



Health Crisis Can Affect Timber-Processing Activities: A Case of COVID-19 in the South Region of Cameroon

Rodine TCHIOFO LONTSI^{1*}, Freddy Rodrigue NANGNDJEL^{1,2}, Mbezele Junior Yannick Ngaba³

¹Higher Institute of Agriculture, Forestry, Water and Environment (HIAFWE), University of Ebolowa, B.P. 118 Ebolowa, Cameroon

²Cameroon United Forest (CUF), B.P. 15181 Douala, Cameroun

³Higher Technical Teacher' Training College of Ebolowa, University of Ebolowa (HTTTC), Ebolowa, Cameroon

ARTICLE INFO	ABSTRACT
Published Online: 13 February 2026	The COVID-19 health crisis has affected several sectors of activity. The objective of this study was to evaluate the early socio-economic impacts of this crisis on wood processing companies (WPC) in the South region of Cameroon. Thus, six WPCs in the region, justifying at least five years of activity before the pandemic began, with a minimum of 10 employees and a production exceeding 1000 m ³ /year, were surveyed. This study reveals that in just one year after its onset, the crisis caused a suspension of 20% of foreign contracts, a decrease in production of approximately 33% for first-category WPCs, as well as a reduction of 15 to 20% in the prices of processed wood and of 20 to 50% in revenues within these companies. To cope with this situation, some WPCs reduced their employees by 29.42%, eliminating up to 243 jobs. The closure of borders appears to be the main consequence of COVID-19 affecting these WPCs. Indeed, the analysis of the marketing circuits of processed wood showed that 92% of the production from this region is intended for export, of which 33% is exported to China. This strong dependence of the wood sector to international trade justifies the significant impact of COVID-19 on the WPCs in the South region of Cameroon, highlighting the need to promote domestic and sub-regional wood trade.
Corresponding Author: Rodine TCHIOFO LONTSI	
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1. INTRODUCTION

The COVID-19 pandemic, declared by the World Health Organization on March 11, 2020, has manifested as an unprecedented health and socioeconomic crisis globally, affecting diverse sectors, including the wood processing industry in Cameroon (Castro & Zermeno, 2021; Nicola et al., 2020). In particular, the pandemic's impact extends beyond immediate health consequences to profound economic disruptions, specifically exacerbating vulnerabilities within small and medium-sized enterprises (SMEs) (Madai Boukar et al., 2021; Mahmoud et al., 2022; Andrianarison & Nguem, 2020). The crisis led to significant reductions in consumer demand, logistical disruptions, and persistent operational challenges, contributing to observed declines in enterprise profitability across various sectors (Sun et al., 2022).

Reports indicate that approximately 85% of private companies in Cameroon have experienced negative revenue impacts (Madai Boukar et al., 2021), highlighting an urgent need for empirical understanding of COVID-19's prolonged

effects on the economy, particularly in export-dependent sectors like wood processing (Nguiffo & Wankeu, 2020; Nicola et al., 2020). The Cameroonian wood sector significantly contributes to the national economy, supporting thousands of jobs and forming a critical part of the gross domestic product (Madai Boukar et al., 2021). The export dynamics of the wood sector reveal that Asia is the predominant destination for Cameroonian wood products, notably logs and processed timber, suggesting a high sensitivity to market fluctuations driven by international demand, particularly from major trading partners like China (Mahmoud et al., 2022).

The repercussions of COVID-19 have been severe, with a significant proportion of both large enterprises and small and medium enterprises facing increased risks and operational constraints due to the pandemic (Castro & Zermeno, 2021; Madai Boukar et al., 2021). Consequently, there is an urgent imperative to examine the structural vulnerabilities within the wood processing chain, assess the pandemic's socioeconomic impacts, and identify actionable

strategies for future resilience (Mahmoud et al., 2022). The complexity of the COVID-19 crisis necessitates a nuanced understanding of the socioeconomic implications across different regions and sectors. The Economic Commission for Africa's estimates of a potential GDP loss in the region emphasize the need for strategic economic interventions tailored to address the diverse challenges faced by enterprises in regions such as Cameroon (Sun et al., 2022). The COVID-19 pandemic has further deepened pre-existing socioeconomic inequalities, increased monetary poverty, and forced households to readjust their consumption patterns toward essential goods (Nicola et al., 2020). Consequently, any strategy aimed at revitalizing the wood-processing sector must be grounded in a clear understanding of local realities and the vulnerabilities within the processing value chain (Kang et al., 2020). In this perspective, the present study seeks to (i) map the marketing channels of processed wood products, (ii) assess the socioeconomic impacts of the pandemic on wood-processing actors, and (iii) propose targeted measures to strengthen the resilience of this strategic sub-sector in a post-COVID context. This

comprehensive analysis will facilitate the identification of vulnerable links requiring urgent action, ultimately contributing to a more resilient economic structure capable of withstanding future crises.

2. MATERIALS AND METHODS

2.1. Study site

The present study was conducted between February and June 2021 in the South Region of Cameroon, which covers an area of 47,191 km² and is divided into four administrative departments (Figure 1). The region has an estimated population of 920,715 inhabitants (INS, 2020) and is entirely covered by dense equatorial forest. Formal logging activities are carried out in 42 Forest Management Units and 105 timber sales areas (MINFOF & WRI, 2020), in addition to operations under timber cutting permits. Harvested timber is generally transported outside forest areas for processing. The South Region hosts five category-1, nineteen category-2, and fifteen category-3 wood processing companies (WPCs) (Hiolhiol & Assembe-Mvondo, 2020).

