



STUDY ON SALIENT FEATURES OF SUBSTITUTE PRODUCTS

ITTO PD 928/22 Rev.1 (I)
Development Of Sustainable Domestic Market
For Wood Products

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FINAL REPORT ACTIVITY 1.2

STUDY ON SALIENT FEATURES OF SUBSTITUTE PRODUCTS

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EXECUTIVE SUMMARY

The study of the characteristics of wood substitute products in the provinces of West Java, Central Java, East Java and Banten is a series of activities of the ITTO PD 928/22 Rev.1 (I) Development of Sustainable Domestic Market for Wood Products Project, which is the result of a study related to consumer preferences for wood products compared to substitute products. This study explores consumer characteristics based on factors such as age, gender, education level, income, and occupation, characteristics of wood products and wood substitute products with special attention to decision-making patterns in purchasing wood products.

This study shows that the targeted consumers are mostly in the productive age group and already have an income, with women often acting as the main decision makers when purchasing wood products. Wood products remain attractive to consumers, especially those aged 26-45 years, who prefer wood because of its flexibility in design, although wood is considered more expensive and more difficult to access compared to substitute products. Wood products are still preferred over substitute products in the project locus, especially for categories such as sturdy furniture with multifunctional designs. Consumers generally consider the durability of wood and substitute products to be equivalent, although they acknowledge that wood is vulnerable to water and has a higher price as its drawbacks. On the other hand, this study highlights that public awareness in Java regarding the environmental benefits of wood production is starting to play a role in consumption decisions.

Consumers have a preference for choosing wood products based on several criteria such as practicality, price, ease of purchase, durability, ease of maintenance, aesthetics, and renewable materials. However, the higher price of wood and its limited availability remain barriers to wider adoption. Consumer suggestions focus on improving the quality, affordability, and design of wood products, to ensure that they remain competitive with substitute products in terms of functionality and aesthetics.

The findings of this study are also relevant for industry practitioners and policy makers in the forestry and wood processing sectors. The wood industry can improve their competitiveness by diversifying products, designing products that combine traditional and modern elements with contemporary and classic design trends and customization, supported by educational campaigns on the benefits and innovations of wood products, and collaboration between the industry and market research. Consumer feedback serves as an important component in shaping wood products that are not only desirable but also sustainable. Further market research to understand consumer trends and preferences can be a strategic step towards achieving long-term success of wood's position in the domestic market.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	v
TABLE OF CONTENTS	vii
LIST OF FIGURES	viii
LIST OF TABLES	x
 I. INTRODUCTION	 1
1.1. Background	1
1.2. Objective	2
1.3. Output	3
 II. METHODOLOGY	 4
2.1. Time and location	4
2.2. Methodology	4
2.2.1. Data Collection	4
2.2.2. Data Analysis	4
 III. Results	 6
3.1. Study on Consumer Preferences of Substitute & Wood Products in West Java	6
3.1.1. Characteristics and type of consumers	6
3.1.2. Consumers' preference for the product by type of consumers	10
3.1.3. Recommendation for increasing wood product consumption	18
3.2. Study on Consumer Preferences of Substitute & Wood Products in Banten and DKI Jakarta Province	19
3.2.1. Characteristics and type of consumers	19
3.2.2. Consumers' preference for the product by type of consumers	22
3.2.3. Recommendation for increasing wood product consumption	34
3.3. Study on Consumer Preferences of Substitute & Wood Products in Central Java	35
3.3.1. Characteristics and type of consumers	35
3.3.2. Consumers' preference for the product by type of consumers	36
3.3.3. Recommendation for increasing wood product consumption	41
3.4. Study on Consumer Preferences of Substitute & Wood Products in East Java	45
3.4.1. Characteristics and type of consumers	43
3.4.2. Consumers' preference for the product by type of consumers	48
3.4.3. Quantity and quality comparison of wood and substitute product consumption...	62
 IV. CONCLUSION AND RECOMMENDATION	 63
4.1. Conclusion	63
4.2. Recommendation	65
 REFERENCE	 66

LIST OF FIGURES

Figure 1.	The framework of the study	5
Figure 2.	(a) Respondents by age in West Java; (b) Respondents by gender in West Java; (c) Respondents' education level in West Java	6
Figure 3.	(a) Income level of respondents in West Java; (b) Type of occupation of respondents in West Java	7
Figure 4.	Respondent's interest in furniture products in West Java	11
Figure 5.	Respondent's interest in construction products in West Java	11
Figure 6.	Respondent's interest in craft products in West Java	12
Figure 7.	Respondent's interest in wood products and their substitutes in West Java	12
Figure 8.	Respondent's interest in wood products and their substitutes in West Java	13
Figure 9.	Respondent's interest in furniture design in West Java	13
Figure 10.	Respondent's interest in the design of craft products in West Java	14
Figure 11.	Costs incurred by respondents for furniture products in West Java	15
Figure 12.	Costs incurred by respondents for woodcraft products in West Java	15
Figure 13.	(a) Advantages of engineered wood products according to respondents; (b) Advantages of substitute products according to respondents in West Java	16
Figure 14.	(a) Weaknesses of wood products by respondents in West Java; (b) Weaknesses of substitute products by respondents in West Java	16
Figure 15.	Payment methods for wood products and their substitutes in West Java	17
Figure 16.	(a) Banten respondents' age level; (b) DKI Jakarta respondents' age level; (c) Banten respondents' gender; (d) DKI Jakarta respondents' gender; (e) Banten respondents' education level; (f) DKI Jakarta respondents' education level	21
Figure 17.	(a) Income levels of Banten respondents; (b) Income levels of DKI Jakarta respondents; (c) Employment type of Banten respondents; (d) Employment type of DKI Jakarta respondents	22
Figure 18.	Banten respondents' interest in furniture products; (b) DKI Jakarta respondents' interest in furniture products	22
Figure 19.	(a) Banten respondents' interest in construction products; (b) DKI Jakarta respondents' interest in construction products	23
Figure 20.	(a) Banten respondents' interest in craft products; (b) DKI Jakarta respondents' interest in craft products	24
Figure 21.	(a) Percentage of Banten respondents' interest in wood products and their substitutes; (b) Percentage of DKI Jakarta respondents' interest in wood products and their substitutes	25
Figure 22.	(a) Banten respondents' interest in wood products and substitutes; (b) DKI Jakarta respondents' interest in wood products and substitutes	26
Figure 23.	((a) Banten respondents' interest in furniture design; (b) DKI Jakarta respondents' interest in furniture design	27

Figure 24. (a) Banten respondents' interest in craft product design; (b) DKI Jakarta respondents' interest in craft product design	28
Figure 25. (a) Costs that Banten respondents are willing to pay for furniture products; (b) Costs that DKI Jakarta respondents are willing to pay for furniture products	29
Figure 26. (a) Banten respondents' willingness to pay for craft products; (b) DKI Jakarta respondents' willingness to pay for craft products	30
Figure 27. (a) The advantages of processed wood products according to Banten respondents; (b) The advantages of wood substitute products according to Banten respondents	31
Figure 28. (a) The advantages of processed wood products according to DKI Jakarta respondents; (b) The advantages of wood substitute products according to DKI Jakarta respondents..	31
Figure 29. (a) Weaknesses of wood products based on Banten respondents; (b) Weaknesses of wood products based on DKI Jakarta respondents	32
Figure 30. (a) Weaknesses of wood substitute products based on Banten respondents; (b) Weaknesses of wood substitute products based on DKI Jakarta respondents	32
Figure 31. Payment methods for wood products and their substitutes of interest to Banten respondents; (b) Payment methods for wood products and their substitutes of interest to DKI Jakarta respondents	33
Figure 32. Respondent preference regarding substitute of wood products	36
Figure 33. Respondent preference in substitute of wood products	37
Figure 34. Respondents' willingness to pay for wood substitutes	38
Figure 35. Respondent's preference for the design of substitute products	38
Figure 36. Respondent perception related to the quality of domestic wood products compared to the imported wood products	39
Figure 37. Respondent preference for the material of the wood products	40
Figure 38. Respondents' preference for considering the criteria for selecting wood products and the substitute	41
Figure 39. Consumer preferences for wall materials	48
Figure 40. Consumer preferences for flooring materials	49
Figure 41. Consumer preferences for roofing material	50
Figure 42. Profile of respondents who are consumers of non-building wood products	50
Figure 43. Types, usage, shopping methods, and consumer locations	52
Figure 44. Respondents' preferences for wood materials in East Java	54
Figure 45. Respondents' preferences for wooden furniture design	55
Figure 46. Respondents' preferences on the design aspects of furniture made from processed wood	56
Figure 47. Respondents' preferences for wood product certification	57
Figure 48. Furniture stores accessed by respondents	57
Figure 49. Respondents' perceptions of price, quality, location, and innovation in furniture	59

LIST OF TABLES

Table 1	Key informants and respondents of the study in West Java Province	9
Table 2	Key informants and study respondents in Banten Province and DKI Jakarta	20
Table 3	Characteristic of consumer	36
Table 4	Consumer characteristics	44
Table 5	Multinomial logit estimation of consumer preference for substitute and wood products in East Java	46
Table 6	Respondent Profiles	47
Table 7	Respondent perception on strategic steps in educating the community regarding wood-processed products	60

I. INTRODUCTION

1.1 Background

The COVID-19 pandemic has slowed economic activity in all sectors. This is due to reduced state funds being diverted from development to protecting public health. Apart from that, the government's strict implementation of health protocols also limits people's economic activities. As reported by ITTO (International Tropical Timber Organization), domestic consumption has proven to stabilize tropical wood production during previous economic crises. During the widespread COVID-19 pandemic, the government and the wood industry are trying to increase domestic consumption of wood products which is experiencing a slowdown.

Based on ITTO research entitled "Impact of the COVID-19 Pandemic on Tropical Timber Production" ITTO concluded three important points, namely:

- Exports of primary wood products are highly vulnerable to economic shocks.
- The focus and high dependence on unprocessed wood products should be reconsidered to determine the future resilience of the forestry sector.
- Domestic consumption has proven to stabilize tropical wood production during previous economic crises.

In a study entitled "Impact of the COVID-19 Pandemic on Tropical Timber Production" conducted by ITTO, there are three important points that need to be considered. First, exports of primary wood products have proven to be highly vulnerable to economic shocks. Second, the heavy reliance on unprocessed wood products should be re-evaluated to increase the future resilience of the forestry sector. Third, domestic consumption has been proven to stabilize tropical wood production in previous economic crises.

Various efforts need to be made to overcome the decline in domestic consumption of wood products in Indonesia. Strong encouragement is needed to encourage sustainable growth in the consumption of domestic wood products, to maintain economic stability in this sector. These efforts can include increasing people's preferences for products rather than wood substitute products, diversifying the wood products available to consumers, and reducing the use of wood substitute products. In this way, the domestic market for wood products will grow stronger and make a greater contribution to the national economy.

The public's need for wood products is increasing along with the increase in population. Most wood products are used as building construction materials, raw materials for pulp and paper, fuel and charcoal, as well as raw materials for making furniture. Based on a preliminary survey, most of the wood products consumed daily consist of furniture, construction, and wooden craft products. Based on the producer's perspective, to increase sales of their

products, industry or business actors (producers), intermediaries, and sellers) need to understand consumer behavior towards the products being marketed. By understanding consumer behavior, business actors can determine the level of consumer satisfaction which can be used as an evaluation in developing fortified wood products so that it could attract consumer interest in wood products and support sustainable use of wood products.

Wood products which have initially gone through processing in the factory. This processing then produces a final product with a design, shape and strength according to needs and desires (Wulandari et al. 2022). Dumairy (1996) states that the industrial sector is believed to be a sector capable of leading other sectors to open an economy. The wood processing industry is an institution that carries out wood processing into various kinds of products, both those that still show physical wood or not. In increasing economic growth, the wood processing industry sector has a role in the form of industrial sector output or Gross Regional Domestic Revenue (GRDP) in the industrial sector which cannot be separated from the role of investment and labour. In increasing the consumption of domestic processed wood products, an in-depth study is needed to consumers on consumer preferences in using processed wood products, both in the form of furniture wood, craft wood and construction wood.

Consumer preference can be interpreted as a person's choice of likes or dislikes for a product, both goods and services consumed. The product chosen by the consumer shows the consumer's preference from a wide selection of existing products (Kotler 1997). According to Engel et al. (1994) in Pratama (2010), consumer preferences for products and services can be measured with a measurement model that can analyze the relationship between consumer product knowledge and attitudes toward products according to product characteristics or attributes.

Project PD 928/22 Rev.1 (I) "Development of Sustainable Domestic Market for Wood Products", implemented by the Directorate of Forest Products Processing and Marketing, Directorate General of Sustainable Forest Management, Ministry of Environment and Forestry, aims to encourage the development of product consumption domestic wood, to anticipate population and economic growth, through increasing consumption resilience, improving supply chains, and improving government policies. This project will be implemented in a participatory and collaborative manner to encourage domestic consumption of strong and resilient wood products, achieved through two outputs, namely: i) increasing domestic market capacity to meet consumer needs for wood products, and ii) improving institutional arrangements to increase domestic consumption of wood products. The problem formulation of Activity 1.2 is to determine the characteristics or salient features of prominent substitute products in the locus of ITTO PD 928/22 Rev.1 (I).

1.1 Objective

This study aimed to examine substitute products' salient characteristics or features in the project area. The benefits of this research are as follows:

- To improve the characteristics of wood products to strengthen its competition with prominent substitute products;
- To meet consumer needs for wood products to increase the domestic market.

1.2 Output

The study covers the information on salient characteristics or features of substitute products from targeted consumer groups in the project locus. The expected proposed activity to achieve the output of Activity 1.2 consists of:

- To select relevant consumers and sellers in the project area.
- To conduct the study by collecting information and practices regarding the preference for the consumption of wood products by targeted consumer groups in the project area.
- To conduct the study by collecting information and practices regarding the preference for consumption of substitute products of targeted consumer groups in the project area.
- To develop the recommendation for developing wood products to compete with substitute [products].
- To integrate the analysis results with the Timber Legality Information System.

The study was conducted by the universities consisting of the Faculty of Forestry and Environment IPB University for the locus of West Java Province and Banten Province, the Faculty of Forestry Gadjah Mada University for the locus of Central Java, and the Faculty of Agriculture of Brawijaya University. The output of the study consists of 1 package of analysis results (1 activity report).

II. METHODOLOGY

2.1. Time and location

Activity 1.2 was carried out from November 2023 to January 2024. The study on salient features of substitute products has been conducted with the locus of West Java, Central Java, and East Java Province with the additional locus of Banten Province.

2.2. Methodology

2.2.1 Data Collection

The study on salient features of substitute products was carried out by distributing questionnaires to retailers and consumers in the study area. Primary data collection was carried out through surveys and interviews with relevant consumers and retailers of wood products, and questionnaires were distributed to the public online via Google Forms.

2.2.2. Data Analysis

This research applies SWOT analysis methods as qualitative approaches to dig up in-depth and comprehensive information. The qualitative approach begins with identifying and collecting information about the preference for consumption of substitute products from the consumers and the seller. This data is then analyzed to identify internal strengths and weaknesses, such as product performance or resource shortages. External analysis includes monitoring market trends, regulatory changes, and other environmental factors that could impact the preference for the consumption of wood products and substitute products from the consumers. With this approach, the stakeholder SWOT analysis becomes more focused and relevant, helping in better exploring the dynamics of the preference and characteristics of the wood products and substitute products. Furthermore, the results of this analysis will become the basis for a better strategy to support the growth and competitiveness of domestic wood products. The logical framework of the study is summarized in the diagram below.

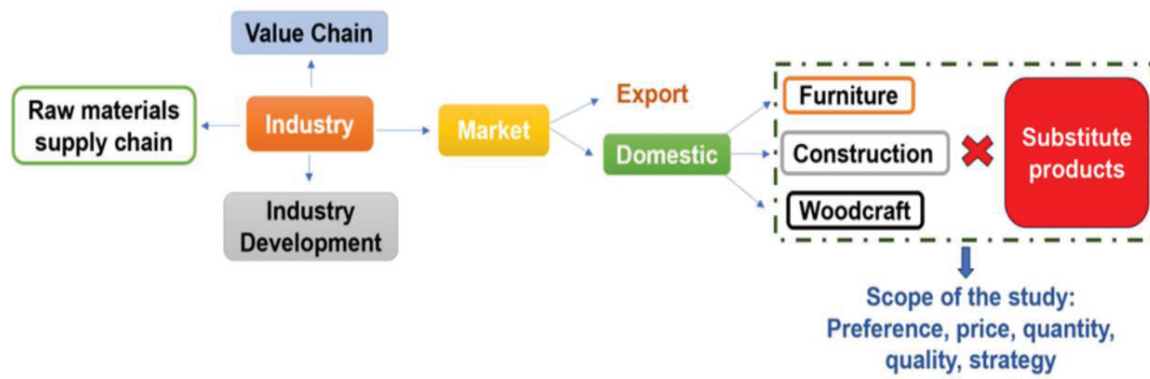


Figure 1 The framework of the study

III. RESULTS

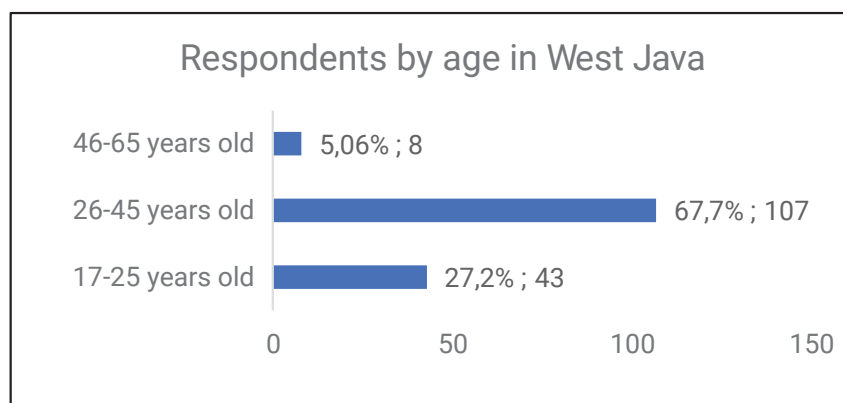
3.1. Consumer Preferences of Substitute and Wood Products in West Java

3.1.1. Characteristics and type of consumers

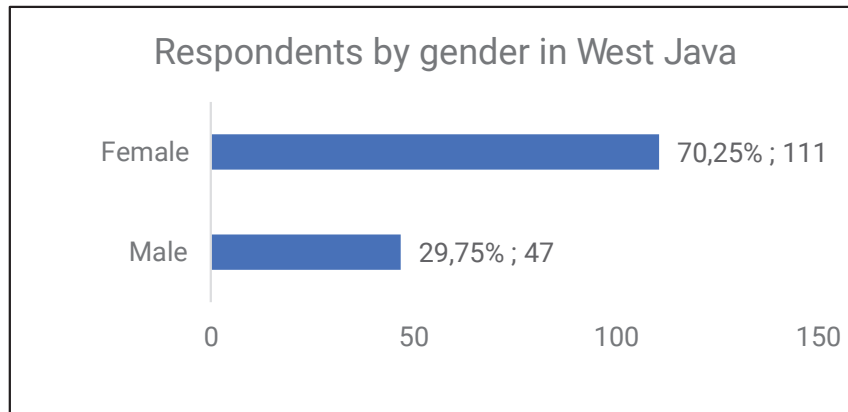
This study was conducted in West Java Province, and the study period was from September 2023 to March 2024. The survey has been conducted in 19 cities/regencies out of 28 cities/regencies in West Java province. The regions include Bandung, Bogor, Bekasi, Cianjur, Cimahi, Ciamis, Cirebon, Garut, Kuningan, Karawang, Majalengka, Depok, Indramayu, Purwakarta, Subang, Sumedang, and Sukabumi. The total number of respondents in West Java Province is 158 respondents. The following is a description of the characteristics of respondents in West Java Province.

Most of the respondents were in the age group of 26-45 years (67.72%). The age group above 45 was less interested in filling out the questionnaire. (Figure 2a). Female respondents dominated the questionnaire; in West Java Province, female respondents comprised 70.25% (Figure 2b). In West Java Province, respondents from senior high school education level dominated, at 61.39%, followed by respondents from tertiary institutions at 32.9% (Figure 2c).

(a)



(b)



(c)

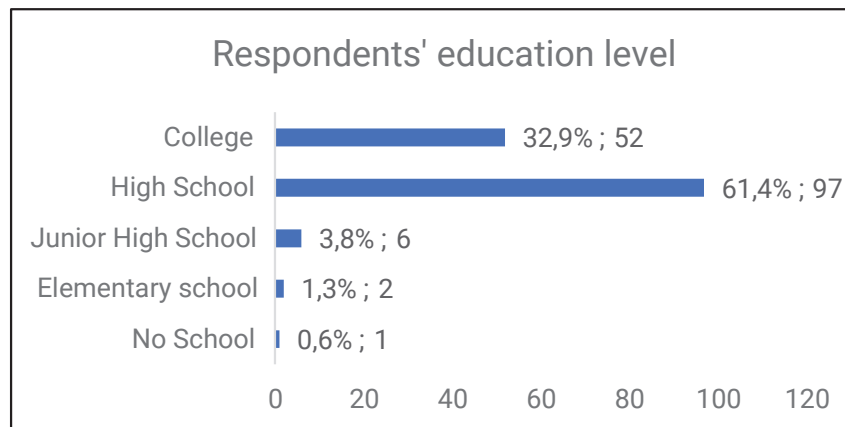
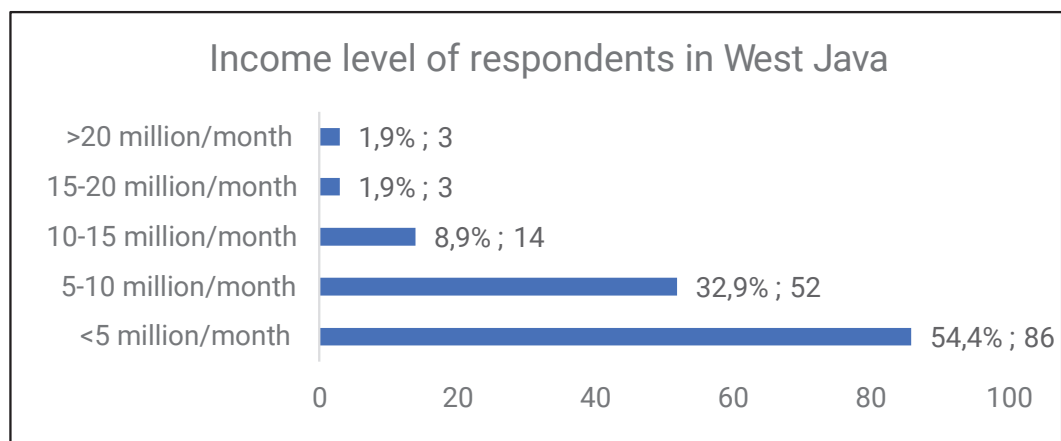


Figure 2 (a) Respondents by age in West Java; (b) Respondents by gender in West Java; (c) Respondents' education level in West Java

Figure 3a shows that the dominance of respondents in West Java Province has an income of less than IDR 5 million/month, namely 54.4% followed by respondents with an income of IDR 5-10 million/month as much as 32.9%. There are 12 types of respondents' jobs as part of filling out the questionnaire: cashiers, private employees, entrepreneurs / self-employed, housewives, farmers, traders, laborers, freelance, fresh graduates, developers, BUMN, ASN, and academics. Figure 2b shows that private employee respondents are the most respondents in West Java Province at 53.16%.

