

Environmental, Social, and Governance Adoption in the Malaysian Wood Products and Furniture Industries: Awareness, Adoption, and Challenges

Jegatheswaran Ratnasingam,^{a,*} Hazirah Ab Latib,^{a,*} Lim Choon Liat,^a Natkuncaran Jegatheswaran,^b Kamaruzaman Othman,^c and Mohd. Afthar Amir ^c

As the world intensifies efforts to mitigate the effect of global climate change, an on-line survey was carried out involving 1,081 wood products and furniture manufacturers in Malaysia. The main objective was to evaluate the level of awareness, extent of adoption, and challenges faced by these manufacturers in adopting environmental, social, and governance (ESG) practices. The survey found that large-sized companies were more receptive to adopting ESG practices, as opposed to the medium-, small-, and micro-sized companies. Respondents were apparently more responsive to environmental requirements, followed by governance, and finally the social factors. Within the environmental sphere, compliance with using certified and legal wood and wood products, waste management, and conformance to emission standards were well received among respondents. The survey revealed that market forces and legislative requirements were the two most important factors that enticed respondents to comply with the ESG practices; among those respondents who did not comply with ESG requirements, the primary deterrent factors include lack of awareness, no direct benefit from adopting ESG, and the high cost involved. The ESG compliance may transform the wood products and furniture industries into a more sustainable industry, offering equitable wages and green jobs while producing high value-added products.

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Contact information: a: Faculty of Forestry, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia; b: Faculty of Business, University of Wollongong, NSW 2522, Australia; c: Malaysian Timber Industry Board (MTIB), Level 13-17, Menara PGRM, Jalan Pudu Ulu, 56100 Kuala Lumpur, Malaysia;

* Corresponding author: jegaratnasingam@yahoo.com

INTRODUCTION

The Malaysian wood-based sector has done relatively well despite facing challenges from three phenomenon, namely the Covid-19 pandemic, climate change, and the global economic uncertainty due to the conflict in Ukraine-Russia. In fact, the 3C global phenomenon has affected almost all countries, and recovery is still a work in progress. In 2021, exports of wood and wood-based products from Malaysia registered RM 22.1 billion in export earnings, while the domestic market continue to report a strong demand of RM 14.5 billion (MTIB 2022). Within the overall wood-based sector, the furniture industry has continued its sterling performance, emerging as the largest export earning sub-sector, fueled primarily by a spillover trade effects from Chinese

manufacturers, who continue to relocate their operations to other countries in the ASEAN region to circumvent the anti-dumping tariff imposed on Chinese imports, arising from the United States-China trade conflict. According to a market review report by MTIB (2022) and Ratnasingam (2022), export of furniture is envisaged to continue its strong performance driven not only by the decoupling of the manufacturing from China to Malaysia, but also the strength of the USD against all other currencies, which provides furniture exporters a bigger financial gain (Ratnasingam 2017; MTIB 2019).

Figure 1 shows the relative export value of wood and furniture products from Malaysia in comparison to China, Vietnam, Thailand, Philippines, and Indonesia for 2021. Interestingly, Malaysia's position as a leading exporter of wood and furniture products globally is vulnerable, due to its dependence on low-cost factor inputs, especially raw materials and labor. In fact, previous studies by Ratnasingam (2015, 2017) and Ratnasingam *et al.* (2018) have conclusively shown that the growth of the Malaysian wood products and furniture industries is fueled primarily by incremental inputs, rather than productivity gains. Much of the competitiveness is drawn from the product's low price-points, which is unsustainable in the long term (MTIB 2019).

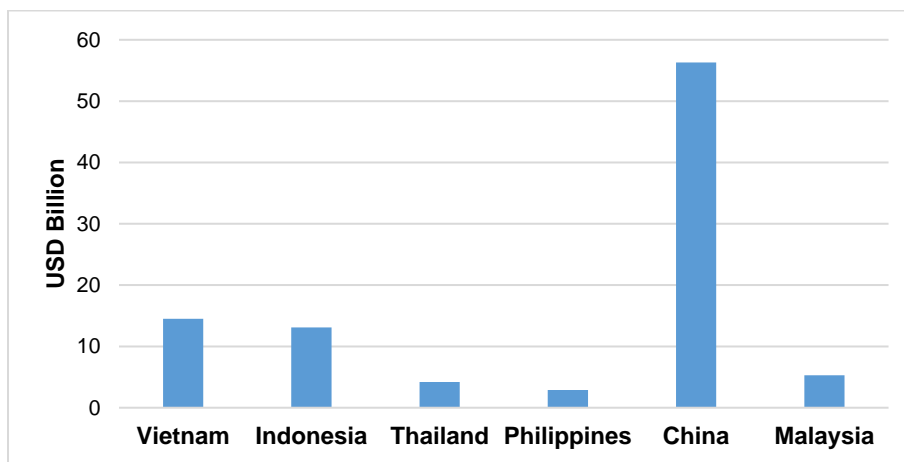


Fig. 1. Relative export value of wood and furniture products of different countries in 2021

Another point of contention is the fact that small and medium enterprises (SMEs) make up almost 82% of all registered wood products and furniture manufacturing enterprises in the country in 2020 (MTIB 2021). According to the Malaysian Industrial Development Authority (MIDA), SMEs in the manufacturing sector are defined as firms with sales turnover not exceeding RM 50 million, or with the number of full-time employees not exceeding 200. In fact, the wood products and furniture industries have the largest number of SMEs compared to any other manufacturing sector, and this is attributed to the low-entry barrier and the traditional, cottage-based nature of the sector (SME Corp. 2019). The distribution of wood products and furniture manufacturing enterprises by size of company is as shown in Fig. 2.