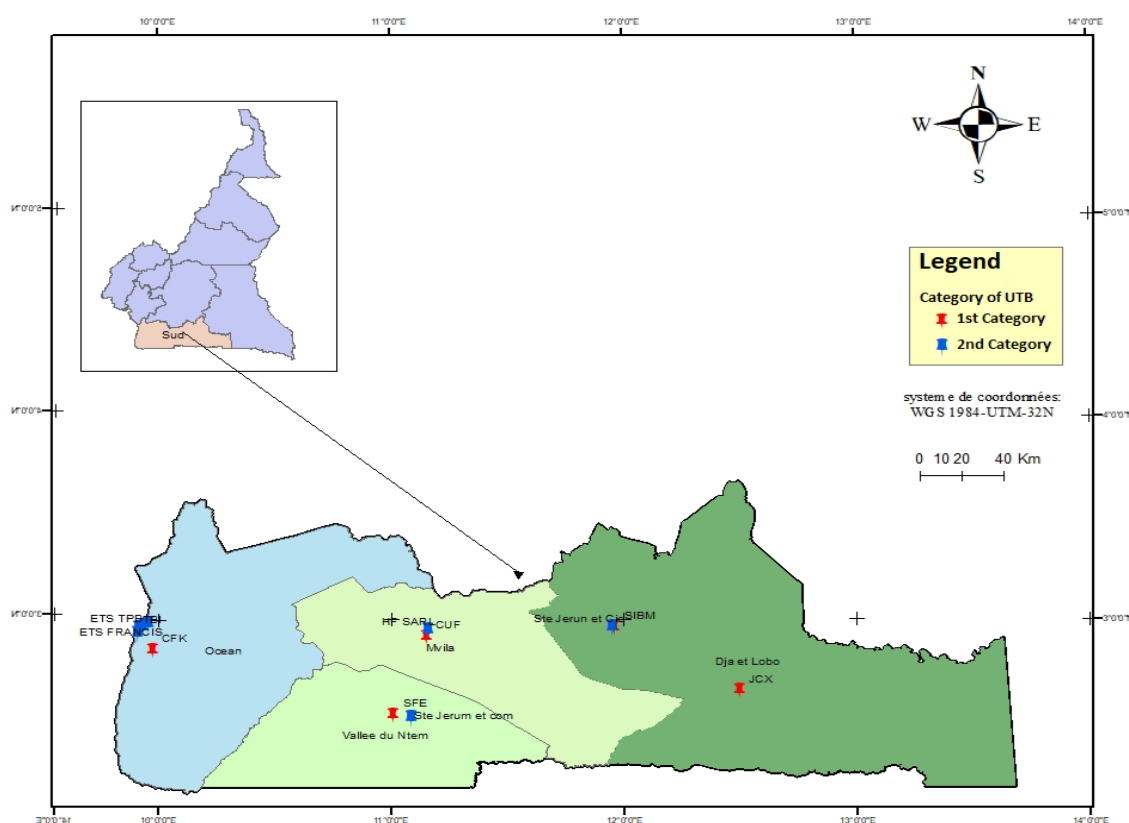


Fig. 1. Location of the wood processing units studied in the South Region of Cameroon.

2.2. Methods

2.2.1. Selection of wood processing companies

The selection of wood processing companies (WPCs) was based on seniority. Thus, priority was given to WPCs with at least 5 years of activity before the start of the pandemic in Cameroon, which allows for a comparison of the pre- and post-COVID-19 periods. Among these WPCs, only those

with a minimum workforce of 10 employees and an annual production volume exceeding 5000 m³/year for category 1 WPCs, and between 1000 and 5000 m³/year for category 2 WPCs (MINFOF, 2012), were retained. With this approach a sample of six WPCs was selected, representing 20% of the WPCs operating in 2021 in the South region. This includes

four first-category WPCs and two second-category WPCs (Table 1).

Table 1. Characteristics of the selected WPCs for the study.

Name of the WPC	Year of Creation	Department / City	Main Products	Number of Employees	Category
Cameroon Forest (CUF)	United 2009	Mvila / Ebolowa	Sawlogs	297	1
Compagnie de Kribi (CFK)	Forestière 1990	Ocean / Lokoundje	Sawlogs	209	1
Jin Cheng Xiang Int'l Trade Co. Ltd (JCX)	2015	Dja and Lobo / Sangmélina	Planks	200	1
Société Industrielle de Bois Missoko (SIBM)	1995	Dja and Lobo / Sangmélina	Sawlogs	40	1
Huguette Forestière (HF)	2014	Mvila / Ebolowa	Sawlogs	21	2
Toge et Bois (TNB)	Ngothiri 2015	Ocean / Kribi	Sawlogs	40	2

2.2.2. Data collection

Data from the pre-COVID-19 period were extracted from the annual reports of the South Regional Delegation of Forests and Wildlife, covering the period from 2015 to 2019. For the crisis period, an open-ended multinomial questionnaire was developed and provided to the heads of the WPCs a few days before the scheduled meetings for semi-structured interviews. This questionnaire was organized into five main sections: the timber sources of the WPCs, target markets, production since the onset of the pandemic, employment situation, and income. The interview with the designated representative of the host organization allowed for the collection of additional information to analyze the behavior of the WPCs during the pandemic, assess the parameters influencing wood processing activities since the onset of the crisis, as well as the socio-economic consequences of this situation on businesses. This also helped to identify which business categories were the most affected.

2.2.3. Data analysis

The collected data have been processed, purged, and organized into a table to allow for descriptive statistical analysis. Performance gaps have been evaluated by calculating the variations in volumetric production between the pre-COVID-19 period and the COVID-19 period. For this, the average annual productions before COVID-19 (from 2015 to 2019) and during COVID-19 (from March 2020 to March 2021) were calculated for each WPCs and by category of WPC.

