private consultants. It is also important that the persons offering such advice have the knowledge and skills needed to do so.

**Recommendation 16. Qualified, independent, one-to-one advisory services on agroforestry should be available. Although some agencies are currently providing personalised services without charge, the trend is toward the provision of one-to-one advice either by private consultants or on a cost recovery / fee for service basis. Nevertheless, because of the public benefits associated with agroforestry, a case can be made for subsidisation of some one-to-one advisory services.**

#### **4.13 Formal or structured education and training**

The integration of agroforestry into current farming systems requires an investment in education and training by a range of stakeholders. Opportunities for structured learning are needed at a variety of levels.

Melbourne University's Graduate Certificate in Forest Science (Farm Forestry), details of which were given in Chapter 3, is particularly suited to extension workers, consultants and other information providers, as well as landholders seeking a formal qualification. This course has been offered in various locations throughout Australia.

The Master TreeGrower Program is a flexibly structured learning program that aims to foster in rural communities a culture conducive to agroforestry, by providing participants with relevant knowledge and experience, by developing their confidence in decision-making, and

by encouraging the flow of information and experience from participants to other landholders in their region. Although the Program has no formal accreditation as an academic or skills training course, it has generally been well received by participants wherever it has been conducted. The course complements, rather than replaces, local field days that might deal with issues such as site preparation, or training courses on topics like tree pruning, chainsaw use or pruned stand certification.

In some States, work has been done on the development of modules on agroforestry for inclusion in Property Management Planning (PMP) workshop programs. These programs take different names in different States: Better Business in Western Australia; Farm\$mart in Victoria; Future Profit in Queensland; Farmwi\$e in Tasmania; Farming for the Future in New South Wales; and Property Management Planning in South Australia and the Northern Territory. PMP uses a strategic planning process to help landholders assess their situation, determine their goals, decide how best to reach these, and monitor their progress. Participants identify issues on which they would like to learn more. These could include general topics such as financial planning, succession planning, or conflict resolution within the family, as well as specific topics relating to their current farm enterprises or possible new ones. Agroforestry could, in principle, be included.

The approach taken in PMP programs is intended to be integrative, adaptive and contextually relevant. Hence, program modules must be flexible enough to deal with a wide variety of situations. PMP program facilitators need to consider whether modules on agroforestry should be developed or whether to recommend the Master TreeGrower Program or some other short course instead. If agroforestry is largely invisible in PMP programs, landholders might give little attention to this option.

Other short courses that are available include those offered in Victoria by the Rural Industries Skill Training Centre at Hamilton, and in New South Wales by the Subtropical Farm Forestry Association at Lismore, the Coombell Farm Forestry Centre near Casino, and the Murrumbidgee College of Agriculture at Yanco. The form of these varies from a one day (Yanco) or two day (Coombell) intensive course, to six days spread over six months (Lismore), or 3 hours per week over 13 weeks (Hamilton). Likewise, the content varies, depending on the location. For example, the Yanco course focuses on irrigated agroforestry, whereas the Coombell course gives particular though not exclusive attention to management of regrowth, especially in somewhat drier areas. The course in Lismore focuses more on the use of coastal species and production of cabinet timbers. Other locally focused programs have been conducted by various agroforestry networks.

There is also a need for training programs covering relevant ‘hands on’ skills such as those associated with site preparation (e.g. earth works, ripping, mounding, fencing), silviculture (e.g. planting, monitoring, pruning, thinning, pest control), harvesting (e.g. tree selection, felling, transporting) and plant operation (e.g. tree planters, cherry pickers, chainsaws, harvesters). Such programs are needed both for landholders who will perform these operations and for contractors. Where there is sufficient demand in a particular locality, various training agencies may be approached to provide training and assessment of competencies such as these. Regional Plantation Committees, agroforestry networks and cooperatives could be vehicles through which the local demand for such training can be estimated and approaches made to training agencies.

