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Skills Gap and Training Needs Analysis

The Northern Territory and Ord Valley Forestry Region

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INTRODUCTION

The Northern Territory is home to important areas of managed native forests and plantations and a small scale, geographically fragmented and diverse wood processing sector.

The Northern Territory and Ord Valley Regional Forestry Hub and its supporting organisations, NT Farmers and Forest Industry Association Northern Territory (FIANT) commissioned this study to inform the future policy development regarding plantation development opportunities, infrastructure needs, additional processing potential, and employment opportunities for the forest industries.

Specifically, this study identifies and provides recommendations for supporting the current and future skills and training needs of the forest industry within the Hub's geographic area. This area includes the northern part of the Northern Territory and the Ord Valley region of the Western Australia (Figure 1).

METHODOLOGY

The findings in this study are based on desktop research, interviews with industry businesses and training providers, and input from industry support organisations.

The interviews and discussions were held during November 2022 and designed to gather information on the current and future workforce and skill demand, training requirements, barriers to access training, and difficulties in attracting and recruiting employees.

The desktop research consisted of two components:

- the use of Australian Bureau of Statistics (ABS) datasets, including the 2021 Census of Population, to produce a regional industry overview and workforce profile, and
- an analysis of published industry studies and reports that outline significant strategic directions for and within the industry supply chain to determine what these opportunities mean for the workforce, what jobs will be created, and what support is required for training to build capacity to support these goals.

1 INDUSTRY PROFILE

This section provides an overview of the forest and wood processing industry in the Northern Territory and the Ord Valley region of Western Australia. It describes the scope of its main sectors, activities, and business count so that the industry's diversity, the range of jobs it offers, and its importance as a major source of jobs might be appreciated more fully.

1.1 SUMMARY OF KEY POINTS

There are over fifty businesses in the forest and wood processing industry in the Northern Territory and Ord Valley region of Western Australia, with only around half of them being employing businesses.[1]

The industry encompasses a wide range of activities, from private native and plantation forestry (including support services) to harvesting (for timber production, forest thinning as part of the management of vegetation/trees regrowth and log salvage from mining leases as), wood processing (wood chips for paper and landscape products, and essential oil), and the production of wood joinery, kitchen cabinets, and timber structural components (such as wall frames and roof trusses), all of which add to the diversity of jobs generated by the industry in the region.

1.2 OVERVIEW

The Northern Territory's forest and wood products industry, including its workforce, is small in scale, geographically fragmented and diverse because of the relative remoteness of the forestry regions from wood processing facilities, ports and population centres.

Commercial forest lands and related activities are located in the northern part of the Territory, specifically in the Tiwi Islands, East Arnhem, West Arnhem, North Roper Gulf, Katherine and Douglas Daly. To the west, it extends into the Ord Valley region of Western Australia, which is the east corner of Wyndham-East Kimberley (Figure 1).

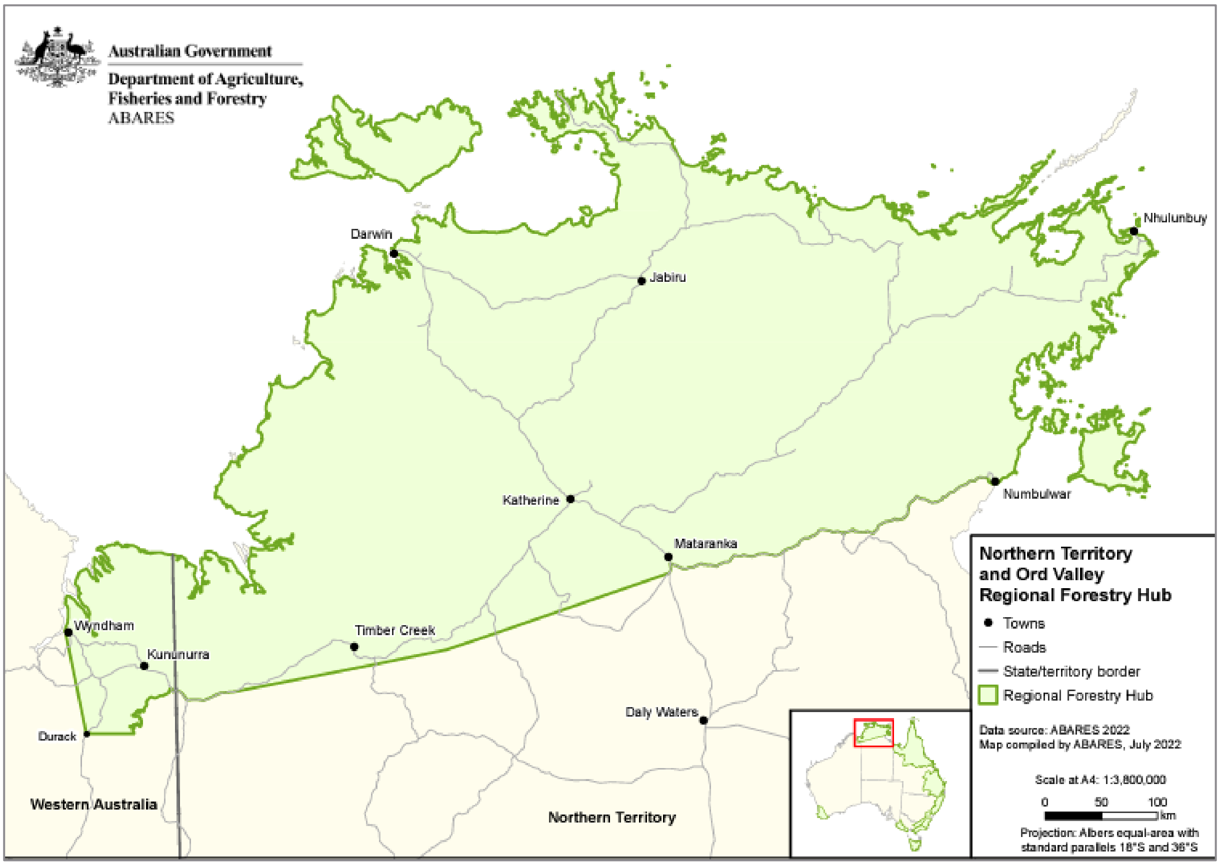
The forestry industry in the Northern Territory generates distinct regional employment opportunities and economic benefits to the local communities while maximising the value through synergies, partnerships and shared resources with the landscape, agriculture, horticulture and civil construction sectors.

Collaborations enable the commercialisation of residual forest biomass for landscaping products (slash, bark, potting mix) and the sharing of seasonal workforce and skills in areas such as heavy machine operations and logistics. They also enable plantation growers of African Mahogany and Indian sandalwood in Douglas-Daly and Kununurra to integrate farm forestry and use cattle and goats for weed control and silvopastoral potential.[2]

[1] ABS, 2021, Counts of Australian Businesses June 2017 to June 2021, Cat. No. 8165.0

[2] Stephens, M., Woods, T., Brandt, C., Bristow, M., Annandale, M., 2020, Northern forestry and forest products industry situational analysis. https://crcna.com.au/resources/publications/northern-forestry-and-forest-products-situational-analysis

Figure 1: Map of the Northern Territory and adjacent region with commercial forest lands and related activities (Northern Territory and Ord Valley Regional Forestry Hub boundary)



Source: ABARES, 2021[3]

1.3 FORESTRY AND SUPPORT SERVICES

The forest sector consists of a small number of businesses that are responsible for the management of commercial native forests, including state-owned, private and Indigenous native forest estates, and plantations.

According to ABS data[4, 5], there were around 15 forest growers in the Northern Territory in 2021. The vast majority of these were non-employing businesses, with only a few employing and paying a salary to a small number of people (between 1 and 19 people)[6]. Important plantation growers in the Territory include Quintis, African Mahogany Australia and Tiwi Plantations Corporation/ Plantation Management Partners; and in the Ord Valley of Western Australia, these include Quintis and Santanol

[3] https://www.agriculture.gov.au/agriculture-land/forestry/regional-forestry-hubs#northern-territory
[4] ABS, 2021, Counts of Australian Businesses June 2017 to June 2021, Cat. No. 8165.0
[5] ABS Counts of Australian Businesses dataset counts all actively trading businesses in the Australian market sector that remit GST through Business Activity Statements (BAS) lodged with the Australian Tax Office (ATO). Businesses are classified according to Australian and New Zealand Industry Classification (ANZSIC).
[6] In ABS Counts of Australian Businesses dataset, businesses with a Pay As You Go (PAYG) withholding role with the ATO are considered employing businesses. Employment excludes non-salaried directors, volunteers, persons paid by commission only, and self-employed persons such as consultants and contractors.

In addition, there were 6 businesses that provided forestry support services in the Northern Territory, such as planting and pruning trees, forest restoration or maintenance. Some of these businesses employed between 1 and 19 people.[7]

1.3.1 Native forestry

Native forest area available and suitable for commercial wood production has a low level of sawlog commercialisation.[8] These forests are managed by the state forestry organisation, Indigenous forestry enterprises and farm forest growers who combine productive private native forests and farm activities such as cattle grazing.

A small volume of hardwood sawn wood is produced from native forests locally and this is mostly used for posts, poles and high value appearance applications, such as flooring, decking, veneer and furniture for domestic/local consumption.

1.3.2 Plantation forestry

Plantation forestry is the second largest production land use in the Northern Territory after beef grazing, with more than 47,000 hectares.[9]

There are three types of plantations in the Territory and the Ord Valley region of Western Australia, which are owned and managed by different companies: Quintis, Santanol, African Mahogany Australia and Tiwi Plantations Corporation / Plantation Management Partners. These are:

- Indian sandalwood (*Santalum album*) in the Ord River Irrigation Area (ORIA) in Western Australia and the Douglas Daly, Katherine and Mataranka[10] regions of the Northern Territory to produce dry sandalwood heartwood for the crafting industry and oil for pharmaceutical and wellbeing industry,
- African mahogany (*Khaya senegalensis*) in the Douglas Daly region of the Northern Territory and the Ord Valley region of Western Australia to produce high value sawn timber used for flooring, fine furniture or veneers, and
- Black wattle (*Acacia mangium*) in the Tiwi Islands to produce pulp from woodchips.