Regarding the factors likely to influence the performance of WPCs, the Kolmogorov-Smirnov test, a non-parametric statistical test, was used to check for a significant difference between the performance gaps of first-category WPCs and second-category WPCs, with the hypothesis that the variation in performance is identical for both categories of

WPCs. To assess the influence of the age of the WPC on its performance, the Pearson correlation test was employed, assuming as the null hypothesis that there is no linear association between the age of the WPC and the observed gaps.

Finally, we examined the influence of market choice on the performance of WPCs by conducting a Spearman correlation test between the main targeted markets and the performance gaps. In order to determine priority sectors for implementing mitigation measures, we gathered the operators' opinions on the most significant effects of the pandemic on their activities using an open-ended questionnaire. The score for each identified effect of COVID-19 was established, and the Pareto diagram was used to rank these effects in order of importance to propose mitigation measures. Unless otherwise indicated, the tests were conducted using SPSS Statistics 25, with a 95% confidence interval and a significance threshold of 5%.

3. RESULTS

3.1. Marketing channels for processed products

Five main destination markets for timber products were identified in Southern Cameroon. China emerged as the primary outlet for wood products marketed by the studied WPCs ($n = 4$), followed closely by the European Union ($n = 3.5$), together representing the dominant markets for processed timber (Figure 2). In contrast, the domestic market ($n = 1$), the American market ($n = 1$), and other African markets ($n = 1.5$) played a comparatively minor role in the commercialization strategies of WPCs in the region.

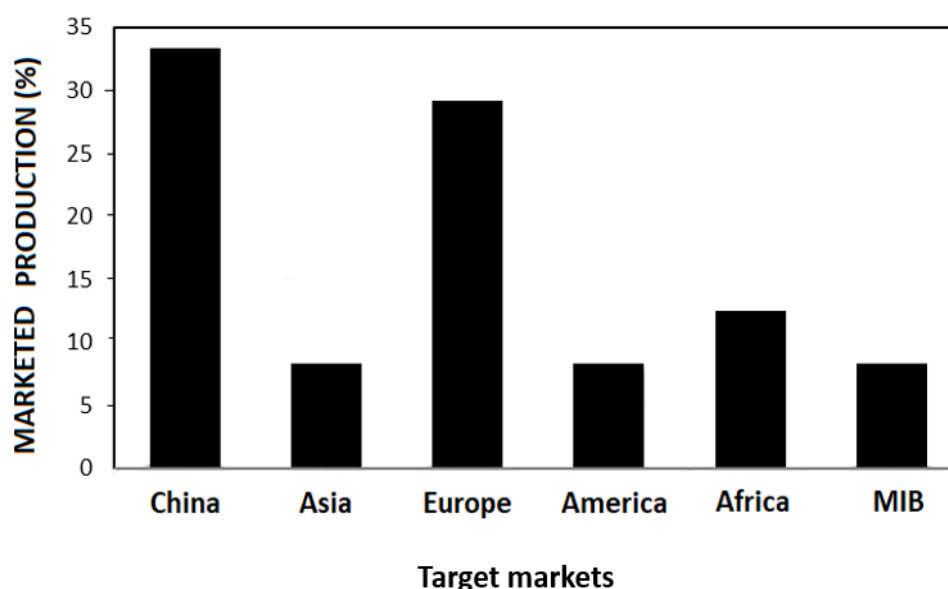


Fig. 2. Main markets for processed timber in the South Cameroon region. "Asia" refers to Rest Asia, excluding China. MIB stands for "Domestic Wood Market."

3.2. Performance gaps by WPC Category

Figure 3 presents the production variations between the pre-COVID-19 period and the onset of the pandemic, as well as the performance gaps observed for Category 1 WPCs. Since the beginning of the pandemic, overall production in this category has declined by 31.80%, decreasing from an

average annual output of 14,892 m³ before COVID-19 to 10,175 m³ thereafter. CFK was the most affected company, recording a reduction of 44.41%, corresponding to a loss of 7,434 m³ (Figure 3). Similarly, SIBM experienced a production decrease of 40.70%, equivalent to 572 m³ (Figure 3).