(a)



(b)

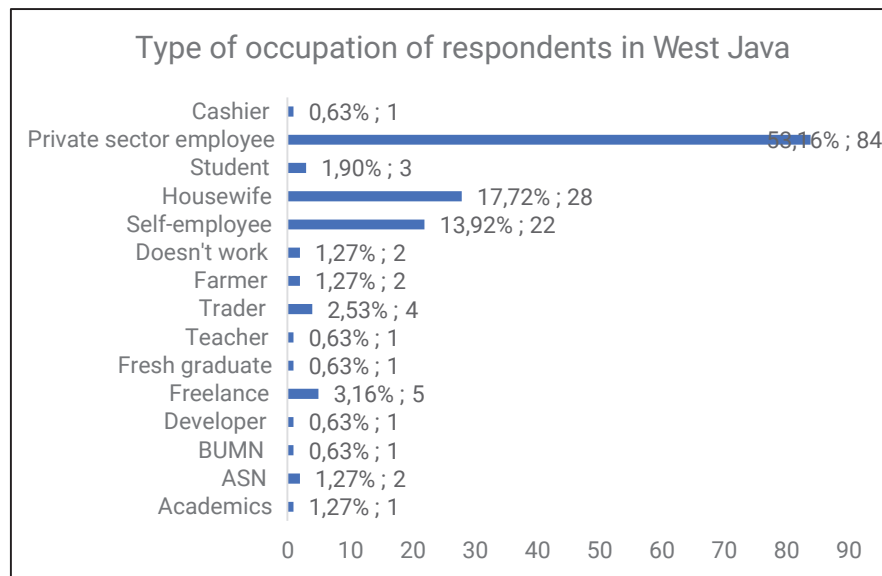


Figure 3 (a) Income level of respondents in West Java; (b) Type of occupation of respondents in West Java

The tools used in this research include note-taking boards and questionnaire sheets, cameras, voice recorders, calculators, stationery, and laptops that have Microsoft Excel and Microsoft Word software. The main material used is primary data obtained from interviews and distributing questionnaires and data obtained from stakeholders or related agencies.

The study on the development of sustainable domestic market for wood products in the provinces of west java was conducted by collecting primary data. Primary data was obtained by interviewing business actors such as contractors/developers, retailers, and industries, and distributing questionnaires to general public consumers in the study locations. The questionnaire was distributed online using social media through google forms.

Interviews and distribution of questionnaires to general public consumers are intended to determine the characteristics and preferences of consumers for both wood products and their substitutes. The minimum sample size of respondents was determined using the Slovin formula as follows:

$$n = \frac{N}{(1 + Ne^2)}$$

Notes:

N = Total population

e² = Margin of error

n = Minimum sample size

In this study, the margin of error for social research is set at 10% while the population taken into account are people of productive age (17 to 65 years) for example, namely in the West Java region, the productive age is 35,309,200 people so that the minimum sample size can be known as 100 people with the following description:

$$n = \frac{N}{(1 + Ne^2)} = \frac{35.309.200}{(1 + ((35.309.200)(0,1^2))} = 100 \text{ people}$$

The level of enthusiasm of the people in West Java for participating in filling out the questionnaire was high. This is evidenced by the incoming data (returned questionnaires) of 158 respondents from West Java. Thus, the sampling error decreased to 8% which can increase the accuracy of the data. Key informants and respondents are presented in Table 1.

Table 1 Key informants and respondents of the study in West Java Province

Key Informant and Respondent Entities	Sample	Description
Government	1	Provincial Forestry and Environment Agency
Retailer	2	Ikea or Informa and Traditional Furniture Stores
Consumer	10	@ 5 people per retailer category
Manufacturer	3	1 each for sawmill, furniture, woodcraft industries
Housing developer	1 (real estate)	-
General public	141	Disseminate the Google form to WAG, Telegram, etc.
Association		Asmino, ISWA, Apkindo, dsb
Total	158	

A consumer survey was conducted to identify and understand consumer preferences for wood products and their substitutes in more detail. Wood products were limited to furniture, construction wood, and crafts, while substitutes for wood products were limited to plastic, aluminum, and mild steel.

Respondents' characteristics are seen in terms of age, gender, education, income level, and type of work. Respondents were categorized into three age groups, namely (1) 17-25 years old, (2) 26-45 years old, and (3) 45-65 years old. These age groups represent potential consumers as users of processed wood products and their substitutes. The education level consists of university, high school, junior high school, elementary school, and no schooling. At the income level, there are 5 income ranges, namely less than IDR 5 million/month, IDR 5-10 million/month, IDR 10-15 million/month, IDR 15-20 million/month and more than IDR 20 million/month.

Respondents' preferences in the use of processed wood products and their substitutes are seen from the respondents' interest in the product choice of product type, product design, product price, product quality, and product payment method. Respondents' interest in processed wood products in the form of furniture wood, woodcraft wood, and construction wood is expressed on a Likert scale with a value of 1 to 5. The closer the number 5 is, the more the respondent likes wood products, on the other hand, the closer the number 1 is, the more the respondent likes wood substitute products. The scale of respondents' interest when faced with wood products and their substitutes is expressed on a Likert scale with a value of 1 to 10. The closer the number 10 means that the respondents like wood products more, on the contrary, the closer the number 1 means that the respondents like substitute products more.

The types of engineered wood products are classified as follows (1) exclusive products and expensive prices; (2) discounted products and negotiable; (3) low prices and easy to find; and (4) quite expensive prices and not often purchased. Furniture design consists of inflatable furniture, multifunctional furniture, mounted furniture, furniture with wheels, disassembled

furniture, and whole furniture. Inflatable furniture is defined as a type whose size can be developed from small to large so that its function is maximized or vice versa. Multifunctional furniture has more than one function, such as a sofa that can be used as a bed or a minimalist dining table that can be folded into a closed section. Built-in furniture is a furniture design that is generally attached directly to the interior of the house so that it cannot be removed or moved; such as bookshelves and kitchen sets. Furniture with wheels is a type of furniture design with wheels that can be easily moved. Knockdown furniture is a type of furniture that can be dismantled as needed, with the characteristic of this furniture having hinges on certain parts. Whole furniture often also called free-standing furniture is furniture that is designed in one piece and cannot be assembled such as bed tables, or cabinets.

Preferences for the price of processed wood products are classified as follows; (1) less than IDR 100,000; (2) IDR 100,000 - 1,000,000; (3) IDR 1,000,000 - 3,000,000; (4) IDR 3,000,000 - 6,000,000; (5) IDR 6,000,000 - 9,000,000 and (6) more than IDR 9,000,000. In addition, the quality of processed wood products is seen from several aspects of the advantages of wood products so that respondents can consider wood as an option for furniture, handicrafts, and construction products, including wood that is environmentally friendly, durable, more beautiful, and stronger than its substitutes. As for some aspects of the advantages of substitute products such as waterproof, environmentally friendly, easy to maintain, relatively cheaper prices, and suitable for all types of weather. Meanwhile, there are also disadvantages of using processed wood products which are classified as not environmentally friendly, susceptible to termites, not fire resistant, easily weathered, and expensive. Even substitute goods have disadvantages that are classified as less beautiful appearance, limited design, not environmentally friendly, and less strong. Payment methods are classified using various methods, such as debit/e-money, online, contract, credit, and cash.

Enrichment of wood product types is done through the identification of relevant consumer groups; this is done by understanding market characteristics and consumer characteristics through literature studies such as supporting data collection. Next, analyze the wood products that are in demand and available through consumer surveys and market analysis. Consumer surveys are conducted to identify and understand in more detail consumer preferences for wood products. Market analysis was conducted comprehensively to analyze existing wood products and assess their availability and demand.

3.1.2. Consumers' preference for the product by type of consumers

The survey was conducted to determine consumer preferences for the use of processed wood products and their substitutes. The use of processed wood products includes furniture, handicrafts, and construction. Respondents' interest in furniture products

The survey shows that respondents still have a high interest in using wooden furniture. Interested respondents (Likert scale 4) were very interested (Likert scale 5) in wooden furniture products 96%, and substitute products only 57% (Figure 4). This indicates that most people in West Java still demand wooden furniture products.

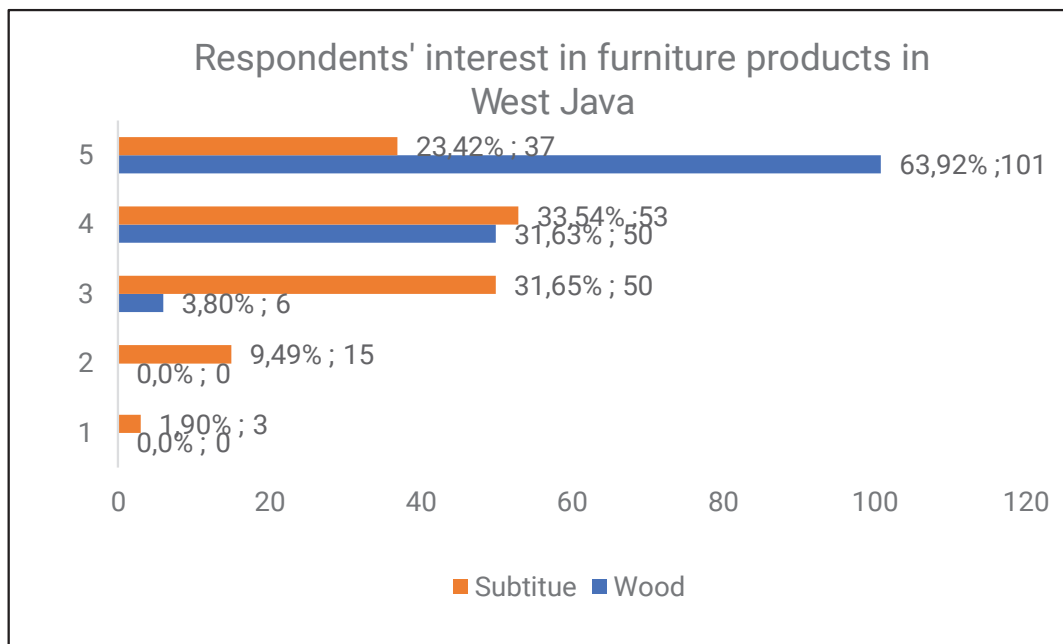


Figure 4 Respondent's interest in furniture products in West Jawa

As with the use of furniture, respondents in West Java Province are still interested in using wood as a construction option. The survey shows that interested respondents (Likert scale 4) to very interested (Likert scale 5) in wood construction materials are 84% and substitute products 60% (Figure 5). This indicates that timber construction materials are still in demand by most people in West Java, but substitute products are also in demand. If the production efficiency and product innovation of timber construction materials are not addressed immediately, it seems that substitute products will be a tough competitor in the future.

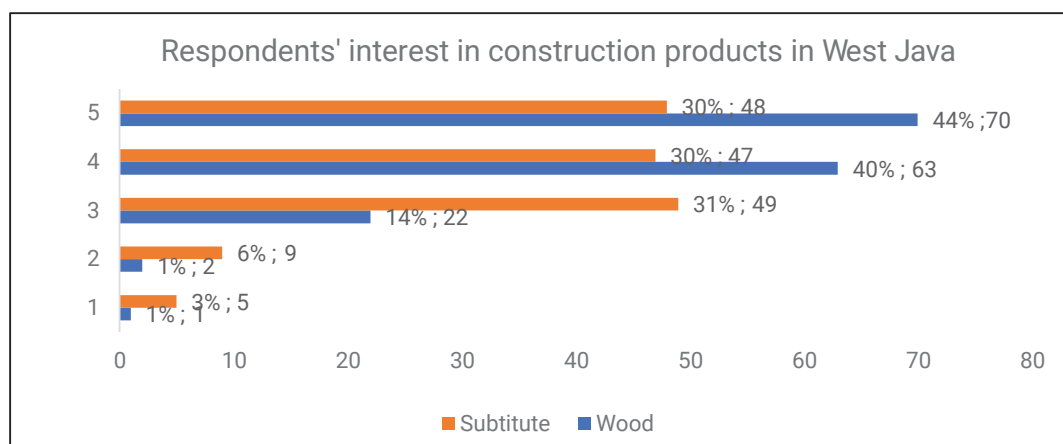


Figure 5 Respondent's interest in construction products in West Java

Crafts products are still in demand. Based on the survey results on respondents' interest in the use of craft wood, 88% of respondents were interested (Likert scale 4) to very interested (Likert scale 5) in wooden craft products, while only 42% were interested in their substitutes (Figure 6). Similar to wooden furniture products, wooden craft products are still in demand by most people in West Java.

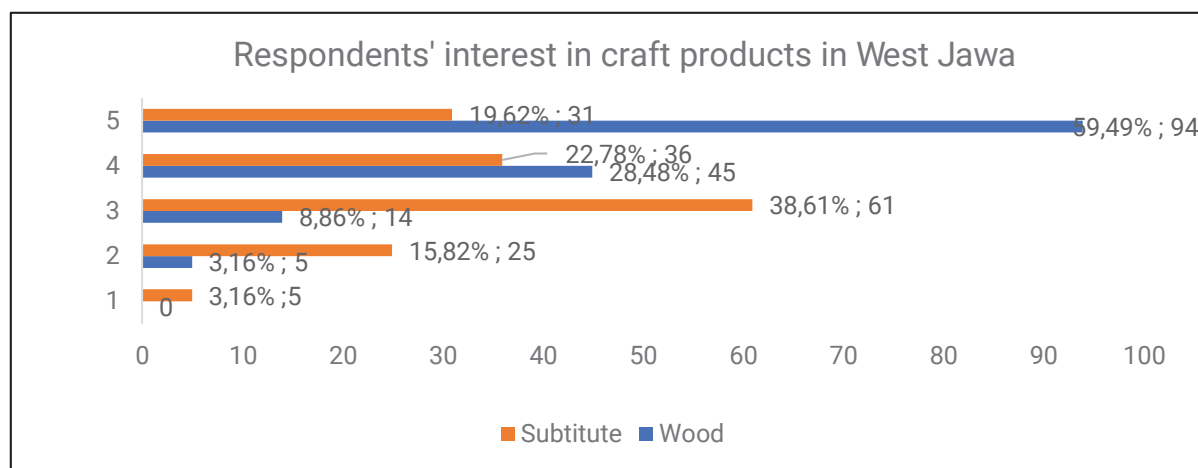


Figure 6 Respondent's interest in craft products in West Jawa

To assess the level of interest of respondents when faced with the choice to use wood or substitute goods, an assessment has been made with the criteria of a 1-10 rating scale. The higher the score, the more interested respondents are in wood products. The results of the assessment show that respondents are more interested in choosing to use wood when compared to the option of using substitute goods. As shown in Figure 7, 75% of respondents gave a score of 8 (27%), a score of 9 (15%) and a score of 10 (33%). This indicates that currently, wood products are still in demand.

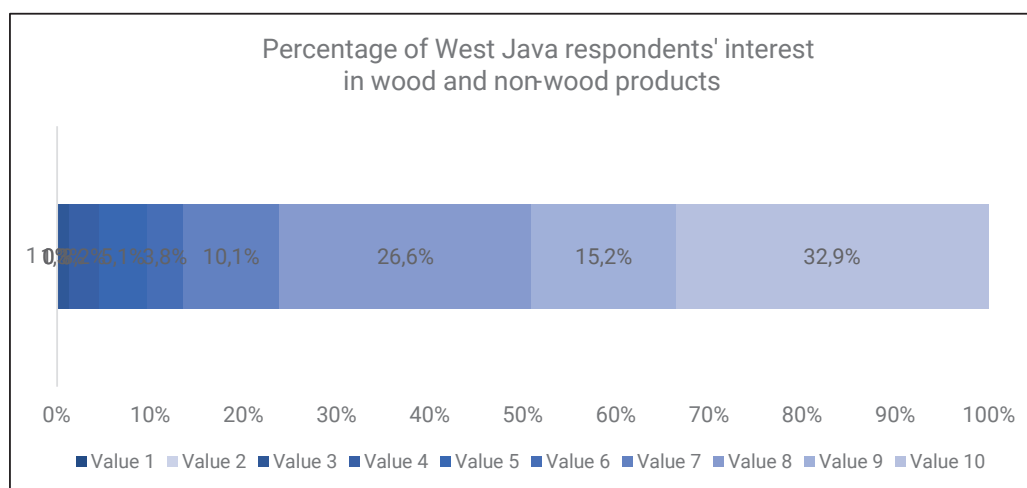


Figure 7 Respondent's interest in wood products and their substitutes in West Jawa

In addition to respondents' interest in wood products, there is also a choice of the type of goods that respondents prefer. Based on the survey, it is known that the type of goods with low prices and easy to find are favored by respondents, both for wood products 46.84% and their substitutes 58.23%. Also, 19.62% of respondents favored discounted and negotiable products for timber products and 22.78% for their substitutes. The results of the survey on other classifications of goods are presented in Figure 8.

It appears that price and ease of obtaining products are the main considerations for respondents. Lower prices can be achieved if the efficiency of processed wood production can be pursued. The ease of obtaining products is related to the sustainability of the forest as a wood producer. As a renewable resource, sustainable forest management is a necessity. Without the presence of sustainable management, the utilization of renewable resources will be the same as the utilization of non-renewable sources, which will be depleted faster the more they are used.

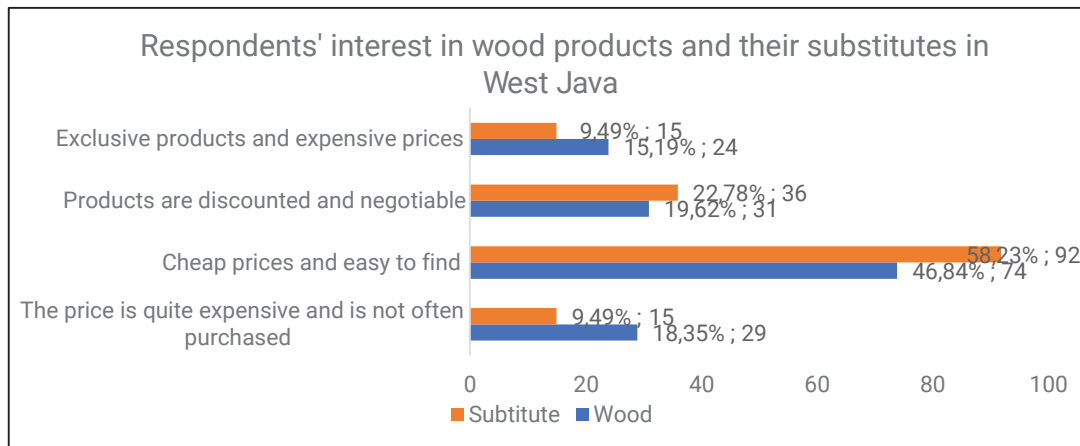


Figure 8 Respondent's interest in wood products and their substitutes in West Java

Regarding design, the survey results show that the design of wood furniture products that respondents are interested in is whole furniture, at 35.4%, followed by built-in furniture, at 25.3%, and multifunctional furniture, at 20.3%. While the preferred design choices for substitute products are built-in furniture, at 26.6%, and furniture with wheels, at 22.8%. The results of the survey of design choices favored by respondents are presented in Figure 9.

The information in Figure 9 shows that the more desirable wood-based furniture products are built-in and multifunctional furniture, while for the other types (inflatable, wheeled, and unassembled furniture), respondents tend to prefer wood substitute-based products (aluminum, plastic, iron, etc.). In the case of built-in furniture, consumers' preference for wood-based products and their substitutes is almost the same. This shows the fierce competition between wood products and substitutes.

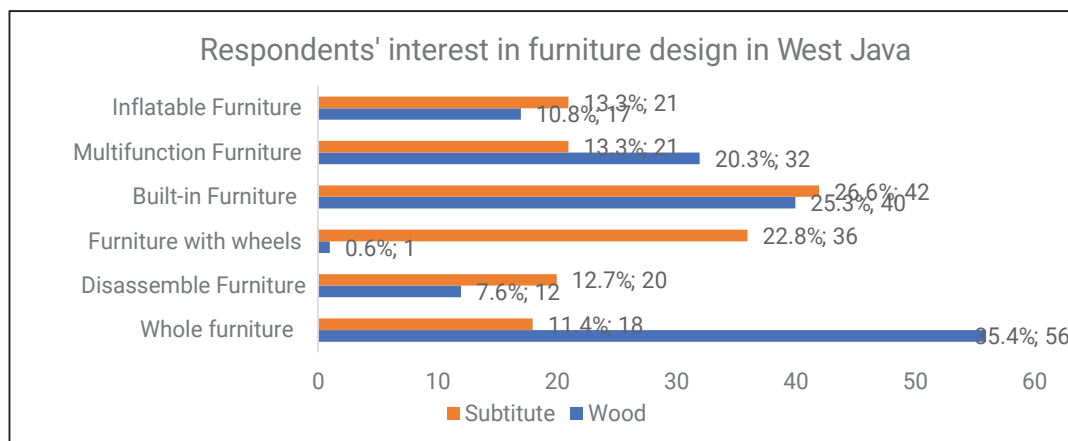


Figure 9 Respondent's interest in furniture design in West Java

The various craft designs that respondents were interested in were fashion and lifestyle, artwork, home décor, and toys. The overall choice of designs for the most popular wood crafts and substitute goods can be seen in Figure 10.