The state-based northern cypress pine (*Callitris Intratropica*) plantations, which were established in the 1960s at Howard Springs near Darwin, are also worth highlighting. In 1995, these plantations were decommissioned and turned into a recreational area. Australian Blue Cypress is authorised to take from this pine plantation about 1ha (or 1,000 trees) annually to make essential oil.[11]

1.4 HARVESTING

Forest harvesting involves cutting trees and transporting them to a site for processing into products such as timber or sandalwood oil. Log haulage may be performed either by the same harvesting business or a company specialising in transport.

[7] ABS, 2021, Counts of Australian Businesses June 2017 to June 2021, Cat. No. 8165.0
[8] ABARES
[9] https://nt.gov.au/industry/agriculture/food-crops-plants-and-quarantine/forestry
[10] Quintis has sold the sandalwood plantation estate near Mataranka and the future of this plantation is uncertain. The purchasing company may continue the plantation management and thus the resource remains a current part of the industry assets.
[11] https://www.abc.net.au/news/2021-07-28/howard-springs-pine-forest-development-investigation-plan-worry/100325986

Harvesting equipment is also used to cut vegetation (tree) regrowth or conduct thinning in plantations and private native forests managed for timber production. In many instances, these activities are carried out by workers employed in forestry or forestry support organisations or sourced from agriculture-related businesses.

According to ABS data[12], there were three harvesting businesses in the Northern Territory in 2021, each of which had a small number of employees. The 2021 ABS Census also reports some employment levels for the harvesting industry in the Tiwi Islands and Darwin (Table 2). Thus, it is possible that the three harvesting business reported by the national data operate in these areas and are involved in woodchip harvesting operations in the Tiwi Islands in Australian and Blue Cypress harvesting activities close to Darwin. The latter is licensed to harvest about 1ha (about 1,000 trees) a year from the Howard Springs's pine plantation, nearby Pinelands, to produce blue essential oil.[13]

Since the ABS data is provided by state, it is not possible to determine the number of harvesting businesses (contractors) that provide services to the sandalwood plantations in the Ord Valley of Western Australia.

Quintis harvested 256 hectares (about 60,000 Indian sandalwood trees) from its 15-year-old Packsaddle plantation near Kununurra in the Ord Valley in 2021, resulting in the company's highest harvest ever. The company projected a doubling of production in 2022 and substantial increase over the next five years. The first harvest on the Northern Territory plantation estate owned by Quintis is not expected until 2027.[14]

Santanol harvested more than 106 hectares of timber in 2020. This was the company's most important harvest yet from one of its very early plantations. Santanol had plans to resume harvesting at its Kneebone plantation in Kununurra in April 2021, with the size of the harvest depending on the recovery of global oil demand from COVID. The company expects to increase output as plantations mature.[15]

1.5 WOOD PROCESSING AND MANUFACTURING

The wood processing sector in the Northern Territory and Ord Valley region includes four important businesses with vertically integrated operations (forestry and wood processing) that provide diverse products and employment opportunities. These are:

- Gumatj Corporation Limited 's hardwood sawmill in Nhulunbuy, East Arnhem, which provide sawn products from Indigenous owned and managed forests to local markets for housing projects,
- Tiwi Plantations Corporation / Plantation Management Partners woodchip processing and ship loading facilities on Melville Island (the Tiwi Islands), which provide export chips for pulp and bioenergy markets,
- Quintis' primary processing facility of Indian sandalwood logs in Kununurra, Western Australia (WA) which process harvested logs into dry heartwood and woodchips and transport material to the company's oil distillery near Albany, WA, and
- Santanol's primary processing facility of Indian sandalwood in Kununurra, which dry, sort and process harvested logs into chips and transport material to the company's oil distillery in Perth.

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12 ABS Catalogue No 8165.0 Counts of Australian Businesses, including Entries and Exits, June 2017 to June 2021
13 https://www.abc.net.au/news/2021-07-28/howard-springs-pine-forest-development-investigation-plan-worry/100325986
14 https://www.abc.net.au/news/2021-09-02/quintis-record-sandalwood-harvest/100427246
15 https://www.abc.net.au/news/rural/2020-11-17/santanol-harvest-sets-a-record-in-wa/12888172

In addition, this sector includes 21 businesses (with half employing and half non-employing businesses)[16] that produce wood joinery, kitchen cabinets, and timber structural components such as wall frames and roof trusses, as well as other niche operators such Australian Blue Cypress. Australian Blue Cypress produces a pure blue essential oil by distilling the combined wood and bark of Northern Cypress Pine trees at its Holtze facility. Other niche businesses may process African Mahogany amenity trees into landscaping products, outdoor furniture and wood chips.

[16] ABS, 2021, Counts of Australian Businesses June 2017 to June 2021, Cat. No. 8165.0

2 WORKFORCE PROFILE

This section provides a profile of the forest industry workforce in the Northern Territory and the Ord Valley region of Western Australia, including employment levels and workforce diversity, using the 2021 ABS Census data.

Caution should be applied when using this data for any analysis or decision-making due to an apparent gap in the ABS Census' employment figures (see comments in the employment section below). The ABS Census also does not provide data on seasonal workforce, which is a key component of the forest industry in the region.

2.1 SUMMARY OF KEY POINTS

The industry employs well over 300 people in the Hub's region of the Northern Territory and Ord Valley. About 85% of these people work in forestry operations.

Industry's operations in the Ord Valley region of Western Australia employs the most people.

Over half of workers in forestry (57%) are young people under the age of 40. About 9% of workers are older than 60, approaching retirement age.

Aboriginal people represent 41% of the industry's workforce in the region, supporting mainly forestry operations.

Women make about 26% of the industry' workforce. There are nearly twice as many women working in forestry in this region (34%) as there are in national forest and wood products industry (18%).

Park rangers, inspectors and regulatory officers, farm forestry, garden and other forestry workers, farm, forestry production and other managers, foresters and fire fighters are the main occupations in forestry in the region.

2.2 EMPLOYMENT

About 300 people are employed in the forestry and wood processing sectors in the Northern Territory Forestry Hub's region (Table 1).

The 2021 ABS Census data classifies a person's industry of employment based on how they answer a number of questions, and this is coded according to the Australian and New Zealand Standards Industrial Classification (ANZSIC). ANZSIC's codes and definition of the forest industry sectors are provided in Attachment 1.

It is noted that the ABS Census data does not include employees who work for the following established industry operations under their respective regions and industry of employment. The industry of employment for these operations would be sawmilling, wood chipping, logging, and other wood product manufacturing according to ANZSIC.

- the hardwood sawmill in Nhulunbuy, East Arnhem,
- the woodchip processing plant in Tiwi Islands,
- harvesting of sandalwood plantations from Kununurra, the Ord Valley region,
- primary processing of sandalwood in Kununurra, the Ord Valley region
- other small niche wood processors from the Northern Territory.

In addition, the Tiwi Islands' plantation activities reportedly employ between 57 and 75 people depending on the harvesting and non-harvesting seasons, contrasting to the 18 people recorded in the ABS Census as working in the industry in the Tiwi Islands.

Hence, it is believed that the actual employment in the industry is larger than what is reported.

Close to 85% (294) of the reported workforce is employed in forestry and forestry support services businesses/operations, while 12% (39) are engaged in the manufacturing of wooden structural fittings and components (such as roof trusses, doors, wood-framed doors, wall and window frames, shop fronts and joinery including kitchen fittings for buildings).

The largest employing region is the Ord River Irrigation Area of Wyndham-East Kimberley in Western Australia, with 25% (78) forestry and forestry support services workers, followed by Darwin with 19% (59), West Arnhem and the north region of Roper Gulf, each with approximately 12% (35) (Table 1 and Figure 2).

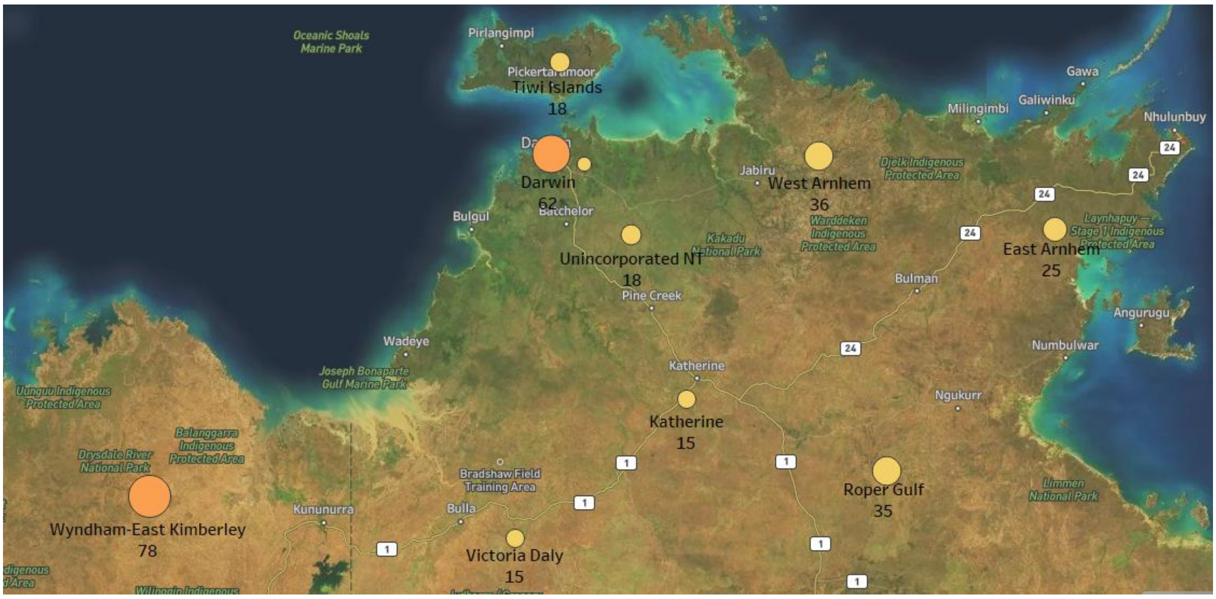
Table 1: Industry employment by local government area (LGA) and sector, the Northern Territory and Ord Valley Forestry Hub region, 2021

