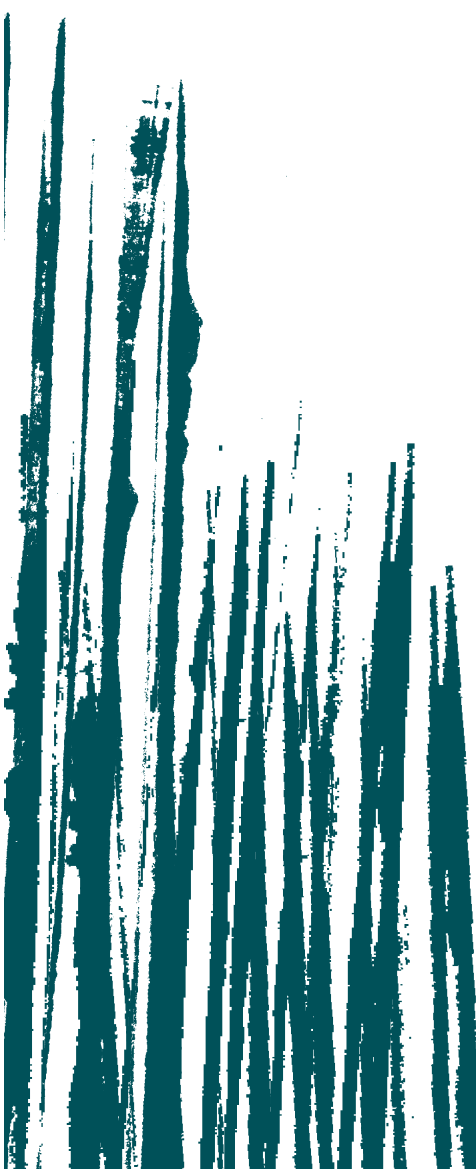


7 *Social Dimensions of Forests*



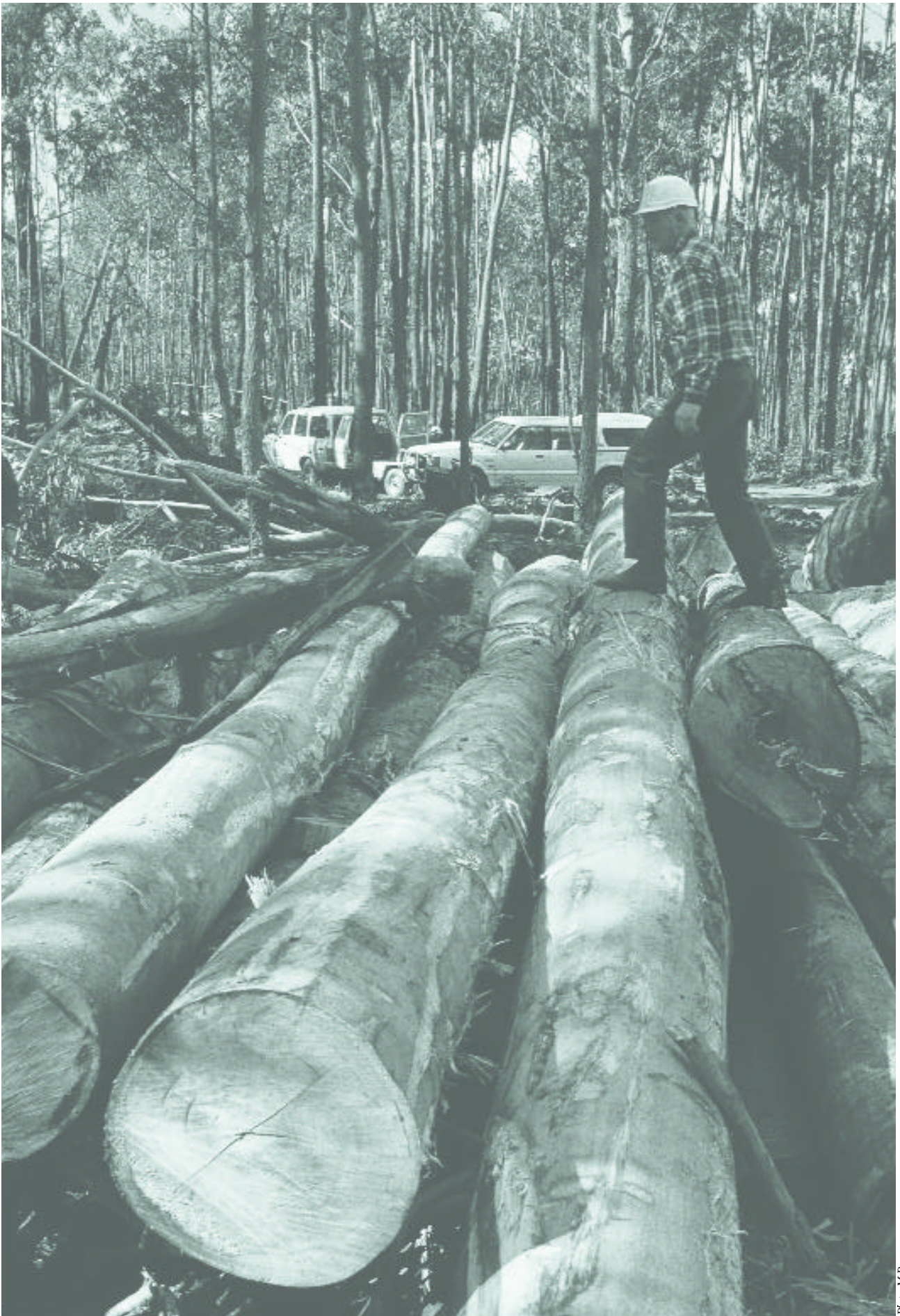


Photo: M. Ryan

Social Dimensions of Forests

There are a number of measures of forest worth, of which economics is only one. Forests have a social dimension: the human population interacts with them in complex ways that affect the character and well-being of the nation and the way forests are used.

Many of these interactions cannot be – or, at least, currently are not – measured. This chapter looks at those interactions between the forest and the community that are conducive to some level of quantification: the number of ‘forest-dependent’ communities; health and safety in the forest industries; forest research; education in the forest sector; international forest-related activities; and forest awards.

Forest-dependent communities

Forest-dependent communities have been defined as:

Communities dependent upon forests for their survival. Such communities include municipalities, indigenous communities and family groups. (Technical Advisory Committee to the Montreal Process Working Group on Criteria and Indicators of Sustainable Forest Management)

Because of the wide range of conditions prevailing amongst Montreal Process Working Group countries, this definition needs to be interpreted to meet local conditions. A measure of financial dependence of communities is the number of people employed in forest-related industries as a proportion of the total working population. In Australia, 186 towns have a forest dependency above 5 per cent (Figure 38). Of these, 104 towns (average size of the working population = 604 people) have a dependency in the range 5–10 per cent; just 5 towns (average size of the working population = 153) have a dependency of more than 50 per cent. In 35 towns, more than 20 per cent of the workforce is employed in forest industries: all are relatively small

communities, the working population ranging from 75 to 2063 people.

Communities may also be dependent on forests in non-financial ways such as for food, raw materials and cultural ties. Information of this kind is not available at a State, Territory or national level and cannot be reported here.

Current data on the viability of forest-dependent communities are not adequate to support discussion of this issue at the national level. Through the regional forest agreement process, methods of social assessment and consultative processes are being developed. These may yield baseline social data for that part of the forest estate covered by the regional forest agreement process.