The survey showed that home décor wood crafts were the most popular with 48.10% of respondents, followed by artwork crafts (39%) and children's toys (6%). For home décor, there seems to be no difference in preference between wood products or their substitutes, with both being favored by 48.10% of respondents. Meanwhile, for fashion and lifestyle, substitute products are more favored, at 39.24%.

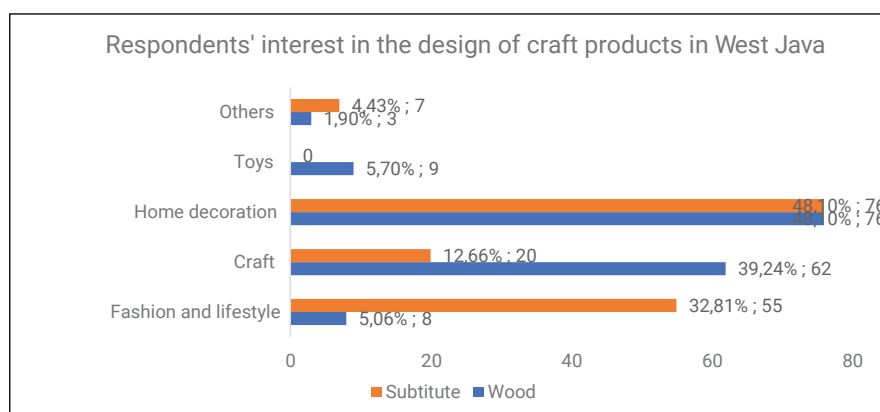


Figure 10 Respondent's interest in the design of craft products in West Java

Willingness to Pay (WTP) is a form of economic valuation conducted by looking at the willingness to pay of individuals to improve their health due to environmental damage. This WTP approach essentially seeks individual judgments regarding the increase or decrease in cost expenditure toward improving environmental quality. In addition, willingness to pay is influenced by income levels, while willingness to accept environmental damage is unlimited (Saptutyningsih 2007). Fathia et al. (2018) stated that consumers' willingness to pay more is usually influenced by age, knowledge, and income. Another factor that affects willingness to pay is the quality of the goods offered, especially processed wood products. Product quality is one of the reasons consumers are willing to pay more.

The survey shows that for the purchase of wooden furniture products, the cost that consumers are willing to spend (WTP) is dominated by the price range of IDR 1,000,000 - 3,000,000 (38%) and IDR 3,000,000 - 6,000,000 (30%). However, for furniture products in the price range of IDR 1,000,000 - 3,000,000, respondents were more interested in purchasing products from wood substitutes (47%). It seems that for expensive products (> IDR 3,000,000), respondents are more interested in buying wood-based products (43%) this is shown in Figure 11.

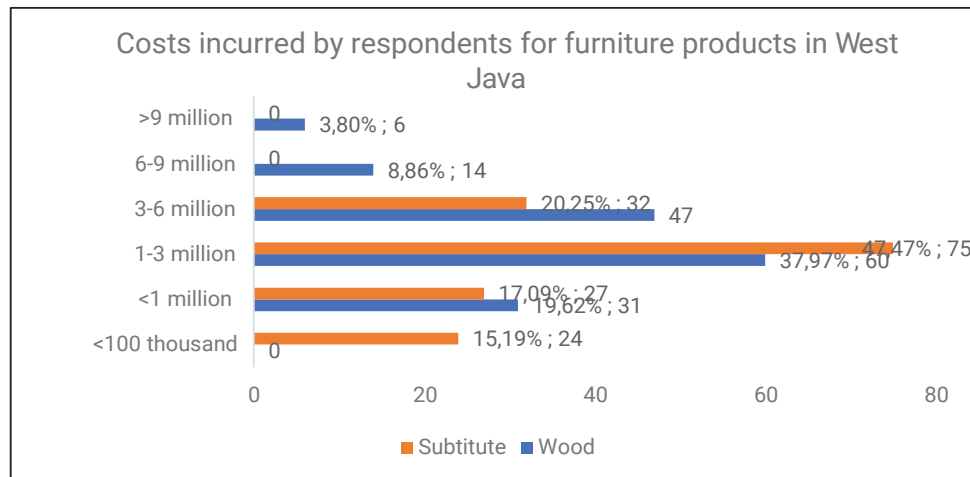


Figure 11 Costs incurred by respondents for furniture products in West Java

Figure 11 shows that most respondents (42%) are willing to pay for wood craft products in the price range of IDR 1,000,000 - 3,000,000. As for substitutes, most respondents (49%) were more interested in buying products priced less than IDR 1,000,000, although there were also respondents (4%) who were willing to spend more than IDR 9,000,000.

Wooden handicraft products priced at less than IDR 6,000,000 are more desirable to consumers, while handicraft products from substitutes are more desirable at prices of more than IDR 1,000,000. It appears that in the price range between IDR 1,000,000 and IDR 6,000,000, there is strong competition between wooden craft products and their substitutes.

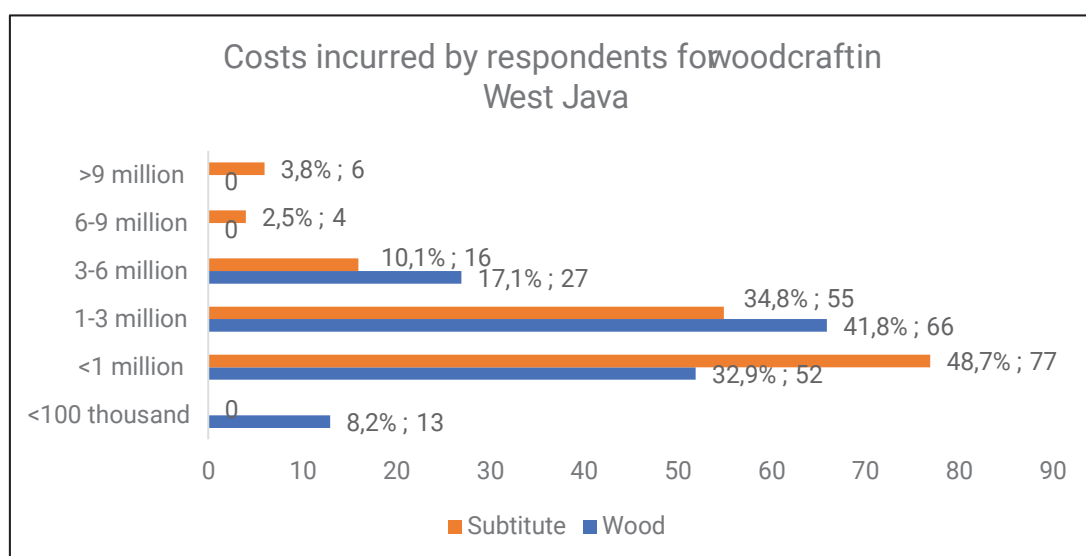


Figure 12 Costs incurred by respondents for woodcraft products in West Java

Respondents' reasons for using engineered wood products are also determined by their knowledge of the quality of the product. How superior the product is determines respondents' choice of using wood products or their substitutes. Respondents in West Java chose engineered wood products because of their advantages of a more beautiful appearance

(29%) and environmental friendliness (28%), Figure 13(a). In addition to engineered wood products, respondents also chose substitute products. The survey shows that respondents predominantly choose substitute products with the advantage of water resistance at 25.9%, followed by easy maintenance at 23.3%, Figure 13(b).

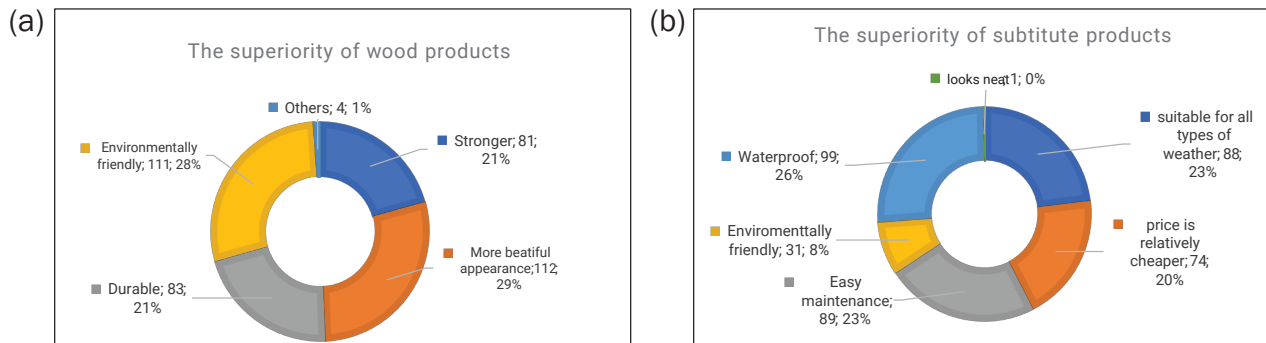
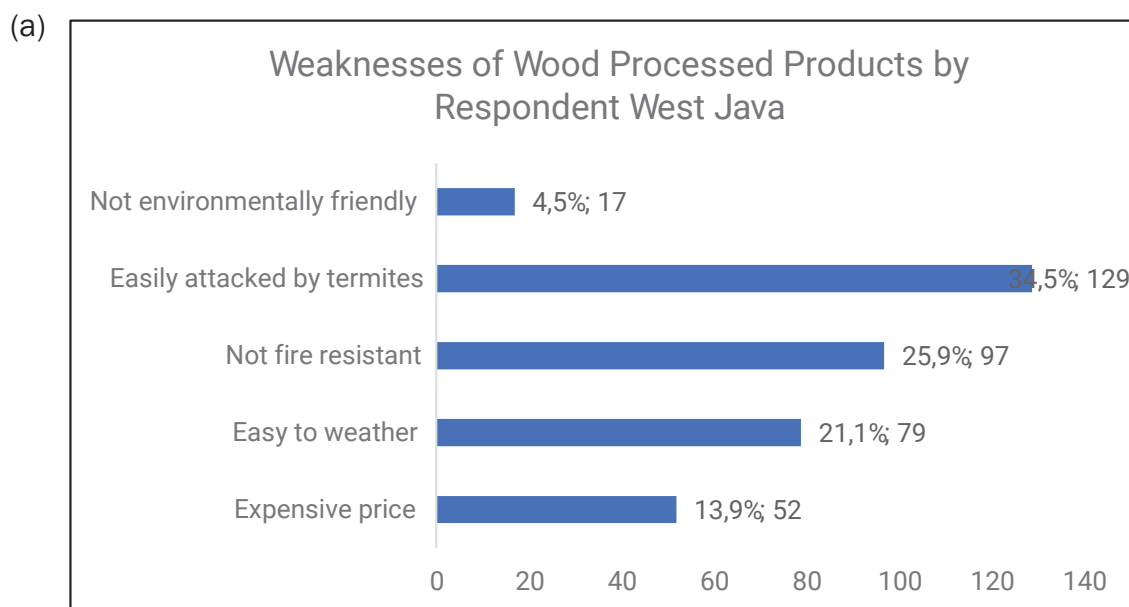


Figure 13 (a) Advantages of engineered wood products according to respondents; (b) Advantages of substitute products according to respondents in West Java.

The most prominent disadvantages of using engineered wood products are that they are susceptible to termites 34.5%, are not fire resistant 25.9% and are not environmentally friendly 4.7% (Figure 14a). Some weaknesses regarding product strengths should be addressed through product innovations created by research institutions. Even substitutes have weaknesses. Respondents in West Java Province rated limited design at 50.8% as the most dominant weakness, followed by less strong materials at 33.7% (Figure 13b).



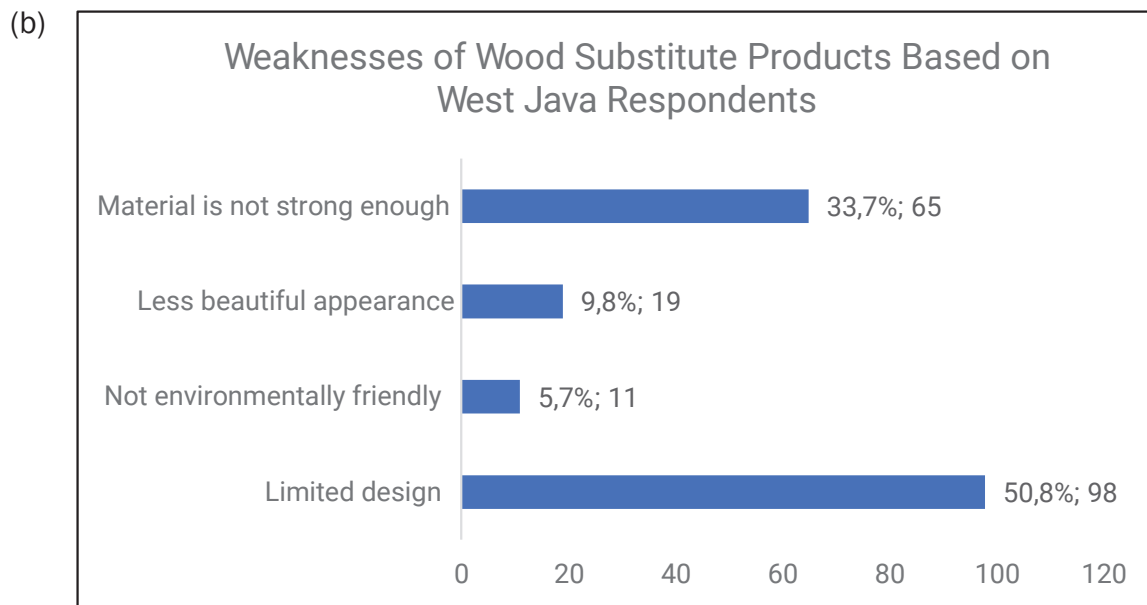


Figure 14 (a) Weaknesses of wood products by respondents in West Java; (b) Weaknesses of substitute products by respondents in West Java

The payment method chosen by respondents in transactions to buy wood products and their substitutes is dominated by the cash payment method (88%) for wood products and 84.4% for substitute products. Public interest in buying wood products in cash will be very beneficial in terms of marketing efficiency and maintaining business liquidity, in addition, entrepreneurs can save on the cost of borrowing money (cost of money). In addition to the cash method, there are also other methods such as debit/e-money, online, contract, and credit payments (Figure 15).

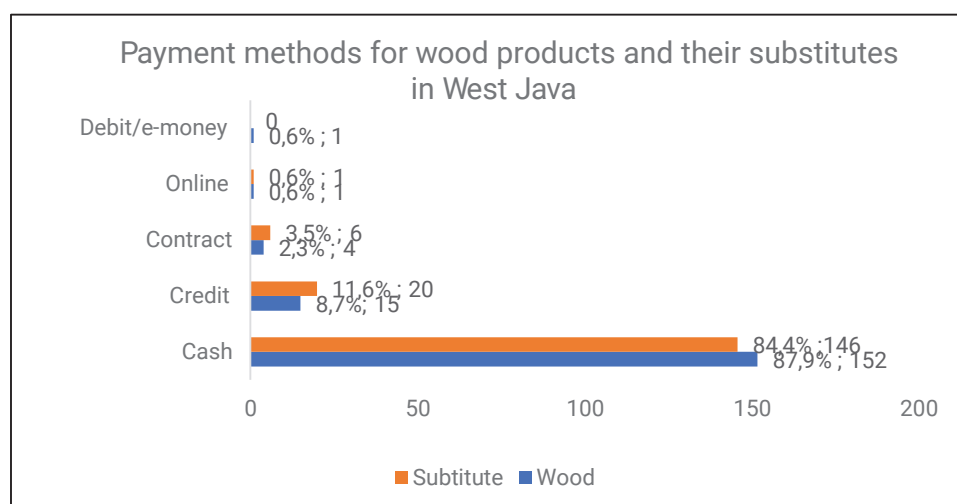


Figure 15 Payment methods for wood products and their substitutes in West Java

3.1.3. Recommendation for the development of an enriched assortment of wood products sold in the West Java market

In addition to the promotional media suggested by respondents, there are some key recommendations to increase the consumption of processed wood products, such as furniture, crafts, and construction timber. These recommendations aim to address product-related issues and policy challenges that can encourage the sustainable development of the wood products industry in West Java.

For furniture wood, respondents suggested the following improvements:

1. Use of high-quality wood species to ensure longer product life,
2. Improving product durability while maintaining environmental friendliness,
3. Offering products at more affordable prices, especially for the middle-class market,
4. Create designs that are attractive, functional, easy to maintain, and continue to innovate,
5. Educate the public to remove the negative stigma towards wood products, especially in terms of sustainability and durability.

For woodcraft, many of the recommendations are in line with those for furniture, with emphasis on:

1. Affordable price,
2. Improved product quality and durability,
3. Unique, creative, artistic, and functional designs, with a focus on product innovation and variety,
4. Improved market access, including through e-commerce platforms and strategic store locations to reach a wider range of consumers.

For construction wood products, respondents provided similar suggestions with an additional focus on the specific needs of the sector:

1. High-quality materials with long-lasting durability,
2. Environmentally friendly production methods,
3. Affordable prices that cater to a wider market,
4. Diverse product designs, emphasizing neatness, aesthetics, and ease of maintenance,
5. Understanding market conditions to align product offerings with demand,
6. Increase the supply of construction wood to meet the growing demand,
7. Promote business cooperation with housing developers to streamline the use of timber in housing projects,
8. Ensure strategic sales locations to increase product availability.

In addition to the specific recommendations provided by respondents related to product improvements, several broader challenges must be addressed to encourage the consumption and development of processed wood products. These challenges involve policy aspects that play an important role in maintaining the sustainability of wood supply and supporting the growth of the timber industry as a whole.

One important aspect that has emerged is the role of community forests as a major supplier of processed wood. In addressing policy challenges, the fact that community forests (HR) are the largest wood supplier must be considered. Currently, the supply from community forests thrives mainly in Java, while it is difficult for community forests to develop outside the island. If the growth of community forests outside Java increases, it will create opportunities for greater investment in the processed wood industry in those regions, including both large-scale industries and SMEs (Small and Medium Enterprises) focusing on processing logs into

wood veneer or sawn timber, which would significantly reduce transportation costs.

Currently, high transportation costs are driven by the need to ship unprocessed logs from outside Java to Java. By increasing local processing capacity outside Java, these costs can be reduced. Moreover, suppose the growth of community forests outside Java accelerates. In that case, it will also encourage more investment in the wood processing industry outside Java or at least support SMEs that process logs into veneer or sawn timber, reducing the need to transport raw logs to Java. This would lead to lower transportation costs, which have traditionally been high due to the transport of raw logs, resulting in elevated raw material and product prices, thereby creating a barrier to entry into the market, particularly the domestic market.

Therefore, policies that promote the growth of community forests outside Java are crucial to supporting the development of the timber industry in these areas, improving the supply chain, and ensuring the sustainable growth of the domestic timber market.

3.2. Consumer Preferences of Substitute and Wood Products in Banten Province and DKI Jakarta Province

3.2.1. Characteristics and type of consumers

In Banten Province, which is the location of the study, specifically Cilegon City, Serang City, Serang Regency, Tangerang Regency, Tangerang City, and South Tangerang City. Meanwhile, the DKI Jakarta region which is the location of the special study is Central Jakarta, North Jakarta, South Jakarta, East Jakarta, and West Jakarta.

In this study, the margin of error for social research is set at 10% while the population taken into account are people of productive age (17 to 65 years) for example, namely in the West Java region, the productive age is 35,309,200 people so that the minimum sample size can be known as 100 people with the following description:

$$n = \frac{N}{(1 + Ne^2)} = \frac{35.309.200}{(1 + ((35.309.200)(0,1^2)))} = 100 \text{ people}$$

The enthusiasm of the people in West Java, Banten, and DKI Jakarta for participating in filling out the questionnaire was high. This is evidenced by the incoming data (returned questionnaires) of 158 respondents from West Java and 99 respondents from Banten and DKI Jakarta. Thus, the sampling error decreased to 8% which can increase the accuracy of the data. Key informants and respondents are presented in Table 2.

Table 2 Key informants and study respondents in Banten Province and DKI Jakarta

Key Informant and Respondent Entities	Sample	Description
Government	1	Provincial Forestry and Environment Agency
Retailer	2	Ikea or Informa and Traditional Furniture Stores
Consumer	10	@ 5 people per retailer category
Manufacturer	3	1 each for sawmill, furniture, woodcraft industries
Housing developer	1 (real estate)	-
General public	99	Disseminate the Google form to WAG, Telegram, etc.
Association		Asmindo, ISWA, Apkindo, dsb
Total	116	

The survey has been conducted in 6 cities/districts out of 8 cities/districts in Banten province and 5 administrative cities in DKI Jakarta. These areas include Cilegon City, Serang City, Serang Regency, Tangerang Regency, Tangerang City, South Tangerang City, Central Jakarta Municipality, North Jakarta, South Jakarta, East Jakarta, and West Jakarta. The total number of respondents in Banten and DKI Jakarta was 116. The following is a description of the characteristics of respondents in Banten Province and DKI Jakarta Province.

Most respondents in Banten and DKI Jakarta were in the age group of 26-45 years. 77.8% in Banten Province (Figure 16a) and 83% in DKI Jakarta Province (Figure 16b). Age groups above 45 years old were less interested in filling out the questionnaire. Female respondents dominated in filling out the questionnaire as in Banten Province, with 53.3% of female respondents (Figure 16c) and DKI Jakarta as much as 56% (Figure 16d). In Banten Province, respondents from high school education level dominated, amounting to 51.1%, followed by respondents from tertiary institutions at 42.2% (Figure 16e). Meanwhile, in DKI Jakarta Province, respondents from senior high schools reached 52%, followed by respondents from tertiary institutions at 41% (Figure 16f).