As already noted, the Melbourne University Graduate Certificate Course in Forest Science (Farm Forestry) and the Master TreeGrower Program are delivered from time to time in

selected locations around Australia. There would also be scope for the development of a home study course on agroforestry. Tocal Agricultural College in NSW has a home study course on Trees on Farms. This course does not deal in a comprehensive way with agroforestry options. The course could be rewritten, or another home study course developed, to do this. Especially if available in modular form, such a course would be useful for landholders unable to attend a Master TreeGrower Program.

There are two somewhat related issues that could affect future arrangements for formal or structured education and training for agroforestry. The first relates to participants' eligibility to receive the benefits of a rebate under the FarmBis scheme for part of the fees incurred for a particular education or training program. In at least some States, rebates are payable only to *bona fide* farmers (defined as working at least half-time on the farm and deriving at least half of their income from the farm) for part-time or short courses offered by a training provider registered with the agency administering the FarmBis scheme in that State. Course organisers may need to take this requirement into account. Furthermore, at the time of writing, it was not clear which types of training courses would be subject to GST and which would be exempt. The final decision on this could influence the cost of various extension and training programs in the future.

**Recommendation 17.** In addition to events such as field days and Agroforestry Expo, there should be an array of opportunities for formal or structured education and training relevant to agroforestry, including the following:

- university courses such as Melbourne University's Graduate Certificate in Forest Science (Farm Forestry);
- short courses such as the Master TreeGrower Program, appropriate modules in Property Management Planning programs, and other local or regional courses;
- training programs covering relevant 'hands on' skills such as those associated with site preparation (e.g. earth works, ripping, mounding, fencing), silviculture (e.g. planting, monitoring, pruning, thinning, pest control), harvesting (e.g. tree selection, felling, transporting) and plant operation (e.g. tree planters, cherry pickers, chainsaws, harvesters, etc.);
- home study courses.

#### **4.14 Group facilitation and empowerment**

For reasons both of equity and of efficiency, most publicly funded extension agencies tend, at least officially, to prefer group-based methods of extension rather than providing personalised advice. In Chapter 2, there was an examination of the advantages and limitations of group-based methods. Some group methods, such as field days, fall primarily under the heading of information access and technology transfer. Group methods may also be used in various forms of formal or structured education and training. Group facilitation and empowerment are most fully developed where on-going groups set their own goals and members are actively involved in accomplishing those goals. Such groups have the potential to:

- develop and maintain a culture of continuous learning;
- draw on the accumulated skills, knowledge and experience of all participants, as well as on skills, knowledge and experience from outside the group;
- contribute effectively to the solution of community problems such as salinity;
- engage actively in experimentation, local innovation and adaptation;

- achieve economies of scale in various operations such as purchasing inputs, employing contractors or consultants, harvesting and marketing;
- provide greater public visibility for farm forestry, thereby encouraging others to consider this option.

Nevertheless, as noted in Chapter 2, landholders vary in their propensity to participate in groups. Some prefer to keep to themselves. Others who are sympathetic to group activities may already be heavily involved in other groups or may have work or family commitments that make it difficult for them to participate. Landholders are likely to weigh up the costs and benefits of group participation. This is one of the factors impelling some farm forestry networks in the direction of establishing growers' cooperatives that offer marketing advantages to members. It is also one reason why some cooperatives are either offering, or planning to offer, one-to-one advisory services to members.

Farm forestry extension agents could, in principle, work with various types of groups. They could, for example, work with existing landcare or catchment groups, or with existing commodity-based groups (e.g. groups of dairy farmers or prime lamb producers). Provided that such groups see agroforestry as consistent with, or complementary to, members' existing enterprises, these groups may provide a forum for disseminating initial information about agroforestry. However, it is unlikely that such commodity groups would be willing to become vehicles for on-going agroforestry extension. Landcare groups offer more prospects for this, though most would probably not wish to make agroforestry their only focus.