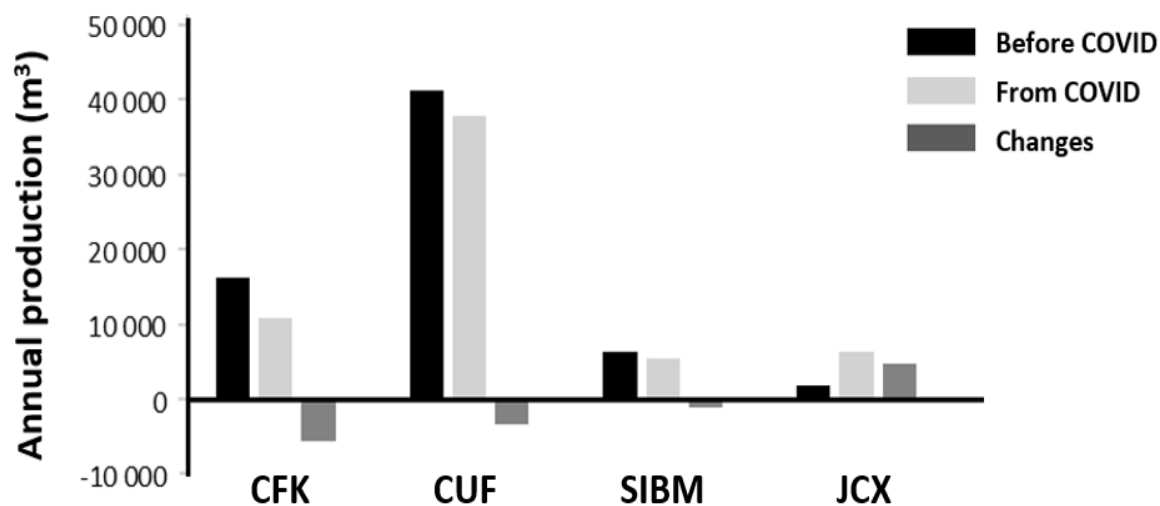


Fig. 3. Variation in production of Category 1 WPCs. Compagnie Forestière de Kribi (CFK), Cameroon United Forests (CUF), Jin Cheng Xiang Compagnie (JCX), Société Industrielle de Bois Missoko (SIBM).

In contrast, CUF has experienced a slight decrease in production of 2.9% (1,198 m³). Unlike CFK and SIBM, a significant share of its products is targeted toward local and African markets, enabling it to better withstand the impacts of international market closures. Furthermore, Jin JCX is the only Category 1 WPC that has recorded positive results in terms of performance since the beginning of the pandemic, with an increase of 20%, or 1,022 m³ (Figure 3).

Category 2 WPCs, although they do not always have a consistent activity over the years, have also been impacted by this pandemic. They do not always have reliable supply sources or updated databases to reconstruct statistics on their production. This explains their limited number in this study, as very few met our selection criteria. The results obtained are summarized in Figure 4.

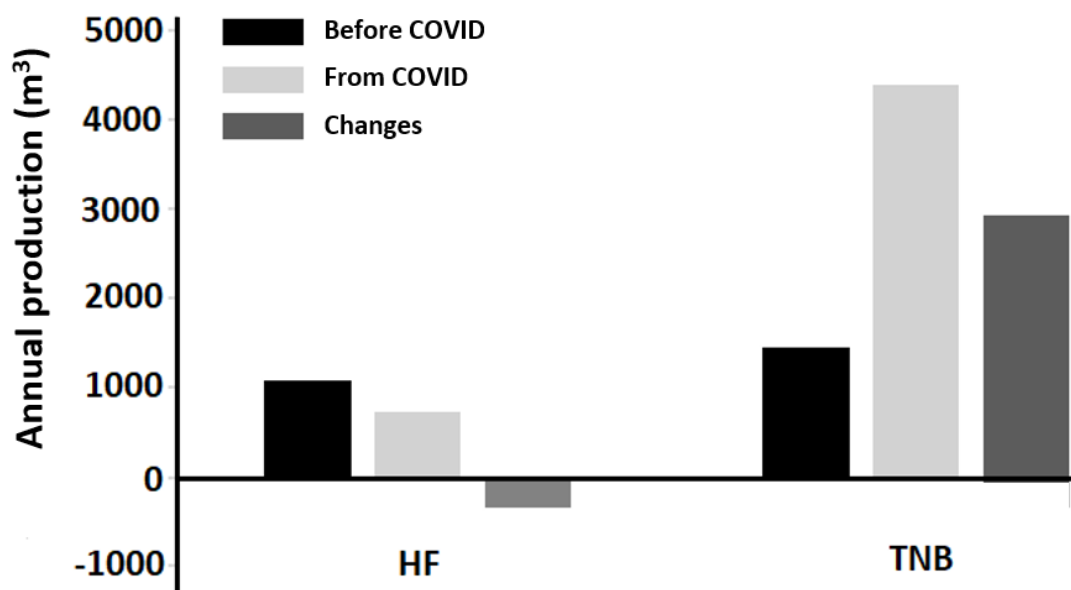


Fig. 4. Performance changes of second-category WPCs. Huguette Forestière (HF) and Toge et Ngothiri Bois (TNB).

Figure 4 shows that Huguette Forestière (HF) experienced a production decrease of 31.44%, or 733 m³. In contrast, the company Toge et Ngothiri Bois (TNB) has tripled its production since the beginning of the pandemic, with an average volume increasing from 1,457 m³ to 4,386 m³. One could say that the crisis had a positive impact on this WPC. Indeed, just like the category 1 WPC JCX, the company TNB started its activities in 2015 and did not yet have a stable supply source, relying instead on subcontracts, which explains the initially low production. However, since early 2020, the company has operated under a valid license, which has facilitated a significant increase in production over this period.

3.3. Determinants of change in WPC performance following COVID crisis

3.3.1. Influence of WPC category and age

The Kolmogorov–Smirnov test showed that WPC category did not have a significant effect on the performance gaps observed between the pre-COVID and COVID periods ($P = 0.139$). However, a significant negative correlation was observed between WPC age and the impact of the pandemic on production ($r = -0.734$; $\alpha = 0.036$). This finding suggests that older WPCs were more adversely affected by the pandemic, resulting in greater performance variability compared to younger WPCs. This pattern may be associated with differences in adaptability and resilience, which could decline as organizations mature and become more structurally rigid. Consequently, further investigation into the mechanisms underlying this relationship is warranted to better understand how organizational age shapes performance during periods of crisis.

3.3.2. Influence of the target market

The correlation between product destination and performance gaps was very weak and not significant ($r = -0.129$; $\alpha = 0.807$), indicating no evidence of a causal relationship between market destination and the impact of the crisis on WPC production. This suggests that the pandemic affected multiple markets simultaneously rather than disproportionately influencing specific export destinations. Although some WPCs reported increased production during the pandemic, many still experienced substantial difficulties in marketing their products. Notably, the most affected WPCs tended to be those with limited or no engagement in the domestic market. Given that national demand has exceeded an estimated 830,000 m³ per year over the past decade, making the domestic market comparable in scale to export markets (Lescuyer et al., 2017), these findings highlight the strategic importance of domestic market integration for WPC resilience.