	ANZSIC 4-digit level Industry of Employment					
LGA (Place of Work)[1]	Forestry	Forestry Support Services	Logging	Wooden Structural Fitting and Component Manufacturing	Total Employees (No)	Proportion (%)
Wyndham-East Kimberley (Ord Valley)	66	12			78	25%
Darwin	11	13	5	30	59	19%
West Arnhem		36			36	12%
Roper Gulf		35			35	11%
East Arnhem		25			25	8%
Unincorporated NT	15	3			18	6%
Tiwi Islands	4	10	4		18	6%
Victoria Daly		15			15	5%
Katherine	15				15	5%
Litchfield		5		4	9	3%
Palmerston				5	5	2%
Total	111	157	9	39	313	100%
Proportion (%)	35%	49%	3%	13%	100%	

[1] This and the next tables, which are based on the 2021 Census, provide data at the Local Government Area (LGA) level. LGAs and Statistical Areas Level 2 are the smallest geographical areas used in the 2021 Census datasets.

Source: ABS Census of Population and Housing, 2021, TableBuilder

Figure 2: Map showing the industry employment level by local government area (LGA) according to the ABS Census 2021, the Northern Territory and Ord Valley Forestry Hub region



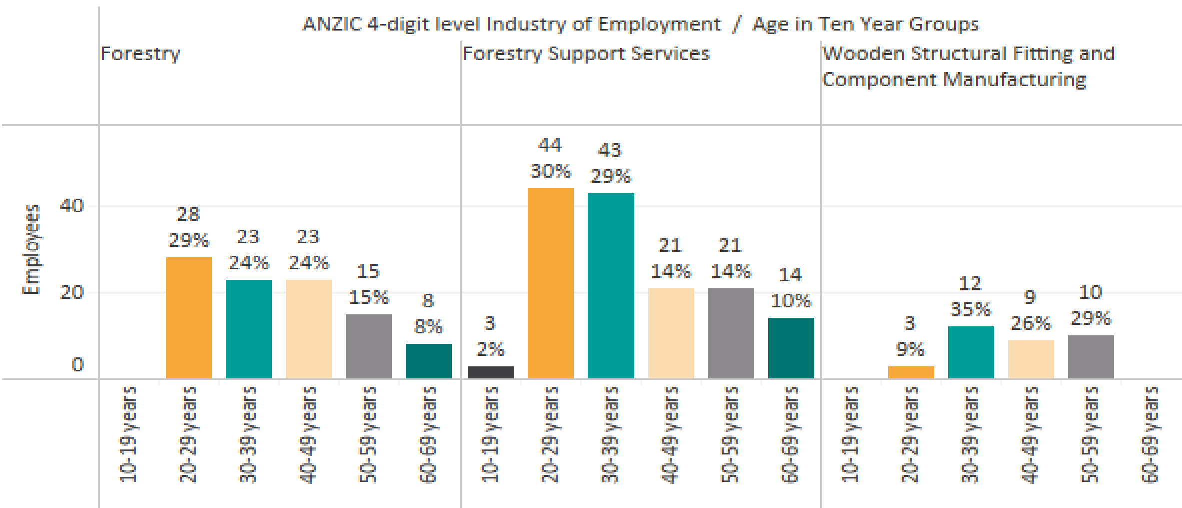
2.3 WORKFORCE DIVERSITY

2.3.1 Age distribution

There is a substantial proportion of young people working in the forestry and forestry support services sectors in the Hub's region of the Northern Territory and Ord Valley. Over half of this workforce (57%) is under the age of 40, with another third (33%) being between the ages of 40 and 60. Nine in one hundred workers (9%) are over the age of 60, approaching retiring age (Figure 3).

In contrast, the workforce in manufacturing of wooden structural components is more heavily concentrated in the elder age groups. More than half of the workforce in this sector (55%) falls into the middle-aged bracket (40-60).

Figure 3: Age distribution of industry workforce by sector, the Northern Territory and Ord Valley Forestry Hub region, 2021



Source: ABS Census of Population and Housing, 2021, TableBuilder

2.3.2 Gender

Women had been considerably underrepresented in the Australian forest and wood products industry, with their participation increasing slightly from 11% in 2016 to 18% in 2021[17].

In the Hub's region of the Northern Territory and Ord Valley, women comprise 26% of the industry's workforce. This participation can be attributed to the forestry and forestry support services sectors, which employ nearly up to twice as many women (34%) as the average national forest and wood products industry (18%). Women participation in the regions' logging and manufacturing of wooden structural components is below the national average for the forest and wood products industry, at 0% and 16%, respectively (Table 2).

Table 2: Women workforce participation by industry sector, the Northern Territory and Ord Valley Forestry Hub region, 2021

ANZIC 4-digit level Industry of Employment	Gender	Employees (No)	Proportion (%)
Forestry	**Female**	**41**	**34%**
	Male	78	66%
	Total	119	100%
Forestry Support Services	**Female**	**40**	**26%**
	Male	112	74%
	Total	152	100%
Logging	**Female**	**0**	**0%**
	Male	9	100%
	Total	9	100%
Wooden Structural Fitting and Component Manufacturing	**Female**	**6**	**16%**
	Male	31	84%
	Total	37	100%
Total	**Female**	**87**	**26%**
	Male	230	74%
	Total	317	100%

Source: ABS Census of Population and Housing, 2021, TableBuilder

2.3.3 Aboriginal and Torres Strait Islander participation

Aboriginal people make up 41% of the workforce in the forest and wood products industry in Hub's region of the Northern Territory and Ord Valley, and they all work in forestry and forestry support services (Table 3).

Aboriginal employment is present throughout the majority of the state's forestry regions; however, it is more prevalent in regions with Indigenous Forest estates (such as West and East Arnhem and Roper Gulf), and Ord Valley (Table 4).

It should be noted that the actual figure of Aboriginal workforce may be higher than that reported. Industry interviews suggest that approximately one-third of the workforce involved in the *Acacia mangium* (Black wattle) plantations' operations in the Tiwi Islands is made up of people of Aboriginal descent, and this number rises to about half within plantation management activities. The workforce

[17] ABS Census 2021

at the *Accacia mangium* plantation ranges from 57 during off-season to 75 during the harvesting season.

There are no records of Torres Strait Islanders working in the forest and wood products industry in the region.

Table 3: Aboriginal workforce participation by industry sector, the Northern Territory and Ord Valley Forestry Hub region, 2021

ANZIC 4-digit level Industry of Employment	Indigenous Status	Employees (No)	Proportion (%)
Forestry	**Aboriginal**	**0**	**0%**
	Non-Indigenous	103	100%
	Total	103	100%
Forestry Support Services	**Aboriginal**	**124**	**83%**
	Non-Indigenous	26	17%
	Total	150	100%
Logging	**Aboriginal**	**0**	**0%**
	Non-Indigenous	9	100%
	Total	9	100%
Wooden Structural Fitting and Component Manufacturing	**Aboriginal**	**0**	**0%**
	Non-Indigenous	40	100%
	Total	40	100%
Total	**Aboriginal**	**124**	**41%**
	Non-Indigenous	178	59%
	Total	302	100%

Source: ABS Census of Population and Housing, 2021, TableBuilder

Table 4: Aboriginal workforce participation by local government area (LGA), the Northern Territory and Ord Valley Forestry Hub region, 2021

LGA (Place of Work)	ANZIC 4-digit level Industry of Employment / Indigenous Employees	
	Forestry Support Services	
	Aboriginal Employees (No)	Proportion (%)
West Arnhem	30	24%
Roper Gulf	28	23%
East Arnhem	21	17%
Wyndham-East Kimberley (Ord Valley)	17	14%
Victoria Daly	11	9%
Darwin	5	4%
Tiwi Islands	5	4%
Litchfield	4	3%
Unincorporated NT	3	2%
Katherine	0	0%
Palmerston	0	0%
Total	124	100%

Source: ABS Census of Population and Housing, 2021, TableBuilder

2.4 CURRENT JOB ROLES

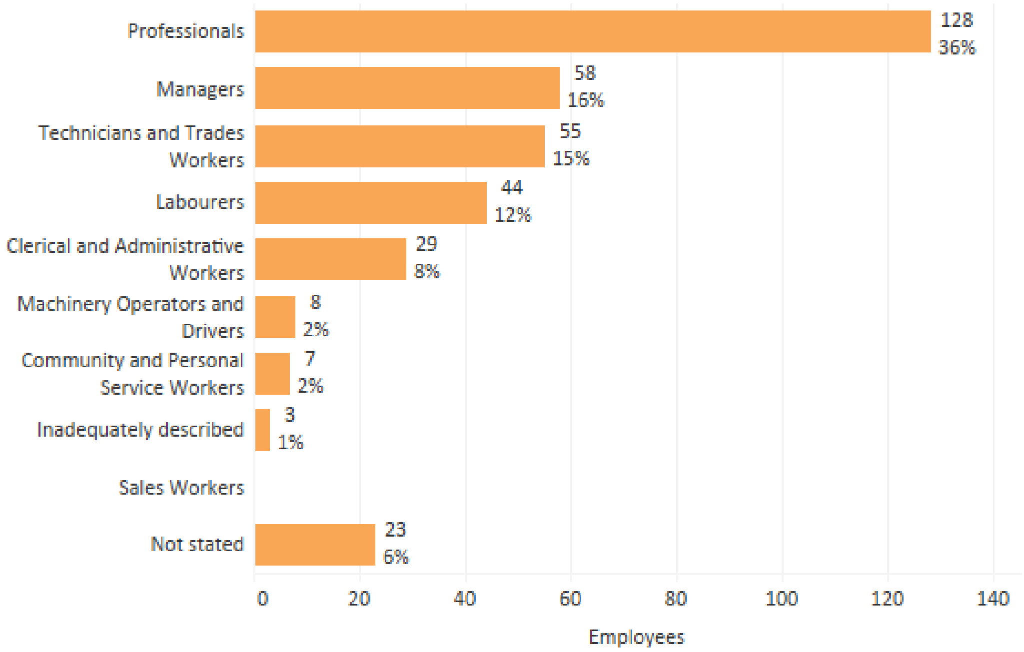
The largest occupation group in the forest and wood products industry in the Northern Territory and Ord Valley region is professionals (36%), followed by managers (16%) and technicians and trade workers (15%) (Figure 4).