For more advanced learning about agroforestry, specialised groups or networks are needed. The Master TreeGrower Program has both built upon, and contributed to a strengthening of, regional agroforestry networks. These networks, in turn, have begun to accumulate knowledge relevant to their region and are contributing to the development of a wider awareness of agroforestry through events such as Agroforestry Expo.

Where local or regional groups are involved in experimentation, it is important that rigorous research designs are used and that the results of the research are disseminated, not only within the region but also through publications such as *Agroforestry News*. Such reports should include information about the particular agro-ecological zone in which the research was conducted, so that readers can take this into account in deciding whether the results are likely to be applicable in their situation.

**Recommendation 18. Participatory methodologies involving group facilitation and empowerment should be major elements in publicly funded extension programs for agroforestry.**

#### **4.15 Knowledge and skills required by extension agents**

To prepare publications, provide one-to-one advice, conduct structured learning programs or work with groups, extension agents need appropriate education and training. It is unreasonable to expect that each agent will know everything that is to be known about agroforestry. It is more realistic to expect that extension agents will have a sound general framework of technical and economic knowledge about agroforestry and will know where additional information can be sought to fill the gaps. Sometimes these gaps can be filled by experienced landholders, sometimes by other extension agents, sometimes by researchers. In addition, extension agents need skills in communication, team work and group facilitation,

together with a good understanding of adult learning principles, rural communities, and program planning and evaluation (Straw, Stubbs and Mullaney, 1996).

On the technical side, the Graduate Certificate in Forest Science (Farm Forestry) offered by Melbourne University is recommended for extension agents and consultants. With reference to other skills and knowledge required by extension agents and consultants, Straw, Stubbs and Mullaney (1996) provide a useful comparative evaluation of rural extension training courses. Some agencies also have in-service training programs to develop staff competence in extension methods. Many of the most innovative methods are described in the two volumes of Proceedings of the 2nd Australasia Pacific Extension Conference, held in Albury, NSW, in November 1997. A careful study of these Proceedings would be found beneficial by agroforestry extension agents and could usefully inform in-service training programs. So, too, would membership of the Australasia Pacific Extension Network Inc. (<http://life.csu.edu.au/apen/about.html>), which provides a communication and support network for extension professionals, conducts conferences and workshops, and issues a quarterly newsletter, *ExtensionNet*, containing news, case studies, information on extension theory and practice, and details of forthcoming events.

**Recommendation 19. In the recruitment and on-going professional development of extension agents, attention should be given to the need for competence in technical and economic aspects of agroforestry and also for skills in communication, teamwork and group facilitation, together with a good understanding of adult learning principles, rural communities, and program planning and evaluation.**

#### **4.16 Maintaining agroforestry extension and advisory programs**

Time, skilled facilitation and resources are all required for groups to set goals, implement actions, review their performance and adjust accordingly. Some people currently working in extension for agroforestry are employed on relatively short-term contracts, often funded by the Farm Forestry Program (now administered as part of the Natural Heritage Trust). At least four questions follow from this:

- Do these conditions of appointment lead to undesirable levels of staff turnover and discontinuity of effort?
- Are agencies likely to continue funding agroforestry extension positions and programs?
- Are facilitators enabling groups to become self-reliant in the long term?
- What will happen if funding from the Natural Heritage Trust ceases?

Obtaining detailed answers to these questions would require data gathering that is beyond the scope of the present project. It is important that policy makers address these questions in the near future, lest the current impetus in farm forestry extension be lost.

Given the high public benefit associated with the national goals of preventing or ameliorating salinity and other forms of land degradation, achieving the targets identified in *Plantations for Australia: the 2020 Vision*, and meeting Australia's international obligations to deal with greenhouse gas omissions, a strong case can be made for continued public funding of agroforestry extension programs.

