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**GENERAL STATISTICAL STATEMENT
WESTERN AUSTRALIA**

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CHAPTER I.

A description of the part played by forestry and the forest industry in the economic structure of the country in the five years 1951-55.

A.—AREA STATEMENT.

WESTERN AUSTRALIA.

(i) Total area of forest	.. .. .	41,826 sq. miles
(ii) Total area of land permanently devoted to agriculture, short-term fallow and improved pasture	.. .. .	24,844 sq. miles
(iii) Total area of other land, excluding water surfaces, but including long-term bush fallow	.. .. .	897,438 sq. miles
(iv) Total land area (excluding water surfaces)	.. .. .	964,108 sq. miles
(v) Forest area as a percentage of total land area	.. .. .	4.34 %
(vi) Total population in millions	.. .. .	0.658
(vii) Population per square mile	.. .. .	0.68

CLASSIFICATION OF FOREST AREA, 1954-1955.

TABLE 1.

Square miles.

Class of Forest. (1)	State Forest. (2)		Communal Forest. (3)		Private Forest. (4)		Total. (5)		Percentage of Total Forest Area. (6)	
	a. Perma- nent.	b. Other.	a. Perma- nent.	b. Other.	a. Perma- nent.	b. Other.	a. Perma- nent.	b. Other.	a. Perma- nent.	b. Other.
(a) Exploitable—(South-West Zone)—										
(i) Softwoods (conifers) ..	32	..	..	..	..	..	32	..	..08	..
(ii) Mixed Woods ..	..	..	..	..	..	..	..	..	..	..
(iii) Hardwoods (broadleaved) ..	5,992	4,433	..	310	..	..	5,992	4,743	14.32	11.34
Total	6,024	4,433	..	310	..	..	6,024	4,743	14.40	11.34
(b) Potentially Exploitable — (South-West Zone)—										
(i) Softwoods (conifers) ..	..	..	..	..	..	..	..	..	..	..
(ii) Mixed Woods ..	..	..	..	..	..	..	..	..	..	..
(iii) Hardwoods (broadleaved) ..	..	..	..	1,562	..	..	..	1,562	..	3.73
Total .. ..	..	..	..	1,562	..	..	..	1,562	..	3.73
(c) Other land classed as forest—(low rainfall woodlands)										
.. ..	..	28,997	..	..	..	..	..	29,497	..	70.53
Grand Total	6,024	33,430	..	2,372	..	..	6,024	35,802	14.40	85.60
Percentage of total forest area	14.40	79.93	..	5.67	..	..	14.40	85.60	14.40	85.60

Note.—Percentages may be misleading in view of the large area of low rainfall woodlands.

Notes on Table 1.

(i) The total area of forest as shown in Table 1 is 41,826 square miles, inclusive of woodlands of low rainfall area of 28,997 square miles, which produce only fuel, fence posts, and round mining timber.

(ii) Revised estimates of the forest area indicate 41,826 square miles, an increase of 570 square miles. The forest area represents 4.34 per cent. of the total land area, but if exploitable and potentially exploitable forest only is considered, the percentage is only 1.28 per cent.

(iii) The most significant changes in the table since 1950 have been the addition of 663 square miles of permanently dedicated State Forest (Hardwoods) and an increase of 12 square miles of softwood plantations.

B.—PROGRESS IN SURVEY OF FOREST RESOURCES.

(i) Area of forest covered by topographical survey or maps up to the end of 1955.

TABLE 2.

Square miles.

Class of Forest.	Approximate Scale.				Total.	Per-centage of totals given in Col. 5 of Table 1.
	Over 2 inches = 1 mile.	2 inches = 1 mile.	1 inch = 1 mile.	1/2 inch = 1 mile.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(a) Exploitable—						
(i) Permanent						
(ii) Other .. }	4000	..	..	..	4000	37
Total	4000	..	..	..	4000	37
(b) Potentially exploitable—						
(i) Permanent ..						
(ii) Other						
Total						
(c) Other land classed as forest—						
(i) Permanent ..						
(ii) Other						
Total						
Grand Total ..	4000	..	..	..	..	Not applicable

(ii) Discussion of the progress of survey of forest resources.