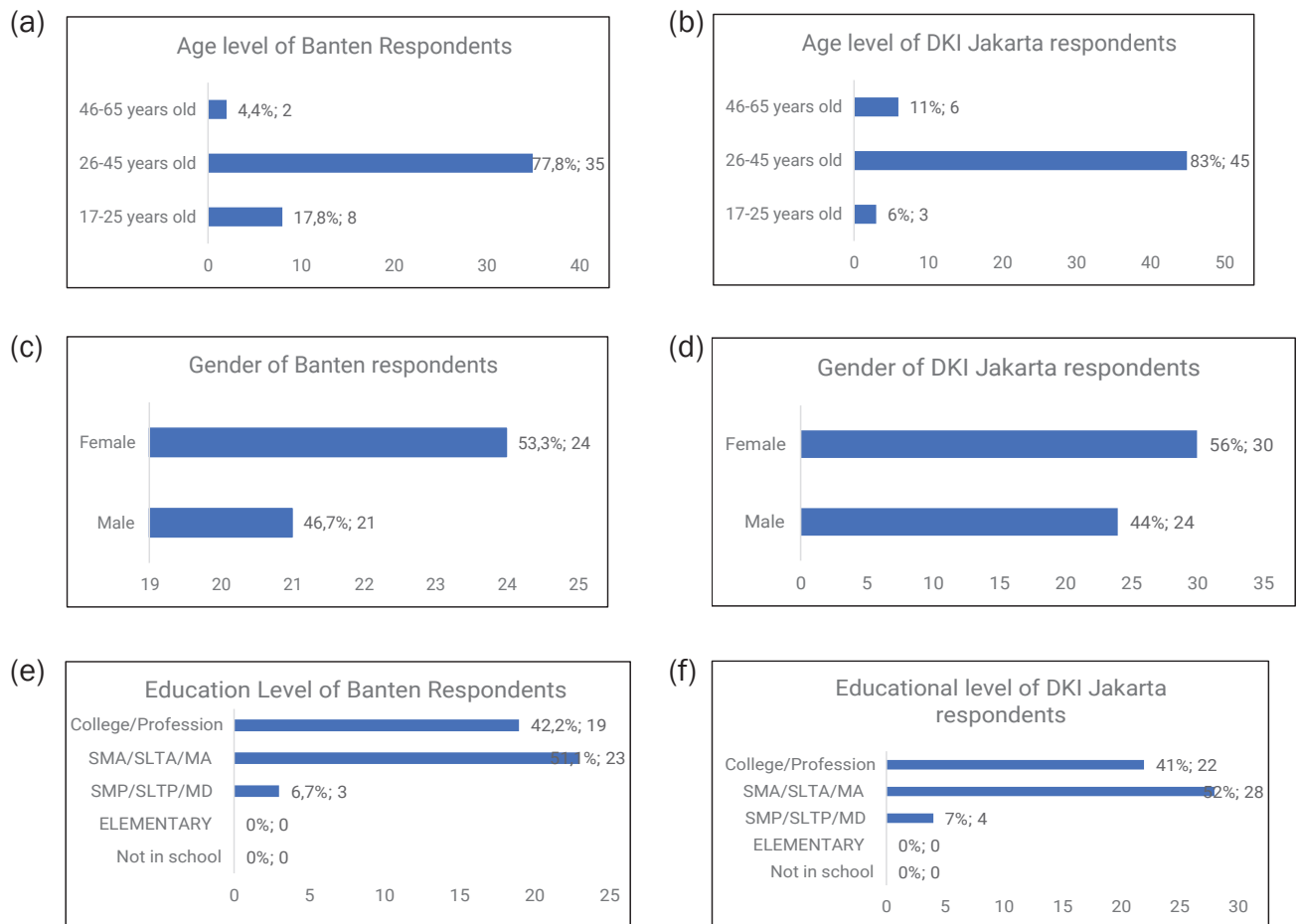


Figure 16 (a) Banten respondents' age level; (b) DKI Jakarta respondents' age level; (c) Banten respondents' gender; (d) DKI Jakarta respondents' gender; (e) Banten respondents' education level; (f) DKI Jakarta respondents' education level

Figure 17a shows that the dominance of respondents in Banten Province has an income of less than IDR 5 million/month, 48.9%, followed by respondents with an income of IDR 5 - 10 million/month, 44.4%. Meanwhile, the dominance of respondents in DKI Jakarta Province has an income of IDR 5 - 10 million/month as much as 56% followed by an income of less than 5 million/month as much as 35% (Figure 17b). 12 types of respondents' jobs are part of filling out the questionnaire, namely, cashiers, private employees, entrepreneurs/self-employed, housewives, farmers, traders, laborers, freelance, fresh graduates, developers, BUMN, ASN, and academics. Banten and DKI Jakarta show the dominance of respondents as private employees as much as 62.2% (Figure 17c) and 65% (Figure 17d), respectively.

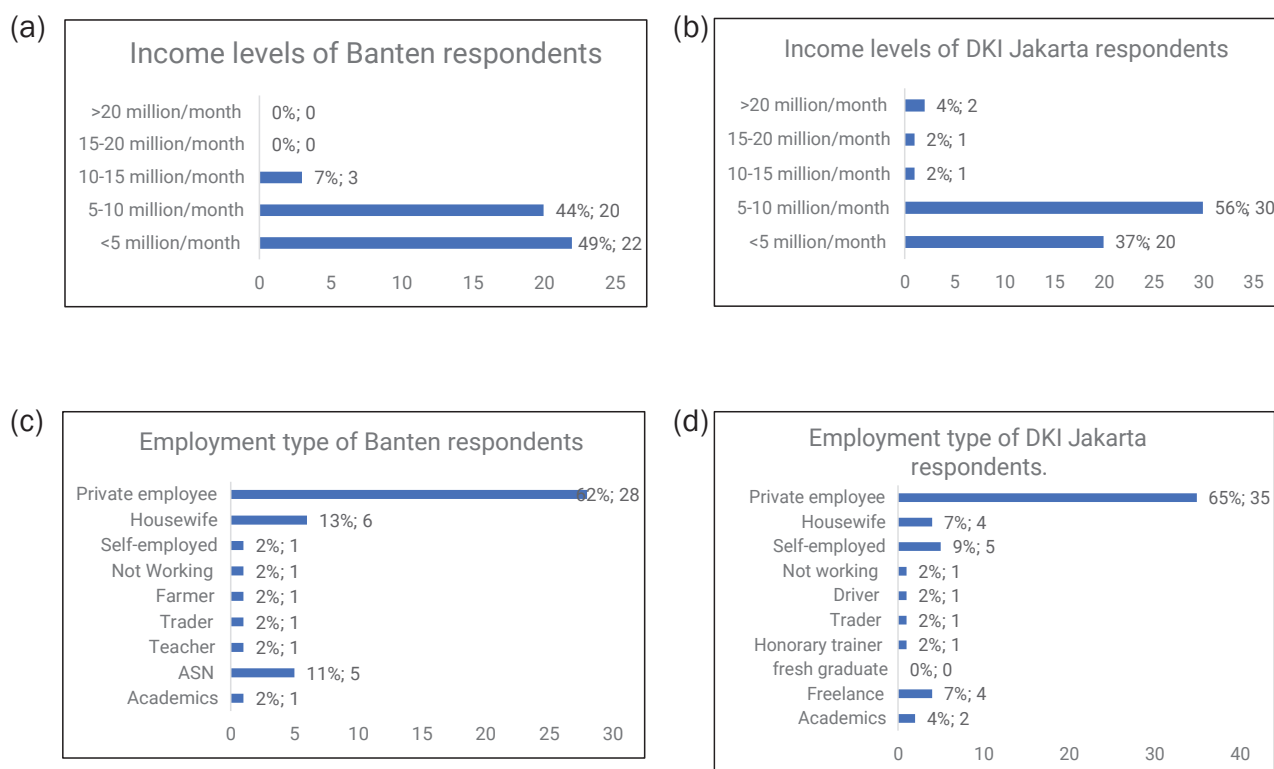
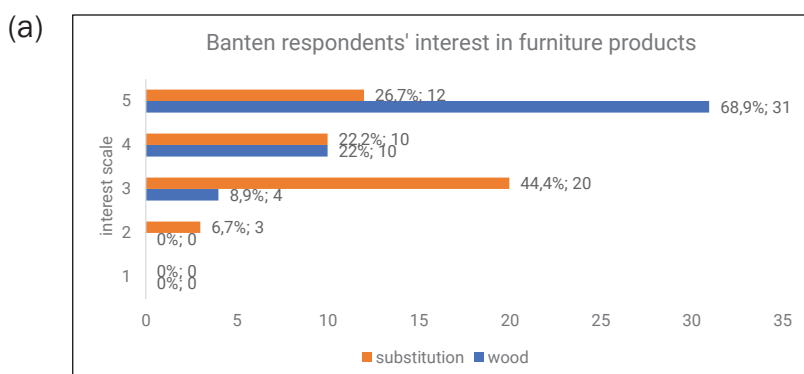


Figure 17 (a) Income levels of Banten respondents; (b) Income levels of DKI Jakarta respondents; (c) Employment type of Banten respondents; (d) Employment type of DKI Jakarta respondents

3.2.2. Consumers' preference for the product by type of consumers

The survey was conducted to determine consumer preferences for the use of processed wood products and their substitutes. The use of processed wood products includes furniture, construction, and handicrafts. The survey shows that respondents still have a high interest in the use of wooden furniture. Interested respondents (Likert scale 4) to very interested (Likert scale 5) in wooden furniture products 91% and for substitute products only 49% (Figure 18a). This indicates that wooden furniture products are still in demand by most Banten people. Similar to Banten, the people of DKI Jakarta also indicated that wooden furniture products are still in demand by most people because interested respondents (Likert scale 4) to very interested (Likert scale 5) in wooden furniture products are 87% and for substitute products only 56% (Figure 18b).



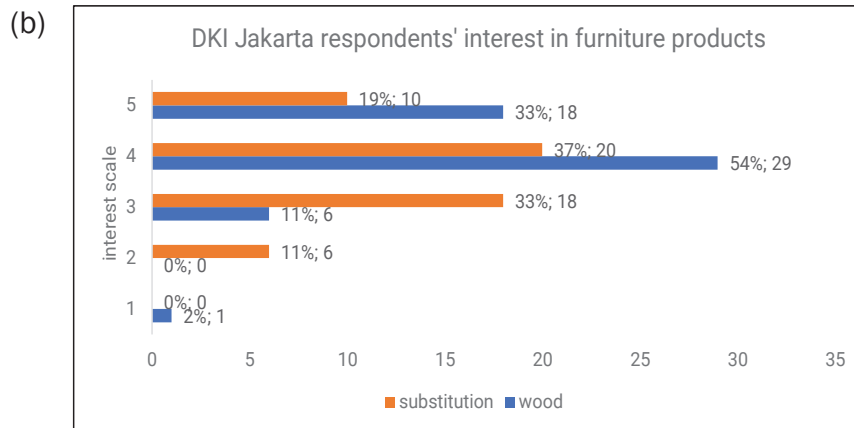


Figure 18 (a) Banten respondents' interest in furniture products; (b) DKI Jakarta respondents' interest in furniture products

As with the use of furniture, respondents in Banten Province and DKI Jakarta are still interested in using wood as a construction option. The survey shows that Banten respondents who are interested (Likert scale 4) to very interested (Likert scale 5) in wood construction materials are 69% and substitute products 48% (Figure 19a). The DKI Jakarta survey shows that interested respondents (Likert scale 4) were very interested (Likert scale 5) in wood construction materials, 78%, and substitute products, 70% (Figure 19b). This indicates that wood construction materials are still in demand by most people in Banten and DKI Jakarta, but substitute products are also in demand. If timber construction materials' production efficiency and product innovation are not addressed immediately, substitute products will become heavy competitors.

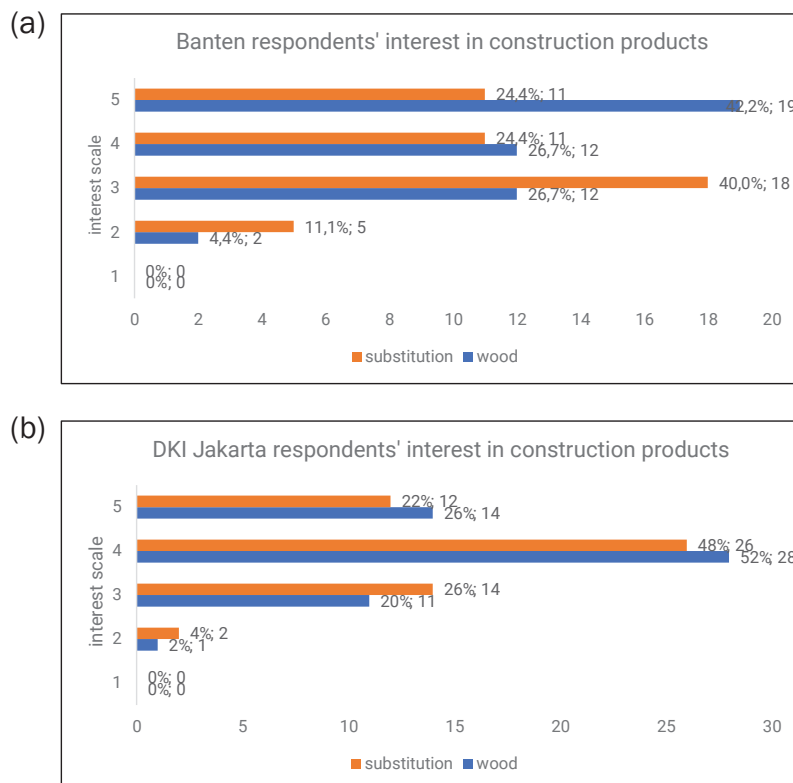


Figure 19 (a) Banten respondents' interest in construction products; (b) DKI Jakarta respondents' interest in construction products

Crafts products are still in demand. Based on the survey results on respondents' interest in the use of craft wood, 88% of respondents were interested (Likert scale 4) to very interested (Likert scale 5) in woodcraft products, and only 37% were interested in their substitutes (Figure 20a). Similar to wooden furniture products, wooden handicraft products are still in demand by most Banten residents. DKI Jakarta respondents also indicated the same thing. Based on the survey results on respondents' interest in the use of craft wood, 82% of respondents were interested (Likert scale 4) to very interested (Likert scale 5) in woodcraft products, and only 47% were interested in their substitutes (Figure 20b). Similar to wooden furniture products, wooden handicraft products are still in demand by most DKI Jakarta residents.

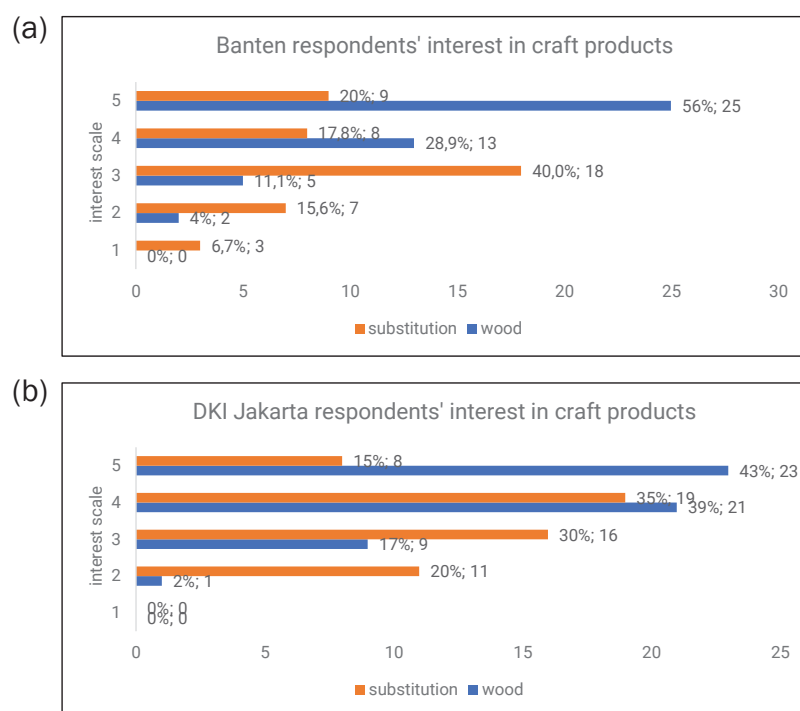


Figure 20 (a) Banten respondents' interest in craft products; (b) DKI Jakarta respondents' interest in craft products

To assess respondents' level of interest when choosing wood or substitute goods, an assessment was made using the criteria of a 1-10 rating scale. The higher the score, the more interested respondents are in wood products. The assessment results show that Banten respondents are more interested in using wood than substitute goods. As shown in Figure 21a, 76% of respondents scored above 8. This indicates that wood products are still in demand in Banten. The assessment of respondents' interest in DKI Jakarta Province also shows that respondents are more interested in using wood than substitute goods. As shown in Figure 21b, 60% of respondents gave a score above 8. This indicates that wood products are still in demand by the people of DKI Jakarta.

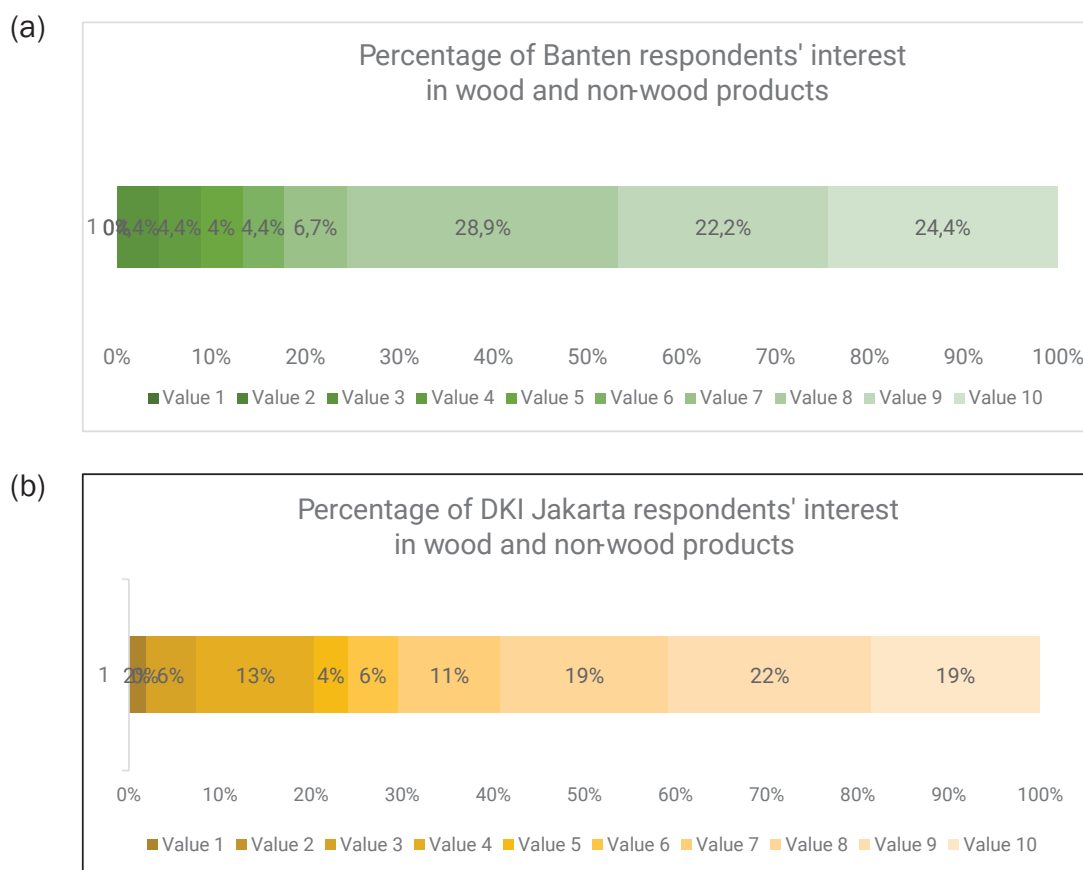


Figure 21 (a) Percentage of Banten respondents' interest in wood products and their substitutes; (b) Percentage of DKI Jakarta respondents' interest in wood products and their substitutes

In addition to respondents' interest in wood products, there are also choices of types of goods that respondents prefer. Based on the survey, it is known that the type of goods with low prices and easy to find are favored by Banten respondents, both for wood products 49% and their substitute products 76%. Not only that, respondents also chose the type of product with discounts and negotiable for wood products 20% and its substitutes 16%. The survey results of Banten respondents on other types of goods are presented in Figure 22a.

The same thing can be seen in the survey results in DKI Jakarta Province. Low-priced and easy-to-find goods were more popular with respondents for timber products and their substitutes. For wood products, the percentage of respondents who chose this type of goods reached 57%, while for substitute products, it reached 56%. In contrast to Banten respondents, DKI Jakarta preferred products that were quite expensive and not often purchased for wood products at 22% and with substitutes at 26%. The survey results on other types of goods are presented in Figure 22b.



Figure 22 (a) Banten respondents' interest in wood products and substitutes;
(b) DKI Jakarta respondents' interest in wood products and substitutes

It appears that price and ease of product access are respondents' main considerations. Lower prices can be achieved if the efficiency of processed wood production can be pursued. The ease of obtaining products is related to the sustainability of forests as wood producers. As a renewable resource, sustainable forest management is a necessity. Without the presence of sustainable management, the utilization of renewable resources will be the same as the utilization of non-renewable sources, which will be depleted faster the more they are utilized.

Regarding design, the survey results in Banten Province show that the most preferred furniture design for respondents is free-standing furniture at 36%, transformable furniture at 22%, and built-in furniture at 20%. Meanwhile, the preferred furniture design for its substitute product is built-in furniture at 24%, followed by knockdown furniture at 22%. The survey results are presented in Figure 23a.

The survey results in DKI Jakarta Province show similar results. The furniture design respondents are most interested in is free-standing furniture at 28%, followed by knockdown furniture and built-in furniture at 20%. Meanwhile, the most preferred furniture design for the substitute product is built-in furniture at 35%, followed by knockdown furniture and mobile furniture at 17% each. The survey results are presented in Figure 23b.