At least two possibilities have been suggested if public funding is not maintained:

- Government agencies or non-government organisations could offer extension and advisory services on a cost-recovery or fee-for-service basis.
- Grower cooperatives or other landholder groups could employ staff or consultants to provide extension and advisory services to members.

Whilst initiatives such as these may provide a substitute for some existing programs, it is debatable whether they would be adequate to achieve the national goals mentioned above.

**Recommendation 20. Policy makers should give urgent consideration to maintaining or expanding funding for farm forestry extension and advisory programs, in order to achieve the substantial public benefits associated with an increase in well-informed adoption of agroforestry.**

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## 6. Appendices

### 6.1 Appendix A: Interview schedule

#### *Extension and advisory personnel personal interview questions*

1. What is your role and how are you connected with farm forestry/agroforestry? What proportion of your work is extension or extension related? PMP person: How much do you promote farm forestry within PMP?
2. What specific extension methods are being used for farm forestry in this region? Maybe you could list them in order of importance. (What about field days, discussion groups, publications, media releases, radio, television, software packages, Internet?)
3. Have you received or passed on information about farm forestry from other states or regions? How useful is it? Is it being used? How?
4. How flexible are existing farm forestry extension approaches? Can they be molded to suit different situations?
5. To what extent do existing extension programs cover the full range of skills and knowledge needed for successful farm forestry? (Identify gaps).
6. For farm forestry, what is the current balance between top-down (big brother) types of extension and bottom-up (grass roots) approaches such as action learning/research? What do you see as the ideal balance between these approaches?
7. What sources of technical information do you use when planning extension programs or giving advice about farm forestry? What about financial and economic information? How adequate do you find these to be?
8. Keeping in mind the audience for farm forestry information, how appropriately is the information designed, written and targeted to meet the audience's needs?
9. To what extent do extension programs advise people of the potential risks of farm forestry or in other words to what extent do you advise people of *credible* opportunities?
10. Have any surveys been done on the impacts of various farm forestry extension or advisory programs in this State? If so, can we get a copy of the results? Have any extension efforts been altered in the light of reviews or feedback - how?
11. We're interested in discovering gaps in information for farm forestry extension, whether in terms of technical information or of extension materials. Are you aware of any gaps?
12. It appears that farm forestry has developed much more quickly in some regions than others. What explanations are there for this difference? Are there any differences in the extension methods used in different regions?
13. Do you think that different types of extension programs are needed for different regions (e.g. in high rainfall versus low rainfall regions; or among dairy farmers or grain growers; and so on)? If so, what differences in extension methods are needed?

14. Within the one region, do you think that different types of extension programs are needed for different types of farmers (e.g. dairy farmers or cane farmers or progressive farmers or more conservative ones)? If so, what differences in extension methods are needed?
15. In your opinion, what criteria should be used to judge the effectiveness of farm forestry extension programs (e.g. number of people reached, number adopting recommended practices, number of trees appropriately planted, or what)?
16. How appropriate are formal courses such as those offered through TAFE, the Melbourne University Graduate Certificate Course in Farm Forestry, and Master TreeGrower course?
17. We're also interested in extension of farm forestry to other potential stakeholders. What measures are taken to ensure that financial institutions, lending agencies, investment advisers and city councils are aware and knowledgeable about farm forestry?
18. How much coordination is there between public and private information agencies?
19. What are your impressions of the quality and comprehensiveness of advice given by commercial/government advisers?
20. Are you aware of any instances where different agencies or individuals are giving conflicting advice or information about farm forestry? What main issues are at the base of the conflict?
21. How well do government agencies or even sections within agencies coordinate when delivering farm forestry advice and information? Do they ever conflict? What issues are at the bottom of this conflict?
22. In summary then, what suggestions do you have for ways that existing farm forestry extension or information exchange programs can be improved?
23. Is there anything else about farm forestry extension or information transfer that you would like to comment on?

