

# Potentials for enhanced contributions of wood value chains to the national economy in Viet Nam

**Wood for Work: Funded by the German Federal Ministry of Food and Agriculture (BMEL) through the German Federal Office of Food and Agriculture (BLE)**

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## **Client**

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# 1. Introduction

## **Wood for Work**

The Wood for Work (WfW) project aimed at producing reliable information on employment dynamics within forest value chains in selected economies. The project focused on studying key aspects of informal employment, gender, decent work, and the impacts of institutional, legal, and economic changes on forest-related employment.

As part of the project, in-depth studies were conducted in four different countries: Viet Nam, Ecuador, Ukraine, and Kenya. These country studies aimed at providing a comprehensive understanding of employment patterns in forest value chains and at identifying potentials and challenges for improvements.

WfW was funded by the German Federal Ministry of Food and Agriculture (BMEL) through the German Federal Office of Food and Agriculture (BLE) and coordinated by Unique land use GmbH and Thünen Institute, in cooperation with the University of Hue in Viet Nam.

## **Viet Nam case study**

Besides its leading role in global furniture production, Viet Nam is also a major exporter of wood chips and increasingly wood pellets. In 2022, Viet Nam exported more than 25 million m<sup>3</sup> of wood chips. However, Viet Nam shows significant deficits in raw material supply to feed its domestic wood processing industries. In Viet Nam, natural production forests (10,3 million hectares) are under a logging ban since 2014. Thus, Vietnam's timber production focuses on approximately 3 million hectares of its 4.4 million hectares of planted forests, mostly Acacia, Eucalyptus and Rubber. Most of Viet Nam's planted forests are managed by 1.8 million smallholders, mostly Acacia short rotation for wood chip production. The furniture sector and other processing industries are highly dependent on imported roundwood and primary wood products (derived from local plantation forestry). Between 2017 and 2021 Viet Nam imported 2.5 million m<sup>3</sup> of roundwood per year. The imports of primary processed wood products amounted to ca. US\$ 2 bn per year.

## **The Viet Nam case study focused on the following aspects:**

1. Analyzing the key patterns and differences in forest value chains that utilize the same raw material base, following a value adding gradient from low value-added products (wood chips) to higher value products (fiber board and plywood) value chains.
2. Identifying the potential contributions to national economy in terms of employment and value added when switching from wood chips to higher value-added products.

## 2. Summary of case study results

The following results are based on a survey of 24 companies in Viet Nam, operating in wood chip (constituting 50% of the total), fiberboard (30%) and plywood industries (20%). All companies source roundwood, mainly Acacia and Eucalyptus from short rotation plantation production systems. The surveyed companies fall within the Vietnamese definition of small and medium enterprises<sup>1</sup>. The data was collected in 2022. Table 1 describes the key characteristics of the surveyed companies.

- The woodchip producing enterprise in this survey were characterized by high production capacities (Table 2), but comparably low number of employees (Table 1) and low revenues (Table 1).
- The fiberboard producing companies were the largest units in this survey with the highest average capacities (Table 2) and largest workforce employed (Table 1).
- The plywood producers accounted for the lowest average capacities (Table 2) installed and generated the lowest average revenue per company in this survey. Their workforce was characterized by a comparably high share of female employees (Table 1).

**Table 1. Key characteristics of the surveyed companies**

Type	Number of enterprises	Average revenue (million US\$)	Average in-take volume roundwood (thousand tons)	Average number of workers in production (n)	Average female workers in production (n)	Average monthly salary in production (US\$)
Wood chips	12	6.9	119	50	21	365
Fiberboard	7	25.9	294	234	50	375
Plywood	5	3.4	28	91	68	320

Source: Enterprise survey 2022

The comparison of key performance indicators revealed the following (see also Table 2 and Figure 1):

- Across all enterprise types, the purchase price of raw material was rather leveled. Minor differences resulted mainly from transport cost.
- The lowest value-added and employment generation potential was identified for woodchip production.
- In fiberboard production, the revenues generation per ton of raw material input was almost five times higher than that observed in woodchip production. Furthermore, the

<sup>1</sup> Decree 56/2009/CP-ND, Government of Viet Nam: Small enterprises 11-200 employees; Medium enterprises 201-300 employees.

companies created twice as much employment per ton of roundwood processing compared to woodchip producers.

