

: Comparative analysis of economic performance and employment situation in wood-based value chains: A case study of Viet Nam

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: ABSTRACT

This study examines the economic performance and employment situation of the wood industry in Viet Nam, with a focus on wood chip, wood pellet, and fiberboard industry. The results revealed that the fiberboard industry, utilizing the same raw material as wood chip and wood pellet, exhibited higher economic performance and employs a larger workforce. Our analysis shows that the fiberboard industry employed a larger number of workers per unit of input volume, indicating a potentially greater labor demand for workers per unit of processed input volume compared to other wood industries. Additionally, the wood pellet industry offered the highest average monthly wages, followed by fiberboard and wood chip industries. These findings contribute to a better understanding of the differences among industries sharing the same (scarce) resource base and emphasize the importance of strategic resource allocation. Further research is needed to explore the implications of allocating all roundwood exclusively to fiberboard production.

: KEYWORDS

Wood chip, wood pellet, fiberboard, wood industries, Viet Nam, employment, economic performance

1 INTRODUCTION

Viet Nam has become a major exporter of wood products, particularly wood chip, and wood pellet, which have contributed significantly increasing the country's income. From 2010 onwards, the production and export of wood chip has experienced remarkable growth (FAOstat, 2020). The export value has increased from USD 0.4 billion to USD 1.7 billion in 2021, with China and other Asian countries being the main destinations (UN Comtrade, 2020). Similarly, the export of wood pellet has witnessed exponential growth, rising from USD 5 million to USD 413 million during the same period. Wood chips are primarily used for energy generation, pulp production, and wood-based panel production, while wood pellet are utilized for energy generation only (Kretschmann, 2010). To meet the demand for wood chip and wood pellet, enterprises in Viet Nam rely on wood from short-rotation plantations of *Acacia mangium* (Pistorius et al., 2016).

The wood industry in Viet Nam has experienced significant growth in various branches such as sawnwood, veneer, plywood, fiberboard, and particleboard manufacturing. According to the General Statistics Office (GSO, 2021), wood processing sector's industrial production index recorded an average annual growth rate of 3.4% from 2016 to 2020. Our study focuses specifically on fiberboard industry, as these, like wood chip and pellet industry, use roundwood as their primary raw material. This industry also experienced a surge in exports over the past decade. In 2021 alone, this sector accounted for USD 1 billion in revenue. The production of these products relies also on wood from domestic short rotation plantations of acacia mangium as well as imported wood (UN Comtrade, 2020).

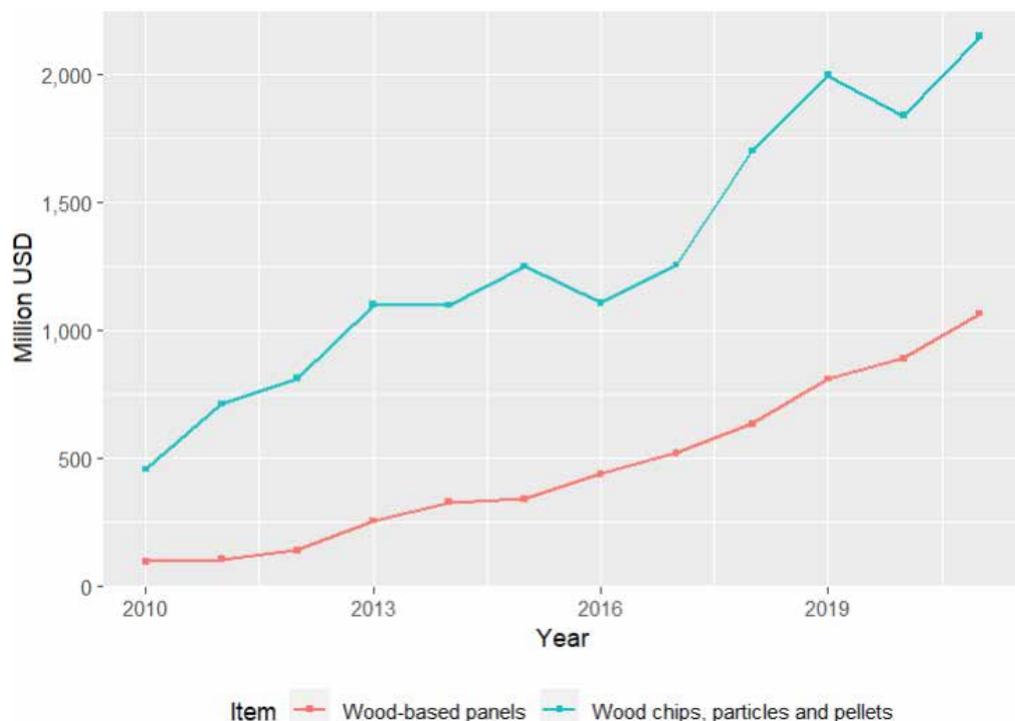


Figure 1. Exports of wood chips, particles and pellets and wood-based panels, 2010-2021 (FAOStat, 2023)

The wood chip, wood pellet, and fiberboard industries all rely on the same source of raw material, for which there is an intense competition in Viet Nam (Vu and Mai, 2021). Considering that these three industries are differently complex (Kretschmann, 2010), it is important to investigate: Are there differences in economic performance and employment situation in wood-based value chains based on the same raw material?