The prevalence of SMEs in the wood products and furniture industries has been adversely affected since the onset of the COVID-19 pandemic in late 2019. A previous report by Ratnasingam *et al.* (2020, 2021) showed that SMEs, with limited financial capability, had suffered the most due to debilitating production disruptions. The size of a company affects its ability to cope with economic uncertainty arising from market disruptions due to the pandemic. Other studies (Ratnasingam *et al.* 2021; Razak *et al.* 2021;

Yi *et al.* 2021) have also reported that the size of the company also influences its decision to invest in technology, sustainable practices, and modern manufacturing systems. Therefore, it is clear that the size of the company in the wood products and furniture industries plays an important role in its ability to transform and comply with new market requirements.

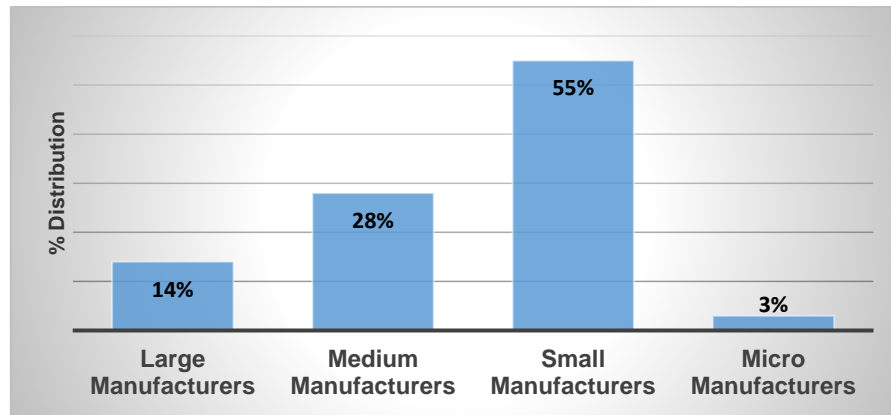


Fig. 2. Proportion of SMEs in the wood products and furniture sector (MTIB 2019)

ESG – A New Market Requirement

The concept of sustainable development, in line with the United Nation's Sustainable Development Goals (SDGs), which requires transparency and obligation of organizations to society, is gaining momentum throughout the world. One dimension of sustainability that is becoming a focus presently is the so-called ESG, an acronym for "environmental, social, and governance". Specifically, ESG indicators are created to capture additional dimensions of corporate performance, which are not reflected in accounting data (Bassen and Kovacs 2008), and this is becoming an important part of mainstream investment decision-making. In fact, ESG is considered as the preferred term for capital markets (Ellis 2020), a valuable mechanism for stakeholders and investment decision-makers, and more precisely, measurement of a portfolio's performance. Although the traditional view of emphasizing towards shareholder value maximization as the main objective of firms is still beholden, the transition towards finding a balance between the environmental, social, and economic performance (Liang and Renneboog 2017) is fast becoming a market requirement.

ESG practices and their impacts on firms has been extensively studied in the developed economies (Rajhans and Kaur 2013; Pellegrini *et al.* 2019a; García *et al.* 2020; Jang *et al.* 2020; Sadiq *et al.* 2020; Xu *et al.* 2020; Zhang *et al.* 2020). Despite the overwhelming demand for ESG compliance in firms worldwide, there are still substantial doubts about the role of ESG in shaping both profitability and firm's value, as alluded by Pellegrini *et al.* (2019b). Atan *et al.* (2017) found an insignificant relation between individual and combined factors of ESG and firm profitability (*i.e.*, ROE) as well as firm value (*i.e.*, Tobin's Q) for publicly listed companies (PLC) in Malaysia. On the other hand, Saadiq *et al.* (2020) reported that the firm's value increased with ESG strength and decreased with ESG concern. A similar outcome was also reported by Yip and Lee (2018), who found that the overall ESG disclosure score was positively associated with Tobin's Q. In another study, Jang *et al.* (2020) used corporate bond data in Korea to investigate the relationship between ESG scores and bond returns. The study found that environmental

scores showed a significant impact on bond returns when interacting with firm size, suggesting that high environmental scores lowered the cost of debt financing for small firms. Positive association between the environmental components of ESG scores with firm profitability were also reported by European and North American publicly listed companies (Fatemi *et al.* 2017; Pellegrin *et al.* 2019).

The Malaysian government showed its support *via* positive determinations of Bank Negara Malaysia (BNM), Securities Commission Malaysia (SC), and Bursa Malaysia (BM) towards the sustainability dimension that kick-started in 2014 (Bursa Malaysia 2020a,b). Since ESG disclosure is still voluntary, and only started recently in the country, it is a challenge to verify ESG's added value and benefits to firms especially in Malaysia. Although Corporate Malaysia appears to have a strong appetite for ESG compliance (PwC 2021), research of acceptance, adoption, and practices of ESG among manufacturing entities appear to be limited. This is particularly true for many labor-intensive manufacturing sectors, including the wood products and furniture industries that draw their competitive strength from low-cost manufacturing bases, which is increasingly scrutinized by international buyers for its ESG compliance. For many of these international buyers and customers, ESG compliance in the wood products and furniture industries has been a requirement that has been gradually imposed primarily on exporters (Pellegrin *et al.* 2019; Ratnasingam 2022).

Evolution of ESG Compliance in the Wood Products and Furniture Industries

ESG compliance in the wood products and furniture industries has focused on several aspects, namely green-house-gaseous (GHG) emission, energy consumption, waste and effluent management, labor issues, workers' health and safety, product life-cycle, supply chain management, use of certified materials, human rights, corporate governance, and anti-corruption practices (Bursa Malaysia 2015). In order to transform the wood products and furniture industries into an industry with sustainable practices, the government has enforced several legislations and regulations to tighten the requirements with the industry (Ab Latib *et al.* 2022). Among the notable pieces of legislation that have come into strict enforcement recently are the Environmental Quality Act (1974), Employees' Minimum Standards of Housing, Accommodation and Amenities Act (1990), Renewable Energy Act (2011), Clean Air Regulation (2014), and Employment (Amendment) Act 2022. In order to alleviate the fears of international buyers and communities, Malaysia also revised the National Forestry Policy (2020) to ensure greater protection of the forest resources and biodiversity conservation, and also formulated the National Action Plan on Forced Labor (2021-2025) to combat allegations of forced and child-labor use in some economic sectors (MTIB 2021). In early 2022, the product certification on formaldehyde emission for wood-based panels was implemented by the Malaysian Timber Industry Board (MTIB), which is another requirement imposed on the wood products and furniture industries, in compliance with the global ESG requirement (Ab Latib *et al.* 2022; MTIB 2022).