Health and safety in the forest industries

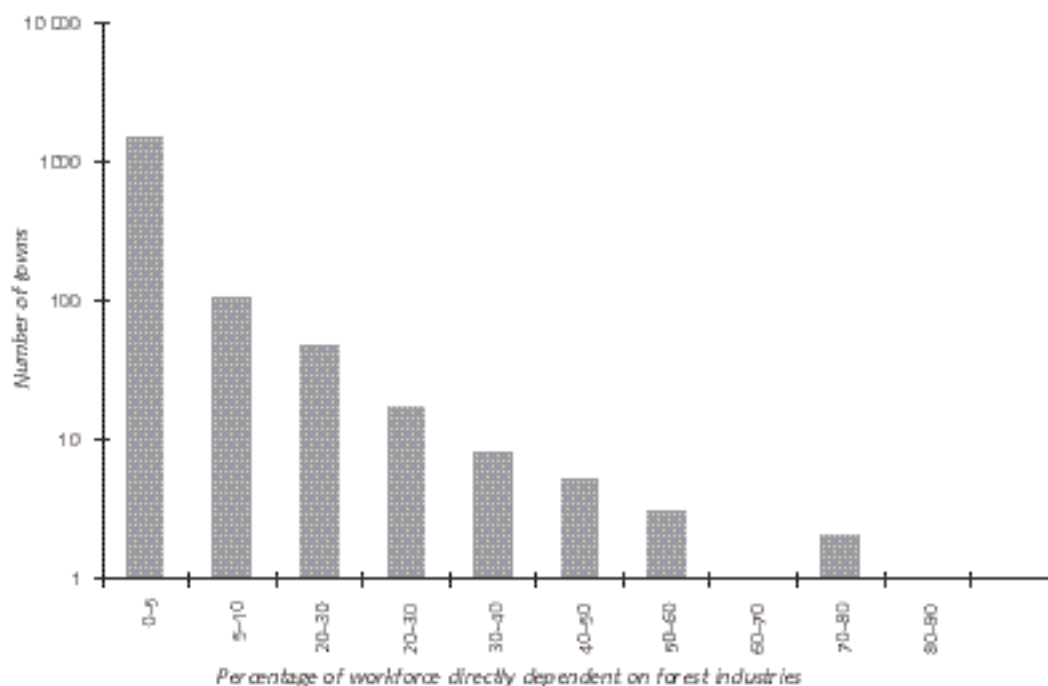
Information provided here relates solely to the three main wood-based forest industries. There are considerable health and safety issues associated with employment in other forest-related industries such as apiculture, tourism and grazing. However, it is difficult to distinguish between forest and non-forest data for these sectors.

Forest workers are exposed to a relatively high degree of occupational hazard: they work with noisy and potentially dangerous machines, often in steep terrain, felling and extracting large and unwieldy trees. They may also be involved in fire prevention and suppression activities. The wood processing industry is less hazardous (Table 64).

In the past three decades, occupational health and safety standards, together with more advanced equipment and methods, have made the forest, the sawmill and the paper mills safer. Nevertheless, the wood-based forest industries remain among the most risky of all professions.

Worksafe Australia studies published in 1994 and 1995 analysed 1991–92 workers’

Figure 38: Relationship between the dependence of towns on forestry and the size of the total workforce



Source: Australian Bureau of Statistics (1998).

Box 17: Social assessment reports in the regional forest agreement process

Social assessments are being conducted for each forest region involved in the regional forest agreement process. Those completed so far have found that the regional forest agreement process was having the following social effects:

- communities were more informed and aware of the regional forest agreement process;
- trust between stakeholders and government authorities was being established;
- increased community participation was being achieved;
- communities had increased access to valuable local data, which could be used for other programs within a range of government agencies;
- technical expertise was being developed to map social values using a geographic information system and to assist in the integration of social data with other assessment work;
- threshold models were being developed to assess critical service impacts on local communities;
- quality scientific and technical advice was being provided to support policy development in relation to forest use; and
- the integration of social data with resource, economic and environmental data should lead to improved policy outcomes.

compensation data for the forestry, logging and log sawmilling industries. The data were collected in New South Wales, the Northern Territory, South Australia, Tasmania and Western Australia, and represented 55.3 per cent of the national workforce in these industries. Some results are presented below.

Injury and fatality rates

Table 64 shows that forest loggers suffered 386 fatalities per 100 000 person-years, compared to 70 per 100 000 person-years in mining and quarrying and 143 in fishing. The figure for sawmill workers was 30 fatalities per 100 000 person-years; the national average is 8.1 per 100 000 person-years.