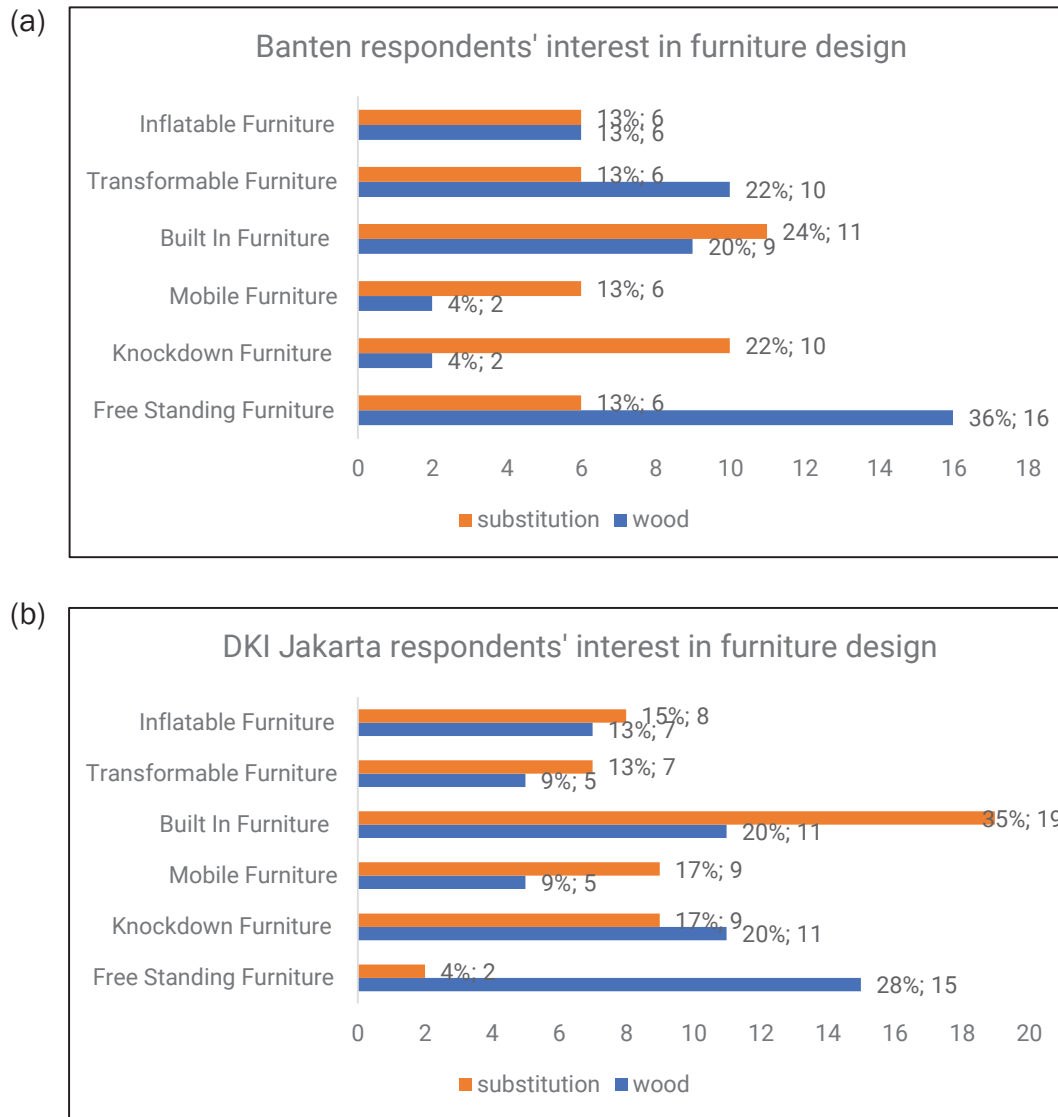


Figure 23 (a) Banten respondents' interest in furniture design; (b) DKI Jakarta respondents' interest in furniture design

This analysis shows that free-standing furniture, built-in, and transformable furniture wood-based furniture designs are the most desirable for respondents in both regions. In a separate finding, consumer preferences for wood products and their substitutes are almost the same. This intense competition between wood products and substitutes suggests a need for further differentiation in product design.

The various craft designs that respondents were interested in were fashion and lifestyle, artwork, home decor, and toys. Overall, the most preferred designs for wood crafts and their substitutes are home décor and artwork, as shown in Figures 24a and 24b. The survey results of Banten respondents' preferences show that wood crafts as artwork are the most preferred by respondents at 46.7%, followed by home décor (44.4%), and fashion and lifestyle (6.7%). The survey results are presented in Figure 24a. Based on the survey results in DKI Jakarta Province, respondents' preference for wood products as home décor was 41%, followed by arts and crafts (37%) and other products (22%). The survey results are presented in Figure 24b.

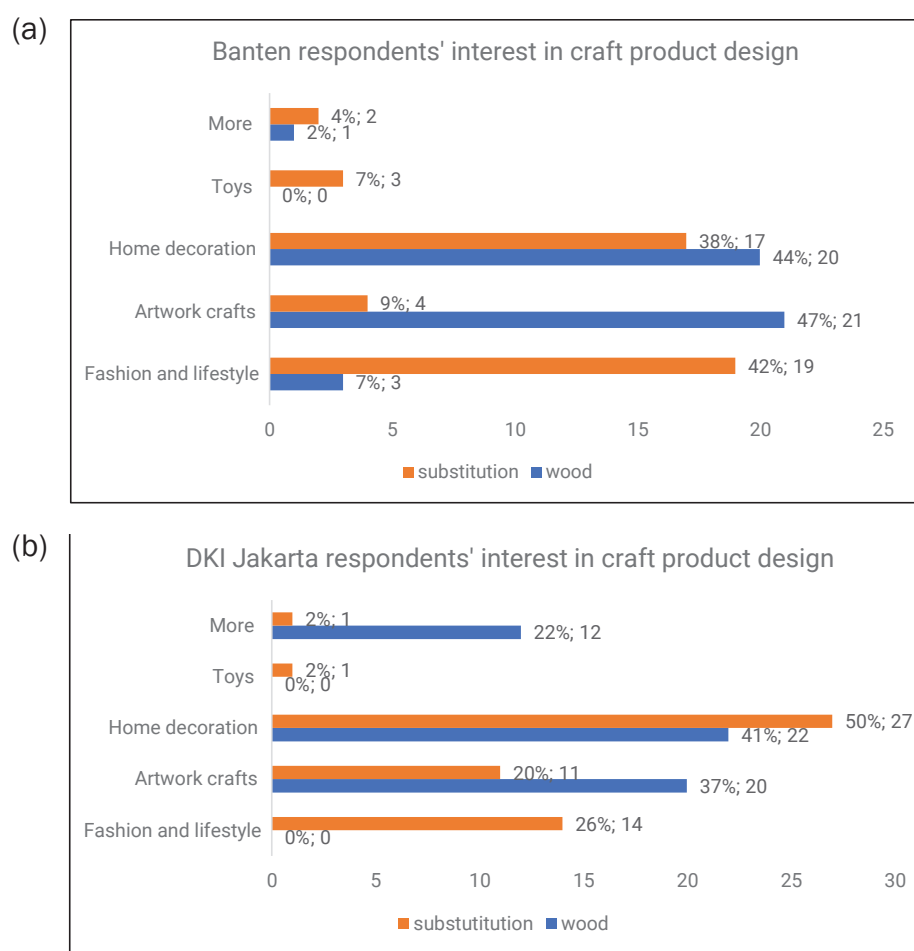


Figure 24 (a) Banten respondents' interest in craft product design; (b) DKI Jakarta respondents' interest in craft product design

The survey results of Banten respondents show that for the purchase of wooden furniture products, the cost that consumers are willing to spend (WTP) is dominated by the price range of less than IDR 1,000,000 (37.8%) and IDR 1,000,000 - 3,000,000 (35.6%). However, for furniture products with a price range of less than IDR 1,000,000, respondents are more interested in purchasing products from wood substitutes (42.2%). It seems that for expensive products (> IDR 3,000,000), respondents are more interested in buying wood-based products (33%), as shown in Figure 25a.

The survey results of DKI Jakarta respondents show a slightly different thing for the purchase of wooden furniture products, the cost that consumers are willing to pay (WTP) is dominated by the price range of less than IDR 1,000,000 (39%) and IDR 3,000,000 - 6,000,000 (35%). However, for furniture products with a price range of less than IDR 1,000,000 and IDR 1,000,000 - 3,000,000, respondents were more interested in buying products from wood substitutes at 39% and 22%, respectively. It seems that for expensive products (> IDR 3,000,000), respondents are more interested in buying wood-based products (50%) as shown in Figure 25b.

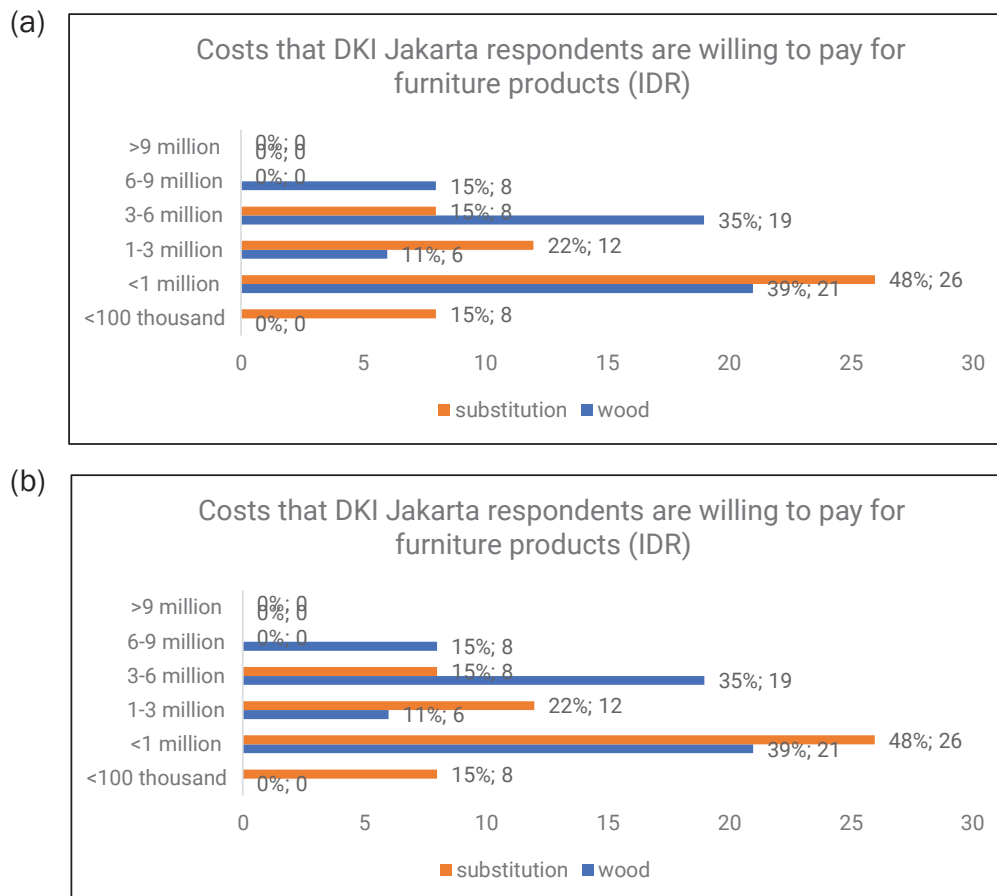


Figure 25 (a) Costs that Banten respondents are willing to pay for furniture products;
(b) Costs that DKI Jakarta respondents are willing to pay for furniture products

Figure 26a shows that most Banten respondents (55.6%) are willing to pay to buy wood craft products at prices less than IDR 1,000,000. As for substitutes, most respondents (36%) were more interested in purchasing products with a price range of IDR 1,000,000 - 3,000,000. In contrast to the results of the DKI Jakarta respondent survey (Figure 26b), most respondents (52%) are willing to pay for woodcraft products with a price range of IDR 1,000,000 - 3,000,000, while most respondents (43%) are more interested in purchasing products with a price range of less than IDR 1,000,000. Wood craft products priced less than IDR 6,000,000 are more desirable to consumers. In the price range between IDR 1,000,000 and IDR 6,000,000, there is strong competition between woodcraft products and their substitutes.

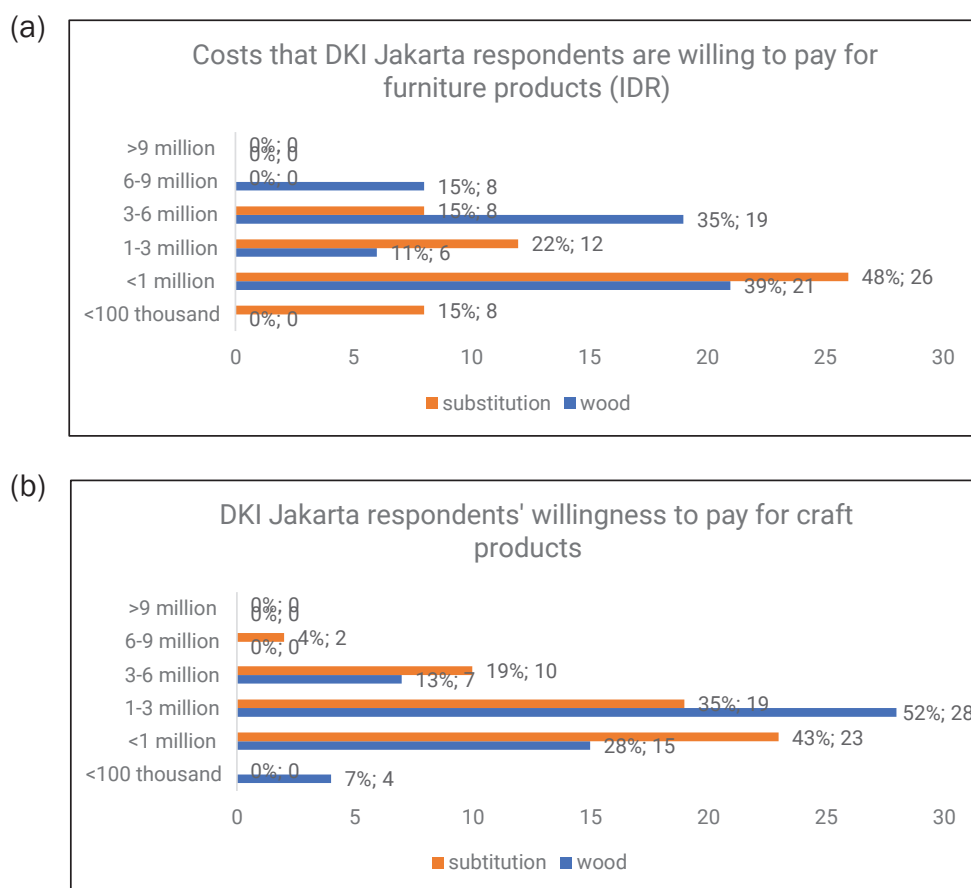


Figure 26 (a) Banten respondents' willingness to pay for craft products; (b) DKI Jakarta respondents' willingness to pay for craft products

Respondents' reasons for using engineered wood products are also determined by their knowledge of the quality of the product. How superior the product is determines the choice of respondents in using wood products or their substitutes. Respondents in Banten chose engineered wood products because of their advantages of having a more beautiful appearance (34.5%) and being environmentally friendly (31%) Figure 27a. In addition to engineered wood products, respondents also chose the advantages of substitute products. The survey showed that respondents predominantly chose substitute products with the advantage of relatively low prices (30.1%), followed by water resistance (25.8%).

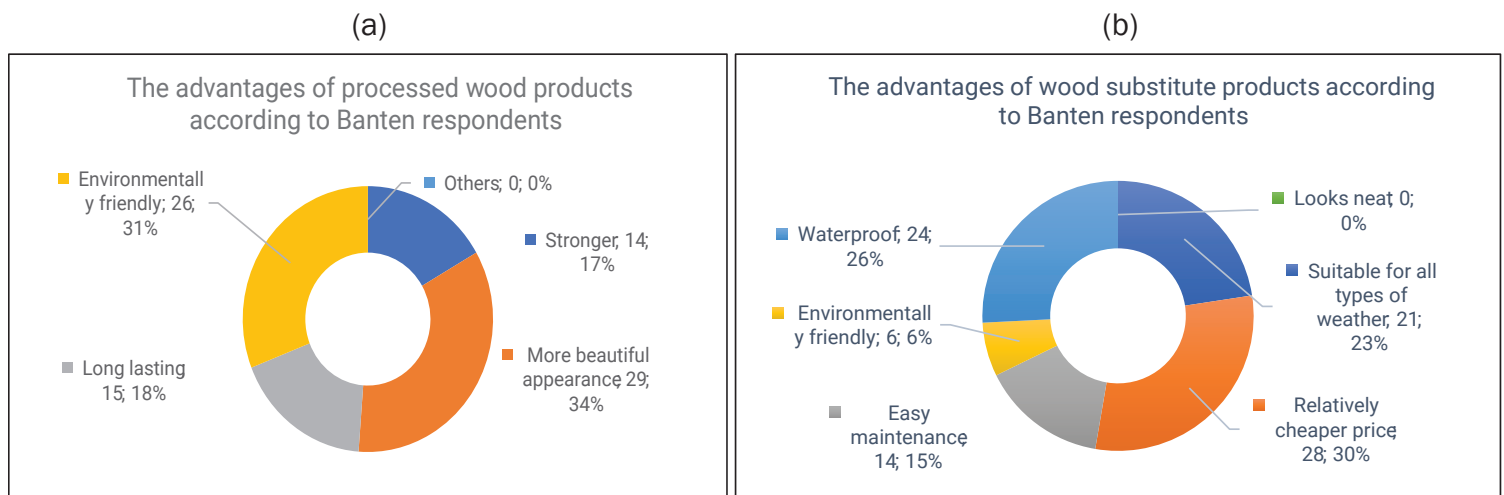


Figure 27 (a) The advantages of processed wood products according to Banten respondents; (b) The advantages of wood substitute products according to Banten respondents

In contrast to Banten Province, the survey results of respondents in DKI Jakarta chose engineered wood products because of their advantages of being environmentally friendly (28%) and stronger (26%) Figure 28a. In addition to engineered wood products, respondents also chose substitute products. The survey shows that respondents predominantly choose substitute products with the advantage of water resistance (25%), followed by easy maintenance (24%).

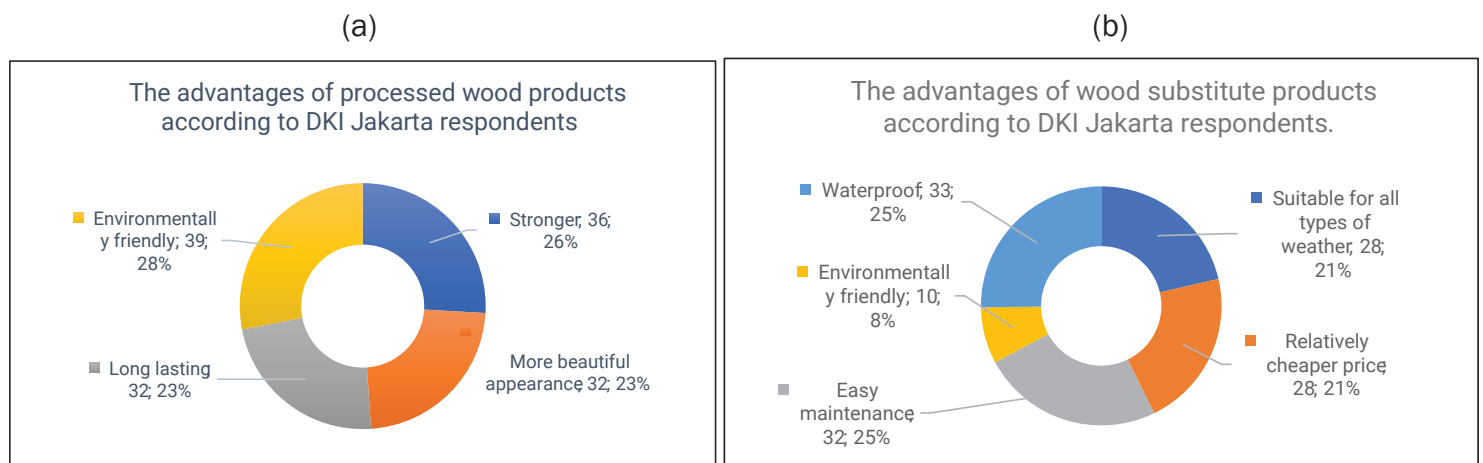


Figure 28(a) The advantages of processed wood products according to DKI Jakarta respondents; (b) The advantages of wood substitute products according to DKI Jakarta respondents

Meanwhile, the most prominent disadvantages of wood according to respondents in Banten are susceptibility to termites (29.1%), not fire resistant (27.9%), and not being environmentally friendly (4.7%). The results of Banten respondents' perspectives on the disadvantages of using wood products can be seen in Figure 29a.

Similar to Banten, according to DKI Jakarta respondents, the most prominent weaknesses are termite infestation (31%), not fire resistant (26%), and not environmentally friendly (3%). The results of respondents' perspectives on the disadvantages of using wood products can be seen in Figure 29b.

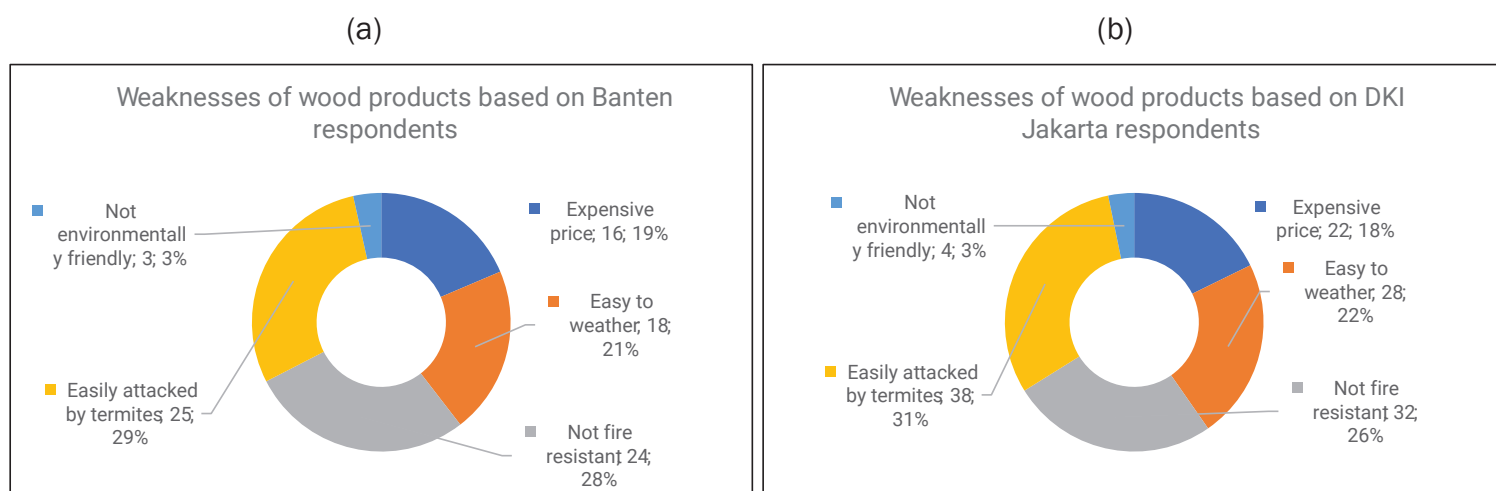


Figure 29 (a) Weaknesses of wood products based on Banten respondents; (b) Weaknesses of wood products based on DKI Jakarta respondents

Negative campaigns alleging that using wood products is not environmentally friendly need to be rectified through education to consumers. Some weaknesses regarding the strength of the product should be answered through product innovations created by research institutions. Even substitutes have weaknesses. Respondents in Banten Province considered that less beautiful appearance at 31.8% was the most dominant weakness, followed by limited design at 27.3% Figure 30a. The survey of DKI Jakarta respondents showed the opposite result. Respondents rated limited design as the most dominant weakness at 36%, followed by less beautiful appearance at 31%. Figure 30b.