Despite the good intentions of the above mentioned legislative and regulative measures, the wood products and furniture industries in Malaysia appear reluctant to accept its imposition. This indirectly reflects the reluctance of the industries to wholly adopt the ESG practices. Unfortunately, ESG requirements will soon be enforced as mandatory in the European Union market, which has emerged as the most environmentally sensitive marketplace globally (MIFF 2018; Ratnasingam *et al.* 2021). Inevitably, it is a matter of time before other international markets follow suit. The wood products and furniture

industries in Malaysia, which exports nearly 80% of its production volume, may be penalized for non-compliance, and may lose its global market share (Ratnasingam 2022). In this context, it is important to examine the adoption of ESG principles among the wood products and furniture industries in Malaysia. In a similar vein, it was also reported that ESG compliance reports for the wood products and furniture industries in many parts of the world is limited (Klinger *et al.* 2022; Lööf *et al.* 2022; Ratnasingam 2022), as the wood products and furniture industries are often seen as a laggard when it comes to global trends. Inevitably, a study was undertaken to examine the level of awareness and extent of adoption of ESG principles among wood products and furniture manufacturers in Malaysia, and also to provide recommendations on possible support measures from the government to facilitate greater adoption of ESG principles among the wood products and furniture manufacturers to ensure compliance with global market requirements, without disruptions to the exporting capacity (Yoon *et al.* 2018). This study is particularly important, considering the fact that the Malaysian wood products and furniture industries are highly export oriented, and any disruptions to their exporting capacity will have serious socio-economic repercussions.

EXPERIMENTAL

This study was commissioned by the Malaysian Timber Associations after discussion with Bursa Malaysia, in anticipation of the market dynamics that will increasingly affect the wood products and furniture industries export performance in years to come. Therefore, an on-line survey of wood products and furniture manufacturers, covering both large enterprises and SMEs, was carried out with the assistance of the Malaysian Timber Association (MTA), which contacted members from all sub-sectors within the Malaysian wood products industry. The Malaysian Timber Industry Board (MTIB) also lent its support to ensure sufficient respondents were obtained for the study. The on-line survey method was preferred, as it provides quick responses in real-time, increases response rate, automated data input, and flexibility in design (Bing and Li 2019). However, this method may have compromised its accuracy due to survey fraud, lack of interviewers, and insufficient sample size (Liu *et al.* 2020).

Table 1 shows the criteria of ESG requirement that was highlighted as being important for the wood products and furniture industries, after consultation with Bursa Malaysia, industry experts, trade associations, and several previous studies (Friede *et al.* 2015; Ismail *et al.* 2020).

Because this is an exploratory survey to assess the level of the awareness and the extent of ESG compliance among wood products and furniture manufacturers in Malaysia, several criteria were chosen for the survey. Prior to the implementation of the survey, a draft questionnaire was pre-tested among 20 randomly chosen wood products manufacturers in the Klang Valley, and with a Cronbach-alpha score of 0.81, the questionnaire was improved based on the feedbacks obtained to improve its effectiveness. The final structured questionnaire had three-parts, which was designed and implemented using Google Forms (Google LLC, Mountain View, CA, USA), and the data were captured and compiled after three weeks of launching the survey. The Malaysian Timber Association (MTA) had informed all their members about this survey through their social-media, and this was helpful in ensuring a high response rate for the survey. From a total of 3,484 wood and furniture manufacturers registered with MTA, a total of 1,081 respondents were obtained (31% response rate), after the three-weeks period.

Table 1. General Criteria Included in ESG Compliance Survey for Wood Product Manufacturing Industry

Criteria	Environmental	Social	Governance
Primary Criteria	<ul style="list-style-type: none"> • Comply with Clean Air Regulation (2014) • Comply with Formaldehyde Emission Guideline (2022) • Use of renewable energy • Waste Management Policy • Carbon Footprint Label • Use of Certified Wood Product 	<ul style="list-style-type: none"> • Comply with Employees Minimum Standard for Housing, Accommodation and Amenities Act (1990) • Comply with Employment (Amendment) Act (2022) • Workers Health and Safety Policy • Minimum Working Hours of 45 • Comply with Minimum Wage Level 	<ul style="list-style-type: none"> • Good Corporate Governance • Practice of Corporate Social Responsibility (CSR) • Anti-Corruption Policy
Secondary Criteria	<ul style="list-style-type: none"> • Comply with Environmental Quality Act (1974) • Product Life-Cycle Analysis • Water Consumption Policy • Energy Consumption Policy • Waste and Effluent Management Policy • Management of Green House Gaseous (GHG) Emission • Climate Change Mitigation Policy • Environmental Compliance Policy 	<ul style="list-style-type: none"> • In-line with National Action Plan on Forced Labor (2021-2025) • Comply with Human Rights Principles • Good Employment and Labor Relation Practices • Positive Impact on Society 	

Source: Bursa Malaysia

The first part of the questionnaire was designed to capture the level of awareness of ESG practices among the respondents. The second part of the questionnaire assessed the extent of compliance of the respondents against a set of ESG criteria, as shown in Table 2. The responses were captured using a 5-point Likert scale score (1 = not compliant at all, while 5 = fully compliant). The third part of the questionnaire, involving open-ended questions, solicited responses from the survey respondents on the factors that encouraged or discouraged them from complying with the ESG requirements.