Managers and professionals such as forest production managers, farm managers, foresters, and other experts account for almost half of the jobs in forest management organisations (Table 5).

Professionals make up two-thirds of the workforce in forestry support services and these include park rangers, agricultural consultants, conservation officers or professionals in community service. Inspectors, regulatory officers, and firefighters are also positions present and important in this sector.

Cabinetmakers and carpenters play a critical role in the production of wood joinery and timber structural components.

Figure 4: Distribution of occupation groups in the industry, the Northern Territory and Ord Valley Forestry Hub region, 2021



Source: ABS Census of Population and Housing, 2021, TableBuilder

Table 5: Job roles by industry sector, the Northern Territory and Ord Valley Forestry Hub region, 2021

ANZIC 4-digit level Industry of Employment	ANZSCO 1-digit level Occupation	ANZSCO 6-digit level Occupation	Employees (No)	Proportion (%)
Forestry	Managers	**Production Manager (Forestry)**	**9**	29%
		Crop Farmers nec	3	
		Farmers and Farm Managers nfd	3	
		Not stated	18	
	Professionals	**Forester**	**10**	19%
		Not stated	12	
	Technicians and Trades Workers	Plumber (General)	9	12%
		Not stated	5	
	Clerical and Administrative Workers	Accounts Clerk	6	8%
		General Clerk	3	
	Labourers	**Farm, Forestry and Garden Workers nec**	**13**	29%
		Forestry Worker	3	
		Labourers nfd	3	
		Logging Assistant	3	
		Not stated	11	
		Inadequately described	3	3%
	Total		114	100%
Forestry Support Services	Managers	**Managers nfd**	**6**	12%
		Production Manager (Forestry)	3	
		Not stated	10	
	Professionals	**Park Ranger**	**88**	66%
		Agricultural Consultant	4	
		Conservation Officer	4	
		Family Support Worker	3	
		Professionals nfd	3	
		School Teachers nfd	3	
	Community and Personal Service Workers	**Fire Fighter**	**9**	6%
	Clerical and Administrative Workers	**Inspectors and Regulatory Officers nec**	**12**	8%
	Machinery Operators and Drivers	Truck Driver (General)	4	3%
	Labourers	Farm, Forestry and Garden Workers nec	3	6%
		Not stated	7	
	Total		159	100%
Logging	Managers	**Managers nfd**	**4**	100%
Wooden Structural Fitting and Component Manufacturing	Technicians and Trades Workers	**Cabinetmaker**	**12**	100%
		Carpenter	**5**	
	Total		17	
Not stated			23	
Total			313	

Definitions: nec - not elsewhere classified; nfd - not further defined

Source: ABS Census of Population and Housing, 2021, TableBuilder

3 CURRENT AND FUTURE SKILLS AND TRAINING NEEDS

This section provides an overview of the specific skills that forestry businesses from the Hub's region require now and in the future, based on interviews with four plantation growers and one forest management contracting business from the Tiwi Islands, Ord Valley, Douglas-Daly and Katherine regions. Collectively, these businesses employ more than 225 people in the region.

Additionally, it is important to highlight a recent pre-employment training and workforce development program as an example for attracting and developing workforce for the forest industry. Funded by the Northern Territory Government and delivered by NT Farmers in July 2022, the three-week program featured mentors and guest speakers, a one-day excursion to two plantations, and accredited training sessions for using a chainsaw and felling small trees.

3.1 SUMMARY OF KEY POINTS

Direct employment, seasonal employees, and independent contractors all provide skills that help the industry run its operations. Interviews and reports indicate that forest businesses will need to hire more people and expand their workforce in the following occupational areas over the next three years to meet their operational and strategic objectives.

Table 6: Workforce demand in the forest industry (present and the next 3 years), the Northern Territory and Ord Valley Forestry Hub region

Region	Job role	No of workers	Job-specific pre-employment requirements
Douglas Daly and Katherine	Harvest manager	2	Forest industry harvest experience
	Irrigation manager & irrigators	3	Advanced technical understanding of crop evapotranspiration and irrigation scheduling
	Process operators	5	Range of production-based skills including mechanical, scheduling and manual labour
	Saw doctor	1	Experience in saw blade maintenance and sharpening
	Sawmill workers	2	NA
Ord Valley	Goat manager / Farm hand	1	Qualification & experience
	Irrigators	1	Experience
	Tractor operators	4	Driver's license, excavator, skidder, forklift tickets and experience
Across the above regions	Machinery operators	18	License and experience
	Mechanics (Diesel)	1	Trade certificate and experience
	Operations managers	1	Trade certificate and experience
Tiwi Islands	Mechanics (Diesel)	4	NA
	Jobs in plant propagation (nursery workers), planting (planter/seasonal), machinery operation, spraying, ground preparation	NA	NA
	Safety managers	1	NA
	Workshop managers	1	NA
Total		45	

Note: This and the information that follows is not an exhaustive list of the workforce and skill needs in the Northern Territory and Ord Valley Forestry Hub region; rather, it is based on a select sample of businesses that includes key forestry operations in specified regions.

Source: Northern Territory and Ord Valley Forestry Hub interviews, 2022

Businesses anticipate that they will need to organise and provide training to skill the new hires for the job for the majority of the above specialist occupations where there is shortage of qualified candidates.

Additional skills and qualities sought when recruiting for entry-level positions are listed below.

Table 7: Entry-level skills and attributes sought by forest industry employers, the Northern Territory and Ord Valley Forestry Hub region

Skills and attributes
Work ethic
Basic industry knowledge
Workplace health and safety awareness
Pre-employment medical check, including drug and alcohol test
Driver's license

Source: Northern Territory and Ord Valley Forestry Hub interviews, 2022

Businesses plan to invest in training their employees in the following areas over the next three years and on an ongoing basis, in order to maintain compliance, gain new technological skills and knowledge, and enhance their digital capabilities.

Table 8: Required skills and training in the forest industry (present and over next three years), the Northern Territory and Ord Valley Forestry Hub region

Region	Required skills/training	Targeted job roles	Preferred form of training
Douglas Daly and Katherine	Aboriginal Engagement, emotional intelligence	All roles	Any (online, at the workplace, together with trainees from other organisations, within business hours)
	All kinds of agricultural equipment verification of competency (VOC).	Operational roles	
	Certificate III or IV in relevant position	Operational roles	
	Digital skills (Drone, imagery, GIS, LiDAR Excel, statistics)	Technical staff	
	Frontline management, senior management and senior leadership skills development, project management	Management roles	
	FSC and PEFC, ISO	Forest managers; Technical staff; Senior operators	
Ord Valley	Driver's license, excavator, skidder, forklift tickets* and experience	Tractor operators	On-site or TAFE Kununurra
	First Aid, CPR, ChemCert, Chainsaw, Tractor operations, mechanical, irrigation	Forest workers and operators	On-site or TAFE Kununurra
Across the above regions	ChemCert, Firefighting, First Aid*	Forest workers and operators	NA
		Machinery Operator; Tractor, Grader, Loader, Hedger, Excavator	NA
Tiwi Island	Digital capability - Resolving ICT issues, and word processing and basic computer operation (e.g., excel and other software)	Operational staff	At workplace, together with workers from other organisations, at a campus
	Management and leadership	Management roles	
		Operational staff	

Region	Required skills/training	Targeted job roles	Preferred form of training
	Transferable skills (e.g., problem solving, critical thinking, teamwork, attention to detail, self-management, leadership)	Operational staff	

Note: * Regular reviews and updates are required on these skills and associated certifications.

Source: Northern Territory and Ord Valley Forestry Hub interviews, 2022

Businesses believe that access to the following support services will help them better plan for the future training and workforce development of their employees.

Table 9: Workforce development support services required by the forest industry businesses, the Northern Territory and Ord Valley Forestry Hub region

Required workforce development support service
Guidelines for conducting workforce development plans
Information about available training programs
Information about the cost of training
Information about government subsidies for training

Source: Northern Territory and Ord Valley Forestry Hub interviews, 2022

Businesses highlighted a lack of available labor and the difficulty of finding skilled workers as a significant challenge. They find it hard to compete with other industries that pay their operators up to $60 per hour, despite the fact that our industry is praised for its exceptional work conditions. As such, businesses have gone to great lengths to attract potential candidates. Recruitment videos have been produced, and national and international marketing campaigns have been launched in Ireland and New Zealand. Additionally, businesses are exploring the option of sponsoring internationals to fill available positions. Unfortunately, the isolated location of our industry and lack of accommodation make recruitment difficult, and the high crime rate in certain locations is a major concern. When recruiting, businesses must be mindful of potential candidates' backgrounds and look for those with a farming background to fill available positions. In summary, they believe the following factors contribute to their ability to attract, recruit and retain workers.