## **6.2 Appendix B: Questions for focus group discussions**

### ***Introduction used by the moderator for all focus groups***

- Hello, I'm xxxxxx xxxxxx from Edith Cowan University in Perth.
- I'm working on a project called 'Developing effective and efficient extension and advisory strategies for agroforestry.'
- The project is funded by the Joint Venture Agroforestry Program and although various government departments are assisting us to conduct the research, we are not officially connected to them in any way.

### **Aims**

- Look at and assess farm forestry information, extension and advisory services in each state.
- Identify any strengths or weaknesses.
- Assess which approaches are most successful.
- Very important that we get input and feedback from people on farms.
- Will also be seeking information from other stakeholders e.g. extension staff, suppliers of inputs, timber mills, investors or potential investors, and so on...
- I have been and will be talking to groups virtually all over Australia.
- Report back to extension staff, advisers and policy makers.
- By July next year we will make the results available and you might see various articles published about it in some of the rural magazines and on the world wide web.

### **Confidentiality**

- Today we will be on a first name basis and any names and information given are used only for this research.
- Questionnaire responses and group discussion are held in strictest confidence - no individual responses are reported

### **Taping**

- I would also like to tape record the session--check with the group that this is OK.
- The reason is that I need to be able to recall the main issues and good ideas that were discussed - I have no need to know who said what.
- Tapes will only be used for this research and then destroyed as soon as it's complete.
- Does everyone feel comfortable with the taping? I'd like to check that it's OK.

- During the discussion, I will pose some key questions and ask you to share your opinions and ideas. We don't need everyone to agree, the idea is to get a variety of opinions.
- Just a reminder that here we are using the terms farm forestry and agroforestry interchangeably to mean the incorporation of tree growing into farming systems for commercial or landcare benefits. This can take many forms: plantations on farms, woodlots, timberbelts, alleys and widespaced tree plantings.

### **Farm forestry focus group questions**

1. First, I'd like us to briefly introduce ourselves and tell us why you grow trees on your farm.
2. If someone asked you about farm forestry, what approach to getting information and getting started would you recommend? What sources of information are there for farm forestry? (Government depts., private consultants, books, media, computers, field days, seminars etc.) How adequate are these various sources?
3. To what extent are individual farmers' knowledge and experience of farm forestry shared with other farmers? How could the sharing of such knowledge and experience best be achieved?
4. How well do existing extension programs cover the full range of skills and knowledge needed for successful farm forestry? (Identify gaps) How well do government agencies or departments coordinate when delivering farm forestry information or advice? Do they ever conflict with each other?
5. Do you think that different types of extension programs are required for different types of farmers e.g. progressive farmers or more conservative ones or dairy farmers or grain growers?
6. If we accept that farm forestry is beneficial to individuals and the community, what do you think are the best ways to promote farm forestry and get more people involved? What could government agencies do? What could private industry do? What could the community do?
7. *Reserve question, time permitting: How many of you have a computer and modem at home? How likely is it that you'll get one sometime in the future? If reliable information sources were available on the Internet or the World Wide Web, to what extent do you think you would use it? How would it rate against other methods of getting farm forestry information?*
8. Before we finish up, is there anything else anyone would like to add - something you may have thought of during the session but didn't get a chance to say?
9. Thank you everyone for coming today, we really appreciate it.