The responses were compiled, then analyzed, and the averages were presented graphically. The degree of compliance for each of the criteria was also presented graphically. The student's T-test was used to ascertain the significance, which was set at the level of $P < 0.05$. The P-value is the probability that the results from the data occurred by chance and reflects the probability of finding the results to show no significant differences between the factors tested (*i.e.* null hypothesis). It is calculated using the sampling distribution of the test statistic under the null hypothesis, the sample data, and the type of test being done. The Excel Spreadsheet of Microsoft Windows Professional Version 10 (Redmond, WA, USA) was used to carry out the necessary statistical calculations.

Table 2. ESG Compliance Criteria Assessed in the Survey

Environmental	Social	Governance
<ul style="list-style-type: none"> • Waste Management Policy • Volatile Organic Compound (VOC) Emission Reduction • Product Carbon Footprint Label • Use of Certified and Legal Wood • Use of Recycled Packaging • GHG Reduction Policy 	<ul style="list-style-type: none"> • Workers Health and Safety • Minimum Wage • Minimum Standard for Housing and Amenities • Human Rights 	<ul style="list-style-type: none"> • Transparent Corporate Governance • CSR Activities

RESULTS AND DISCUSSION

The results of this study were divided into three parts, *i.e.*, Part I focused on characteristics of respondents and the level of awareness of ESG practices among the respondents, while Part II discussed on the extent of compliance of the various factor requirements under the three broad categorical requirements of ESG practices. Part III captured the factors that encouraged or discouraged respondents from complying with the ESG requirements, and made recommendations to policymakers to support the wood products and furniture industries to move towards conforming to ESG requirements, in preparation to meet global market trends (Broadstock *et al.* 2021; Alam *et al.* 2022).

Part I: Characteristics of Respondents and the Level of Awareness of ESG Requirements

The characteristics of the survey respondents are as shown in Fig. 3. It is apparent that builders' carpentry and joinery (BCJ) and furniture manufacturers made up almost 78% of the total respondents. Respondents from the other sub-sectors, particularly saw-millers, wood-based panel manufacturers, and timber exporters accounted for the balance 22% of the respondents. This is parallel to the current industry structure, where the furniture and BCJ sub-sectors are the most prolific in both production and export activities, while the other sectors appear to be subdued due to raw materials supply shortages (MTIB 2022). Figure 4 also reveals that only 11% of the respondents were large-sized enterprises, while 87% of the respondents were SMEs. Micro-sized respondents made up 2% of the total respondents. The characteristics of the respondents also highlight the importance of SMEs in the Malaysian wood products and furniture industries (Ismail *et al.* 2019; Ratnasingam *et al.* 2021), where SMEs continue to predominate the industry.