Table 10: Factors affecting a business's ability to attract, recruit and retain workers in the forest industry, the Northern Territory and Ord Valley Forestry Hub region

Factors affecting attraction, recruitment, and retention
Industry's remoteness and the seasonal nature of work
A lack of vocational education and training in forestry in local schools and educational institutions
A lack of support for students who want to pursue a career in the forestry industry after school
A lack of public awareness of our industry's jobs and value to communities and the environment
A mismatch between what applicants expect and what it is like to work in the industry
Local competition for labour
Liveability, housing affordability or ongoing accommodation shortages in the region
High expenses associated with recruiting farm workers and machinery operators through advertising
Intricacies of the migration legislation, with a multitude of grey areas due to the complexity of the legal language used
Climate is difficult to work in (hot & humid at times)

Source: Northern Territory and Ord Valley Forestry Hub interviews, 2022

3.2 TIWI ISLANDS

Between 57 and 75 people are currently employed to perform jobs for the *Acacia mangium* (Black wattle) plantations' operations in the Tiwi Islands. These jobs include harvesting, haulage, wood chipping, stockpiling and wood chip screening at port site, ship loading, equipment maintenance at a central workshop and administration for managing the camp and fly-in-fly-out arrangements.

About 30% (22) of these workers undertake unskilled tasks or hold support positions as labourers, 60% (44) are skilled operators, with or without recognised training/qualifications, and 10% (9) hold management or professional positions.

Current and future workforce needs

There is a reported gap of personnel, notably for trade or skilled occupations, which must be filled now (3 to 4 heavy diesel mechanics, 1 safety officer, and 1 workshop manager) and in the coming years due to the retirement of workers (2 truck drivers, 1 plantation worker, and 2 administration officers).

It is expected that harvesting operations will continue for the next three to four years, requiring all the existing workforce and skills.

In addition, replanting with *Eucalyptus pellita* (Australian red mahogany) is scheduled to begin in 2023, requiring the hiring of additional workers to fill ongoing positions such as machine operators and seasonal positions such as nursery and tree planting employees. Consideration is also given to retraining and reassigning some of the current workforce in the coming years to assume new responsibilities and activities in areas such as tree propagation, tree planting, machinery operation, spraying, and site preparation.

New candidates for entry-level positions are required to satisfy the following requirements before they are trained on-site and get ready for the job: possess employability skills, qualities and attitudes; pass a drug and alcohol test; hold a driver's license; and pass a pre-employment medical check.

Skills and training needs of existing employees

The training of current employees will be considered over the next few years in addition to the training required to develop skills for filling job vacancies. Focus is placed on developing more workplace-related skills and digital capabilities for production workers, as well as management and leadership skills for management roles.

Feedback suggest that a number of support services would improve businesses' capacity to make better decisions about training and workforce development in the future. These include guidelines for conducting workforce development plans and information on available training programs and government training subsidies.

Ability to attract, recruit and retain workers

Access to labor is one of the greatest issues cited by forestry business. Industry's remoteness and the seasonal nature of work are reported to be contributing factors, along with the lack of vocational education and training in forestry in local schools and educational institutions, and the lack of support for students who want to pursue a career in the forestry industry after school.

3.3 ORD VALLEY

Quintis and Santanol, the two largest Indian sandalwood businesses with forestry operations in Western Australia's Ord Valley and in the Northern Territory (Quintis only) employ around 150 and 25 workers, respectively.[18, 19]

Harvesting operations at the sandalwood plantations in Kununurra (Ord Valley) will continue to grow over the following five years as the plantings mature, which will increase the need for more harvesting workers. This year's crop is expected to see a doubling of output, and the following five years will see significant growth.

> *The operators of tree feller can cut down a new Indian sandalwood tree every 30-40 seconds, or at a rate of around 1,000 trees per day during harvest.*[20]

In addition, more truck drivers and process workers will be needed at Kununurra's sandalwood plantations and processing sites to handle the future harvest output. After harvesting, workers transport the sandalwood logs to nearby processing facilities. Process operators then grade the logs according to their shape, size, and the proportion of heartwood and remove the bark and sapwood before drying them in a controlled environment. Logs are fed into grinding equipment and processed into wood chips. Sandalwood chips are then trucked over 3,000 kilometres to the businesses' steam distillation facilities near Albany and Perth, where the sandalwood oil is distilled and refined.

> *Each log of Indian sandalwood is carefully graded and sanded back to reveal the valuable heartwood inside.*[21]

Both sandalwood plantation businesses are committed to planting more land and improving the sustainability of their operations by reducing insecticide use and producing biochar from old host trees and leftover biomass material to improve soil health. As a result, the region will require an increased number of heavy machine workers to mechanically prepare the site for new plantings, and workers for manual planting of trees, spraying, tending the plantation (as it grows) and pyrolysis conversion of biomass waste.

In 2022, Quintis has reportedly planted more than 165,000 Indian sandalwood trees and 476,000 host trees (sandalwood is parasitic and requires a host tree to thrive) on 327 hectares at its Ord Valley Packsaddle plantation.[22]

Sandalwood businesses also employ research staff in Kununurra for programs designed to enhance tree selection, genetics, weed management and chemical usage so that future plantings will give healthier trees yielding greater amounts of sandalwood oil upon harvest.

Ability to attract, recruit and retain workers

Sandalwood businesses with operations in Ord Valley have identified a challenge in recruiting and retaining workers due to a limited pool of available personnel. To attract and retain suitable

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[18] Santanol. (2021). Our Plantations. https://santanol.com/plantations/
[19] Fowler, C. (2021, September 2). *Sandalwood giant Quintis celebrates record harvest in Western Australia's Ord Valley.* ABC News. https://www.abc.net.au/news/2021-09-02/quintis-record-sandalwood-harvest/100427246?utm_campaign=abc_news_web&utm_content=link&utm_medium=content_shared&utm_source=abc_news_web
[20] Ibid.
[21] Ibid.
[22] Ibid.

employees, they have implemented various incentives, including increased leave for certain roles, a more competitive salary, a pleasant working environment, and a diverse workforce (15 different nationalities). Additionally, they provide daily transport to the job site, and offer information about the local area, including schools, shops, and nearby locations such as Darwin and Broome. They also aim to encourage couples and families to join their team.

To reduce time and money spent on training, these businesses prefer to hire workers with the necessary skills to do the job. Although they may provide in-house training on tractors and basic irrigation, it is much more efficient if workers already have the knowledge.

3.4 DOUGLAS-DALY AND KATHERINE

African mahogany plantations (Douglas-Daly)

Nearly 14,000 hectares of African mahogany plantations are managed northwest of Katherine in the Douglas-Daly region of the Northern Territory to produce high-value sawn timber for flooring, furniture or veneer. The planting operation, which was set up for a single rotation, began in 2006. Trial harvests are anticipated to commence in about 7 to 10 years, when the plantation reaches harvest age.

Current and future workforce needs

Three employees are currently involved in the plantation management operations, with one responsible for administration work. Currently, there are no confirmed job vacancies in the African mahogany plantations.

Seasonal work is also required for plantation management. This work is done in accordance with the stage of growth of the trees and to address biosecurity issues (such as fungus infection), weeds, termites, and feral animals. These services, which include shooting, hunting, and chemical spraying, are frequently outsourced. During the summer, there is an upsurge in jobs related to fire prevention.

Contractors currently perform harvester thinning and seedling planting operations on African mahogany plantations to replace stems damaged by genetic causes and drought stress. The anticipated completion date for the thinning is 2024.The plantation owner engages in agistment to bridge the revenue gap until the plantation is ready for harvest. Both coppicing (the growth that results after pruning) and thinning, which increases grass growth by allowing more light to reach the forest floor, produce good quality cattle feed. A lot of intensive work on the young trees, water points and fencing is conducted by the agistee (cattle farmer).

The Northern Territory's African mahogany resource continues to be developed, and the goals for the following three years are to increase the number of clients and examine the next stage of resource development, which is harvesting and processing the existing resource. It is anticipated that a small-scale processing plant will be implemented during 2023 to research and better understand potential products, markets and customers. This will require the recruitment and training of additional people, including 2 sawmill workers and 1 saw doctor. According to the employer, the majority of the specialised sawmill training will be provided on the job, but new hires should have basic knowledge of sawmilling, awareness of workplace health and safety and employability skills, qualities and attitudes before beginning work. In addition, candidates for the saw doctor position should have more specialised skill sets related to saw blade maintenance and sharpening.

Skills and training needs of existing employees

Training is sought for existing employees over the next three years and on an ongoing basis to maintain compliance, gain new technological skills and knowledge and improve digital capabilities.

For instance, employees are required to maintain their skill certification for first aid, chainsaw operations, and other workplace health and safety compliance areas current. Annual reviews and updates are performed on these skills and associated certifications.

The management team will need to acquire a thorough understanding of industry practices and standards, such as forest and chain of custody certification of the African mahogany resource, in the following years, prior to the start of primary processing. Some of these practices will need to be implemented immediately, while others will be required over the next 3-5 years.

In addition, skills in the use of technology and digital tools (such as production and dissemination of digital maps and the application, interpretation and understanding of LiDAR technology (light detection and ranging remote sensing) as a forestry measuring tool will become increasingly important to the operations of the African mahogany plantations and there is an immediate need for training in this skill area.

Feedback suggests that a number of support services would improve businesses’ capacity to make better decisions about training and workforce development in the future. These include guidelines for conducting workforce development plans and information on available training programs, the cost of training and government training subsidies.

Ability to attract, recruit and retain workers

According to local forest industry, recruiting people with the right skills is a challenge in the region due to a lack of public awareness of our industry's jobs and value to communities and the environment, a lack of applicants for vacant positions, and a mismatch between what applicants expect and what it is like to work in the industry. Other contributing causes include local competition for labour and factors such as liveability, housing affordability or ongoing accommodation shortages in the region.