3.4. Socioeconomic consequences of COVID-19

3.4.1. On the market

Since the onset of the COVID-19 pandemic, major disruptions have been observed in wood product markets at both international and national levels. Border closures, reduced trade flows, and restrictive government measures have significantly affected marketing channels for processed timber, with direct consequences for the wood-processing sub-sector in Southern Cameroon. However, the magnitude of these impacts varied across WPCs. The main market-related effects of the pandemic on WPCs are summarized in Table 2.

Table 2. Market-related effects of COVID-19 on studied WPCs.

WPC	Observed impacts on the market
CUF	15% decline in prices of logs and sawn timber Suspension of 20% of Asian contracts Significant accumulation of cargo at the Douala seaport Increased difficulty in securing international clients
CFK	Suspension of more than 50% of existing contracts
JCX	Reduced external demand Termination of approximately five contracts 30% decline in prices of logs and sawn timber
SIBM	Suspension of existing contracts
TNB	Decline in timber prices Suspension of five contracts

3.4.2. On the income of WPCs

COVID-19 had a significant negative impact on the income of WPCs in Southern Cameroon (Figure 5). Lockdown measures and mobility restrictions disrupted supply chains, reducing the availability of raw materials for processing. At the same time, demand for processed wood declined as

construction activities slowed and access to export markets became constrained. The simultaneous contraction of supply and demand placed considerable financial pressure on WPCs, leading some firms to downsize their workforce or temporarily suspend operations. Moreover, heightened market uncertainty limited the ability of companies to plan and invest strategically amid unstable conditions.

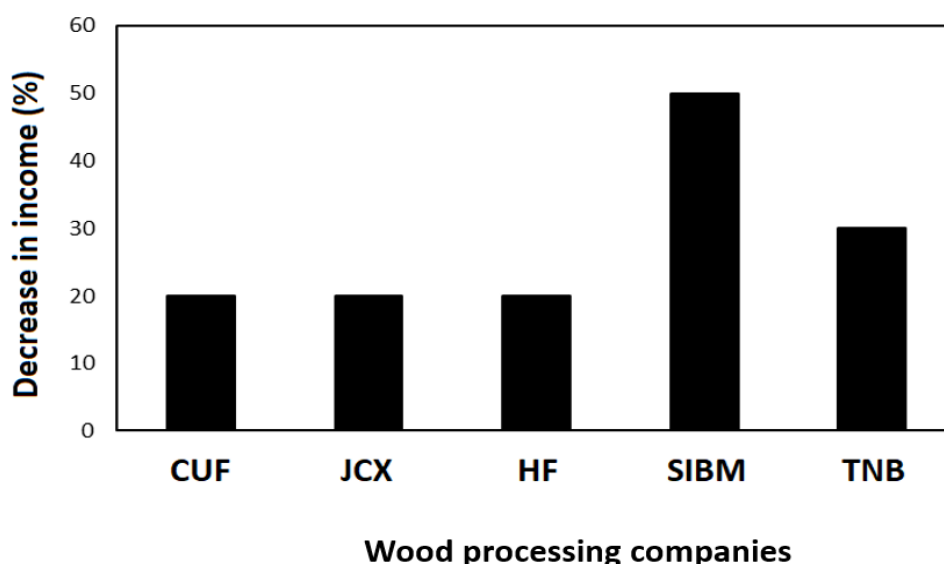


Fig. 5. Estimated income decline of WPCs following the COVID-19 outbreak.

3.4.3. On the social front

Although COVID-19 generated multiple disruptions in the wood-processing sub-sector, it remained primarily a public health crisis with significant implications for workers in WPCs. To limit the spread of the virus, companies implemented preventive measures, including the installation of handwashing stations, distribution of face masks, and systematic temperature checks at entry points (notably at

CUF and TNB). Beyond these health measures, the pandemic also had notable social consequences linked to reduced production and economic constraints. Several WPCs were constrained to temporarily or permanently lay off part of their workforce. Figure 6 illustrates the evolution of number of employees across WPCs since the onset of the pandemic.