- The plywood enterprises showed the highest value added on roundwood intake and generated most employment in relation to processing capacity. These companies generated 10 times more employees per ton of roundwood processing compared to woodchip producers, and 10 times more in value addition per unit of raw material input.

**Table 2. Key indicators for employment and value-adding**

Type	Average capacity intake (1,000 tons/year)	Average cost of raw material (US\$/ton)*	Average revenue on roundwood intake <sup>2</sup> (US\$/ton)**	Value added on roundwood intake <sup>3</sup> (US\$/ton)	Total employment factor <sup>4</sup> (n/1,000 tons intake)	Female employment factor <sup>5</sup> (n/1,000 tons)	Salary factor <sup>6</sup> (US\$/1,000 tons)
Wood chips	119	51	58	7	0.4	0.2	1.8
Fiberboard	294	55	88	33	0.8	0.2	3.6
Plywood	28	50	120	70	4.0	3.0	15.4

Source: Enterprise survey 2022\*; delivered at mill gate; \*\* ex-mill.

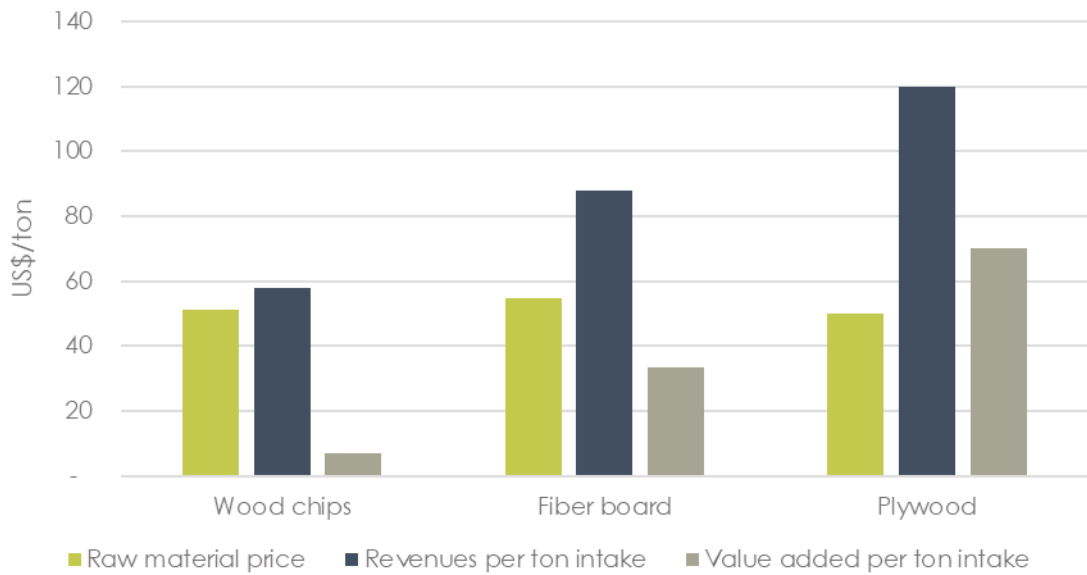
<sup>2</sup> Average revenue on roundwood intake = Sales price of 1-ton final product x Recovery factor during processing of 1 ton of roundwood. Recovery factors are: 100% for wood chips, 60% for fiber board, 50% for plywood.

<sup>3</sup> Value added = Sales price for final product derived from 1 ton of roundwood intake less the purchase cost for 1 ton of roundwood.

<sup>4</sup> Total employment factor = Number of total employees required to produce a given final product from 1,000 tons of roundwood.