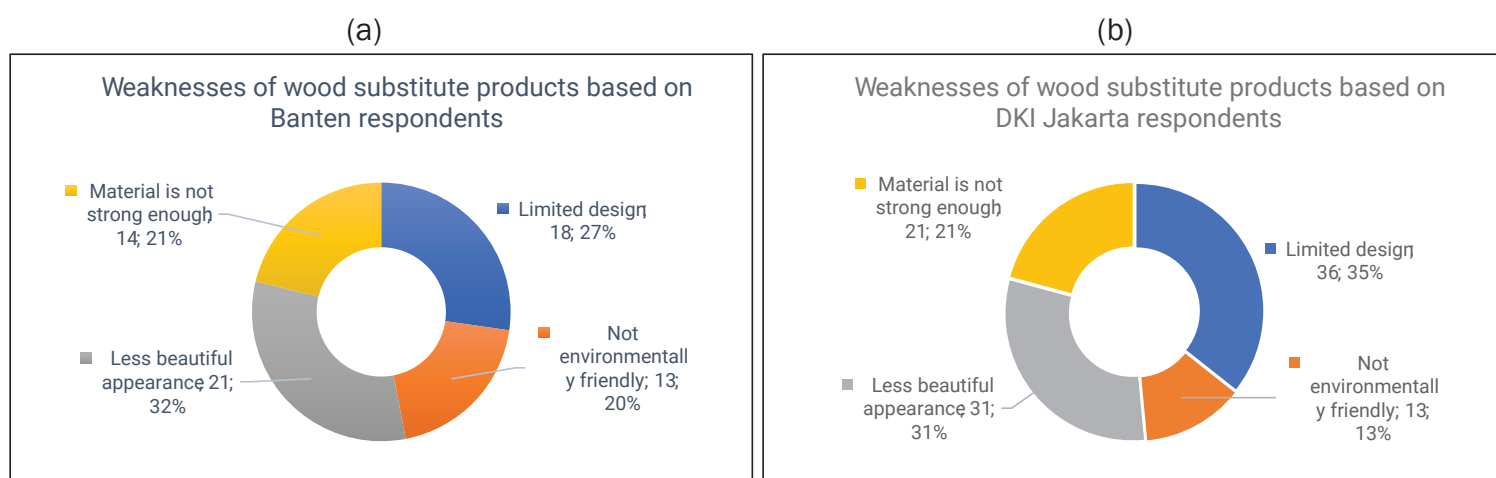


Figure 30 (a) Weaknesses of wood substitute products based on Banten respondents; (b) Weaknesses of wood substitute products based on DKI Jakarta respondents

The payment method chosen by Banten respondents (Figure 31a) in transactions to buy wood products and their substitutes was dominated by cash or cash payment methods 79.2% for wood products and 82.4% for substitute products. DKI Jakarta Province (Figure 31b) also received 74% cash payments for wood products and 69% for substitutes. Public interest in buying wood products in cash will be very beneficial in terms of marketing efficiency and maintaining business liquidity, in addition, entrepreneurs can save on the cost of borrowing money (cost of money). In addition to the cash method, there are also other methods such as debit/e-money, online, contract, and credit payments.

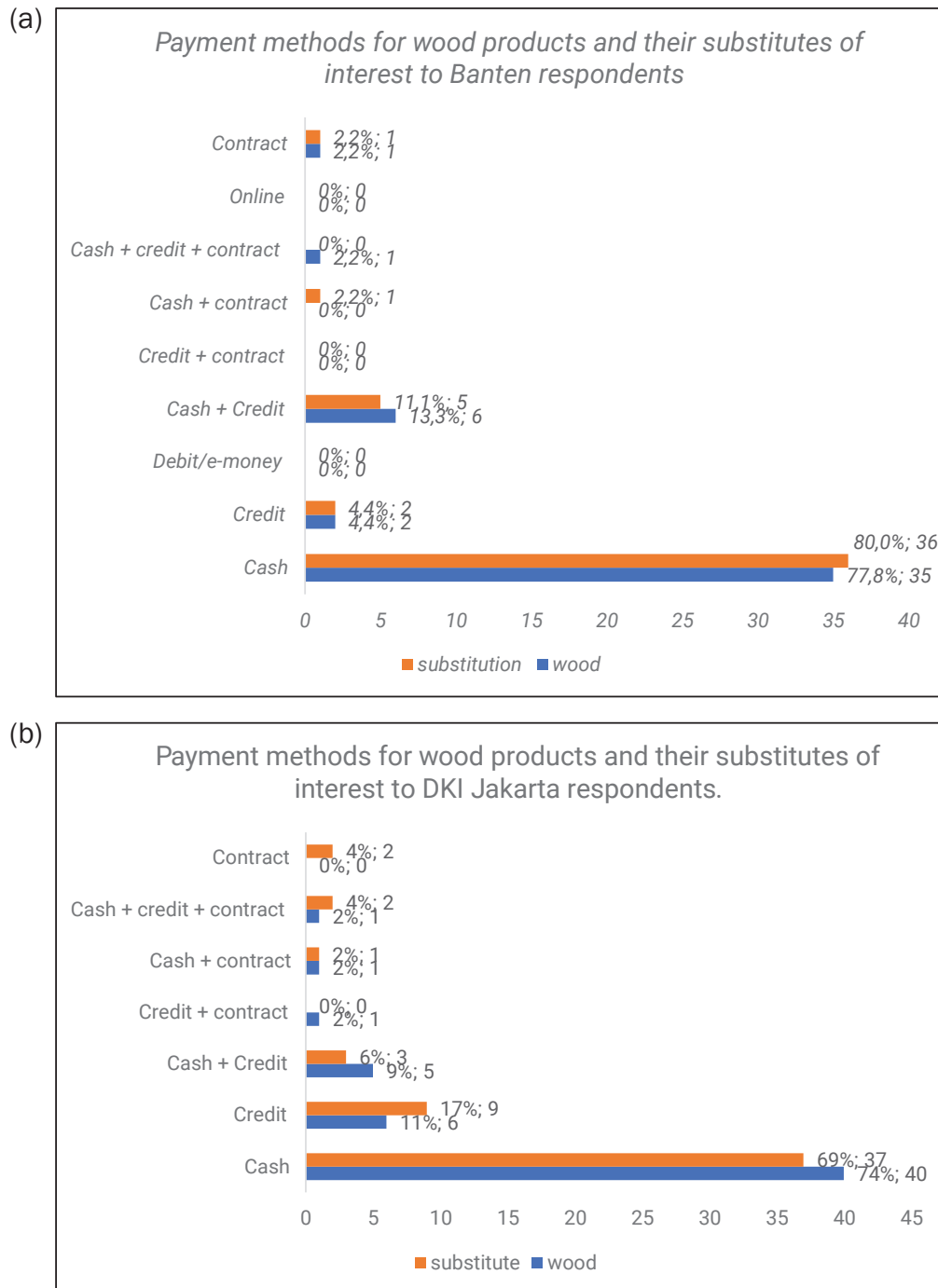


Figure 31 (a) Payment methods for wood products and their substitutes of interest to Banten respondents; (b) Payment methods for wood products and their substitutes of interest to DKI Jakarta respondents

3.2.3.Recommendation for increasing wood product consumption

In addition to the promotional media suggested by respondents, there are some key recommendations to increase the consumption of processed wood products, such as furniture, crafts, and construction timber. These recommendations aim to address product-related issues and policy challenges that can encourage the sustainable development of the wood products industry in Banten and DKI Jakarta.

For furniture wood, respondents suggested the following improvements:

1. Use of high quality wood species to ensure longer product life,
2. Improving product durability while maintaining environmental friendliness,
3. Offering products at more affordable prices, especially for the middle-class market,
4. Create designs that are attractive, functional, easy to maintain, and continue to innovate,
5. Educate the public to remove the negative stigma towards wood products, especially in terms of sustainability and durability.

For woodcraft, many of the recommendations are in line with those for furniture, with emphasis on:

1. Affordable price,
2. Improved product quality and durability,
3. Unique, creative, artistic, and functional designs, with a focus on product innovation and variety,
4. Improved market access, including through e-commerce platforms and strategic store locations to reach a wider range of consumers.

For construction wood products, respondents provided similar suggestions with an additional focus on the specific needs of the sector:

1. High-quality materials with long-lasting durability,
2. Environmentally friendly production methods,
3. Affordable prices that cater to a wider market,
4. Diverse product designs, emphasizing neatness, aesthetics, and ease of maintenance,
5. Understanding market conditions to align product offerings with demand,
6. Increase the supply of construction wood to meet the growing demand,
7. Promote business cooperation with housing developers to streamline the use of timber in housing projects,
8. Ensure strategic sales locations to increase product availability.

In addition to the specific recommendations provided by respondents related to product improvements, there are also a number of broader challenges that must be addressed to encourage the consumption and development of processed wood products. These challenges involve policy aspects that play an important role in maintaining the sustainability of wood supply and supporting the growth of the timber industry as a whole.

One important aspect that has emerged is the role of community forests as a major supplier of processed wood. In addressing policy challenges, the fact that community forests (HR) are the largest wood supplier must be considered. Currently, the supply from community forests thrive mainly in Java, while it is difficult for community forests to develop outside the island. If the growth of community forests outside Java increases, it will create opportunities for greater investment in the processed wood industry in those regions, including both large-scale industries and SMEs (Small and Medium Enterprises) focusing on processing logs into wood veneer or sawn timber, which would significantly reduce transportation costs.

Currently, high transportation costs are driven by the need to ship unprocessed logs from outside Java to Java. By increasing local processing capacity outside Java, these costs can be reduced. Moreover, if the growth of community forests outside Java accelerates, it will also encourage more investment in the wood processing industry outside Java or at least support SMEs that process logs into veneer or sawn timber, reducing the need to transport raw logs to Java. This would lead to lower transportation costs, which have traditionally been high due to the transport of raw logs, resulting in elevated raw material and product prices, thereby creating a barrier for entry into the market, particularly the domestic market.

Therefore, policies that promote the growth of community forests outside Java are crucial to supporting the development of the timber industry in these areas, improving the supply chain, and ensuring the sustainable growth of the domestic timber market.

3.3. Consumer Preferences of Substitute and Wood Products in Central Java Province

3.3.1. Characteristics and type of consumers

This survey is expected to represent consumers of wood products in Central Java. Based on the survey results in Table 3, consumers who buy wood products consist of 79% men and 19% women. Buyers are dominated by productive age, which is in the age range 41-65 years by 56 % and 30-40 years by 32%. Considering educational background, respondents are dominated by elementary-high school graduates by 45% and diploma-graduate graduates by 37%. In terms of the type of work or profession, respondents are dominated by private sector workers at 34% followed by entrepreneurs/business owners at 56%

To find out consumer behavior, a sampling was made with a total of 230 respondents with 180 interviews conducted directly in filling out the questionnaire and 50 people filling out the questionnaire online. This survey is expected to represent consumers of wood products in Central Java. Based on the survey results in Table 3, consumers who buy wood products consist of 79% men and 19% women. Buyers are dominated by productive age, which is in the age range of 41-65 years by 56 % and 30-40 years by 32%. In terms of educational background, respondents are dominated by elementary-high school graduates at 45% and diploma-graduate graduates at 37%. Based on the type of work background, respondents are dominated by private sector workers at 47% and followed by entrepreneurs/business owners at 21%.

The Directorate General of Population and Civil Registration (Dukcapil) of the Ministry of Home Affairs noted that the population of Central Java was 37.49 million in June 2022. A total of 25.99 million people (69.34%) of the population in this Central Java Province are in the productive age group (aged 15-64 years). There were 51.8 million households out of a total population of 154.34 million in the Java region in June 2022. Central Java Province has 12.63 million households. This data shows the market potential for housing construction needs in Java in general and in Central Java in particular.

Table 3 Characteristic of consumer

Characteristics of Respondent	Number of Respondent	Percentage
Gender		
Male	181	79%
Female	43	19%
Age		0%
Age <25 years	26	11%
Age 25-40 years	74	32%
Age 41-65 years	128	56%
Age > 65 years	7	3%
Education Background		0%
Elementary School-Senior High School	104	45%
Undergraduate and Diploma	86	37%
Postgraduates	48	21%
Job/Profession		0%
Farmer	20	9%
Government Employee non academicst	26	11%
Academics profession	31	13%
Private worker	107	47%
Busines owner	48	21%

3.3.2. Consumers' preference for the product by type of consumers

Respondents have a preference for replacing wood products. These wood substitute products become inevitable due to several reasons or due to several considerations. Several products that respondents would like to replace related to household needs was furniture, which was 75% followed by construction materials, home decoration or handicrafts, and child's toys, which were 43%, 32%, and 8%, respectively Figure 32. Several respondents mentioned other types of household needs, which was 8%. Compared to respondents' preferences for the use of wood, the number of respondents who want to replace wood products is lower in proportion. This indicates that customer of wood products has loyalty to wood products.

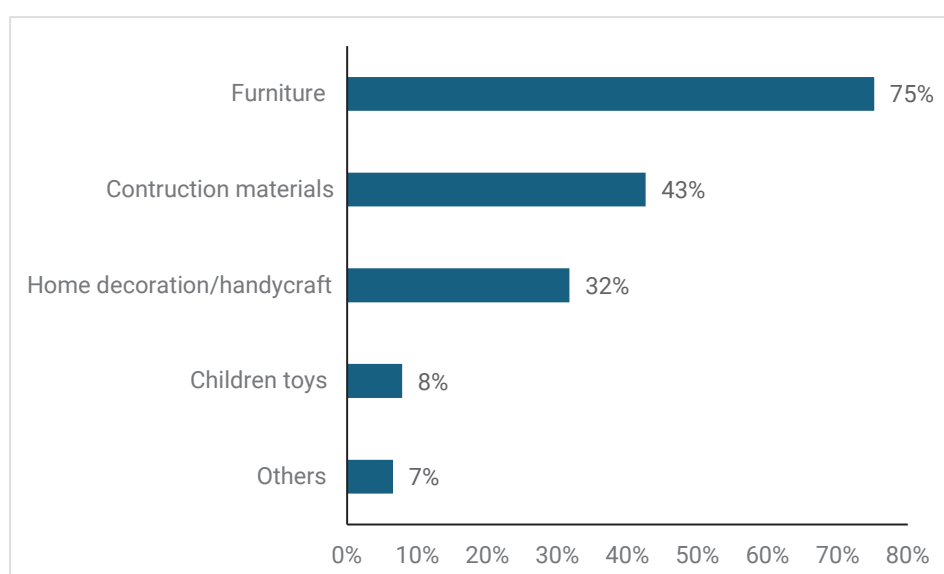


Figure 32 Respondent preference regarding substitute of wood products.

Although wood has a high appeal in household needs, it is often necessary to choose wood substitute products. The highest rank of the considerations or factors in choosing wood substitutes is practicality, which was 59.1%, followed by price, easy to buy, model, durability, ease of maintenance, beauty of appearance, and renewable materials, which was 49.1%, 31.7%, 26.5%, 24.3%, 15.2%, 11.3%, and 7%, respectively. Respondents considered that the practicality of wood substitutes was the choice of using wood substitute products. The practicality of substitute wood products is the main attraction for consumers. This practicality includes several things, such as suitability for limited space conditions, suitable for certain uses, easily available in various sizes, easy to carry/move, and easy to store.

The current type of house is dominated by limited land area, especially housing in the city and the suburbs. With limited land, the houses built are also narrower, so the furniture used also tends to be minimalist, including the selection of wood substitute products also chosen because of their practicality in installation and in moving. This result is also in line with the results of the study that the selection of wood products is also chosen which are simple or minimalist models. To increase the selling value of wood products, it is also necessary to adopt models of household furniture forms that replace wood.

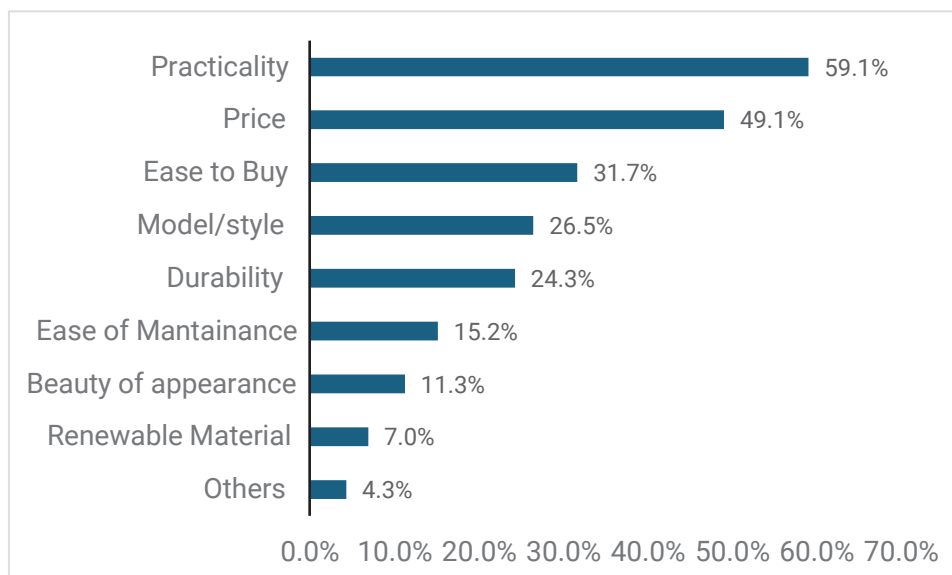


Figure 33 Respondent preference in substitute of wood products

Concerning household needs, this practicality is associated with willingness to pay. The highest willingness to pay of respondents was in the range of 1-5 million with a proportion of 40% followed by the range below 1 million by 21% and the range of 6-10 million by 15% (Figure 34). This range is similar to the willingness to pay for wood products. Interestingly, the percentage of respondents who want to buy a product worth more than 10 million rupiah is quite high, which was 27%. This price range also matches the selection of preferred models. With a price range of IDR 1-5 million, it is expected that the products purchased already have high quality, especially in terms of durability.

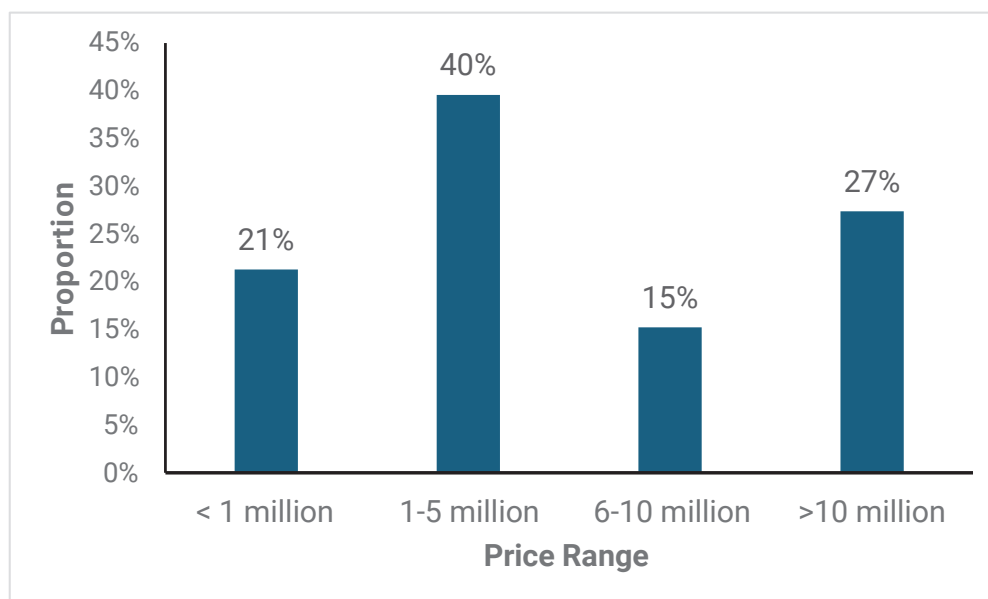


Figure 34 Respondents' willingness to pay for wood substitutes

The preferred design condition of the substitute product is knockdown form, which was 52%, followed by assembled product and built-in/modular, which were 47% and 27%, respectively (Figure 35). The results in this wood substitute product are slightly different from those in wood products. Knockdown models are preferred because there are special needs, for example, families who are still moving or renting. Household furniture that is knocked down in nature is easier to remove and rebuild when moving house or renovating a house

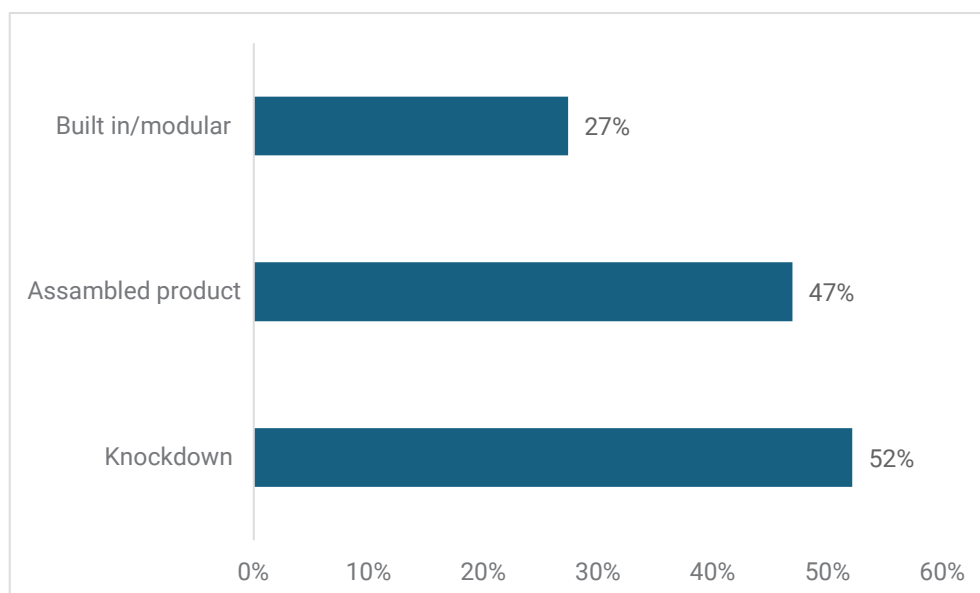


Figure 35 Respondent's preference for the design of substitute products

Considering the quality of domestic wood products compared to imported wood products, 10.4% of respondents stated that domestic products were very good, 39.6% of respondents said domestic products were good, 43.5% of respondents stated that domestic products were quite good, 6.1% of respondent stated that domestic products were less good, and only

0.4% of respondent stated that domestic products were not good (Figure 36 Respondent perception related to the quality of domestic wood products compared to the imported wood products. This information is important because consumer perceptions showed that domestic products are promising and have good competitiveness compared to imported products.