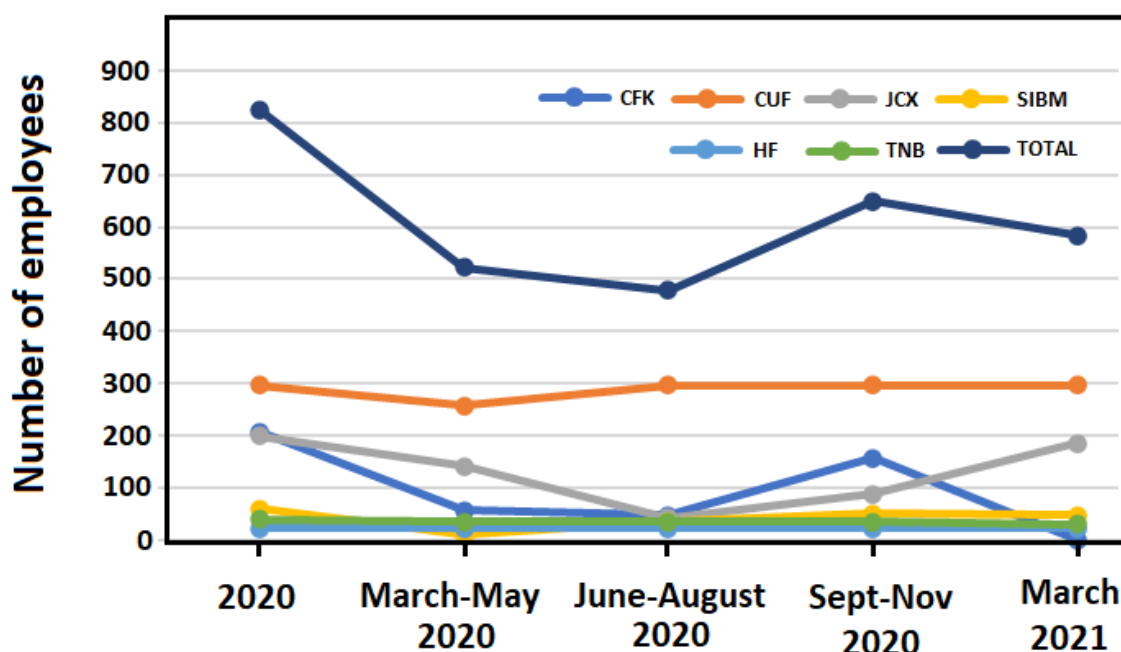


Fig.6. Quarterly change in employment levels.

Figure 6 shows that the onset of COVID-19 in Cameroon generated a sharp employment shock between March and May 2020. Across all WPCs, total employment declined by 42.13% between January and June 2020. Although job numbers subsequently recovered gradually until early 2021, 29.42% of workers had lost their positions permanently. Employment losses were markedly higher among category 1 WPCs, which recorded more than 200 layoffs between March 2020 and 2021, compared with only 14 layoffs in category 2 WPCs.

4. DISCUSSION

4.1. Performance gaps among wood processing companies and their implications

The COVID-19 pandemic negatively affected the production of most Wood Processing Companies (WPCs) in Southern Cameroon, except for JCX and TNB, which recorded increased output. This improvement does not reflect a positive effect of the pandemic but rather company-specific structural factors. Both firms began operations in 2015 with unstable raw material supplies, which initially limited production. During the pandemic, JCX strengthened local partnerships and benefited from sustained demand for veneer products. Similarly, TNB obtained a logging title in early 2020, improving its access to raw materials and partly explaining its increased production.

In contrast, HF, CFK, SIBM, and CUF experienced production declines due to mobility restrictions, supply chain disruptions, and reduced market access, consistent with global trends affecting SMEs (Xiong et al., 2021). Older and larger WPCs were more adversely affected, likely due to their greater dependence on export markets and

limited technological adaptation (Zulfikar et al., 2021). While these sawmills primarily serve international markets, their by-products are sold locally, where artisanal milling proved more resilient during restrictions.

CUF revenue was less affected than SIBM because a significant share of its products targets domestic and regional African markets, which would have helped to buffer the effects of border closures (Xiong et al., 2021). This highlights the strategic importance of the domestic timber market, with an estimated demand of more than 830,000 m³ annually, comparable to export volumes (Lescuyer et al., 2017). The widespread revenue decline among WPCs (Figure 5) reflects the national trend as 92% of national companies reported revenue declines since the pandemic began (Madai Boukar et al., 2021; Andrianarison & Nguem, 2020), with losses ranging from 20% for more resilient firms to 50% for the most vulnerable (notably CFK and SIBM) as found in other areas (Razumovskaia et al., 2020). Even JCX and TNB faced financial challenges due to fluctuating export access.

Regarding employment, WPCs were largely unprepared for the crisis. Government restrictions in March 2020, including bans on gatherings of more than 50 people, forced workforce reductions as elsewhere (Xiong et al., 2021). Although some workers returned after restrictions were eased in June 2020, further layoffs occurred in early 2021 (Figure 6), particularly at CFK, which has since become inactive.

4.2. Mitigation measures and pathways for strengthening resilience of wood processing companies

The impacts of COVID-19 on varied considerably across WPCs in Southern Cameroon. A Pareto analysis was conducted to identify and rank these impacts according to their relative importance, and the cumulative distribution of effects is presented in Figure 7. The results indicate that border closures were the most critical driver of disruptions,

triggering a cascade of secondary effects including contract suspensions, declining external demand, revenue losses, and workforce reductions (Emeto et al., 2021). Many WPCs reported challenges in relationships with foreign buyers, leading to contract terminations and order cancellations, which exacerbated financial pressures and prompted cost-cutting measures, particularly layoffs (Katare et al., 2021).