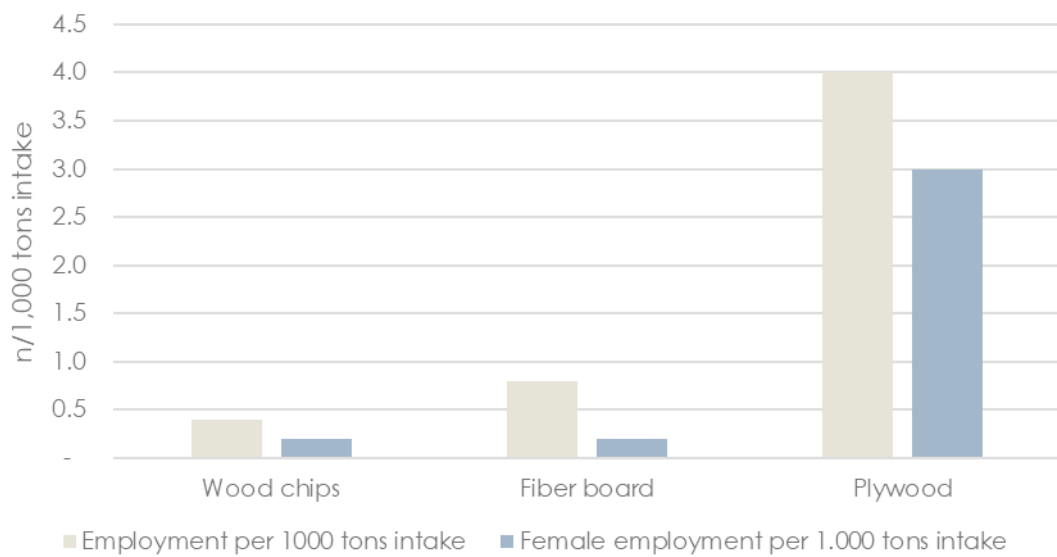
<sup>5</sup> Female employment factor = Number of female employees required to produce a given final product from 1,000 tons of roundwood.

<sup>6</sup> Salary factor = Salaries paid for production employees for the processing of 1,000 tons of roundwood.



**Figure 1. Cost, revenues and value added per ton of roundwood intake in survey companies**

Source: Enterprise survey 2022



**Figure 2. Employment factors per ton of roundwood intake in survey companies**

Source: Enterprise survey 2022



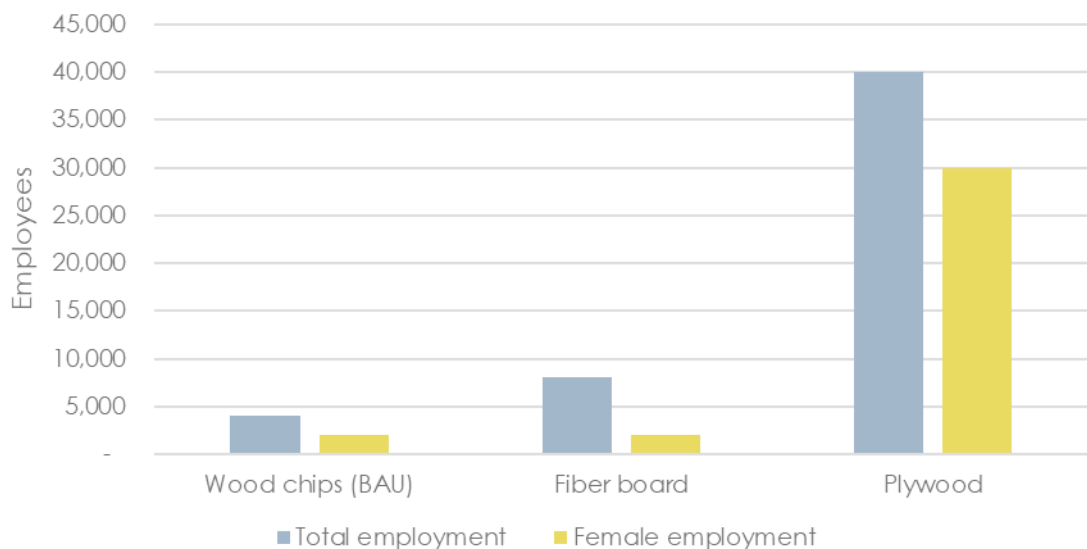
### 3. Potentials for enhanced contributions to national economy

In 2021 and 2022, Viet Nam produced 25 million m<sup>3</sup> of wood chips annually for export (FAO Statistics)<sup>7</sup>. This substantial volume of raw material is leaving the Vietnamese forestry sector without significant value added. Thus, the following calculations exemplify the potential if shares of this volume would be redirected to processing in domestic fiberboard or plywood production.