Table 64 shows the average injury rates by various task categories in the forestry sector in 1991–92. Data for the agricultural sector and the national average are presented for comparison. Additional data (not presented in the table) showed that around 20 per cent of reported logging-related injuries were severe, resulting in more than 60 days lost work time per injury. In the sawmilling sector, injuries resulting in more than 60 days off work represented 15 per cent of all injuries.

Unskilled workers suffered the highest rate of injuries. Within the logging industry, workers most at risk were machine operators, trades assistants and forestry labourers. While 38 per cent of the total wood-based forest industry workforce consists of labourers, this group makes up 47 per cent of the logging workforce. More than a third of the logging-related injuries are a result of being hit by falling or moving objects. Muscular stress due to lifting

Table 64: Incidence of fatalities, by industry sector⁽¹⁾

Sector	Fatalities
Forest loggers	386
Forest service workers	52
Sawmill workers	30
Mining and quarrying	70
Agriculture	19
Commercial fishing	143
National average	8.1

⁽¹⁾ Per 100 000 employees per year.
Sources: *Worksafe Australia (1995).*
Driscoll et al. (1995).

Table 65: National average injury rates in the forest sector compared with agriculture and all Australian industry⁽¹⁾

Sector	Injuries
Forest sector (1991–92 data)	
Logging	68.09
Forestry	21.23
Log sawmilling and timber dressing	
Log sawmilling	52.38
Timber resawing and dressing	28.29
Woodchipping	6.72
Other wood product manufacturing	
Wooden doors	56.16
Plywood and veneer	51.80
Other	51.67
Wooden containers	44.78
Wooden structural components	28.21
Average of forest and wood (above industries)	39.32
Paper and paper-product manufacturing	
Paper bag and sack ⁽²⁾	135.65
Other	35.93
Corrugated paperboard container	35.58
Pulp, paper and paperboard	17.60
Solid paperboard containers	0.00
Comparative industries (1992–93 data)	
Services to agriculture	75.2
All agriculture	49.1
Agriculture	47.1
All Australian industry (1991–92 data)	23.7
All Australian industry (1992–93 data)	25.5

⁽¹⁾ Per 1000 employees per year.

⁽²⁾ Small industry but based on small sample size (19.5 per cent of the industry).

Sources: *Worksafe Australia (1995).*
Driscoll et al. (1995).

or handling is the next most common injury. This order is reversed in the sawmilling industry.

Cost of injuries

The Worksafe Australia studies referred to above indicated that workers' compensation costs amounted to more than \$1900 per employee in the logging industry in 1991–92, and more than \$1200 per employee in log sawmilling. These were considerably lower than the average cost for such claims in some comparable industries. For example, workers' compensation claims for individual farmers and farm managers in 1992–93 were \$6229, for sheep shearers \$9545, and for farmhands and assistants \$5554.

Forest research

Forest research and development adds to our knowledge of the ecological, economic and social nature of forests. Quantifying the extent of such research and development therefore acts as an indicator of the importance we place on forests and the role they play in society.

Range and scope of forest research

There is no consolidated national process for reporting details of forest research; thus, it is not possible to provide a comprehensive report on forest research across Australia. By the new definition used in this report, forests cover some 20 per cent of the continent.

Traditionally, any collation of forest research has focused primarily on forests used for timber production (mainly multiple-use native forests and plantations) and on wood-based products. Research conducted in the forests of the predominantly agricultural and pastoral zones, which constitute the bulk of the forest estate, is currently not quantified and is not considered below.

Research can be classified into four types, although there are overlaps between these classes:

- applied: research, including inventory, done with specific applications in mind;
- strategic basic: research done in expectation of useful discoveries or solutions to practical problems;

- experimental development: using existing knowledge to create new or improved materials, products, processes or services; and
- pure basic: experimental or theoretical research for the advancement of knowledge.

Table 66 reports these research types as a percentage of the total number of forestry research projects, as reported in 1994. Table 67 lists the main forest research areas and the number of projects conducted in each.

The largest single organisation conducting research into the forest, forestry, wood and paper sciences is CSIRO Forestry and Forest

Table 66: Research types as a percentage of total forestry projects

Type of research	% of total
Applied	48.3
Strategic basic	33.7
Experimental development	11.0
Pure basic	7.0

Source: derived from Fryer et al. (1994).