Sandalwood plantations (Douglas-Daly and Katherine)

The sandalwood business operations of the Douglas-Daly and Katherine region have set ambitious goals for the next three years. They aim to attract investment for new plantations, maintain and manage existing estates, and continue to develop technical expertise in sandalwood plantation management. To achieve these goals, they need to recruit additional personnel such as two harvest managers, five process operators, and three irrigation managers and operators. Pre-employment requirements include forest industry harvest experience, a range of production-based competencies such as mechanical, scheduling, and manual labour, and advanced technical understanding of crop evapotranspiration and irrigation scheduling.

To ensure their existing employees have the necessary skills and training, the business operations seek to provide training programs in Certificate III and IV qualifications in relevant positions, recognition of prior learning for all kinds of agricultural equipment, knowledge of FSC, PEFC and ISO, frontline management, senior management and senior leadership skills development, project management, digital skills (such as drone, imagery, GIS, Excel, and statistics), aboriginal engagement, and emotional intelligence training.

The business has reported difficulty in attracting forestry workers from the forest industry in Australia, believing that this is due to the perception that the Northern Territory forestry industry is not taken seriously, and people from the south do not view it as a desirable job option. Furthermore, the fly-in and fly-out offers for harvest managers are seen as unrealistic and non-committal. Although the big machinery used in forestry is attractive to potential workers, this is not viewed in the same way by workers from the southern industry. To address these issues, the business has opted to systemise their processes internally, providing more continuity as it doesn't depend on a specific skill set. However, this approach is limited in that it leaves room for workers to leave for other industries and jobs.

3.5 RECOMMENDATIONS

The following recommendations are made to support workforce and skill shortage in the industry:

Recommendation 1: Support forestry businesses to clearly identify their skill needs and training priorities through workforce development plans and provide them with information on available training programs, engagement requirements and government training subsidies.

Recommendation 2: Support forestry businesses and other local industries that rely on seasonal workers and contractors to coordinate and develop plans to pool and share their labour and skills by extending and expanding on the Department of Employment and Workplace Relations' Harvest Trail Services delivered by NT Farmers (or similar). This would entail advocating for forestry to be included in the Harvest Trail Services' guidelines alongside grain and horticulture harvesting, noting that sandalwood is currently covered. The services and arrangements needed would also include activities to sequentially manage the hiring of seasonal workers and contractors based on harvesting time of various crop types in the region.

Recommendation 3: Support forest businesses with information and application services pertaining to migration programs that provide regional employers with access to overseas workers to address labour gaps, particularly when extensive and temporary labour is needed for large forestry projects. Current examples of such programs are the Pacific Australia Labour Mobility (PALM) scheme nationally and the Northern Territory Designated Area Migration Agreement (NT DAMA). To make the PALM scheme more practical for our industry in the Northern Territory, it is also necessary to lobby the Australian Government to reduce the contracted time from 6 to 3 months and streamline the approval process, given that the climate here (wet seasons, monsoons, etc) allows for a peak period of work that last only 3 to 4 months.

Recommendation 4: Seek funding and support programs for promoting the industry, its jobs and career pathways to local communities. Encourage and support forestry businesses to develop long-term partnerships and activities with local schools to provide teachers, students and parents with a wealth of specialised timber knowledge and insight into many different career pathways. Engagements with schools may have the goal of incorporating forestry aspects and educational materials (e.g., Forest Learning) into the school curriculum (e.g., STEM, Geography), supporting school-based apprenticeships and traineeships in forestry for year 10, 11 or 12 students, setting up programs like industry tours for senior students, and/or facilitating student-based projects centred on industry topics and issues. Participate in the creation of Northern Territory-specific teaching resources that include forestry, putting the resources on the NT Farmers website for teachers to access nationally.

4 ACCESS TO TRAINING – CHALLENGES AND OPPORTUNITIES

This section outlines barriers to accessing industry-specific training and opportunities to collaborate with training providers. Interviews with state-based and private registered training organisations (RTOs), including an Indigenous community education provider, served as the basis for this information.

This section also offers recommendations on how to support the industry to build training capacity in the region.

4.1 SUMMARY OF KEY POINTS

Specialised jobs, a regional and remote location, a small workforce base and an insufficient pool of trainees contribute to challenges in providing training services tailored to the skill needs of the forest industry in the Northern Territory.

According to industry reports, workers who take up training offered by RTOs are unable to translate/apply the skills they learn to their job roles. From the perspective of growing skills into the industry, this is an issue and a phenomenon in the industry that needs to be addressed.

Local/regional state-based and private RTOs focus their business models on the delivery of training to the region's larger employing industries, as well as on training that develops skills with a broad application such as leadership, business and workplace safety skills. As a result, the only available training options to the forest industry in the Northern Territory are those that develop skills transferable across a range of industries, including conservation and land management, agriculture, horticulture and civil construction. No training organisation provide training that cater to the specific skill sets required for forest management and operations.

Because the training is not tailored to our industry's practises or based on a forest and wood products (FWP) unit of competency, the learning outcomes from such training courses — which may sound applicable to our industry (such as caring for nursery plants or operating basic machinery and equipment) — frequently do not translate to the task requirements or roles in our industry.

Partnerships with local and interstate RTOs that specialise in forestry, and Indigenous community education providers, present an opportunity to create and deliver training programs that are fit for purpose and address the industry-specific skill priorities.

RTOs are willing to liaise with forestry businesses to learn about their training needs and collaborate co-developing vocational training programs that are suited to the industry skill requirements, although they describe the process as a "numbers game" (referring to the level of enrolments) with inherent cost risks.

4.2 TRAINING PROVIDERS INTERVIEWS

The perspectives of training and education organisations that were interviewed for this study are presented in this section. Topics covered include challenges in training small and remote industries and developing new training programs for specific skill needs, and prospects for developing industry-RTO partnerships.

4.2.1 State-based Registered Training Organisations

There are three state-based RTOs operating in the Hub's region, Charles Darwin University, Batchelor Institute and North Regional TAFE WA. They have campuses in key forestry locations, including Katherine (along with Darwin) and East Arnhem in the Northern Territory and Wyndham and Kununurra in Western Australia, but no records that they have trained workers of the forest industry.

Available training options – These RTOs offer a wide range of training courses in areas such as conservation and land management, agriculture and civil construction plant operations, for skills that selectively may be applicable to forestry operations. These include chemical handling, chainsaw operations, earthwork and loading machine operations, pest management, animal trapping, irrigation, drone technology and first aid. Additionally, they offer training in leadership, business and workplace safety, which are all applicable across industries. No industry-specific courses based on the forest and wood products units of competency are delivered by these organisations.

The available courses can be contextualised and centred around literacy and numeracy skills, as well as the work activities and skill requirements of the forestry industry, but only to the extent that the knowledge of the trainer specialising in that area permits. Essential in the contextualisation process is the availability of such knowledge from industry experts. When there are not enough students from forestry businesses in the region to constitute a sufficient class (minimum 8 trainees), training customisation becomes unfeasible. Forest industry participants then have the option of enrolling in a class alongside groups from other industries, in which case contextualisation would be limited. Alternatively, a trainer provider may be able to offer individualised training to less students with reduced face to face contact hours, depending on the situation.

Challenges in developing new training programs for specific skill needs – These RTOs are open to collaborate with the forest industry to understand its skills and training needs and develop vocational training programs tailored to those needs. New accredited courses for the forest industry (based on one or more units of competency) or non-accredited courses (e.g., industry micro credentials) could emerge as a result.

Since it takes a lot of time and effort to register a training program, create training and assessment materials, and find suitable (qualified) trainers, it is expected that the industry commits to enrolling at least 50 students each year to prevent losses and assure the success of a new vocational training program designed to meet an industry specific skill requirement.

Developing industry-RTO partnerships – The following information is required from businesses before training recommendations may be made:

- skills needed (indicating the jobs and job levels for which they are needed),
- businesses committed to training,
- number of learners and their profile (new or existing worker),
- required duration of training,
- required training location (and accommodation specifications),
- preference for accredited/non-accredited course.

Training cost after subsidies – Fees and government subsidies for a training course generally vary according to the following factors:

- state-government funding scheme available in the respective state when the learner enrols in training,
- learner eligibility that varies with the funding program and regionality (i.e., urban, regional, remote),
- selected course, and
- location of training delivery (travel/logistics costs associated with training delivery).

For example, the cost of training for eligible urban students has been $1.5 per nominal hour[23] after subsidies under the User Choice Funding Program in 2022. This suggests that the average cost per urban student for a Certificate II in agriculture, horticulture and/or conservation and land management , which may average 400 nominal hours, has been $600 after subsidies. The subsidy reduces or eliminates the cost of training for regional and remote students, but there may be travel and logistics costs associated with training delivery.

The Australian Government also supports improved educational access for Indigenous Australians, particularly those who are living in remote and regional areas. This support is provided through two Away from Base (AFB) programs administered by Services Australia and the National Indigenous Australians Agency (NIAA). These programs provide assistance with meals, accommodation and travel expenses for Indigenous students who are studying mixed-mode (distance education and face-to-face residential teaching) education courses away from their permanent home.[24]

Industry Skills Advisory Council NT (ISACNT) maintains a web page listing funding programs available in the Northern Territory to support businesses and workforce skills development.[25]

4.2.2 Local Private Registered Training Organisation

One local private RTO was interviewed for this study. This RTO provided training to the forestry industry once, around eight years ago, when it was hired by a Sandalwood company with plantations in Douglas-Daly to teach a course in driving quad bikes and chainsaw operations for felling small trees.

Challenges in training small and remote industries – When an industry's workforce is already small, training becomes prohibitively expensive due to the unpredictable and unstable demand associated with a very small pool of trainees.

Remoteness that entails a lack of infrastructure (relating to travel, phone reception, health clinic, or appropriate housing) at the training location (where trainees live and work) and the transient nature of trainees (backpackers and seasonal employees) can compound the challenges and cost of training.