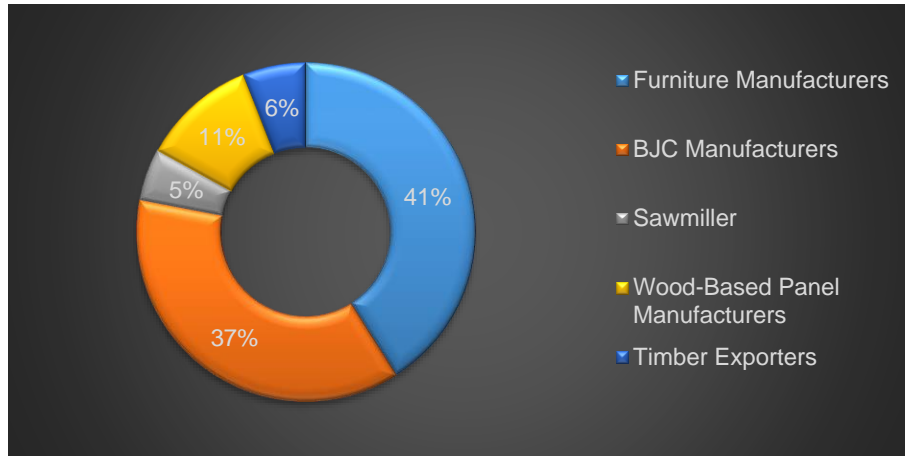


Fig. 3. Characteristics of survey respondent

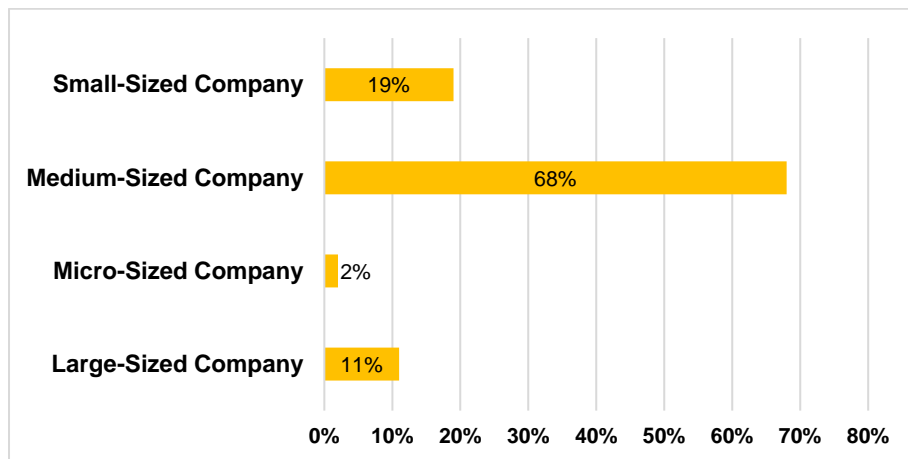


Fig. 4. Respondents by company size

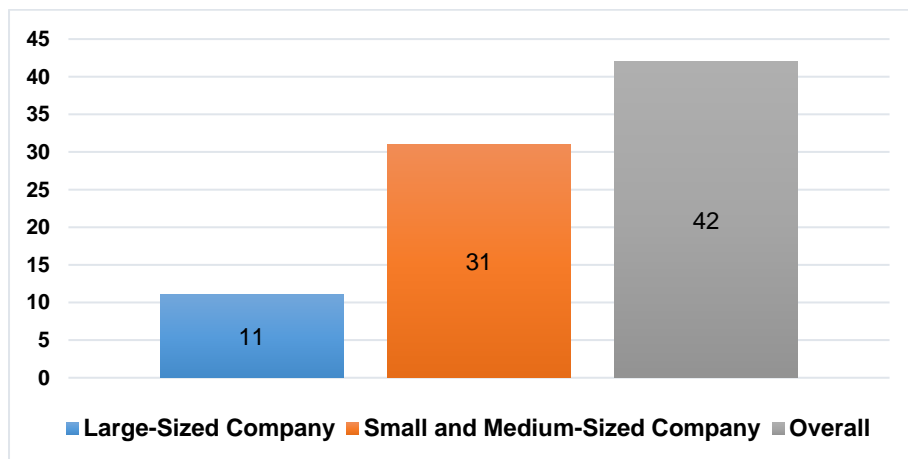


Fig. 5. Level of awareness of ESG practices by company size

In terms of the level of awareness of ESG practices, it is apparent that all the large-sized enterprises are aware of the ESG practices, while only 31% of the SMEs are aware of the ESG requirements, and micro-sized enterprises are completely unaware of the ESG practices. Further, among the respondents who are aware of ESG requirements, almost all

are involved in the export-market, clearly indicating that ESG requirements are gaining traction in the global export market, while it appears to be insignificant in the domestic market (Lu *et al.* 2018; Ismail *et al.* 2020; Lööf *et al.* 2022). Upon further scrutiny of the survey data, it is also apparent that a higher degree of awareness of ESG requirements is more prevalent among furniture and BCJ manufacturers, as opposed to saw-millers, wood-based panels, and timber exporters (Fig. 5). This trend could be attributed to the fact that furniture and BCJ are end-consumer products, while the other wood-products are semi-finished products, which may be not be subjected to the full ESG requirements at this moment of time (Mohammad and Wasiuzzaman 2021; Ratnasingam 2022).

Part II: Extent of Compliance of the Various Factors of Requirements under the Three Broad Categorical Requirements of ESG

Generally, the survey revealed that the extent of compliances of the various factor requirements under the three broad categorical requirements of ESG were varied among the respondents. Figure 6 shows that all respondents who were aware of the ESG compliance requirements paid greater attention to environmental, followed by governance, and finally the social requirements. According to several previous reports (Kweh *et al.* 2017; Mohamad 2020; Natkuncaran and Ratnasingam 2021; Kamaludin *et al.* 2022), this may be attributed to the fact that the various factor requirements under the environmental category were more adoptive, as it was supported and enforced through regulatory and legislative measures that came into force some time back. On the other hand, the social factor requirements appear to be a challenge for many manufacturers, as the relevant legislation only came into effect very recently.

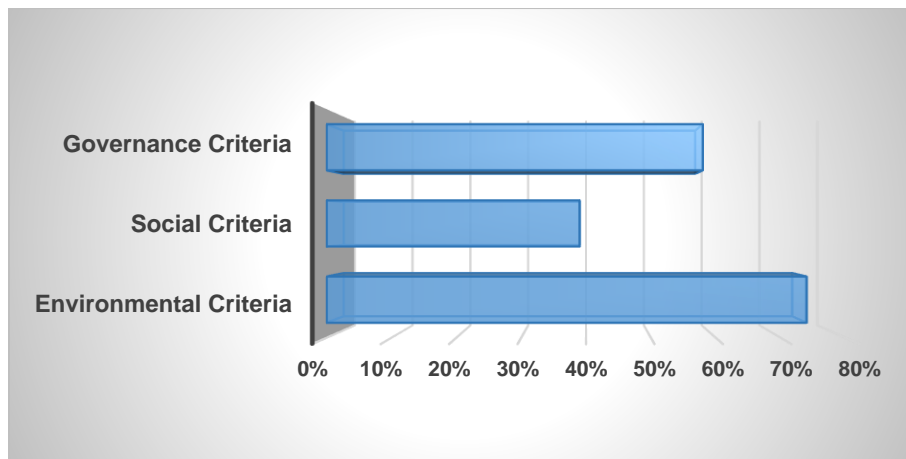


Fig. 6. Present level of compliance of ESG among respondents

The survey revealed that within the environmental category of requirement factors, not all factors recorded an equal level of adoption. Figure 7 shows the level of adoption of the various environmental factors among the respondents, clearly indicating greater adoption of certified and legal materials, waste management, and emission criteria, as opposed to the others (Klinger *et al.* 2022; Ratnasingam 2022). In fact, only 3% of the respondents reported that they have any form of carbon footprint assessment for their products, while another 1% indicated that they have a formal GHG management policy; and 14% of the respondents indicated that they comply with requirements to use recycled packaging materials in the respective factories. The issue of credence attributes among

environmental factors is often a point of contention in global wood products and furniture trade, and manufacturers who are unable to convince their buyers of their compliance record often suffer losing the market (Klinger *et al.* 2022).