Products, employing more than 270 people in research centres at Canberra, Melbourne, Hobart, Mount Gambier and Perth. Other CSIRO divisions, such as Wildlife and Ecology, also conduct forest-related research, as do a number of State and Territory agencies and universities. Cooperative research centres,

Table 67: Principal categories of industry-based research

Research category	Number of projects
Silviculture (systems, regeneration and formation and tending of stands, agroforestry, husbandry of non-wood forest products)	175
Environmental factors (site factors, animal ecology, general and systematic botany, plant ecology)	95
Forest products and their use (wood, bark, manufacturing, preservation, pulp)	60
Forest injuries and protection from disturbance from drought, soil erosion, fire, harmful plants and animals (including insects)	45
Forest mensuration (assessment of site quality, development and structure of stands, surveying and mapping)	26
Forests and forest policy – national viewpoint	6
Marketing and trade	4
Forest management and business economics of forestry	3
Work science	1

Source: Fryer et al. (1994).

such as the Cooperative Research Centre for Sustainable Production Forestry and the Cooperative Research Centre for Tropical Rainforest Ecology and Management bring a range of Commonwealth, State, Territory, private and independent institutions together to focus research in particular areas.

A number of research and development corporations funded by the Commonwealth Government and the private sector sponsor forest-related research. These include the Forests and Wood Products Research and Development Corporation, the Rural Industries Research and Development Corporation (particularly through its Joint Venture Agroforestry Program) and the Land and Water Resources Research and Development Corporation.

Private research currently focuses on developing plantations, particularly through genetic manipulation of tree stock to optimise form, growth, seed production and resistance to pests and disease. Research is also directed towards improving silvicultural methods and managing plantations more efficiently, sustainably and productively. Considerable public and private effort is also being applied to the development of trees capable of growing in and contributing to the rehabilitation of salt-affected agricultural land.

Forest conservation research

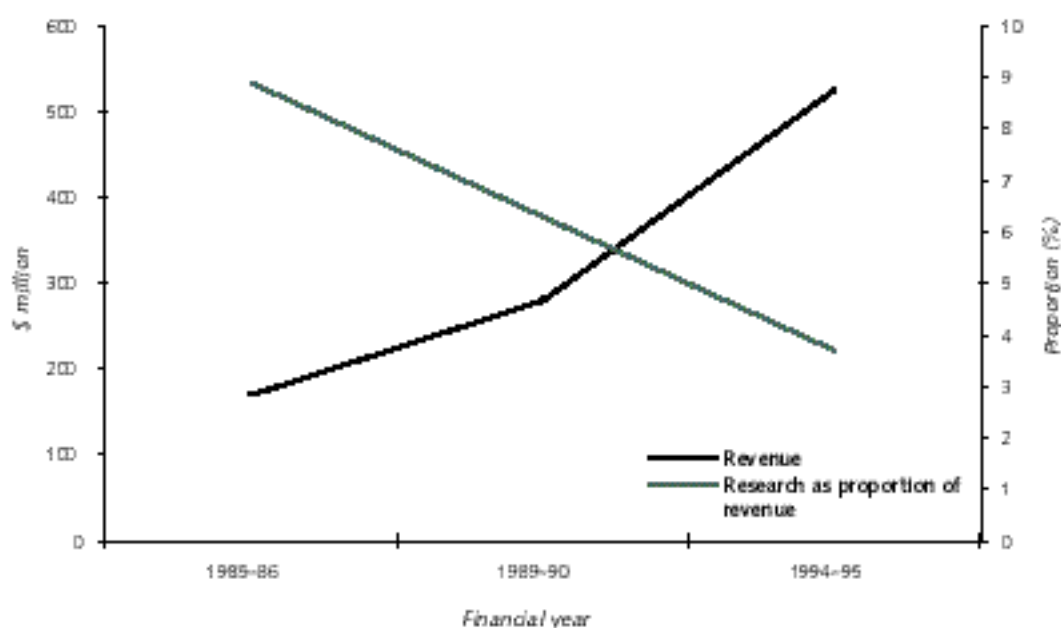
Many institutions conduct research and inventory into aspects of forest conservation. These include State and Territory agencies such as national parks and wildlife services and forestry departments, several CSIRO divisions and numerous universities. However, there are no nationally collated data available for expenditure on such research.