As a further disadvantage, according to this RTO, there is no government support for private RTOs – all funds are directed to state-based RTOs. For example, government policies that provide free TAFE training courses accessible only thorough TAFEs (state-based RTOs) have a detrimental effect on

[23] Nominal hours are the number of hours that a teacher needs to spend on teaching, assessment, and any other supervised training activities to meet course requirements.
[24] https://www.niaa.gov.au/indigenous-affairs/education/away-base-program; https://www.servicesaustralia.gov.au/abstudy-away-from-base-assistance
[25] https://www.isacnt.org.au/funding#SkillingTerritorians

private RTOs, as their clients are drawn away. This calls into question the fairness of the marketplace and could lead to a devaluation of training due to the removal of costs for the consumer, resulting in a decrease in expectations.

Trainers in a private RTO earns money only when they train, and not regardless of whether they have students to teach or not, and the amount of money they earn is contingent on the number of students enrolled in the course.

Paying trainers to travel to the work site is seen as a more cost-effective approach than sending workers to a designated training facility or location; however, the industry needs to realise that this can be expensive and possible to assess on the individual basis with the selected RTO.

Challenges in developing new training programs for specific skill needs – According to this RTO, businesses frequently request new training courses to address specific skill and training needs; however, for a private RTO, it is not economically viable unless there are between 100 and 200 enrolments per year at a course charge of between $1,000 and $2,000.

For a new unit of competency to be added on an RTO's scope of registration and be available for delivery, the training provider should either hire or contract a person with extensive knowledge and experience in the field to take on the role of trainer. The requirement for a Certificate IV in Training and Assessment to work as a trainer is a common barrier because of the difficulty involved in completing this qualification. Finding experts who are willing to teach part-time is challenging as well because they typically do not want to give up their full-time positions.

The following case study illustrate the financial risks faced by private RTOs with developing a new training course.

> *A company approached the RTO two years ago asking for a course in the shooting of feral animals. The RTO spent $80,000 on the course registration process that took a year. This cost included expenses associated with finding a specialist contractor to deliver the course, obtaining firearm permits, obtaining the registration of the course, and developing teaching and assessment materials. The course was delivered to eight individuals, after which no more students were enrolled. The RTO suffered a significant loss as a result and learnt an important lesson about the risks working with small industries. Although the RTO is hopeful for the future of the forest business in the NT, it does not anticipate that enough students will enrol in any given training session for it to be economically sustainable.*

4.2.3 Interstate Private Registered Training Organisation specialising in forestry

One interstate private RTO was interviewed for this study. This RTO delivered pre-employment training to two small scale sawmills on the Tiwi Islands, one in Wurrumiyanga and the other in Pirlangimpi. Working with the Tiwi Islands Training and Education Board (TITEB) under a third-party agreement, a one-off grant from the Northern Territory Government was accessed to support the costs of training. The training led to and resulted in the issuance of the Certificate II in Timber Processing.

This RTO has also delivered a Certificate IV and Diploma in Forest Operations in Katherine.

The following are their learnings from this Northern Territory training delivery experience:

- It takes twice as long for a new learner to complete the training than it takes for upskilling an existing worker. This is due to industry-specific terminology and the need to provide the new learner with ample opportunities to practice the skill.
- Continuous delivery is not practical for full-time qualification or other long duration training course because of the emotional toll it takes on the trainer to be away from home for so long. A suitable model would be 3-week block of learning with 2-week break.
- A partnership with local state-based RTOs has not been materialised previously.

The following information is required from businesses before training recommendations may be made:

- Who/what is the target learner market? Is the training for the upskilling of existing workers, pre-employment programs for new industry entrants and/or indigenous new industry entrants, or school-based traineeships for entry post-secondary school?
- Where are these training programs needed? The Western Australia State Training Authority used to have considerably different timeframes and requirements for Certificate II and III learning programs compared to other states. At the same time the Northern Territory is a big place with varying resources and services. Are there some preferred locations where training could be delivered? Ease of travel to/from will impact on training delivery costs.
- Will jobs be available immediately for learners completing the learning programs? Under what employment conditions? E.g., casual/seasonal, full time, part time etc.
- How much (if any) lead time is required between training and employment?

This RTO has the option of sending trainers from out of state to teach the course and/or working with two local trainers they know (each with their own RTO business) under a third-party agreement. One of these local trainers is based in Katherine and has expertise in forestry and resource management. The other is in Darwin and has expertise in tree felling, harvesting, haulage, and chemical handling.

Developing workplace trainers and assessors to improve access to industry-specific training in the region is viewed as a viable alternative; however, the employer must be willing to release them from their regular duties so that they can engage in training activities. If the business is unwilling to modify the requirements of the person's job, then the initiative becomes ineffective.

4.2.4 Indigenous Community Education and Training Centre

One Indigenous community education and training centre was interviewed for this study. The organisation, which was previously an RTO designed to service Indigenous communities in the Arnhem forestry region, stopped offering accredited training due to a low level of participation from the Indigenous community. This may be attributed to the language barrier that discourages people from pursuing formal training.

Educational programs offered – The organisation takes a broad approach, with programs geared on encouraging, assisting and equipping local Indigenous community people with the skills necessary to secure a job in land rehabilitation and management post mining. The programs involve:

- Language exchange, by engaging with local communities in their respective languages and supporting them understand what this education and training centre accomplishes for the community and the contribution to community values to restore the environment. This is essential for getting through the biases associated with working in a non-Indigenous environment and the mindset of having loved ones leaving home for education and employment.
- Training in safety and compliance awareness, risk assessment, and control measures
- Provision of mentors and trainers who have the capability to engage with local communities and transfer their skills to train and monitor the development of those willing to learn and work.

The Arnhem Land Progress Aboriginal Corporation (ALPA) provides educational and training support to Aboriginal individuals and organisations through their Training and Education Centre. This includes literacy and numeracy programs, financial and business skills training, computer training and accredited courses. ALPA also partners with other organisations to deliver additional courses and programs, such as apprenticeship and traineeship programs, and supports Aboriginal students in their post-secondary education. ALPA also works to improve educational outcomes for Aboriginal students by providing mentoring and tutoring services and advocating for improved access to quality education.

4.3 RECOMMENDATIONS

The following recommendations are made to support the development of training capability:

Recommendation 5: Facilitate partnerships between local industry, local RTOs and interstate RTOs servicing the forest industry to make use of the training resources already available and access funding opportunities to ensure that training courses in industry's priority skill areas are accessible, tailored to the needs of our regions in the Northern Territory, and, where possible, made available online.

Recommendation 6: Support the development of a future generation of trainers from the existing experienced workers to ensure that priority skills and training needs are met on an ongoing basis in the region. This requires a full and continued commitment from businesses, funding to incentivise the uptake of the mandatory qualification (TAE40122 Certificate IV in Training and Assessment), and support to transition the workers qualified in training and assessment into teaching.

Recommendation 7: Advocate at the local, state and federal levels for allocating more funding towards training in thin (small, regional and remote) markets to: a) support the high cost per learner and reduce the financial risks that RTOs face when delivering to our industry; b) ensure that employers can compensate the costs associated with training so that they are motivated to upskill and train their employees as a means to eventually improve productivity, safety and employee retention; and c) assist learners with the travel and accommodation expenses when they need to travel to an appropriate RTO (e.g. interstate). This includes ensuring that industry bodies, businesses and Industry Skills Advisory Council NT (ISACNT) collaborate to provide the Northern Territory Government with advice on skill shortage in our industry for the Northern Territory skilled Occupation Priority List (NTSOPL) that sets up priorities in the allocation of training funding and employer incentives for apprentices and trainees.

The skills required in our industry are high cost to deliver due to a host of factors that include a low ratio of students to trainer and or learners dispersed over a large geographical area with low numbers of students in any one location, along with the fact that some of the skills are highly technical and specific to our industry, requiring access to a business's expensive machinery and a subject matter expert trainer. Without additional financial support and a coordinator function in the region, RTOs struggle to fund development leading to their delivery, affecting their decision as to whether to deliver training or not.

Recommendation 8: Advocate for government policies that ensure fairness in the vocational education and training marketplace, such as ensuring that private RTOs have equal access to free training courses and providing incentives to private RTOs who offer training services to small, regional and remote industries, such as ours, to ensure they are able to continue providing quality training courses.

Recommendation 9: Facilitate and ensure that translation and interpreting services are accessible to Indigenous learners in training environments. It is important to provide Indigenous participants with extra resources concerning literacy and numeracy and holistic support, and in some cases added time may be essential to assist these students in finishing the course.

5 OPPORTUNITIES FOR INDUSTRY DEVELOPMENT AND IMPLICATIONS FOR FUTURE WORKFORCE AND SKILLS

This section outlines the future opportunities for commercial forestry and its downstream sectors in the Hub's region (which have been recently identified in different studies[26, 27]) and describes the workforce implications. It also makes recommendations for how industry groups may assist Indigenous communities and industry businesses in developing the infrastructure for skill development and training that is needed to define this future.

5.1 SUMMARY OF KEY POINTS

There is a great potential in the region for the expansion of new plantations (through silvopastoral / agroforestry practices), Indigenous commercial forestry, long-term supply from crown native forest land, and carbon forestry. Implementation require specific skills and knowledge and will result in the creation of new job opportunities for the local communities. This is further explained in Table 6.

5.2 RECOMMENDATIONS

The following recommendations are made to support the industry to meet its future skills development and training needs:

Recommendation 10: Promote the growth potential of the industry and support long-term initiatives to assist in the attraction, recruitment and formal training of local people.

The industry will need people able to manage commercial forests, plant and grow trees, harvest them, and process the wood. Short, intensive training courses should be developed and offered to equip participants with the knowledge and abilities they need to enter the workforce quickly and advance their careers in the industry.

Recommendation 11: Support the development of resources for formal and informal training on silvopastoral systems and create opportunities for early engagement of landholders in the process and training.