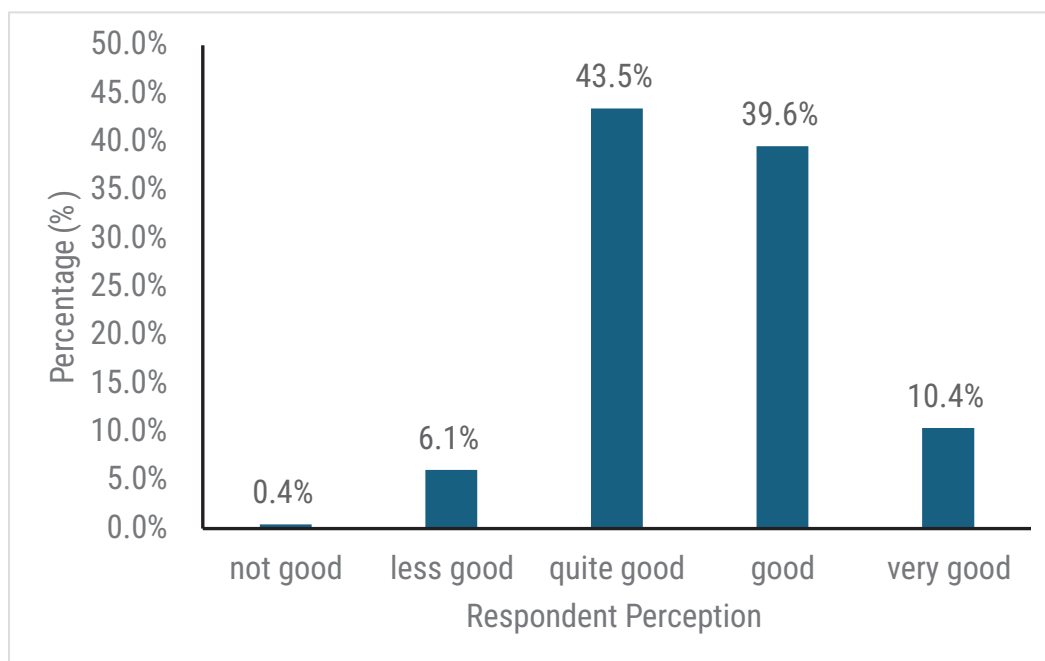


Figure 36 Respondent perception related to the quality of domestic wood products compared to the imported wood products.

In terms of used material for wood products, especially for furniture and home decorations, 92% of respondents prefer to select products made of wood only, 27% of respondents prefer to select a product made of engineered wood, 21% of respondents prefer to select products made of wood and iron/brass, 13% respondent prefer to select products made of wood and textile, 8% respondent prefer to select a product made of wood and resin, 4% respondent prefer to select a product made of wood and stone/granite, and 2% of respondents prefer to select a product made of wood and rattan (Figure 37).

This information indicates that although wood is still a favorite as a necessary ingredient, there has been a shift in the use of materials mixed in products with wood to fulfill certain features. Features that are needed in the category of practicality, for example, increasing comfort in use by adding foam to the seat, and the use of metal or stainless-steel accessories for ease of arrangement.

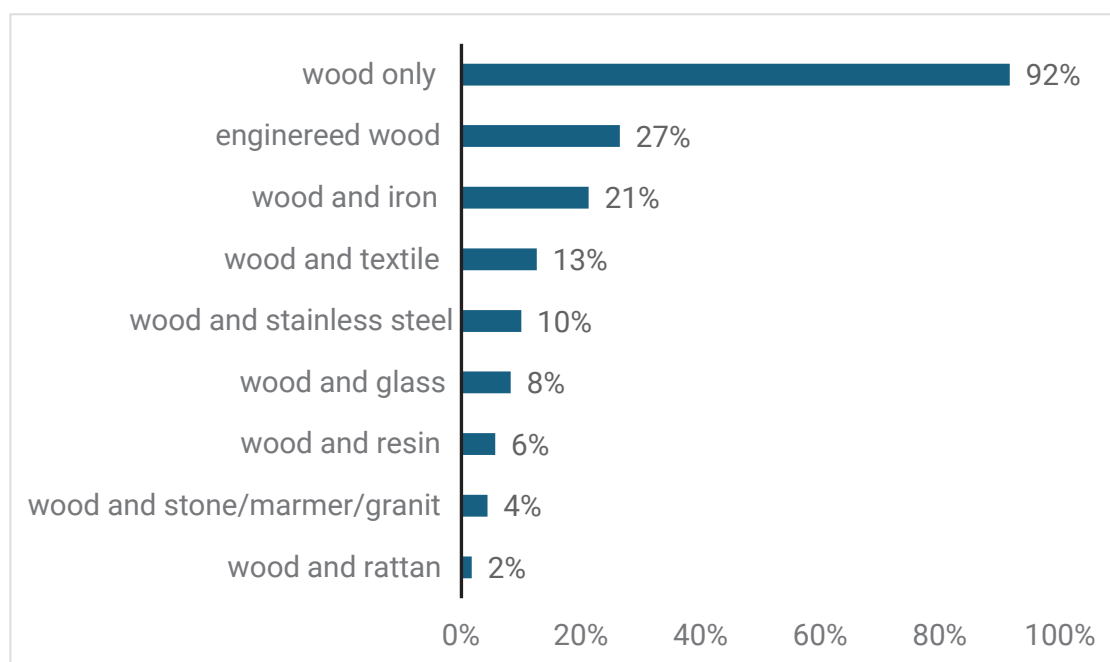


Figure 37 Respondent preference for the material of the wood products.

Consumers' preference for the product by type of consumers (type of products, product design, price, quality, quantity, payment type) has been explained in Activity 1.1. Durability is considered by 73.9% of respondents, followed by model/style, beauty of appearance, price, practicality, ease of maintenance, renewable materials, and easy to buy which were 73.5%, 64.3%, 37.4%, 22.2%, 18.7%, 14.8%, and 14.8%, respectively. A total 87% of respondents chose teak wood as their main choice, followed by mahogany which was 34%. Based on the survey, the number of buyers who have made purchases in the range of IDR 1-5 million has the highest proportion.

Regarding the wood products type, 88% of respondents had experienced buying furniture, 56% of respondents bought construction materials, 46% of respondents bought home decorations or handicrafts, and 10% of respondents bought children's toys. In terms of wood product type, especially for furniture and home decorations, 59% of respondents prefer to buy simple products with no curving, while 26% of respondents prefer products with a small portion of carving and 15% of respondents prefer products with full carving. Built-in or modular furniture is preferred by 59% of respondents.

There are 67% of respondents reported collecting information directly from the shop and 22% of respondents are getting information from social media. The payment or purchase mechanism is also dominated by the direct purchase mechanism to the store, which is 69% of respondents, followed by the online system from the wood manufacture and e-commerce, which are 24% and 7%, respectively.

Wood is a renewable material that is used in at least two or three cycles of use: first, it is used as a product (e.g. sawn timber, wood panels, building construction components, furniture), second in the material recycling process, and thirdly for energy production. No other renewable material can match these advantages of volume and economy. Many materials compete with wood: lightweight steel for windows, steel for large buildings, bricks, concrete or stone for house walls, plastic for furniture, etc. Several (technical) advantages of these competing materials are obvious, but the energy imbalance and environmental balance are

significantly terrible compared to wood. The production of wood products requires very little energy compared to products based on other competing materials. Considering low energy consumption, wood processing has clear advantages in terms of environmental indicators such as greenhouse gas emissions, and global warming potential, acidification, ozone formation, and toxicity potential.

Based on data from the survey showed that considering criteria for selecting wood products is significantly higher than that of substitute products (figure 38). This indicates that respondents have a preference to select wood products based on several criteria such as practicality, price, ease to buy model, durability, ease of maintenance, beauty of appearance, and renewable materials.

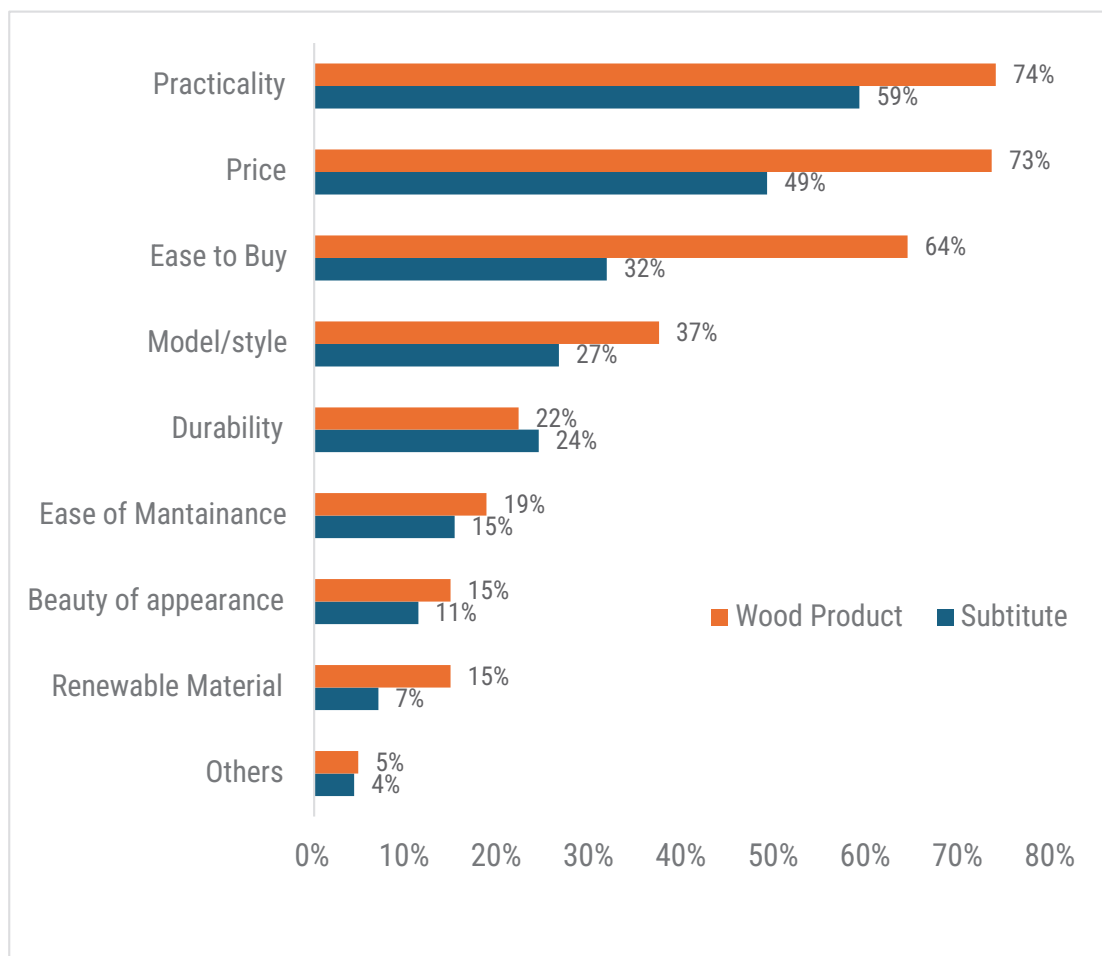


Figure 38 Respondents' preference for considering the criteria for selecting wood products and the substitute

3.3.3. Recommendation for increasing wood product consumption

Recovery of the property market this year is expected to increase demand for wooden furniture. To capitalize on opportunities, wood industries have to carry out plans to expand their market share in the domestic market, including employing reputable designers, increasing product lines for the domestic market, and building a distribution system.

The government and wood industry association are expected to provide scheduled annual fairs in different provinces, so the industries can expand their market share in the domestic market. The fair will also offer opportunities for customers to shop for furniture, and other home furnishing items in various quality with reasonable prices.

To increase the demand for wood products, possible alternatives can be made by increasing the capacity of the wood processing industry, especially increasing the number of industries that are considered industry efficiency. Other solutions that can be pursued are to accelerate the development of industrial plantation forests or similar plantation forests, such as community plantation forests to support industrial needs.

The choice of wood and non-wood products is often also influenced by the quality of the product. This quality is signalled by the fulfillment of standards. Wood substitute products such as iron, plastic, and stainless steel often include compliance with SNI for example and there are also ergonomic considerations. On the other hand, wood products are still relatively lacking in terms of fulfillment of this standard. Buyers tend to be more confident and trust when there is a standard fulfillment logo. In the future, wood products should also fulfill their needs related to the fulfillment of standards.

To meet the standard, two strategies are needed, developing the ability of human resources related to the fulfillment of standards and providing facilities for standard testing. First, the government is expected to be able to work with universities and industry associations to have programs to improve human resource capabilities through structured and scheduled training. Having certified skilled workers who are proficient in quality standards is an obligation for companies. However, it is necessary to consider the ease and low cost of procuring certified skilled workers. Government intervention is very important, especially to strengthen the budget for small and medium industries. Second, the government provides standardized testing facilities for wood products so that the quality of the products can be known. These facilities are in the form of test equipment and certified testing.

Wood is an environmentally friendly material with a lower environmental impact than plastic and metal. Wooden products could help in cutting down carbon emissions because wood is the best for carbon storage. Recently, the new generation required less fossil fuel energy compared to the previous era. Therefore, the government with all its policies must encourage the increased use of sustainable wood raw materials by providing rules that favor wood products, for example, fulfilling the obligation to procure goods for the needs of government agencies by utilizing domestic wood-based products.

Favoring the use of domestic wood products must be given through early education. School children are introduced and given an understanding of the advantages of environmentally friendly wood products. Wood and non-wood products should have the same functionality and consider the use of less energy and emission during manufacture.

There are several strategies to increase wood product consumption, such as management, human resources, innovation, and digitalization. A detailed explanation of for categories is as follows:

- 1) Management
 - a) Establishing market intelligence departments
 - b) Developing smart plans and production control
 - c) Fast coordination and decision
 - d) Develop a powerful system.

- 2) Human Resources
 - a) Training Employee
 - b) Motivation development program
 - c) Salary based on the skill.
 - d) Certified Skill
- 3) Innovation
 - a) New Market Development with unique products.
 - b) Eco-Innovation
 - c) Innovative solutions for design, manufacture, and assembly.
- 4) Digitization
 - a) Flexible information system
 - b) Building information modeling
 - c) Improvement in online communication
 - d) Computer literacy in the company

3.4. Consumer Preferences of Substitute & Wood Products in East Java

3.4.1. Characteristics and type of consumers

The study of East Javan consumers' choices about alternatives to and goods made from wood is based on survey data from the Indonesian Family Life Survey (IFLS), which is an ongoing survey in Indonesia. This group includes over 30,000 people from 13 of Indonesia's 27 provinces, including East Java. It represents about 83% of the country's population. In the IFLS dataset, there is a measure called "non-food consumption" that shows how building materials and furniture are used. This set of data gives us a lot of information about the decisions people make when they need to buy different products for their homes. Individual choices like these show that consumers want certain things. Additionally, interesting patterns in the utilization of wood products that are unique to the East Java region can be observed in the demographic distribution of the dataset.

Table 4 provides a comprehensive overview of essential variables comprising the consumer profile of timber products, thereby illuminating the attributes of the sample under study. To commence, the mean age of the participants is estimated to be around 38.5 years, accompanied by a standard deviation of approximately 18.9 years. This suggests that the age distribution of the sample is relatively broad, as it encompasses individuals from diverse age cohorts. The gender distribution of the respondents is as follows: 51.7% identify as female, whereas the remaining 48.3% belong to the "other" category, which may include males and those who did not provide a gender preference. The data set contains a relatively equitable representation of both genders, as indicated by this distribution.

Upon examining the marriage status of the respondents, it is found that approximately 70.9% are reported to be married, while the remaining 29.1% do not identify as married. This indicates that married individuals are prevalent in the sample. Concerning internet connectivity, it is observed that around 35% of the participants indicate possessing internet access, whereas the remaining 65% do not. This data offers important insights about the level of internet access among the people who were polled.

Multiple tiers of educational achievement are distinguished by the following: elementary, junior high, high school, and tertiary. Approximately 19% of respondents have

completed elementary education, 18.8% have completed junior high school, 3.6% have completed high school, and approximately 10% have a university degree. These numbers provide a comprehensive breakdown of the educational backgrounds of the individuals who participated in the survey.

A large percentage of the respondents likely have little children in their homes, since 51.5% of the responses indicate the presence of children younger than one-year-old. The mean score for health status, as determined by a Likert scale ranging from 4 (indicating excellent health) to 1 (indicating very poor health), is approximately 2.952, with a standard deviation of 0.676. This finding suggests that the surveyed population has a moderate perception of health as a whole, with some variation in how they perceive their health.

Regarding household income, the mean monthly IDR total income is estimated to be around 1,109,876, with a significant standard deviation of around 999,407. The considerable discrepancies in income that are highlighted by this standard deviation are evident in the sample. In addition, the mean number of family members residing in the households of the participants is approximately 4,268; this figure is accompanied by a standard deviation of roughly 1,944; thus, the diversity of family sizes among the individuals surveyed is highlighted. Finally, concerning the place of domicile, the data reveals that around 60.1% of the participants are urbanites, whereas the remaining 39.9% are situated in rural regions.

Table 4 Consumer characteristics

Variables	Measurement	Average	Standard Deviation
Age	Age of the survey participant in years	38.498	18.923
Gender	Categorical: 1 for female; 0 for other	0.517	0.5
Marital Status	Categorical: 1 for married; 0 otherwise	0.709	0.454
Internet Access	Categorical: 1 if they have internet access; 0 otherwise	0.35	0.477
Elementary Education	Categorical: 1 for elementary school; 0 otherwise	0.19	0.392
Junior High School	Categorical: 1 for junior high school; 0 otherwise	0.188	0.391
High School	Categorical: 1 for high school; 0 otherwise	0.036	0.185
University	Categorical: 1 if they have a university degree; 0 otherwise	0.1	0.299
Presence of Children	Number of children under 1 year old	0.515	0.5
Health Status	Likert scale: 1 for very unhealthy to 4 for very healthy	2.952	0.676
Monthly Income	Total monthly household income in rupiah	1109876	999407
Family Size	Number of family members	4.268	1.944
Residence Type	Categorical: 1 if living in a village; 0 otherwise	0.601	0.49

Multinomial Logit (MNL) model stands as a fitting and robust statistical tool. Within the field of statistics, the MNL model enables the meaningful analysis of nominal data, facilitating the exploration of consumer preferences across distinct categories of wood products. Through the application of the MNL model to the collected dataset, researchers gain the capacity to assess probability parameters associated with each product category, thereby enabling a comprehensive investigation into the impact of crucial variables such as price, quality, brand, and product features on consumer preferences.

By scrutinizing the coefficients derived from the MNL model, we were able to pinpoint the most influential attributes of wood products in shaping consumer preferences. Additionally, the examination of odds ratios within the analytical outcomes offers valuable insights into the likelihoods associated with specific variables. These findings offer valuable insights that can inform the development of effective marketing strategies tailored to the East Java market. These strategies may encompass competitive pricing strategies, enhancements in product quality, and the cultivation of an appealing brand image, all aimed at aligning products with the preferences of East Java consumers.

Table 5 begins with several model fit statistics that provide insights into the performance of the Multinomial Logit (MNL) model. These statistics include the log-likelihood, likelihood ratio chi-squared test, and pseudo R-squared. The log-likelihood is a measure of how well the model fits the data, with lower values indicating better fit. The likelihood ratio chi-squared test assesses whether the model significantly improves the prediction compared to a null model, and in this case, it is highly significant, suggesting that the model provides valuable insights. The pseudo R-squared (0.0841) indicates the proportion of variance explained by the model, with a higher value implying a better fit.

Moving on to the variables and their coefficients, the analysis reveals several noteworthy findings. Firstly, concerning age groups, there is a negative coefficient (-0.007) for non-reference age groups, indicating a decreasing likelihood of preferring substitute products as consumers move away from the reference age group. In terms of gender (female), the coefficient is -0.047, which is not statistically significant (p-value = 0.243), suggesting that gender does not significantly influence consumer preferences between substitute and wood products. Marital status emerges as a substantial factor, with a negative coefficient of -0.359 and a low p-value (p-value = 0.000). This implies that being married significantly reduces the likelihood of choosing substitute products over wood products. Internet access also plays a significant role, as evidenced by a negative and highly significant coefficient of -0.511 (p-value = 0.000), indicating that consumers with internet access are less likely to prefer substitute products. Educational levels, specifically “Elementary School” and “High School,” exhibit negative coefficients of -0.216 and -0.291, respectively, for substitute products, both statistically significant. However, “Junior High School” and “University” levels do not significantly impact preferences. The variable “Children” shows a negligible coefficient of -0.017 (p-value = 0.755), suggesting that the presence of children does not significantly affect product preferences. Perceived health status influences preferences, as indicated by a negative coefficient of -0.147 (p-value = 0.000), suggesting that individuals with a perception of better health are less likely to prefer substitute products. Income level is a substantial determinant, with a coefficient of 0.000 (p-value = 0.000), signifying its significant influence on consumer preferences. Family size, represented by the “Family member” variable, has a non-significant coefficient of -0.013 (p-value = 0.278), indicating that family size does not substantially impact preferences. Urban residence is a significant driver of preference, with a highly negative coefficient of -1.222 (p-value = 0.000), implying that urban residents are much less likely to prefer substitute products over wood products.