Production-based research

Table 68 summarises expenditure on timber production-based research in the period 1985–86 to 1994–95. Expenditure increased over this period in actual dollar terms, but the real increase was negligible when adjusted for inflation. Most expenditure (about 86 per cent) was contributed by State and Commonwealth agencies; in 1994–95 the two government sectors spent similar amounts on forest research. Figure 39 shows that production-based research expenditure declined as a percentage of State and Territory forest service revenues in the period 1985–86 to 1994–95.

Table 69 presents research expenditure by State and Commonwealth agencies for 1989–90 and 1994–95 on a dollars per hectare and dollars per cubic metre basis.

Figure 39: Changes in revenue and production-based research expenditure as a percentage of revenue for State and Territory forest services, 1985–86 to 1994–95



Note: Does not include expenditure on research by external research providers.
Source: Montreal First Approximation Report (1997).

Table 68: National summary of expenditure on production-based forest research per organisation or sector, 1985–86 to 1994–95

Organisation/ sector	1985–86		1989–90		1994–95	
	Amount (\$m)	% of total	Amount (\$m)	% of total	Amount (\$m)	% of total
State services	15.13	47.4	17.62	44.9	19.45	42.8
Commonwealth ⁽¹⁾	12.11	38.0	14.91	38.0	19.52	43.0
Universities	1.94	6.1	2.22	5.6	2.65	5.8
Private companies	2.71	8.5	4.51	11.5	3.82	8.4
Total	31.89	100.0	39.26	100.0	45.44	100.0
% annual change			+5.8		+3.1	

Note: The definition of research varies between organisations and can include monitoring and inventory activities.

⁽¹⁾ Includes CSIRO and cooperative research centres.

Source: Turner, J. and Lambert, M. J. (1997).

Product research

Wood products

Table 70 shows that expenditure on forest products research increased by an average 4.2 per cent a year in the four years between 1985–86 and 1989–90. In the next five years to 1994–95, the average annual increase was 2.7 per cent a year.

Commonwealth spending through CSIRO and cooperative research centres on product research increased by 67 per cent between 1985–86 and 1994–95; spending by State agencies increased by about 45 per cent. During the same period, spending by private companies and universities in this area of research increased by only 5 to 6 per cent.

Table 71 presents data compiled by the Australian Bureau of Statistics regarding research spending by the paper and paper products industries. These show that research

and development spending in this sector increased over the period covered.

Other products

There are no nationally collated data available for research on non-wood forest products and services such as water, honey, tourism, carbon sequestration or wildflowers.

Education in the forest sector

Forest education forms a part of a large number of tertiary-level courses in Australia, and is increasingly a component of many primary and secondary school activities. Students can be taught a great deal about forests in the classroom, and the educative value of forests themselves is also high.

Broadening social expectations of forests and

Table 69: Production based forest research expenditure, by State and Territory agencies responsible for forest management per hectare of forested multiple-use forest

Year	ACT		NSW		NT		Qld		SA		Tas	
	Expenditure (\$million)	\$/ha	Expenditure (\$million)	\$/ha	Expenditure (\$million)	\$/ha	Expenditure (\$million)	\$/ha	Expenditure (\$million)	\$/ha	Expenditure (\$million)	\$/ha
1985/86	0.095	20.055	2.777	0.897	0.433	N/A	4.011	1.007	1.030	38.726	1.310	1.020
1989/90	0.003	0.633	3.927	1.269	0.410	N/A	3.863	0.970	1.770	66.549	1.420	1.105
1994/95	0.048	10.133	4.917	1.589	0.020	N/A	4.500	1.130	1.823	68.542	2.950	2.296

Notes: Forested MUF figure sourced from National Forest Inventory (1997), refer to Table 1

N/A - Not applicable - no native MUF in Northern Territory

MUF - Multiple-use forest tenure

Sources: Turner, J. and Lambert, M. J. (1997).