Since 1950 considerable emphasis has been placed on the determination of forest resources. This work has been accelerated by an increased use of photogrammetry, the introduction of semi-permanent field assessment parties, and the establishment of a Working Plans office in the far-South of the State to determine the resources of virgin country in the process of being brought under management.

Since its inception in 1945 the photogrammetric section of the Forests Department has produced type maps to cover an area of some 3 million acres and reconnaissance plans for a further 900,000 acres. The greater part of the production of assessment maps has occurred during the past five years, and with interpretation technique almost fully developed, it is anticipated that a complete plan cover of the exploitable forest area will be available within the next two years.

Field assessment parties over the past five years have provided information for 10,000 acres of lines and plots. This information has been used as the basis of calculation for a considerable part of the State's forest area, and it is anticipated that by the end of 1957 the revision of data covering forest resources will be completed. It should be noted that during the five-year period it has been found that there is a greater forest capital than had previously been thought. Some of this improvement is due to altered standards of utilisation, and recognition of the potential use of Marri (*Euc. calophylla*).

C.—VOLUME OF STANDING WOOD AND INCREMENT

in exploitable Forest as it stood at the end of 1955.

TABLE 3.

Thousands of Cubic Feet of round
wood in true measure under bark.

Class of Forest and Wood. (1)	Total Volume. (2)	Gross annual increment. (3)	Natural annual losses by fire, decay, insects, windfall, etc. (4)	Net annual increment— (Col. 3, minus Col. 4). (5)
State—				
(i) Softwoods (conifers) ..	30,800	1,550 (b)	Nil	1,550 (b)
(ii) Hardwoods (broadleaved)	6,652,450 (a)	Unknown	Unknown	66,500 (c)
Total	6,683,250	1,550	..	68,050
Communal—				
(i) Softwoods (conifers) ..	..	..	..	..
(ii) Hardwoods (broadleaved)	..	..	..	..
Total .. ..	..	..	..	..
Private—				
(i) Softwoods (conifers) ..	{ Volume figures are included under State Forest above.			
(ii) Hardwoods (broadleaved)				
Total .. ..	..	..	..	..
Total—				
(i) Softwoods (conifers) ..	30,800	..	..	1,550 (b)
(ii) Hardwood (broadleaved)	6,652,450 (a)	..	..	66,500 (c)
Total	6,683,250	..	..	68,050

(a) This figure includes (i) 325 million cubic feet of non-merchantable logs of acceptable species and (ii) 551 million cubic feet of logs of species for which the demand is at present very limited, but which will become more acceptable in the future, and (iii) 809 million cubic feet of species mentioned under (ii) which cannot be considered potentially acceptable as mill logs.

(b) Net annual increment based on estimates only—due to young plantations on varying sites.

(c) Based on an estimated net increment of 1 per cent. over the exploitable forest.

Explanatory Notes—Table 3.

It should be noted that the wide difference between the figures on Table 3 and those of the 1952 Report may be largely accounted for by the inclusion of Marri (*Euc. calophylla*) as spoken of under (a) and new estimates of the growing stock, i.e., under 60in. G.B.H. which is much greater than previously considered.

The method of determining the increment has been based solely on an estimate in which it is considered that there is a net increment of 1 per cent. on the total forest volume.

D.—WOOD AND WOOD PRODUCTS: OUTPUT, IMPORTS, EXPORTS AND HOME CONSUMPTION.

(i) Output.

Over the past five years there has been a continuous increase in timber production in Western Australia. This has been brought about by a general buoyancy in trade and has met increased local demands for housing projects and other industrial expansion at the expense of the export trade.

Since 1950 there has been an increase of 67 per cent. in the production of hardwood, while softwood output, chiefly of plantation thinnings, has almost doubled. The trend shown by softwood production is rather significant for, although it still represents only a small percentage of milling operations, it nevertheless points to the growing importance of timber supplies from plantation areas.

OUTPUT OF HOME-GROWN WOOD FOR THE YEAR 1954-1955.

Thousands of cubic feet; the equivalent of roundwood in true measure under bark.

TABLE 4.