### Focus group questions for persons not engaged in farm forestry

1. First, I'd like you to briefly tell us what your main farming enterprises are. X, would you like to begin?
2. Where do you go for technical information or advice about your current farming enterprises? Advisory officer, an experienced farmer, library, landcare group, Internet, newspaper, ag department, field day... To what extent do you use private sector advisory services?
3. Do you know of any information or advice provided by these sources about farm forestry? *(Remembering that we are using the terms farm forestry and agroforestry interchangeably to mean the incorporation of tree growing into farming systems for commercial or landcare benefits. It can take many forms: plantations on farms, woodlots, timberbelts, alleys and widespaced tree plantings.)*
4. Are you aware of any farm forestry in your area? What proportion of farmers are involved in farm forestry in your area? Is anyone here already doing some farm forestry? Have you considered including farm forestry in your farming system?
5. What do you think farm forestry has to offer? For you, what are some of the barriers to getting into farm forestry? What sorts of things would help to overcome these barriers?
6. If it could be shown that farm forestry is profitable, how would that affect your decision about the possibility of getting involved?
7. Even if there were no immediate commercial benefits but it could be shown that farm forestry has other benefits like salinity and erosion control, stock shelter, wind breaks etc., how would this affect your decision about the possibility of getting involved?
8. [In addition to those things you have talked about] What would it take for you to get involved in farm forestry? What other things would you need?
9. *Reserve question, time permitting: In your experience, how adequate are information and advice from government agencies like Departments of Agriculture or farm supplies outlets? Information quality? Methods of transfer? What would make their information and advice more adequate?*
10. If more adequate information and advisory services about farm forestry were available, do you think this would affect your decision about the possibility of getting involved in farm forestry? Would it make a difference?
11. Before we finish up, is there anything else anyone would like to add - something you may have thought of during the session but didn't get a chance to say?
12. Thank you everyone for coming today, we really appreciate it.

### **Mixed focus group questions**

1. First, let's briefly introduce ourselves and explain what our main farming enterprise is and whether or not you grow trees on your farm.
2. Where do you go for technical information or advice about your current farming enterprises? (Adviser, agronomist, another farmer, field days, consultants, Ag department, journals, Internet).
3. How many farmers in this area are involved in farm forestry or agroforestry? Have any of you considered including some farm forestry into your farm? What does farm forestry have to offer?
4. What sources are there for information and advice about farm forestry? How adequate are they? How do they compare with the way you normally get your farm information and advice? What gaps are there and where do there need to be improvements?
5. If it was shown that farm forestry is profitable, how would that affect your decision about possibly getting involved or getting involved in a bigger way?
6. If there were only landcare and stock or crop shade and shelter benefits from farm forestry, how would this affect your decision about getting involved?
7. What would it take for you to get involved in farm forestry? In terms of information and advisory services, what could government/private/community agencies do to improve the chances of getting you involved?
8. Before we end, is there anything else anyone would like to add?
9. Thank you for coming.

## Extension officer focus group questions

1. Before we begin, let's go around the group to introduce ourselves and briefly say where we work and how we are involved in farm forestry in the region. What proportion of your work is extension or extension related?
2. How is farm forestry being promoted and encouraged within the community and landholders in this region? How flexible are existing farm forestry extension approaches? Can they be molded to suit different situations and/or people?
3. Why has farm forestry developed much more quickly in some regions than in others? Are there differences in the extension methods?
4. Do you think that different extension strategies are needed for different regions (e.g. in high rainfall versus low rainfall regions)? How should they differ? Do you think that different extension strategies are needed for different types of farmers (e.g. for hobby farmers or conventional farmers)? How should they differ?
5. To what extent do existing extension programs cover the full range of skills and knowledge needed for successful farm forestry? Are there any gaps in technical, financial or economics information? What are they?
6. What criteria should we use to judge the effectiveness of an extension program for farm forestry (e.g. number of people adopting practices)?
7. How well do government and private agencies coordinate or integrate when delivering farm forestry advice or information? Is there ever conflict and if so, what are the main issues?  
How could these agencies work together better for this region?
8. What suggestions do you have for ways that existing farm forestry extension or information exchange programs can be improved? How can this be made to happen more effectively?
9. *Reserve question, time permitting: What measures are taken to ensure banks, accountants, investment advisers, city councils and the like are aware and knowledgeable about farm forestry? Should they provide any kind of farm forestry advisory service?*
10. *Reserve question, time permitting: Is there any kind of quality assessment of farm forestry information and advice? How do the various agencies assess how well they are performing in achieving their goals?*
11. Before we end, is there anything else anyone would like to add - something they feel was missed or they didn't get a chance to say?
12. Thank you everyone for coming today.