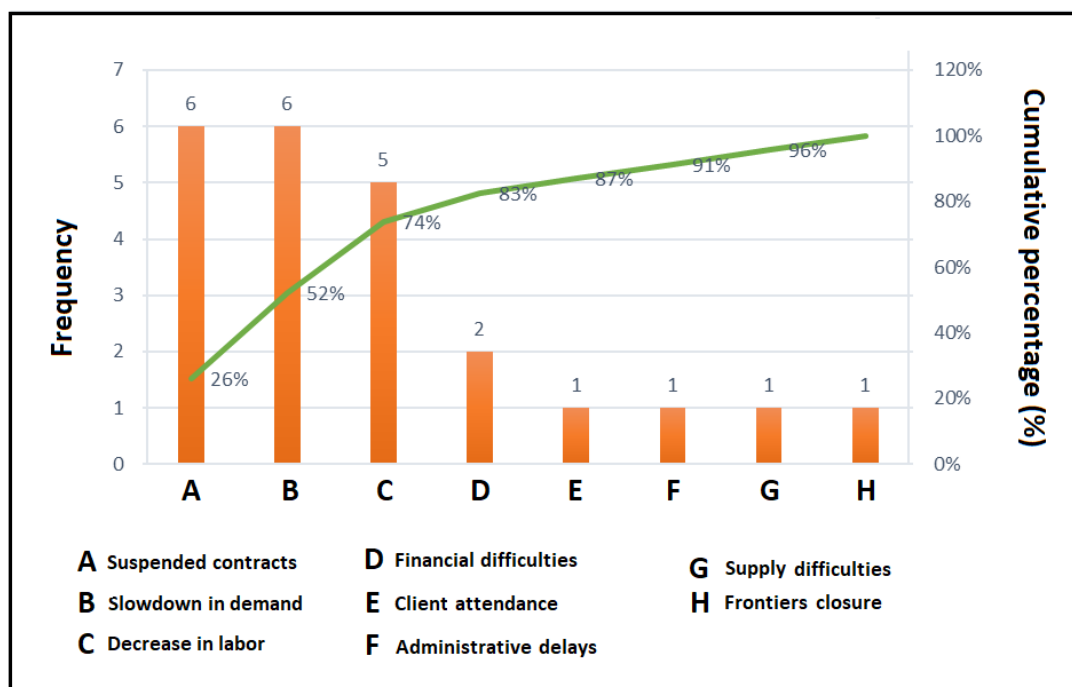


Fig.7. Pareto diagram of the frequencies and cumulative percentage of the effects induced by COVID-19 on wood processing activities in the Southern region.

In response to these challenges, strengthening domestic and regional markets emerges as a central mitigation strategy. The local market, largely dominated by informal wood trade, proved relatively resilient to international disruptions and could serve as a stabilizing buffer during future crises (Kang et al., 2020). Three short-term measures are particularly relevant: (1) valorization of processing residues and waste for local markets, simultaneously addressing waste management and income diversification; (2) improved production planning to reduce inventory bottlenecks and financial risk; and (3) proactive engagement with local and regional buyers to stimulate demand for legally-processed wood products (Freudlsperger et al., 2024).

Workforce management also requires a more strategic approach (Soomro et al., 2022). Rather than relying primarily on layoffs, WPCs could adopt staff rotation, temporary leave, or reduced working hours to preserve skilled labor while lowering operational costs (Liu et al., 2020). Additionally, targeted training and skills upgrading during periods of reduced activity could enhance long-term productivity and enable WPCs to recover more rapidly after crisis (Bou-Karroum et al., 2021).

Over the medium to long term, structural transformation is essential to enhance sectoral resilience. Greater adoption of digital technologies would improve communication with clients, facilitate market intelligence, and expand access to domestic buyers (Spennemann, 2021). Moreover, shifting from predominantly primary processing toward more integrated and diversified production systems—such as furniture, engineered wood, or paper products—could reduce vulnerability to external shocks. Diversification would also allow WPCs to capture more value locally rather than depending heavily on volatile export markets.

Finally, government support should play a critical role in strengthening sector resilience (Ngomba, 2020). Policy measures could include tax relief for WPCs, incentives for local wood consumption, and preferential public procurement for legally sourced timber. Strengthening enforcement against illegal wood trade would further level the playing field for formal WPCs while promoting sustainable behaviors (Zulfikar et al., 2021). Together, these measures would not only mitigate the immediate impacts of COVID-19 but also contribute to a more robust,

competitive, and sustainable wood-processing sector in Southern Cameroon.

5. CONCLUSION

This study assessed the socioeconomic impacts of COVID-19 on wood processing companies (WPCs) in the South Region of Cameroon and demonstrates that industrial WPCs, largely oriented toward international markets, were significantly affected by the pandemic. The survey revealed that 92% of processed wood products were destined for export, mainly to the Asian market (41%), with China alone accounting for 33%. In terms of performance, category 1 WPCs experienced a production decline of 32.66%, whereas category 2 WPCs showed comparatively greater resilience. Older companies, particularly CFK and SIBM, were among the most severely affected during the crisis. Overall, 29.42% of permanent jobs were lost across the surveyed WPCs. A Pareto analysis identified contract suspensions and reduced external demand as the most critical socioeconomic effects of the pandemic on the sector. In response to these challenges, mitigation measures were proposed, including the promotion of the domestic market, the training of staff in new wood-processing technologies during crises, and the provision of government financial support to support sector recovery. Future research should examine how WPCs have recovered from the pandemic in order to better inform strategies for coping with potential health crises in the future.