■ 2 METHODS

A case study with filed interviews was conducted to address the research question. The study focused on a sample of companies operating in the wood chip, wood pellet and fiberboard industries in Viet Nam. Consultants and fourteen industry experts in Viet Nam were contacted to compile the list of companies. The exponential, non-discriminative snowball sampling method was applied to select the companies for the study. Each person contacted provided multiple referrals. These new referrals then contributed additional referrals and formed a recommendation chain until 31 companies located in Viet Nam were identified: 12 of the companies are producing wood chip, 8 companies wood pellet and 7 companies fiberboard. The reference period for the data collected refers to January-December 2022. The analysis methodology is descriptive and comparative.

■ 3 RESULTS

Economic performance

The surveyed companies producing fibreboard on average generated an annual revenue of USD 25.9 million, whereas wood pellet companies USD 15.8 million, and a wood chip companies USD 6.9 million. The corresponding volumes of roundwood processed for these companies were 297 thousand cubic meters, 64 thousand cubic meters, and 57 thousand cubic meters, respectively (cf. Table 1). Prices for roundwood are similar for all. Table 1 illustrates that fibreboard companies achieved the highest revenue per cubic meter of roundwood processed with 112 USD. Wood pellet companies followed with a revenue of 64 USD per cubic meter of roundwood processed, while wood chip companies achieved only USD 58. These numbers indicate that products requiring more complex processing, such as panels, yield greater revenues compared to products that undergo less complex production processes like wood chip and wood pellet.

Table 1. Revenues, input and output, 2022

Industries surveyed	Number of enterprises	Total revenue (million USD)	Average revenue (million USD)	Average volume roundwood processed (thousand tons)	Revenue/input (USD/ton)
Wood chip	12	82.7	6.9	119	57
Wood pellet	8	94.5	15.8	194	64
Fiberboard	7	181.1	25.9	297	112

Employment situation

As presented in Table 2, in 2022, the fiberboard companies surveyed employed a larger workforce in 2022 than the companies producing wood chip and wood pellet, with an average of 237 employees per company. Wood pellet companies followed with an average of 130 employees, while wood chip companies had an average of 65 employees. Among these companies, fiberboard companies also had the highest number of permanent employees and production workers, with an average of 167. Wood pellet companies had an average of 125 permanent employees per company, while wood chip companies employed 50 workers. The same pattern applies to the average number of production workers. Female employment share is higher in fiberboard companies compared to wood chip and pellet companies. In summary, the fiberboard industry stood out with a larger workforce, employing more permanent employees and production workers compared to wood chip and wood pellet, also having a higher participation of female employees.

Table 2. Total workers, average permanent, temporary and production employment, 2022

Industries surveyed	Number enterprises	Total workers	Average total workers	Average total permanent workers	Average female permanent workers	Average temporary workers	Average female temporary workers	Average production workers (permanent and temporary)
Wood chip	12	781	65	50	17	16	5	59
Wood pellet	8	778	130	125	24	15	2	77
Fiberboard	7	1,657	237	234	49	20	3	90

Salaries paid in the three woodworking industries are summarized in Table 3. The wood pellet industries surveyed offered the highest average monthly wages of the three industries, with employees earning an average of USD 442 per month. Fiberboard industry followed closely with an average monthly wage of USD 373, while the wood chip industry had a slightly lower average monthly wage of USD 364. Permanent

production employees received higher average monthly wages compared to permanent non-production employees, with an exception in the case of fiberboard. The average monthly salary in the fiberboard, wood pellet, and wood chip industries surpassed the minimum monthly salary in various regions of Viet Nam, ranging between USD 139 and USD 200 per month in 2022 (Vietnam Briefing, 2023). Additionally, these salaries were higher than the latest average wage values reported by the General Statistics Office (GSO, 2020) in 2020 for the first wood processing sector, which was 309 USD.

Upon analyzing the data in Table 3, the fiberboard industry exhibits the highest workers rate per input volume, generating 1.4 workers per thousand tons of processed input volume (roundwood). Wood pellet follow with a rate of 1.0, while wood chip have the lowest rate of 0.6 workers per thousand tons of processed input volume. However, it should be noted, that further research is needed that considers additional factors such as employment skills and experience to obtain more comprehensive and reliable results on the employment of workers in Vietnamese woodworking industries.

Table 3. Average monthly wages and employees per unit of input volume, 2022

Industries surveyed	Average monthly wage of permanent production workers (USD)	Average monthly wages of temporary production workers (USD)	Average monthly wages of permanent nonproduction workers (USD)	Workers per thousand-tons input
Wood chip	364	358	353	0.6
Wood pellet	442	406	396	1.0
Fiberboard	373	299	333	1.4

■ 4 DISCUSSION AND CONCLUSION

In conclusion, the case study findings provide valuable insights into the wood industry in Viet Nam and shed light on the economic performance and employment situation across different woodworking industries. The research shows that the fiberboard industry, utilizing the same (scarce) raw material as wood chip and wood pellet, exhibited higher economic performance and employed a larger workforce. The results indicate that the fiberboard industry has a potentially greater demand for workers per unit of processed input volume compared to the other industries studied. However, to gain a more comprehensive understanding of employment dynamics, further research is required that takes into consideration additional factors such as employment skills and experience. The wood pellet industry offers the highest average monthly wages, followed by fiberboard and wood chip industry, with all sectors providing salaries that surpass the minimum monthly wage in Viet Nam and exceed the average wage values for the wood processing sector reported by the General Statistics Office.

Further research is required to examine the potential outcomes of allocating all the roundwood exclusively to fiberboard production given the scarcity of raw material.

This analysis will provide a more comprehensive understanding of the economic and employment generation possibilities in the industry.

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Acknowledgment

This study is a result of the research project WoodForWork. It was funded by the German Federal Ministry of Food and Agriculture through the German Federal Office of Food and Agriculture (BLE) due to a decision of the Deutscher Bundestag, Project number 28I-031-01.