National Forest Inventory (1997).

Table 70: National summary of expenditure on products-based forest research per organisation or sector, 1985–86 to 1994–95

Organisation/sector	1985–86		1989–90		1994–95	
	Amount (\$m)	% of total	Amount (\$m)	% of total	Amount (\$m)	% of total
State services	1.49	9.9	1.77	10.0	2.16	10.8
Commonwealth ⁽¹⁾	5.68	37.6	6.18	34.9	9.47	47.2
Universities	0.56	3.7	0.63	3.6	0.59	2.9
Private companies	7.39	48.8	9.11	51.5	7.85	39.1
Total	15.12	100	17.69	100	20.07	100
% annual change		+ 4.2		+ 2.7		

Note: The definition of research varies between organisations and can include monitoring and inventory activities.

⁽¹⁾ Includes CSIRO and cooperative research centres.

Source: Turner, J. and Lambert, M. J. (1997).

the expanded definition of forests mean that many vocations apart from traditional forestry need to be considered in assessing education in the forest sector. In this report we present information mostly directed towards courses and activities readily identified as being industry-based. In the future, other vocations such as those associated with tourism, recreation, landcare, grazing management and ecology could also be considered, although reporting the forest components of such broadly based courses may be difficult.

Tertiary training

Nationally, about one-quarter of the people in the workforce have tertiary qualifications. This is also largely true for the wood-based forest industries, although there are some differences. Compared with the national workforce, comparatively more wood-based forest industry workers have bachelor degrees and

Table 71: Research spending in the paper and paper products industries, 1986–87 to 1995–96

Year	Amount (\$'000)	% increase (per year)
1986–87	8 289	–
1988–89	22 178	168
1990–91	31 936	44
1991–92	49 202	54
1992–93	36 111	– 27
1993–94	ND	–
1994–95	57 185	58
1995–96	161 566	183

ND – No data.

Source: Australian Bureau of Statistics (1998b).

vocational skills and comparatively fewer have postgraduate and undergraduate diplomas.

University

The bachelor degree courses run by The Australian National University and The University of Melbourne have historically been the principal sources of graduate foresters in Australia. Both universities offer combined forestry–commerce and forestry–economics degrees, reflecting the increasing emphasis on financial management required by skilled foresters.

By the mid-1990s, after the major data-collecting period for this section of the report, a number of other universities began offering courses with a forestry component. In 1997 there were at least 20 degree courses of

Vic		WA		Australia	
Expenditure (\$million)	\$/ha	Expenditure (\$million)	\$/ha	Expenditure (\$million)	\$/ha
1.898	0.567	3.579	2.220	15.133	1.133
3.570	1.067	2.656	1.648	17.619	1.320
2.946	0.881	3.038	1.885	20.242	1.516

relevance to forest management available around Australia (Table 72). These included environmental management, plant ecology, agroforestry, forest management and geography.

Certificate-level

In some States the technical and further education (TAFE) system provides certificate courses for forestry technical officers as well as a wide range of vocational training.

In Victoria, advanced certificate and associate diploma courses in resource management or technical officer training are available at six TAFE colleges. New South Wales TAFE offers a certificate course in bushland regeneration and vocational courses in farm tree management and chainsaw operations. It also acts as the delivery provider for the State Forests of New South Wales training course in forest soil and water protection.

In Queensland, TAFE courses include certificates in environmental science and applied rural science. In South Australia, TAFE certificate courses are available in timber technology and forestry technology (two years part time or four years part time for advanced certificate), and other rural courses with subjects relevant to forestry are also provided. In Western Australia, TAFE has a course in natural resource management. In Tasmania, the Hollybank Training Centre offers a TAFE Diploma of Forestry.

Private and semi-private training providers

Colleges associated with industry, universities and TAFEs also provide training courses, as do industry bodies and private companies. A comprehensive list of such training providers has not been compiled for this report.