Class of Forest and Wood.	Timber. *	Round- wood.	Pulp- wood.	Total In- dustrial Wood.	Fire- wood and Char- coal Wood.	Grand Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
State—						
(i) Softwoods (conifers)	758	..	..	758	..	758
(ii) Hardwoods (broad-leaved)	33,231	1,466	..	34,697	7,057	41,754
Total	33,989	1,466	..	35,455	7,057	42,512
Communal—						
(i) Softwoods (conifers)	..	..	..	..	..	..
(ii) Hardwoods (broad-leaved)	..	..	..	..	..	..
Total .. ..	..	..	..	..	..	..
Private—						
(i) Softwoods (conifers)	18	..	..	18	..	18
(ii) Hardwoods (broad-leaved)	20,664	600	..	21,264	12,466	33,730
Total	20,682	600	..	21,282	12,466	33,748
Total—						
(i) Softwoods (conifers)	776	..	..	776	..	776
(ii) Hardwoods (broad-leaved)	53,895	2,066	..	55,961	19,523	75,484
Grand Total ..	54,671	2,066	..	56,737	19,523	76,260

Local units of measurement and conversion factors

Fuel tons × 0.0318
Charcoal tons × 0.1273

* Includes timber used for extraction of tannin.

(ii) Imports and Exports.

It should be noted that the import and export figures given in Table 5 are for overseas trade only and do not give a true picture of Western Australia's role as an exporting State.

Briefly summarised, it may be said that in 1955, 82 per cent. of production was used locally, 15 per cent. exported to the Eastern States of Australia and 3 per cent. exported overseas. The total export figure of 18 per cent. of production is less than the 1950 figure of 27 per cent., and emphasises the greater local consumption due to the growing population. At the same time, it is interesting to note that although export as a percentage of production has fallen, the actual export has increased slightly because of the significant growth of total production.

WOOD AND WOOD PRODUCTS.—IMPORTS AND EXPORTS FOR THE YEAR, 1954-1955.

Volume in thousands of cubic feet in the equivalent of roundwood in true measure under bark ; and value in £ sterling.

TABLE 5.

Category. (1)	Gross Imports.		Gross Exports.		Net Imports (+) or Exports (-).	
	Thousands of cubic feet. (2)	C.I.F. value £ sterling. (3)	Thousands of cubic feet. (4)	F.O.B. value £ sterling. (5)	Thousands of cubic feet. (6)	Value £ sterling. (7)
<i>Primary Products.</i>						
<i>Softwood (conifers)—</i>						
Logs .. .. .	..	..	..	..	..	..
Sleepers (sawn and hewn) ..	..	..	..	..	..	..
Other sawn and hewn timber	404.2	94,571	0.1	25	+ 404.1	+ 94,546
Total softwood timber ..	404.2	94,571	0.1	25	+ 404.1	+ 94,546
Roundwood .. .. .	..	..	..	..	..	..
Pulpwood .. .. .	..	..	..	..	..	..
Firewood .. .. .	..	..	..	..	..	..
Other sorts of wood ..	..	..	..	..	..	..
Total Softwood	404.2	94,571	0.1	25	+ 404.1	+ 94,546
<i>Hardwood (broadleaved)—</i>						
Logs	387.4	63,408	212.5	58,359	+ 387.4	+ 63,408
Sleepers (sawn and hewn) ..	228.5	55,846	1,132.1	306,358	- 903.6	- 250,512
Other sawn and hewn timber	..	..	..	..	..	..
Total hardwood timber ..	615.9	119,254	1,344.6	364,717	- 728.7	- 245,463
Roundwood .. .. .	..	..	..	..	..	..
Pulpwood .. .. .	..	..	..	..	..	..
Firewood .. .. .	..	..	..	..	..	..
Other sorts of wood ..	..	..	..	..	..	..
Total hardwood	615.9	119,254	1,344.6	364,717	- 728.7	- 245,463
Total primary products ..	1,020.1	213,825	1,344.7	364,742	- 324.6	- 150,917

Volume in thousands of cubic feet in the equivalent of roundwood in true measure under bark; and value in £ sterling.

TABLE 5—continued.