### 6.3 Appendix C: Contacts for further information

Names, telephone numbers and email addresses are given below for persons who can provide more information on organisations and networks mentioned in Chapter 3. This list is arranged in the same general order as the sections of that chapter.

#### NATIONAL

##### RIRDC/LWRRDC/FWPRRDC Joint Venture Agroforestry Program

|                 |                |                      |
|-----------------|----------------|----------------------|
| Roslyn Prinsley | (02) 6272 4033 | roslynp@rirdc.gov.au |
| Sharon Davis    | (02) 6271 6671 | sharond@rirdc.gov.au |

##### Industry Development Section of Agriculture, Fisheries and Forestry – Australia

|                  |                |                              |
|------------------|----------------|------------------------------|
| Steve O’Loughlin | (02) 6272 5301 | steve.o’loughlin@affa.gov.au |
| Phil Pritchard   | (02) 6272 4193 | phil.pritchard@affa.gov.au   |

##### Ministerial Council on Forestry, Fisheries and Aquaculture

|             |                |                         |
|-------------|----------------|-------------------------|
| Andre Maine | (02) 6272 4561 | andre.mayne@affa.gov.au |
|-------------|----------------|-------------------------|

##### National Farm Forestry Roundtable

|                |                |                    |
|----------------|----------------|--------------------|
| Peter McKerrow | (03) 9545 1644 | ipma@vicnet.net.au |
|----------------|----------------|--------------------|

##### Department of Forestry, University of Melbourne

|               |                |                                   |
|---------------|----------------|-----------------------------------|
| Rowan Reid    | (03) 9344 5011 | r.reid@landfood.unimelb.edu.au    |
| Peter Stephen | (03) 9344 5011 | p.stephen@landfood.unimelb.edu.au |

##### Greening Australia

|                       |                |                                 |
|-----------------------|----------------|---------------------------------|
| Vanessa Elwell-Gavins | (03) 6267 4448 | veg@greeningaustralia.org.au    |
| Kate Ellis            | (02) 6281 8585 | kellis@greeningaustralia.org.au |

##### Australian Forest Growers

|              |                |                          |
|--------------|----------------|--------------------------|
| Alan Cummine | (02) 6236 8309 | cummine@safetyweb.com.au |
|--------------|----------------|--------------------------|

#### WESTERN AUSTRALIA

##### Department of Conservation and Land Management

|               |                |                          |
|---------------|----------------|--------------------------|
| Richard Moore | (08) 9752 1677 | richardmo@calm.wa.gov.au |
| John Bartle   | (08) 9344 0321 | johnb@calm.wa.gov.au     |

##### Agriculture Western Australia

|                 |                |                            |
|-----------------|----------------|----------------------------|
| David Bicknell  | (08) 9881 0228 | dbicknell@agric.wa.gov.au  |
| Peter Eckersley | (08) 9780 6204 | peckersley@agric.wa.gov.au |

##### Farm Forestry Advisory Service

|            |                |                          |
|------------|----------------|--------------------------|
| Jon Warren | (08) 9531 1954 | jdwarren@agric.wa.gov.au |
|------------|----------------|--------------------------|

**Timber 2002**

|                |                |                       |
|----------------|----------------|-----------------------|
| Julia Levinson | (08) 9892 8520 | t2002@fullcomp.com.au |
|----------------|----------------|-----------------------|

**Trees SouthWest**

|             |                |                        |
|-------------|----------------|------------------------|
| Leoni Offer | (08) 9780 6182 | loffer@agric.wa.gov.au |
|-------------|----------------|------------------------|

**South East Forest Foundation Inc.**

|               |                |                            |
|---------------|----------------|----------------------------|
| Rob Johnstone | (08) 9083 1111 | rjohnstone@agric.wa.gov.au |
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**Oil Mallee Association of WA Inc.**

|                  |                |                         |
|------------------|----------------|-------------------------|
| Chris Richardson | (08) 9478 0330 | chrisr@oilmallee.com.au |
|------------------|----------------|-------------------------|