Recommendation 12: Seek funding, encourage and support the development of post-graduate educational programs (led by industry and administered by a local university with specialist economist skills) that focus on research trials and economic studies to advance our understanding of regional silvopastoral systems. These programs may target graduates with degrees in agriculture and natural science. Further support should be provided to these early career experts to continue and function as future agroforestry educators for landowners and workers.

Recommendation 13: Support training programs based on frameworks for 'best practice' engagement and expert guidance to assist Indigenous landowners in developing skills capacity and knowledge of commercial native forestry management, timber supply characteristics for local and international markets, and economically viable options post mining.

Recommendation 14: Support workplace-based training programs, school-based vocational education and training (VET) programs and/or graduate educational programs for Indigenous learners to develop awareness of commercial forestry practices (including their economic and cultural benefits) and to equip them with the skills to develop and manage forest business

[26] CRC for Developing Northern Australia (CRCNA), 2020, Northern forestry and forest products industry situational analysis. https://crcna.com.au/resources/publications/northern-forestry-and-forest-products-situational-analysis

[27] J. Meadows, M. Annandale, M. Bristow, R. Jacobsen, L. Ota & S. Read (2020) Developing Indigenous commercial forestry in northern Australia, Australian Forestry, 83:3, 136-151, DOI: 10.1080/00049158.2020.1799518

enterprises and take on leadership roles in the future. These programs should incorporate customised courses in administration, finance/budgeting, negotiation, leadership, marketing and forest resource inventory.

Recommendation 15: Collaborate with industry bodies nationally to analyse how carbon market legislation for forestry impacts on jobs, skills, and training needs.

Recommendation 16: It is recommended that the government provides funding for a dedicated education and workforce development officer to oversee the implementation of the initiatives (recommendations) identified and listed in this report. Possible collaboration between two industries (e.g., forestry and horticulture) or multiple regions (the Northern Territory, Ord Valley and North Queensland) could contribute operational resources and support this officer, if necessary.

Table 11: Opportunities for industry development and implications for future workforce and skills in the Hub's region

Opportunities for industry development[28]	What is required	Implications for future workforce and skills	
		Anticipated skills and training needs	**Recommendations**
Prioritise investments in new plantations and native forests that use silvopastoral (agroforestry) practices as a vehicle for new commercial tree plantings Note: Silvopastoral practices involve the joint production of timber and livestock for generating improved revenue streams and business cash flows	• Regional research trials for silvopastoral systems (in particular, integrating grazing of beef cattle with tree growing) considering site conditions, climate and species • More data on the economic benefits of silvopastoral systems in terms of net returns and practical methods to deal with initial land costs (including those associated with weed and grass control) and low early cash flows for new plantations • Extension of existing silvopastoral systems	• Greater understanding of the economic viability of silvopastoral systems among landowners, particularly those engaged in the production of beef cattle and forest owners • Young specialists in silvopastoral systems and knowledge transfer to support the emergence of an industry segment based on silvopastoral practises • Creation of new jobs in tree planting, tending, and harvesting as silvopastoral systems become more prevalent and provide an additional driver for investment in new greenfield plantations • New job opportunities in timber processing on a long-term basis as extra sawn timber output is expected from silvopastoral practices	• Develop and offer an introductory informal training course on silvopastoral systems to explain the concepts and engage landholders early in the process • Establish post-graduate educational programs (led by industry and administered by local university) aimed at agricultural and forest science graduates to contribute to the understanding of regional silvopastoral systems through research trials and economic studies and act as future agroforestry experts for educating landowners and workers • Implement long-term initiatives for attracting, recruiting, and training local people for tasks that include tree planting, operating harvesting equipment, and timber processing
Support the expansion of Indigenous forestry	• Business models that are focussed on maximising the value of forestry resources (trees) in the regions and communities where the resource is found	• Increased understanding of private native forests management for timber production (silvicultural practices), including through forest resource inventory, among Indigenous owners of private native forests	• Work with frameworks for 'best practice' engagement and training to increase the skill and knowledge capacity of Indigenous landowners regarding native forestry management, characteristics of timber supply for specific local and

[28] As identified in the following studies: CRC for Developing Northern Australia (CRCNA), 2020, Northern forestry and forest products industry situational analysis. https://crcna.com.au/resources/publications/northern-forestry-and-forest-products-situational-analysis; and J. Meadows, M. Annandale, M. Bristow, R. Jacobsen, L. Ota & S. Read (2020) Developing Indigenous commercial forestry in northern Australia, Australian Forestry, 83:3, 136-151, DOI: 10.1080/00049158.2020.1799518

	• Research to underpin use of rehabilitated mine land including salvage harvesting, product development and use of residues, and potentially establishment of plantations (rather than other end options postmining) • Training of Indigenous landowners in commercial forestry practices and forest resource inventory	• Preparing the next generation of Indigenous leaders to take charge of efficient and sustainable management of local Indigenous private native forests and production management in the future. Indigenous learners should be assisted by business development programmes in acquiring workplace-based qualifications in administration, finance/budgeting, negotiation, leadership, marketing, and grant/compliance writing. Young entrepreneurs also require mentoring, which involves collaborating with local "champions" and other professionals to exchange ideas, goals, and experiences.[29] • New jobs and opportunities for skill development at the operator level for selective harvesting and production of sawn timber through the entire supply chain on a long-term basis as private forests with commercial potential are actively managed for timber and interest in local processing grows among Indigenous owners	international markets, and economically viable options post-mining operations • Establish workplace-based business development training programmes, school-based VET programs and graduate educational programs for Indigenous learners with the aim to develop awareness of commercial forestry practices (including their economic and cultural needs); and provide skills in business development and management, silvicultural practices, and forest resource inventory to prepare these learners to assume leadership roles in the future • Implement long-term initiatives for attracting, recruiting, and training local Indigenous people for tasks that include tree planting, operating harvesting equipment, and timber processing
Secure access arrangements for long-term supply from crown native forest land (i.e., leasehold)	• Engage with State Government on long-term planning for the utilisation of crown land forest resources	• New jobs and opportunities for skill development at the operator and forest resource/production management levels for selective harvesting and production	• Implement long-term initiatives for attracting, recruiting, and training senior high school students and other potential new entrants (who may bring skills from

[29] J. Meadows, M. Annandale, M. Bristow, R. Jacobsen, L. Ota & S. Read (2020) Developing Indigenous commercial forestry in northern Australia, Australian Forestry, 83:3, 136-151, DOI: 10.1080/00049158.2020.1799518

	• Assess resource availability and implement tender arrangements for supply and promotion of long-term sawmilling investment	of hardwood sawn timber as new supply arrangements and volumes of output from crown native forest land will be secured	agriculture or related sectors) to fill new jobs resulting from an expansion of the hardwood forestry sectors. Short, intensive training courses should be developed and offered to equip participants with the knowledge and abilities they need to enter the workforce quickly and advance their careers in the industry.
Advocate for carbon incentive schemes and policies to support production forestry carbon outcomes	• Review Emissions Reduction Fund (ERF) barriers to carbon market access for forestry activities, with priority on the 'water rule' requirement for new plantations and a view to promoting a level-playing field for plantation activities relative to other vegetation management sequestration activities in the ERF • Research on carbon accounting, especially for native forests, linked to the forestry inventory and silvicultural management	• New jobs and opportunities for skills development as the national policies permit access of forestry to carbon markets • New jobs and opportunities for skills development in plantation establishment and management as a result of carbon market policy settings that provide the required economic incentive to establish new plantations for the value of sequestered carbon in planted forests	• Collaborate with partners in industry on national projects to determine the need for new jobs, skills, and training programs in the forestry sector once legislation provide access to carbon markets • Implement long-term initiatives for attracting, recruiting, and training local people in tasks related to carbon forestry including tree planting and forest management (silvicultural) practices

ATTACHMENT 1: ANZSIC DIVISIONS AND SUBDIVISION CODES AND TITLES

For the purposes of this report, data from the ABS defines the forest industry using ANZSIC Divisions and Subdivision Codes and Titles as follows:

A Agriculture, Forestry and Fishing

03 Forestry and Logging

030 Forestry and Logging

0301 Forestry

This class consists of units mainly engaged in growing standing timber in native or plantation forests, or timber tracts, for commercial benefit. This class also includes the gathering of forest products such as mushrooms, kauri gum or resin from forest environments.

0302 Logging

This class consists of units mainly engaged in logging native or plantation forests, including felling, cutting and/or roughly hewing logs into products such as railway sleepers or posts. This class also includes units mainly engaged in cutting trees and scrubs for firewood.

05 Agriculture, Forestry and Fishing Support Services

051 Forestry Support Services

0510 Forestry Support Services

This class consists of units mainly engaged in providing support services to forestry. Services include silvicultural services, such as planting, pruning and thinning trees, forest reafforestation, forest plantation conservation or maintenance. This class also includes units mainly engaged in operating forestry planting stock nurseries.

C Manufacturing

14 Wood Product Manufacturing

141 Sawmilling and Processing

1411 Log Sawmilling

This class consists of units mainly engaged in manufacturing rough sawn timber, and boards.

1412 Wood Chipping

This class consists of units mainly engaged in manufacturing softwood or hardwood wood chips.

1413 Timber Resawing and Dressing

This class consists of units mainly engaged in resawing or dressing timber, timber boards and mouldings. Dressing timber includes seasoning (kiln or air drying) or chemical preservation.

149 Other Wood Product Manufacturing

1493 Veneer and Plywood Manufacturing

This class consists of units mainly engaged in manufacturing veneers and plywood

1494 Reconstituted Wood Product Manufacturing

This class consists of units mainly engaged in manufacturing wood boards and sheets from reconstituted wood fibres such as wood chips, sawdust, wood shavings, slab wood or off-cuts. Also included are units that manufacture laminations of timber and non-timber materials (including decorative plastic laminates on boards or other substrates).