Category:	Gross Imports:		Gross Exports:		Net Imports (+) or Exports (-).	
	Thousands of cubic feet.	C.I.F. value £ sterling.	Thousands of cubic feet.	F.O.B. value £ sterling.	Thousands of cubic feet.	Value £ sterling.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Derivative Products.</i>						
Veneers, plywood and other veneer products, excluding matches	0.4	974	..	..	+ 0.4	+ 974
Matches	0.1	106	0.1	342	-	- 236
Pulp	17.9	3,228	..	..	+ 17.9	+ 3,228
*Pulp and paper products ..	1,862.9	1,149,297	1.3	1,284	+ 1,861.6	+ 1,148,013
Furniture and cabinetware ..	N/A*	12,914	N/A	1,669	..	+ 11,245
Other wooden ware and builders' woodwork ..	N/A	20,721	N/A	2,803	..	+ 17,918
Charcoal	0.01	29	38.9	5,133	- 38.89	- 5,104
Total Derivative Products	1,881.31	1,187,269	40.3	11,231	+ 1,841.01	+ 1,176,038
Grand Total (Primary and Derivative)	2,901.41	1,401,094	1,385.0	375,973	+ 1,516.41	+ 1,025,121

N/A — Not applicable.

* Excludes rayon and paper manufactures imported to the value of £432,291 sterling, and exported to the value of £31,197 sterling, equivalent roundwood volume unknown.

E.—MINOR FOREST PRODUCTS: OUTPUT, IMPORTS, EXPORTS AND HOME CONSUMPTION.

Complete statistics are not available for minor forest products and it is therefore not possible to indicate a production value. The principal products of Western Australia are tanstuffs produced from Wandoo (*Euc. redunca*), Sandalwood (*Santalum spicatum*), Sandalwood oils and honey.

Table 6 indicates an export of vegetable oils, but this is rather misleading as the industry is based on the importation of crude Eucalyptus oil from the Eastern States of Australia, its refinement in Western Australia and export overseas.

The trend shown during the past five years has been for an increase in production of tanstuffs and animal products, and a fairly constant output of Sandalwood.

MINOR FOREST PRODUCTS.—OUTPUT, IMPORTS AND EXPORTS FOR THE YEAR 1954-1955.

TABLE 6. Values in £ sterling.

Category.	Total Output Value.	Imports C.I.F. Value.	Exports F.O.B. Value.	Average net Imports (+) or Exports (-).
(1)	(2)	(3)	(4)	(5)
Animal products	94,307	3,570	122,855	- 119,285
Bamboos, canes .. .. .	..	16,103	..	+ 16,103
Drugs, spices .. .. .	..	206	338	- 132
Fibres, flosses .. .. .	..	1,466	..	+ 1,466
Fodder and grazing .. .. .	..	..	..	..
Grass and other fodder .. .. .	..	..	..	..
Gums, resins, lac .. .. .	..	6,217	1,660	+ 4,557
Rubber and latex .. .. .	..	..	..	..
Incense and perfume woods	73,468	..	N/A	..
Tanstuffs, dyestuffs	N/A	20,721	271,715	- 250,994
Vegetable ivories .. .. .	..	..	..	..
Vegetable oils and oil seeds	N/A	6,717	33,206	- 26,489
Other sorts of minor forest produce .. .. .	..	84,629	..	+ 84,629
Total	In-complete	139,629	429,774	- 290,145

N/A — Not available.

Note.—Total output value given in Column (2) above refers to forest lands only, while Exports F.O.B. value given in Column (4) refers to exports from all sources.

F.—EMPLOYMENT AND CONSUMPTION.

Employment of Labour in Forestry and Forest Industries with Consumption of Wood and Minor Forest Products for the Year 1954-1955.

TABLE 7.

Employment category.	No. of industrial units.	Number of persons employed annually.			Quantities of wood used in thousands of cub. ft.	Value of minor products used in £ sterling.
		Whole time.	Part time.	Total.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Forestry—						
(i) Management, silviculture and protection .. .. .	..	653	..	653	..	..
(ii) Felling and extraction .. .. .	..	1,548	..	1,548	..	..
B. Industrial—						
(i) Primary	267	5,095	12	5,107	} 57,315	..
(ii) Secondary	365	3,051	..	3,051		
Total	632	10,347	12	10,359	57,315*	Not available

* Applies to both primary and secondary industrial categories. This figure excludes a relatively small quantity of fuelwood other than sawmill waste used in primary and secondary forest industries, and includes a small quantity of undressed timber imports used in industries which are not, strictly speaking, forest industries, e.g., house building.

CHAPTER II.

FOREST POLICY, SILVICULTURE AND MANAGEMENT.