**Oil Mallee Company of Australia**

|             |                |                      |
|-------------|----------------|----------------------|
| Ric Collins | (08) 9478 0340 | ric@oilmallee.com.au |
|-------------|----------------|----------------------|

**Green Skills**

|                |                |                           |
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**Greening Australia (WA)**

|                |                |                            |
|----------------|----------------|----------------------------|
| Rebecca Millar | (08) 9335 8933 | rebecca@gawa.comdek.net.au |
|----------------|----------------|----------------------------|

**Western Timber Cooperative Ltd.**

|                |                |                  |
|----------------|----------------|------------------|
| Craig Leishman | (08) 9761 4112 | westim@wn.com.au |
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**VICTORIA****Department of Natural Resources and Environment**

|               |                |                              |
|---------------|----------------|------------------------------|
| Tracey Jarvis | (03) 9296 4619 | tracey.jarvis@nre.vic.gov.au |
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**Private Forestry Council Victoria**

|               |                |                              |
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| John Houlihan | (03) 9637 8368 | john.houlihan@nre.vic.gov.au |
|---------------|----------------|------------------------------|

**Greening Australia Victoria**

|              |                |                        |
|--------------|----------------|------------------------|
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**Box Ironbark Farm Forestry Network**

|              |                |                             |
|--------------|----------------|-----------------------------|
| Mark Johnson | (03) 5430 4444 | mark.johnson@nre.vic.gov.au |
|--------------|----------------|-----------------------------|

**Corangamite Farm Forestry**

|              |                |                           |
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**Gippsland AgroforestryNetwork of Australian Forest Growers**

|             |                |                            |
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| Joan Wallis | (03) 5182 5155 | joan.wallis@nre.vic.gov.au |
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**Mallee Agroforestry Network**

|               |                |                           |
|---------------|----------------|---------------------------|
| Daryl Walters | (03) 5021 0238 | walters@vic.ozland.net.au |
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**North-East Victoria Branch of Australian Forest Growers**

|               |                |                              |
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| Bruce Sonogan | (03) 5761 1611 | bruce.sonogan@nre.viv.gov.au |
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**Northern Irrigation Farm Forestry Network**

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**Otway Agroforestry Network**

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**Port Phillip Farm Forestry Network**

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**Shepparton Irrigation Region Farm Forestry Network**

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**South West Agroforestry Network**

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**Wimmera Agroforestry Network**

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**Gippsland Farm Plantations Inc.**

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**Central Victorian Farm Plantations**

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**Green Triangle Regional Plantation Committee**

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**Plantations North East Inc.**

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**North-East Victoria Forest Growers Cooperative**

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**Gippsland Wood Producers Cooperative Ltd**

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**FFORNE Hardwood Cooperative**

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**TASMANIA****Private Forests Tasmania**

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**Farmwood Tasmania Cooperative Society Ltd.**

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**TFGA Forestry**

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**SOUTH AUSTRALIA****ForestrySA**

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**Primary Industries and Resources South Australia**

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**New England Regional Plantation Committee**

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**Mid North Coast and Lower Hunter Regional Plantation Committee**

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**Northern Rivers Regional Plantation Committee**

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**Murray-Riverina Farm Forestry**

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**Sub-Tropical Farm Forestry Association**

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**Upper Clarence Farm Forestry Network**

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**Hunter Valley Farm Forestry Network**

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**State Forests of New South Wales**

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**New SouthWales Agriculture**

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**Department of Land and Water Conservation**

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**Coombell Farm Forestry Centre**

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**ACT Forests**

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**Queensland Forestry Research Institute**

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**Greening Australia Queensland**

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**North Queensland Timber Cooperative**

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**Cooloola Forest Growers Cooperative**

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