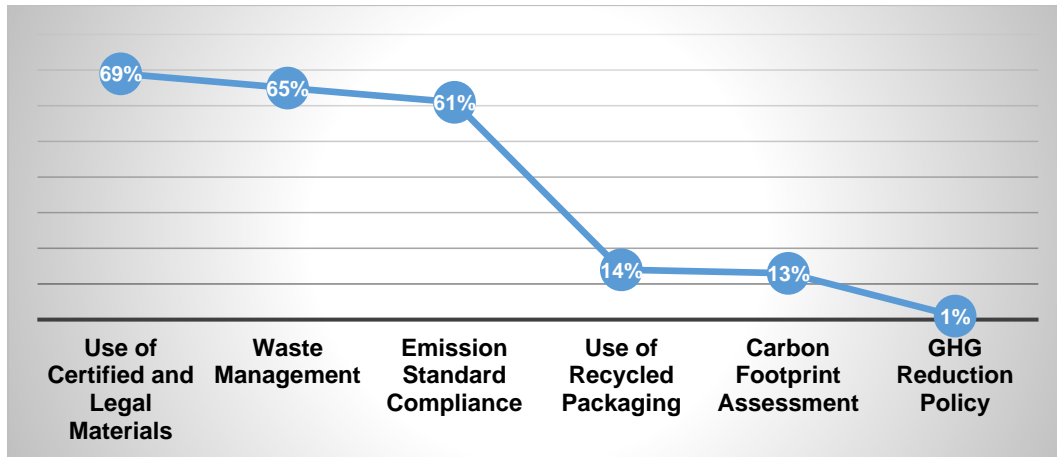


Fig. 7. Level of adoption of environmental criteria among respondents

In terms of the social criteria adoption, the respondents appear to have a dismal performance record. Only 16% of the respondents have adopted a human rights policy in their respective factories, while only 59% of the respondents indicated that they complied with the existing minimum wage requirements. In terms of compliance to workers health and safety, a relatively high proportion of the respondents indicated that they complied with the minimum occupational safety and health (OSH) requirements (Natkuncaran and Ratnasingam 2021; Klinger *et al.* 2022) Unfortunately, compliance with the minimum standard for housing and amenities is still relatively low, as this requirement came into force recently (Fig. 8).

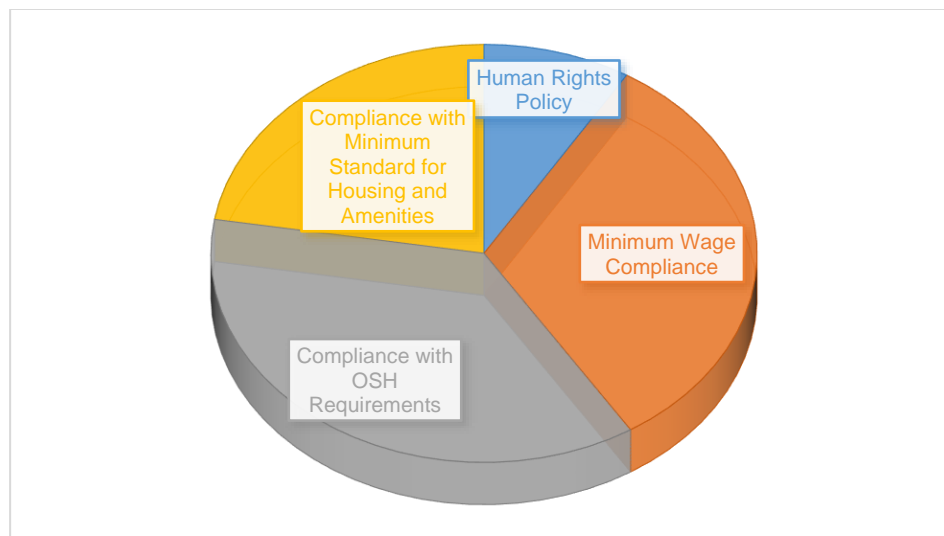


Fig. 8. Level of adoption of social criteria among respondents

In terms of the governance criteria adoption, the respondents indicated a relatively high degree of adoption. Figure 9 shows that 84% of the respondents participated in some form of corporate social responsibility (CSR) activities to positively impact society. As

expected, the corporate governance among the large public-listed enterprises were 100% compliant (PwC 2021), while non-public listed enterprises reported a much lower degree of adoption of corporate governance in their enterprises. In fact, governance compliance also contributes to better cost management, which is crucial for many of the family-owned enterprises in the wood products and furniture enterprises in the country.

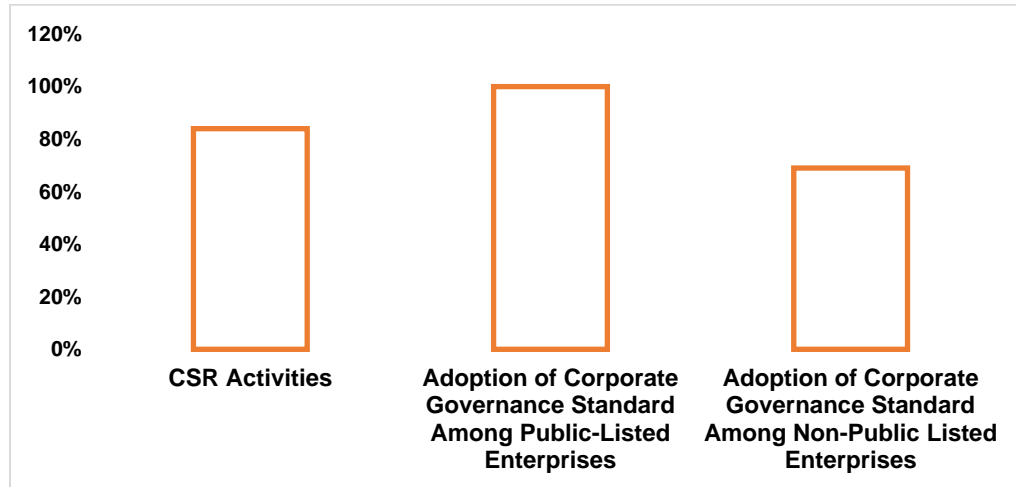


Fig. 9. Level of adoption of governance criteria among respondents

Part III: Determining Factors that Affected the Adoption of ESG Requirements Among Respondents

Generally, the ESG requirements, which are gaining importance throughout the world, are also beginning to affect the competitiveness of the wood products and furniture manufacturers in Malaysia, especially among the exporters (MFC 2018, 2019). In this respect, the results of the survey suggest that the important factors that appear to entice manufacturers to become ESG compliant include market and legislative requirements (Fig. 10).