(1) *Forest Policy.*

(a) The most significant change in forest policy in Western Australia over the past five years has been a revision of the Forests Act which, apart from minor changes, had not been altered from its original form of 1918. The principal changes of the revision provided that—

- (i) No person should be appointed as Conservator of Forests unless he holds approved professional qualifications.
- (ii) Wider and more elastic powers were to be granted to the Conservator regarding the conditions under which permits could be renewed, and royalties determined; also for the issue of licenses and the fixing of conditions and royalties applying thereto.
- (iii) Nine-tenths of the Department's net revenue should be paid to the Reforestation Fund instead of three-fifths as provided in the original Act.

(b) Fire control policy has undergone considerable revision in the course of the five-year period and the introduction of extensive prescribed controlled burning has reduced hazards built up over many years of complete protection.

(c) A further change in policy has been a Cabinet decision to refund a percentage of royalty to owners of land on which timber was reserved to the Crown.

(2) *Silviculture and Management.*

In Western Australia, management of the indigenous forests follows prescriptions laid down in a general Working Plan which is revised at periods not exceeding 10 years. During the period under review management followed the principles laid down in a Working Plan published in 1945, and a revised Plan was produced during the latter part of 1955 which took effect from January, 1956.

Since 1950 approximately 400,000 acres have been added to permanently dedicated State Forest, bringing the total area to 3.8 million acres. Of this area, 2.77 million acres are under intensive management and .32 million acres are in the process of being developed. The remaining area is not yet under management, but steps are being taken to bring this under control as early as possible.

At June, 1955, over 14,000 miles of roads and tracks existed, more than 1,600 miles of telephone lines were in operation, and 389 houses for employees had been constructed.

Over the five-year period there has been a considerable increase in vehicle numbers and other machinery with an associated development of workshops and employment of mechanical staff.

(3) *Other factors affecting forestry in Western Australia.*

To meet the pulp and timber requirements of an increasing population, it will be necessary to have an estimated ultimate pine plantation area of 200,000 acres in Western Australia. The provision of the necessary legislation for this objective has been provided in a *Pine Working Plan* published in 1950 and revised in January, 1956. By 1955 a total of 21,000 acres net had been established.

A problem associated with pine establishment is the selection and reservation of economically suitable land. It has been found that the poorer soils of the coastal area, of which ample areas are dedicated, are suitable for the establishment of the slow growing *Pinus pinaster*, but the species which shows the best economic results in Western Australia is *Pinus radiata*, and this fast-growing tree of large volume increment demands a better soil. The greater part of land suitable for these plantations has been alienated and it has been necessary to repurchase areas where possible. With this species it is considered economically sound to establish plantations at greater distances from market centres.

CHAPTER III.

EXPLOITATION.

(1) The sawmilling capacity of State Forest is limited by a prescription laid down in a Working Plan which is submitted to and endorsed by the Governor in Executive Council. A Plan approved by Parliament in January, 1956, provides a permissible annual intake of 49 million cubic feet by 117 sawmills. This figure shows an increase of 19 million cubic feet when compared with the previous Working Plan brought into operation in 1945, but is due to an extensive revision of forest capital and the decision that the sustained yield capacity will allow this permissible cut.

Private property over the past five years has yielded approximately 27 per cent. of the total timber supply. It is realised that this source cannot be maintained indefinitely and eventually the State Forests will be called on to provide the bulk of timber supplies. A redeeming feature is the fact that actual intake of mills operating on Crown lands is considerably less than their permissible intake. In 1955, when production reached its highest point, the log intake under permit was 37 million cubic feet, 12 million cubic feet less than the prescribed figure set out in the 1956 Working Plan.

Due to the absence of indigenous conifers in Western Australia and the limited areas of young pine plantations, no pulp or paper industries have been developed, but a plywood industry has been established and from its inception in 1946 has developed to large proportions. In this

activity both pine from plantations and native Karri (*Euc. diversicolor*) have been used, together with limited quantities of imported timber.

- (2) (i) During the past five years, extensive reconnaissance by ground parties coupled with application of aerial photographic methods, has provided information concerning large areas of previously little known forest in the far-South of the State.

Proposals have been developed for the utilisation of this country and plans prepared for the building of a large saw-milling centre with a number of sawmills. This development is desirable to provide an equitable distribution of cut through the forest area and to reduce a tendency towards over-cutting of areas in the proximity of major markets.