REFERENCES

1. Andrianarison, F. & Nguem, B. E. (2020). Effets socioéconomiques potentiels du COVID-19 au Cameroun : évaluation sommaire, PNUD, Yaoundé, 29p.
2. Bou-Karroum, L., Khabsa, J., Jabbour, M., Hilal, N., Haidar, Z., Abi Khalil, P., ... & El Bcheraoui, C. (2021). Public health effects of travel-related policies on the COVID-19 pandemic: A mixed-methods systematic review. *Journal of Infection*, 83 (4), 413–423. <https://doi.org/10.1016/j.jinf.2021.07.017>
3. Castro, M. P., & Zermeno, M. G. G. (2021). Being an entrepreneur post-COVID-19 – resilience in times of crisis: A systematic literature review. *Journal of Entrepreneurship in Emerging Economies* 13(4): 721-746. <https://doi.org/10.1108/jeee-07-2020-0246>
4. Emeto, T. I., Alele, F. O., & Ilesanmi, O. S. (2021). Evaluation of the effect of border closure on COVID-19 incidence rates across nine African countries: an interrupted time series study. *Transactions of The Royal Society of Tropical Medicine and Hygiene*, 115 (10), 1174-1183. <https://doi.org/10.1093/trstmh/trab033>
5. Freudlsperger, C., Lipps, J., Nasr, M., Schilpp, E., Schimmelfennig, F., & Yildirim, A. (2024). Pandemic bordering: domestic politicisation, European coordination, and national border closures in the COVID-19 crisis. *Journal of European Public Policy*, 31(10), 3151–3175. <https://doi.org/10.1080/13501763.2023.2294143>
6. Hiolhiol, F. & Assembe-Mvondo, S. (2020). Etat des lieux des acteurs du secteur privé de la filière Forêt-Bois au Cameroun. GFBC/ATIBT. 74p.
7. INS- Institut national de la statistique. (2020). Annuaire Statistique de la Région du Sud édition 2020. République du Cameroun. 221p.
8. Kang, S., Moon, J., Kang, H., Nam, H., Tak, S., & Cho, S. I. (2020). The evolving policy debate on border closure in Korea. *Journal of Preventive Medicine and Public Health*, 53(5), 302-306. <https://doi.org/10.3961/jpmph.20.213>
9. Katere, B., Marshall, M. I., & Valdivia, C. B. (2021). Bend or break? Small business survival and strategies during the COVID-19 shock. *International Journal of Disaster Risk Reduction*, 61, 102332. <https://doi.org/10.1016/j.ijdrr.2021.102332>
10. Lescuyer, G., Tsanga, R., Essiane Mendoula, E., Ahanda, B. X. E., Ouedraogo, H. A., Fung, O., ... & Bigombe Logo, P. (2017). National demand for sawnwood in Cameroon. A barrier to or an opportunity for promoting the use of timber resources of legal origin? Center for International Forestry Research (CIFOR): Bogor, Indonesia. 57p. <https://www.cifor-icraf.org/knowledge/publication/6375/>
11. Liu, Q., Luo, D., Haase, J. E., Guo, Q., Wang, X. Q., Liu, S., ... & Yang, B. X. (2020). The experiences of health-care providers during the COVID-19 crisis in China: a qualitative study. *The Lancet Global Health*, 8(6), e790-e798. [https://doi.org/10.1016/S2214-109X\(20\)30204-7](https://doi.org/10.1016/S2214-109X(20)30204-7)
12. Madai Boukar, A., Mbock, O., & Kilolo, J. M. M. (2021). The impacts of the Covid-19 pandemic on employment in Cameroon: A general equilibrium analysis. *African Development Review*, 33, S88-S101. <https://doi.org/10.1111/1467-8268.12512>
13. Mahmoud, M.A., Mahmoud, A., Abubakar, S.L., Garba, A.S., Daneji, B.A. (2022), COVID-19 operational disruption and SMEs' performance: the moderating role of disruption orientation and government support. *Benchmarking: An International Journal*, 29 (9), 2641–2664. <https://doi.org/10.1108/BIJ-03-2021-0131>
14. MINFOF. (2012). Décision N°2637/D/MINFOF du 06 Décembre 2012 portant catégorisation des unités de transformation et déterminant le degré de

- transformation des produits bois.
15. MINFOF (Ministry of Forestry and Wildlife) & WRI (World Resources Institute). (2020). Cameroon's Forest Estate, December 2020.
 16. Ngomba B. F.G. (2020). Quels sont les effets des chocs liés à la pandémie COVID-19 au Cameroun ? BEAC Occasional Paper N°04/20, Banque des Etats de l'Afrique Centrale (BEAC).
 17. Nguiffo, S. & Wankeu, A. (2020). Analyses statistiques des données de production et des exportations de bois au Cameroun en 2019. Centre pour l'Environnement et le Développement. 09p.
 18. Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., ... & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International journal of surgery*, 78, 185-193. <https://doi.org/10.1016/j.ijsu.2020.04.018>
 19. Razumovskaia, E., Yuzvovich, L., Kniazeva, E., Klimenko, M., & Shelyakin, V. (2020). The effectiveness of Russian government policy to support SMEs in the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 160. <https://doi.org/10.3390/joitmc6040160>
 20. Sun, T., Zhang, W. W., Sorin Dinca, M., & Raza, M. (2022). Determining the impact of Covid-19 on the business norms and performance of SMEs in China. *Economic Research-Ekonomska Istraživanja*, 35(1), 2234-2253. <https://doi.org/10.1080/1331677X.2021.1937261>
 21. Spennemann, D. H. R. (2021). “No entry into New South Wales”: COVID-19 and the historic and contemporary trajectories of the effects of border closures on an Australian cross-border community. *Land*, 10(6), 610. <https://doi.org/10.3390/land10060610>
 22. Soomro, M. A., Ali, M. H., Tan, K. H., Kumar, A., & Sinniah, S. (2022). Workforce resilience in the post-COVID-19 era: Differences based on manufacturing-service orientation and firm size. *Production Planning & Control*, 35(13), 1674-1686. <https://doi.org/10.1080/09537287.2022.2106446>
 23. Xiong, H., Wu, Z., Hou, F., & Zhang, J. (2021). Which firm-specific characteristics affect the market reaction of Chinese listed companies to the COVID-19 pandemic? In *Research on Pandemics* (pp. 99-110). Routledge.
 24. Zulfikar, R. Z., Widyanti, R. W., Basuki, B., Mayvita, P. A., & Purboyo, P. (2021). Encourage SMEs sustainable behavior during Covid-19 pandemic through competitive advantages and corporate culture. *Serbian Journal of Management*, 16(2), 405-417. <https://doi.org/10.5937/sjm16-25966>