#### Potentials for enhanced contributions to employment

Introducing 10 million tons of woodchips into higher value adding industries could potentially generate around 4,000 additional jobs in fiber board production or 36,000 additional jobs in plywood production. Which is in clear contrast to the 4,000 jobs in the business-as-usual scenario (BAU) for wood chip production. (Figure 3).

Our company data indicated that the share of female employees is significantly higher in plywood production compared to wood chip or fiber board production. Consequently, the shift from wood chips to plywood manufacturing deserves a special attention due to the potential increase female employment generation. However, it is important to acknowledge that the survey data used may not be representative. Thus, a cautious interpretation of this conclusion is recommended.



<sup>7</sup> The conversion of m<sup>3</sup> wood chips to tons is difficult due to varying fraction sizes and varying water content. It may range from 1 ton per m<sup>3</sup> for fresh woodchips to 0.6 tons per m<sup>3</sup> for air-dry wood chips. Since fiberboard and plywood requires rather fresh raw material. The conversion for this study assumes a weight conversion of 1 ton per m<sup>3</sup>.

**Figure 3. Potential enhanced employment impact for alternative use of roundwood in up-graded value chains (employment factors for 10 million tons)**

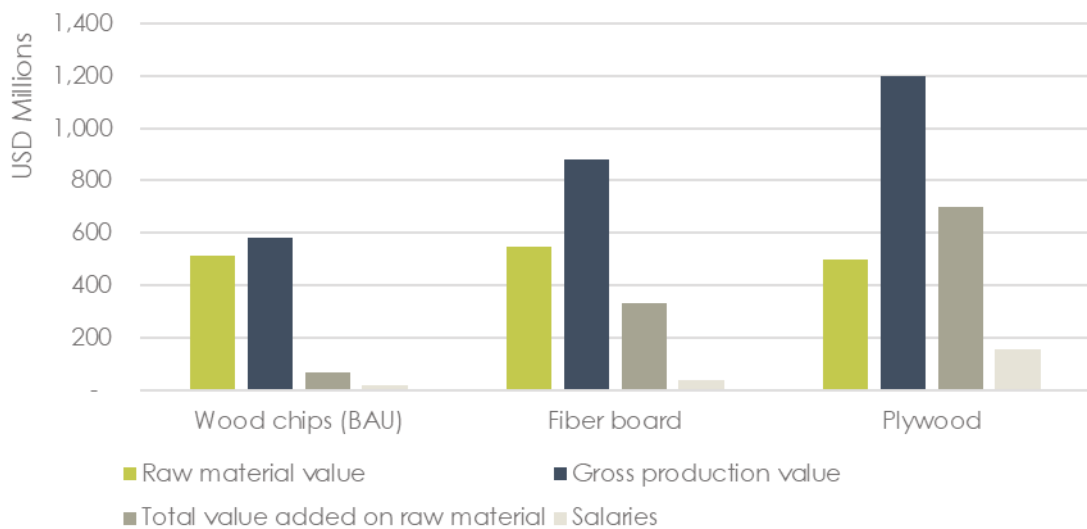
Source: Enterprise survey 2022

### Potentials for enhanced contributions to GDP

The use of 10 million tons of roundwood in fiber board or plywood production instead of wood chip production, has the potential to generate positive contributions to GDP. The total gross production value of products could increase from approximately US\$600 million to nearly US\$900 million in fiber board production or US\$1.2 billion in plywood production (Figure 4).

The share of salaries in value addition could potentially increase from US\$18 million in woodchip production to US\$36 million in fiber board production and to possibly more than US\$150 million in plywood production.