- (ii) No major changes have occurred in methods of felling, extraction and conversion during the five-year period, but the use of power saw falling has found greater application in many centres.

Locomotive extraction methods have continued to give way to motor lorry transport and the greater part of haulage is now carried out by truck with the advantage to forestry in the resultant construction of good roads.

During the last decade, the provision of a large-scale electricity network throughout the South-West of the State has been followed by the electrification of a few small sawmills, but has not yet affected the large industries.

- (iii) Large-scale assessment programmes carried out in the last few years have indicated the presence of very large volumes of Marri (*Euc. calophylla*), particularly in the far-South of the forest area. Unfortunately, this timber has less desirable properties than the well-known Jarrah and Karri. Although it is considered a very valuable secondary species, it may be some years before it is fully recognised.

- (iv) The approaching maturity of portions of the pine plantations has provided a small volume of logs suitable for milling into boards in addition to the main use of thinnings for case making. This production has been limited to weatherboards, flooring and mouldings, and has permitted the building of a few attractive sample houses to demonstrate the use of local pine which have generally been well received by the public.

- (v) Felling control is attained by Working Plans and treemarking. Import and export controls are exercised through policies of the Commonwealth Government, rather than those of the State, but administered by the State.

- (vi) Grading rules applying to Western Australian timbers are published by the Standards Association of Australia. No new publication has been made during the last five years, but grading rules established in 1948 have been applied, particularly to sleepers and export timbers, but have not as yet been put into substantial practice with timber for local consumption.

CHAPTER IV.

ORGANISATION OF RESEARCH AND EDUCATION.

(1) *Education.*

There have been no changes made in the methods of training for professional staff since 1950. Educational facilities are provided by the Commonwealth Government through the Australian Forestry School at Canberra where, following a basic science course at the University of Western Australia, a two-year course is given.

In the period under review there has been a re-institution of a forester trainee scheme to provide training for young men for entry to the subordinate staff. Instruction covers a period of two years and includes a series of schools, lectures and field camps to cover the various phases of forest activity.

(2) *Research.*

There have been no notable changes in the organisation of research since 1950, and satisfactory progress has been made in the various fields of established research.

The principal silvicultural investigations have been carried out through the research laboratory at Dwellingup. Additional work has been carried out through a research branch at Perth, and here investigations have been confined generally to problems associated with exotic coniferous plantations.

Considerable advances have been made in the technique of interpretation of vegetation from air photo studies.

A number of bulletins and papers have been published through the Forestry and Timber Bureau as follows :—

- Bulletin 30. Nutrition of the pine, 1950.
- Leaflet 66. Later disorders in pine stands in South and Western Australia, 1953.
- Leaflet 70. The influence of plant litter on the Jarrah forest soils of the Dwellingup region—Western Australia, 1955.
- Leaflet 71. A preliminary investigation of the fauna of humus layers in the Jarrah Forest of Western Australia, 1955.

An important advance made to assist research has been the reclassification of the Forests Department Library under the Oxford System of Decimal Classification for Forestry.

CHAPTER V.

STAFF AND LABOUR OF THE FORESTS.

A. State and Communal Forests.

(i) Superior Staff (mainly University trained)—		
(a) Forest		23
(b) Research and other specialised services ..		5
(ii) Subordinate Forest Staff—		
(a) Trained		100
(b) Untrained (Trainees)		10
(iii) Clerical		52
(iv) Other Miscellaneous Forest Staff—		
Overseers		40
(v) Permanent Labour Force		423

Since 1950, the position with respect to superior staff has improved considerably, but unfortunately the increase in numbers has not been sufficient to fulfil all requirements of expansion of forest projects. The deficiency in numbers of trained personnel has been assisted to a limited degree by an increase in subordinate staff, but there remains a pronounced shortage of trained foresters in Western Australia.

The permanent labour force has been short supplied during the post-war period and for the greater part of the five-year period. Recent indications of unemployment have increased the availability of labour. Generally speaking, however, the numbers of men employed have been sufficient to meet Forestry Works Programmes except in occasional seasonal activities, such as pine planting.

Over the five-year period, sawmilling in particular has suffered from a shortage and a migration of labour.

B. Private Forests.

No detailed information is held but employment under this category is virtually nil due to the fact that there is practically no private forest under management. Employment in the utilisation of private forest is included in the figures for Table 7 for the industry as a whole.