Primary and secondary schooling

There is no nationally coordinated approach to the teaching of subjects relevant to forests in primary and secondary schools. For example, in South Australia and Western Australia the inclusion of information on forests is at the discretion of teachers. In Victoria, a Curriculum and Standards Framework

Table 72: Australian university courses with relevance to forests

University/qualification

The Australian National University

BSc (Forestry)
Graduate diploma
MSc
PhD
BSc (Natural Resource Management)

University of Queensland

Graduate certificate
Postgraduate diploma
MSc
PhD

Curtin University of Technology

Postgraduate diploma
Honours
MSc
PhD

University of Tasmania

BSc
Graduate diploma/honours

University of Melbourne

BSc (Forest Science) (Melbourne)
MSc
PhD

Southern Cross University (Lismore)

BSc (Forestry)

Monash University

Master of Environmental Studies
Graduate diploma (Pulp and Paper)

Griffith University

BSc (Environmental Science)

University of Western Australia

MSc (Natural Resource Management)
BSc (Natural Resource Management)

University of Ballarat

Graduate certificate and diploma (Forestry and Wood Science)
BSc (Natural Resources Management)
BSc (Environmental Management/Park Management)

University of New England

Bachelor of Natural Resources
Master of Natural Resources
Master of Environmental Management

Deakin University

Environmental Studies (degree)

Source: National Forest Inventory (1997).

provides guidelines for key learning areas, including environmental science.

In the New South Wales syllabus, the environmental studies subject for years 11 and 12 includes topics such as rainforest logging and world rainforests. Another subject, rural technology, examines the work of the State Forests of New South Wales, pine plantations on farms, properties and uses of Australian timbers, and forestry technology. Aspects of forestry are also included in geography in years 7–10.

The curriculum operating in Queensland in 1994 included studies on forests and rainforests in the biology component of years 11–12. Other science, geography and social studies courses feature studies such as resource management, people and the environment, and forest resources.

In the Northern Territory, forestry is part of a year 12 subject, natural resource management. In Tasmania, Forestry Tasmania takes an active role in the development of primary and secondary courses covering forest education.

The Victorian Department of Natural Resources and Environment delivers a school education program through the Toolangi Forest Discovery Centre. It employs teachers on secondment from the Ministry of Education to prepare forest-related curriculum materials.

In-service training

State government forest and natural resource agencies provide a variety of in-service training that includes natural resources skills. A comprehensive list of such training activities has not been compiled for this report.

International forest-related activities

The Commonwealth Government is engaged in a number of international forest-related activities. Some of these, such as the Montreal Process Working Group on national and regional criteria and indicators, have been discussed in earlier chapters. Another ongoing initiative in which the Australian Government plays a significant role is the development of

codes of forest practice in the Asia–Pacific region within the Asia–Pacific Economic Cooperation forum (APEC).

Australia also provides assistance to some countries wishing to improve their forest management. Information on the extent of Australia's forest-related overseas aid can be obtained from the Department of Foreign Affairs and Trade.

Forest awards

Industry and community awards encourage excellence and recognise achievement. The number of awards in a field can therefore be thought of as indicative of that field's level of commitment to quality and improvement. This section lists some of the more nationally significant awards offered in fields relevant to Australian forests. They are not arranged in any particular order.

- The National Treefarmer of the Year Award made by the Australian Forest Growers honours individuals who have made significant contributions to private forestry in Australia.
- The Timber Promotion Council Natural Feature in Furniture Award promotes the value adding opportunities and acceptance of natural features in functional furniture.
- Landcare awards include recognition of achievements in forest rehabilitation, conservation and establishment.
- The Institute of Foresters of Australia offers several annual awards to promote professional development or to recognise outstanding achievement:
 - the Henderson Travel Award for postgraduate research overseas is awarded to a forester for outstanding work;
 - the Peter Jowett Hawkins Award supports forest research;
 - the Hedges Award is given for the best article in *Australian Forestry* by a field or non-research-based forester;
 - the N.W. Jolly Medal is awarded for outstanding contributions to forestry in Australia; and

- the Institute of Foresters Professional Development Award is intended to improve the awardee's professional skills in forest management.
- The Joseph William Gottstein Trust Fund is the national educational trust of the Australian forest industries. The Trust funds fellowships, industry seminars, wood science courses and industry study tours.