The value-added factor related to roundwood raw material intake in plywood has the potential to be 10 times higher than in woodchip production, with an estimated increase from US\$ 700 million to US\$70 million. Shifting to fiber board production could result in an additional US\$ 330 million in value added on raw material intake.



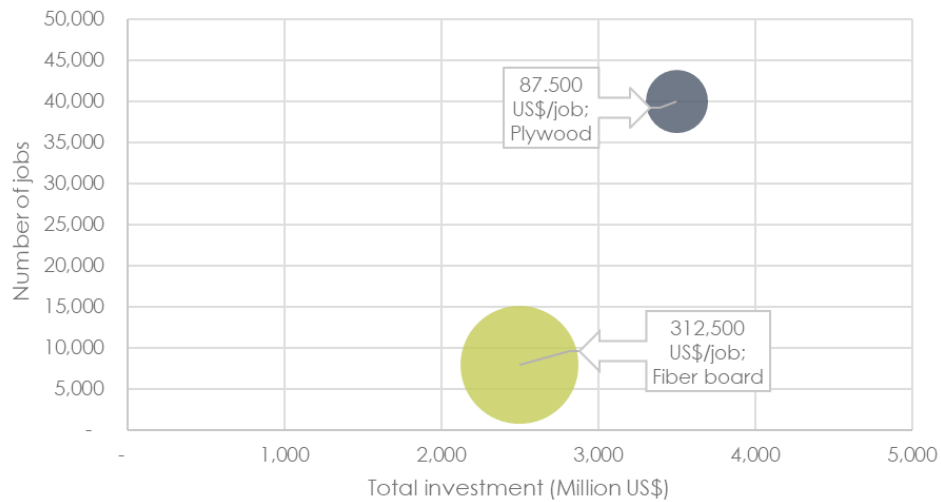
**Figure 4. Potential enhanced value adding for alternative use of roundwood in upgraded value chains**

Source: Enterprise survey 2022

## Investment requirements

To materialize the positive impacts of upgrading value chains from woodchip production to higher value-added products, substantial investments are required. The shift to fiber-board production triggers total investments of more around US\$2.5 billion<sup>8</sup>. Thereby the investment for each of the additional 8,000 created jobs is around US\$300,000.

The total investment requirements for a switch to plywood production could be higher compared to fiber board, amounting to US\$3.5 billion). However, the cost per created job is estimated to be much lower in plywood industries, at approximately US\$90,000 per job. Which could be attributed to the higher number of employees (40,000) required in this production process.



**Figure 5. Investment requirements for 10 million tons, for alternative use of roundwood in upgraded value chains**

Source: Enterprise survey 2022

<sup>8</sup> The investment requirements were derived from industry investment benchmarks that indicate ca. US\$250 investment per 1 ton of roundwood processing in fiber board industries and US\$350 in plywood industries. The data was derived from historical review of industry investments in emerging economies.

## 4. Conclusions

Viet Nam's forest sector is currently missing out on significant opportunities to enhance value added and create employment due to the large export of woodchips.

Upgrading the woodchip value chain to fiberboard or plywood production, could generate additional employment for up to 36,000 persons, a figure which is around ten times higher than the current employment generated by woodchip production.

The upgrading could increase both the forest sectors' value-adding capabilities and to elevate its contribution to GDP. The gross production value based on the roundwood volumes currently used for woodchip production could increase by 5 to 10 times when redirected to fiberboard or plywood industries.

The enhancement would require investments in industries of US\$2.5 to US\$3.5 billion. The employment impact would be highest in the plywood industry with approximately US\$90,000 investment per new job; compared to around US\$300,000 per job in fiber board production. The total number of employments that could be created (40,000) and the value added to raw material (US\$700 million) in plywood production would be significantly higher than fiber board production.

However, uncertainties remain regarding the suitability of the roundwood production systems. Generally, the currently available roundwood from short rotation eucalyptus and acacia plantations seems adequate, but large-scale industry investments in fiberboard and plywood production will require improvements in roundwood quality and the optimization of supply logistics.



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