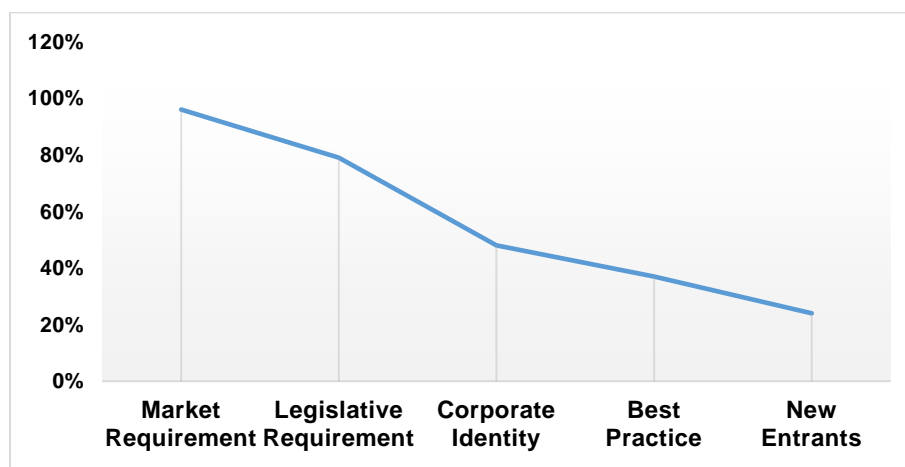


Fig. 10. Reasons for adoption of ESG criteria

Among the non-compliant manufacturers, the main reasons were listed as lack of awareness, no direct benefit, lack of knowledgeable workers, and the prohibitive cost for compliance (Fig. 11). The report by Ratnasingam (2022) clearly underlines the lack of

knowledgeable workers in the country who could carry out relevant measurements and implement ESG practices, which appears to be a major deterrent for the adoption of ESG practices among companies and organizations. Further, it was also found that most of the non-compliant manufacturers were predominantly SMEs and micro-enterprises, who were operating in the domestic market (MIFF 2018; Pellegrini *et al.* 2019b; Natkuncaran and Ratnasingam 2021; Klinger *et al.* 2022).

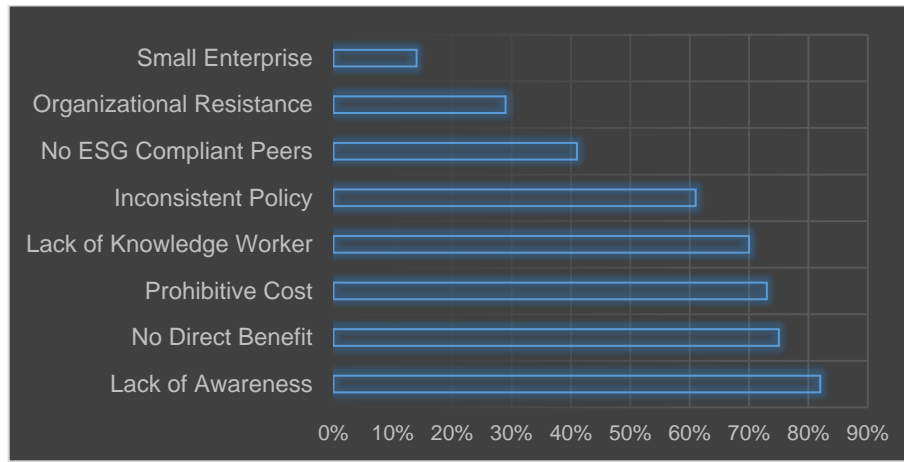


Fig. 11. Reasons for non-adoption of ESG criteria

The results of the survey provide useful insights on the status and challenges of ESG practices within the wood products and furniture industry in the country. It is clear that with the growing awareness to the global climate change phenomenon, and more concerted efforts being taken internationally to mitigate the effects of climate change, together with the preeminent importance accorded to the Sustainable Development Goals (SDGs), the wood products and furniture industries will have to comply with these requirements in order to avoid any backlash from the global market, leading to market share loss (PwC 2021; Klinger *et al.* 2022; Lööf *et al.* 2022; Ratnasingam 2022).

Implications of the Study

The wood products and furniture industries in Malaysia has been driven primarily by low-cost factor inputs, which have enabled strong growth over the last three decades (Ab Latib *et al.* 2022). The incremental capital inputs, rather than actual productivity gains, have resulted in an industry that is increasingly losing competitiveness, due to external pressures, such as rising inflation, unfavorable currency exchanges, and most importantly the ESG requirements. For many in the industry, remedial and corrective actions are often taken, only when a new market requirement, regulative and legislative measures are enforced, and often through strong ‘lobbying’, the enforcement date of such legislations are often delayed in the pretext of giving the industry more time to put their ‘houses in order’. In the early days of the industry, many of these manufacturers have enjoyed double-digit profits, and as globalization took shape together with the emergence of many other producer countries, consumers and buyers are demanding fair competition and a level playing field (Lu *et al.* 2018; MTIB 2019; Mohamad 2020; Lööf *et al.* 2022). With the climate change threat increasing throughout the world, efforts to mitigate climate change is no longer a choice, but a mandatory requirement. The premise on which the global societies are expected to conform is as stated in the United Nation’s Sustainable

Development Goals (SDGs), which is transforming human lives and activities rapidly (MFC 2018; Klinger *et al.* 2022; Ratnasingam 2022). In this context, the wood products and furniture manufacturers in Malaysia will not be spared by the requirements to comply with SDGs and ESG practices. It follows that these traditional industries, with a relatively low entry-barrier, cannot operate in ‘status quo or ‘business as usual’ manner but need to transform or risk becoming non-relevant and non-competitive. Although this survey provides preliminary results on the status of ESG awareness and extent of compliance among wood products and furniture industries in Malaysia, the results obtained are useful in identifying the gaps that must be accorded immediate attention.

Recommendations to Policymakers

Many of the respondents surveyed appear to lack the necessary awareness, and there is an information and structural gap that should be filled by the government to support the wood products and furniture industries in order to become SDGs and ESG compliant. The following are among the important supportive and remedial measures that are needed:

1. An intensive series of engagement, education, and information-sharing programs with the wood products and furniture industries must be carried out to increase the awareness of the industries about SDGs and ESG compliance requirements.
2. The government should mandate all commercial banks providing commercial loans to the wood products and furniture industries to include an ESG requirements transformation, as a fulfillment to secure the loan. This may be particularly applicable to SMEs in the industry.
3. The government should provide a cost-subsidy scheme to support selective ESG practices, to jump start its adoption among SMEs that show a minimum degree of readiness to adopt such measures. This will encourage a more prevalent absorption of such practices within the industry.
4. The government should also provide financial support, in terms of readiness grants, to facilitate more wood and furniture manufacturers, to be ready to adopt ESG practices, to transform their respective enterprises to gain compliance.
5. The government must also ensure that regulations and legislations enforcement dates are not postponed indefinitely, as it may be construed that requirements governing the wood products and furniture industries are weak and could be compromised.
6. The adoption of the ESG practices is a convincing pathway for the wood products and furniture industries to transform itself from being stigmatized as a low-wage, dirty, dangerous and difficult (3D) industry, which may be much more beneficial in the long-run, as it will attract the best human capital, which inevitably will transform the industry into a high value-added, innovation-driven, and sustainable industry.
7. A greater adoption of ESG practices among the wood products and furniture industries will also transform the industry into a circular, green, and sustainable industry that competes in value.

The globalized wood products and furniture industries throughout the world are scrambling to cope with the increasing ESG requirements not only among buyers, retailers, but also the end consumers. In this context, the wood products and furniture industries in Malaysia, which is plagued with the stigma of being a low-wage industry highly dependent of foreign workers, polluting industry, and unsustainable in terms of resource utilization, is being put under scrutiny by many jurisdictions, especially the European Union, United States of America, Australia, Japan, and United Kingdom, which accounts for a huge proportion of the Malaysia's destination for wood products and furniture exports (Ab Latib *et al.* 2022). Therefore, being an export-oriented nation, ESG compliance among wood products and furniture manufacturers in Malaysia is no longer a choice and cannot be delayed, as sooner or later, the global market will demand full compliance.

As expounded previously, failure to comply with ESG requirements, especially the environmental and social factors, has had adverse impact on several large exporters of rubber glove and palm oil producers in the country lately, to an extent that their risks to market share and financial success have increased significantly (PwC 2021). Although, it may be argued that the extent of damage to the wood products and furniture industries due to non-compliance to ESG requirements may be limited for the time being, it must be recognized that as global markets demand complete disclosure and credence attributes for ESG compliance to be made public, the wood products and furniture industries cannot afford to ignore these global trends, and they must take concerted effort to ensure full compliance in due course. It has been found that awareness of credence attributes can inform ESG criteria, certification schemes, and sustainable forest management frameworks about present or potentially future market expectations (Klinger *et al.* 2022). Sustaining and enhancing natural capital and the flow of ecosystem services they provide, as well as social and human capital, will play an increasingly important role for wood and furniture companies in the next decade. A better understanding of forestry and wood industry credence attributes can inform the management of ESG of forestry industries and markets more effectively. In fact, further research is also warranted in this area to identify the credence attributes that are deemed important for specific wood products and market, which may facilitate greater ESG adoption among wood products and furniture manufacturers.

Nevertheless, as with the adoption of Industrial Revolution 4.0 technologies (Yi *et al.* 2021), the adoption of ESG practices must also be facilitated by the relevant government agencies, especially the Malaysian Timber Industry Board (MTIB) and the Malaysian Timber Council (MTC), through awareness and readiness assessment programs. Financial support in the form of cost-subsidies and grants should also be made available for enterprises, especially the SMEs, to prepare themselves for the adoption of ESG practices. Further studies on this subject are warranted and the business ecosystem of the wood products industry is poised to change significantly as ESG adoption becomes mandatory in due course.

CONCLUSIONS

1. The large-sized companies, especially those publicly listed in the Malaysian Bourse, are mostly compliant with the environmental, social, and governance (ESG) criteria, as opposed to small and medium enterprises (SMEs) and micro-sized enterprises, who have a long way to catch up. Further, exporting companies appear to be more aware

and more receptive to ESG requirements, due to market demand.

2. Within the Malaysian wood products and furniture industries, the level of compliances increases into the order of environmental > governance > social. The least attention paid to social factors appears to stem from the fact that a high proportion of the workforce in the industry are foreign-contract workers.
3. In the environmental sphere, the use of certified and legal materials, especially wood and wood products, waste management policy and compliance to emission standards appear to be the primary credence attributed that captured the attention of majority of the respondents.
4. The primary reasons for the adoption of environmental, social, and governance (ESG) among respondents were market demand and legislative requirements, while the lack of benefits, no direct benefits and the prohibitive cost were the main deterrent factors among respondents who have not adopted ESG practices.
5. The adoption of ESG practices is a pathway to transform the wood products and furniture industries from being a low-wage, dirty, dangerous, and difficult (3D) industry to one that is sustainable, providing equitable and green jobs, in line with the circular economy concept of the Sustainable Development Goals (SDGs).

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