Table 5 Multinomial logit estimation of consumer preference for substitute and wood products in East Java

Variable	Substitute products	Wood products		
		Coef.	Std. Err.	Prob.
Age	References Group	-0.007	0.002	0.000 *
Female		-0.047	0.041	0.243
Marital status		-0.359	0.059	0.000 *
Internet access		-0.511	0.061	0.000 *
Elementary School		-0.216	0.055	0.000 *
Junior High School		0.056	0.057	0.324
High School		-0.291	0.148	0.049
University		0.038	0.090	0.674
Children		-0.017	0.053	0.755
Health		-0.147	0.030	0.000 *
Income		0.000	0.000	0.000 *
Family member		-0.013	0.012	0.278
Urban		-1.222	0.043	0.000 *
Constant		-0.187	0.151	0.213
Log likelihood	-13076.129			
LR chi2(26)	2401.31			
Prob > chi2	0.000			
Pseudo R2	0.0841			
Number of obs	2940			

The results derived from the MNL estimation offer several valuable lessons for understanding consumer preferences for substitute and wood products in East Java. Firstly, marital status emerges as a key determinant, with married individuals displaying a notable inclination towards traditional wood products. This highlights the importance of considering marital status when tailoring marketing strategies. Additionally, the impact of internet access cannot be understated, as consumers with such access tend to favor wood products, emphasizing the significance of digital channels in marketing and sales. Educational levels also play a role, with those completing elementary or high school expressing a preference for wood products, suggesting the need for educational targeting in marketing efforts. Moreover, the strong urban-rural divide in preferences underscores the importance of regional strategies. Age, income, and perceived health status further influence choices, offering segmentation opportunities for businesses. The sensitivity of preferences to income levels emphasizes the need for pricing strategies aligned with consumers' income.

The study on consumer preferences regarding wood products has been conducted via an internet-based survey. The respondents were timber product consumers whose identities were confirmed via screening inquiries. While the study fails to provide an overall representation

of consumer preferences, it unequivocally indicates the inclinations of consumers in East Java towards wood products.

Table 6 Respondent Profiles

Variable		Frequency	Percentages
Gender	Male	63	0.56
	Female	50	0.44
Marital Status	Single	29	0.26
	Widow or Widower	5	0.04
	Married	79	0.70
Education Level	College	83	0.73
	Elementary School	1	0.01
	High School	28	0.25
	Junior High School	1	0.01
Employment	Lecturer	1	0.01
	Housewife	7	0.06
	Private Employee	13	0.12
	Student	13	0.12
	Civil Servant (PNS) / State-Owned Enterprise Employee	1	0.01
	Civil Servant (PNS) or State-Owned Enterprise Employee	54	0.48
	Retiree	1	0.01
	Retired Civil Servant	1	0.01
	Entrepreneur	22	0.19

The consumer survey about timber products in East Java unveils a heterogeneous demographic that exhibits noteworthy patterns. Based on the data, it can be inferred that the married majority of respondents (69.912%) and males (55.752%) constitute the principal consumers of wood products. With 73.451% of respondents holding a bachelor's degree or higher, the survey reveals a preponderance of individuals with advanced degrees, indicating that consumers of these products are historically more educated. The respondents' occupational profile exhibits considerable diversity; however, a considerable proportion of individuals (19.47%) are entrepreneurs or civil servants or employees of state-owned enterprises (47.79%). This proportion may indicate that the respondents enjoy economic stability or are engaged in commercial activities that frequently involve the use or purchase of wood products. The information contained in this dataset is of utmost importance for businesses operating in this industry, particularly about adapting and targeting their products to the preferences and requirements of their target demographic.

Eastern Java's customer study on wood products provides various insights that might help create effective company strategies. To begin with, a notable disparity in survey participation exists between the sexes, with males predominating. This finding implies that males might exhibit a greater propensity for engaging in the purchase or decision-making process about timber products. Furthermore, a significant proportion of the participants

declare themselves to be “married,” suggesting that wood products could potentially be utilized for domestic objectives, including furniture construction or renovations, which are associated with the stability of the family. The respondents’ elevated educational attainment signifies a heightened consciousness and admiration for the sustainability and superior quality of wood products, in addition to the possibility of possessing greater purchasing power. The respondents’ primary occupations are also significant factors, as a considerable proportion of them are civil servants, employees of state-owned enterprises, and entrepreneurs, each of whom may have unique product preferences and requirements. The survey findings offer significant contributions towards informing focused marketing tactics, product innovation, and a more comprehensive comprehension of socioeconomic patterns in East Java.

3.4.2. Consumers’ preference for the product by type of consumers

Figure 23 presents data on consumer preferences for wall materials in East Java, Indonesia. The results indicate that the overwhelming majority of respondents, 79.369%, prefer masonry materials such as cement or prefabricated bricks for constructing walls. This preference likely stems from the durability and strength associated with masonry, making it a popular choice for permanent structures. In contrast, lumber, board, or plywood is chosen by 16.642% of consumers, suggesting that while still relatively popular, these materials are less favored than masonry. Bamboo, woven, or mat materials are selected by 3.19% of respondents, indicating a minimal preference, possibly due to these materials being perceived as less durable or more traditional. Other materials are chosen by 0.777% of respondents, reflecting a very low preference for alternatives not specified in the table. The categories ‘Don’t know’ and ‘Missing’ account for 0.013% and 0.008% respectively, indicating a negligible portion of respondents who either did not have an opinion or whose responses were not recorded. This data demonstrates a strong preference for modern, durable wall materials among consumers in East Java, with masonry being the predominant choice.

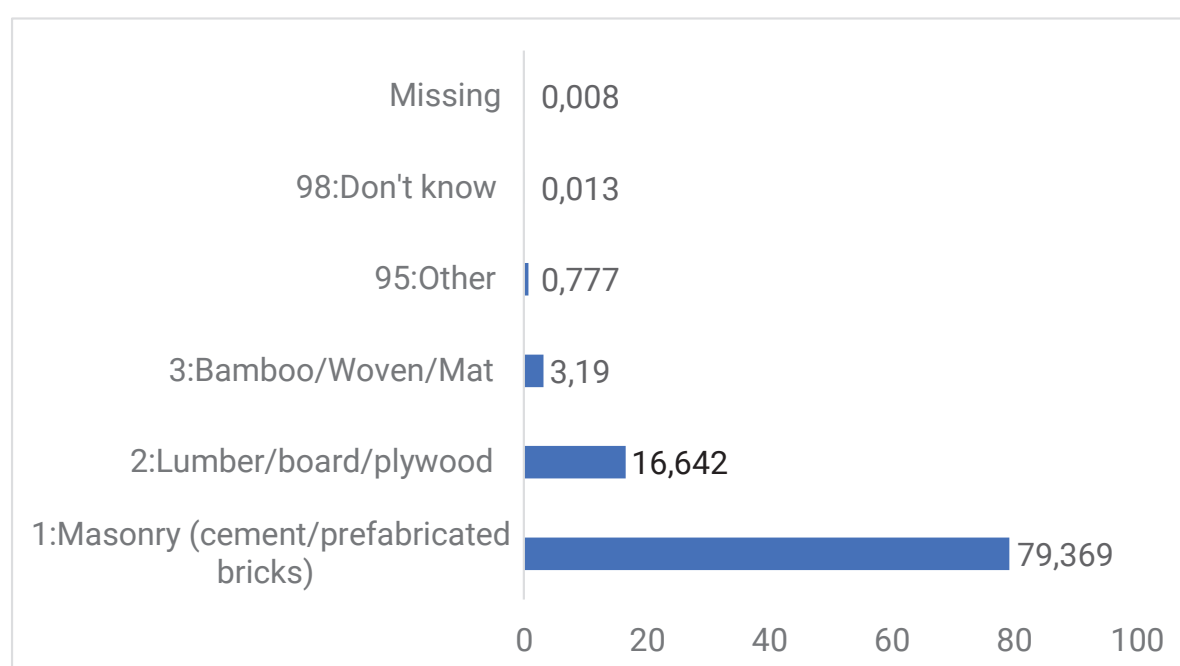


Figure 39 Consumer preferences for wall materials

Figure 40 illustrates consumer preferences for flooring materials in East Java, Indonesia. The data reveals that a significant majority, 51.479%, favor ceramic, marble, granite, or stone for flooring, likely due to these materials' durability, aesthetic appeal, and ease of maintenance. Cement or brick floors are the second most popular choice, preferred by 21.099% of respondents, suggesting their practicality and robustness in various building contexts. Tiles and terrazzo follow, with 13.759% of consumers opting for these materials, which are known for their durability and variety of designs. Lumber or board flooring is chosen by 9.588% of respondents, indicating a preference for wooden materials despite potential concerns about their longevity and maintenance. Dirt floors are selected by 3.814%, possibly reflecting usage in more traditional or rural settings where other materials may not be as accessible or affordable. Bamboo is the least preferred, with only 0.186% of respondents choosing it, likely due to its perceived lack of durability compared to other materials. Categories 'Other', 'Don't know', and 'Missing' account for 0.051%, 0.016%, and 10.008% of the responses, respectively. The relatively high 'Missing' percentage suggests a need for further investigation into why these responses were not recorded. This finding pointed out a strong consumer preference for high-quality, durable flooring materials, with ceramic, marble, granite, and stone being the predominant choices in East Java.

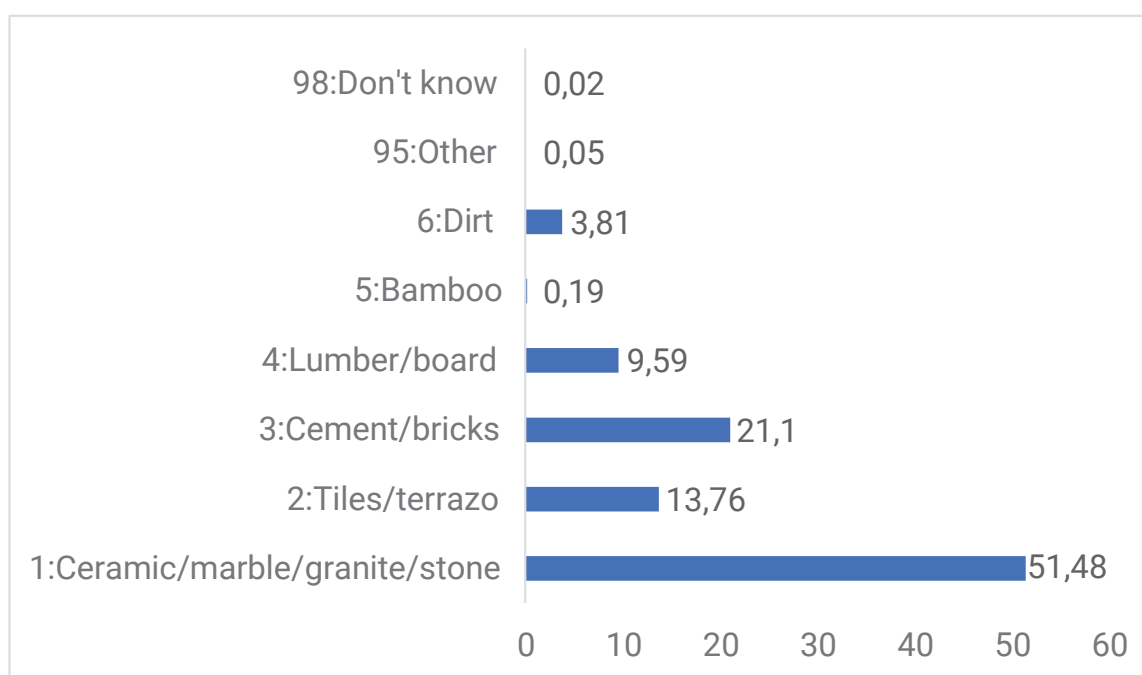


Figure 40 Consumer preferences for flooring materials

Figure 41 presents data on consumer preferences for roofing materials in East Java, Indonesia. The majority of respondents, 41.334%, prefer roof tiles or shingles, which are likely favored for their durability, weather resistance, and aesthetic appeal. Wood is the next most popular choice, selected by 11.078% of consumers, indicating a preference for traditional, natural materials that offer a rustic appearance despite potentially higher maintenance. Foliage, palm leaves, grass, or bamboo roofs are chosen by 10.5% of respondents, suggesting that a significant portion of the population still uses these traditional, eco-friendly materials, possibly due to cultural reasons or cost considerations. Asbestos is selected by 9.83% of respondents, reflecting its continued use despite health concerns associated with this material. Metal plates are preferred by 8.5% of respondents, likely due to their durability

and resistance to extreme weather conditions. Concrete roofs are chosen by 1.528% of respondents, indicating a limited preference, possibly due to higher costs or installation complexity. The categories 'Other,' 'Don't know,' and 'Missing' account for 0.223%, 0.03%, and 0.008% of the responses, respectively, indicating negligible portions of respondents with unclear preferences or unrecorded responses. Overall, the data highlights a diverse range of roofing material preferences in East Java, with a strong inclination towards roof tiles or shingles for their reliability and aesthetics.

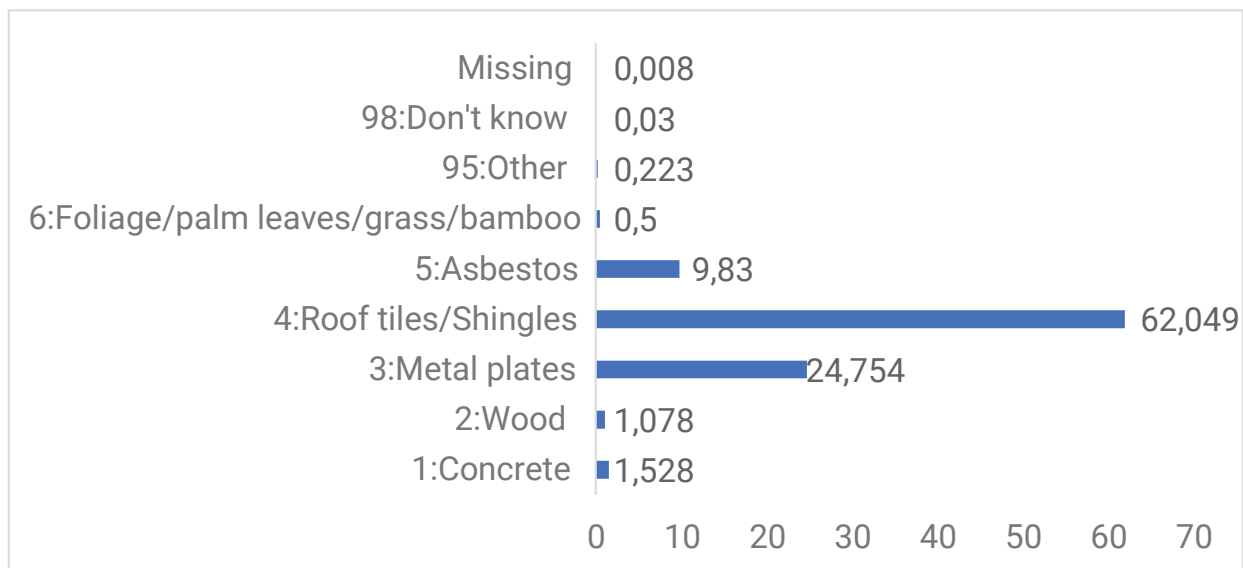
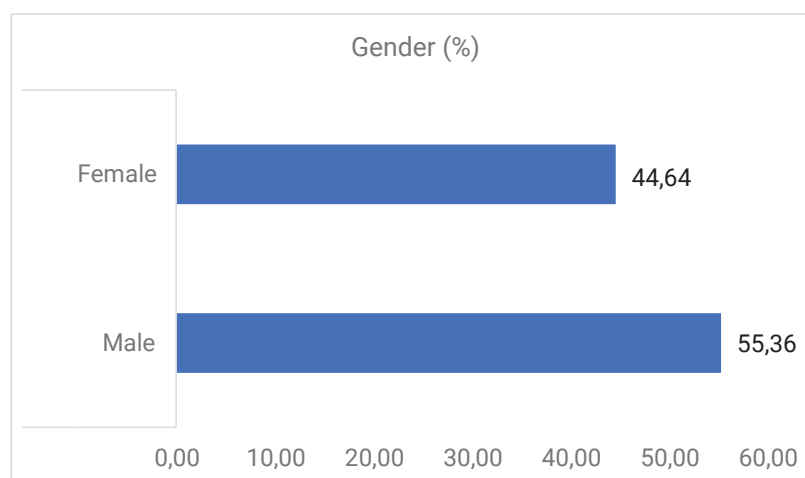


Figure 41 Consumer preferences for roofing material

A study on consumer preferences for wood products other than building materials was conducted through a survey of end consumers. The respondents were verified as wood product consumers through screening questions. Although this study cannot provide a comprehensive representation of consumers in East Java, it indicates consumer tendencies toward wood products.



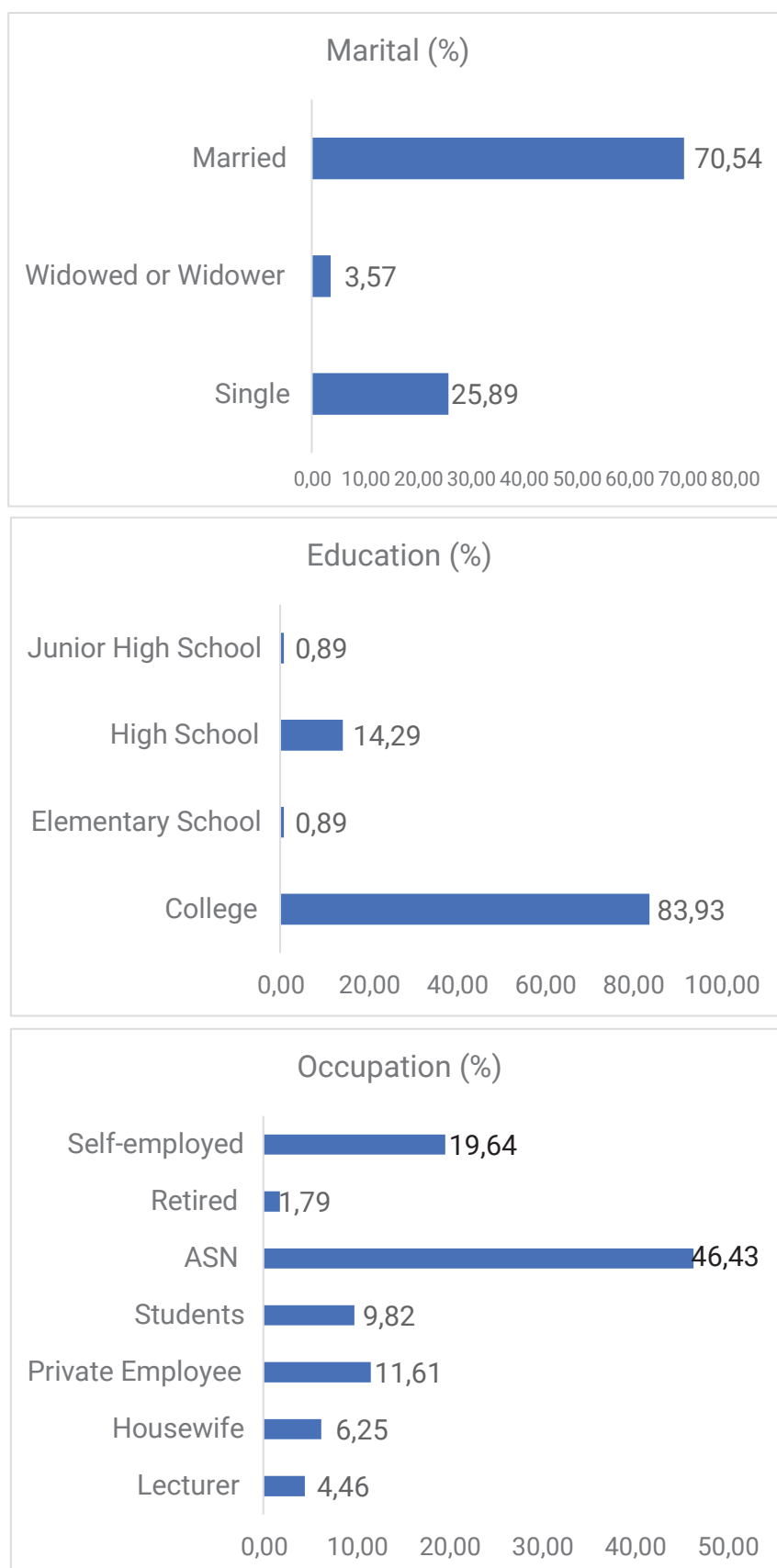


Figure 42 Profile of respondents who are consumers of non-building wood products

A consumer survey related to wood products in East Java reveals a heterogeneous demographic. As shown in Figure 42, the majority of respondents are male (44.64%), although the proportion of female consumers is also significant (55.36%). In terms of marital status, most consumers of non-construction wood products are married (70.54%), while the remaining 28% are either single (unmarried, widowed, or divorced). Regarding educational attainment, the majority of consumers have graduated from college (83.93%), with the rest having completed junior high school (14.29%), and a few having primary or high school education. In terms of occupation, civil servants or those working in state institutions (BUMN) are the dominant consumers (46.43%) of non-construction wood products in East Java. Additionally, 19.64% of consumers are self-employed, with the data also showing relatively small proportions of consumers who are retirees, housewives, lecturers, students, and private employees.

This study provides various insights that can help create effective company strategies. Firstly, there is a noticeable difference in survey participation between genders, with males dominating. This finding implies that men may show a greater tendency to engage in purchasing or decision-making processes related to wood products. Additionally, the majority of respondents identified as “married,” indicating that wood products are potentially used for household purposes, including construction or furniture renovation, associated with family stability. The higher education level of respondents suggests greater awareness and appreciation of sustainability and superior quality wood products, along with the possibility of having greater purchasing power. The primary occupations of respondents are also a significant factor, as most of them are civil servants, state-owned enterprise employees, and entrepreneurs, each with unique product preferences and requirements. These survey findings significantly contribute to informing targeted marketing tactics, product innovation, and a more comprehensive understanding of socio-economic patterns in East Java.



Figure 43 Types, usage, shopping methods, and consumer locations

Figure 43 illustrates the distribution of frequency and percentage of various variables related to consumer preferences for wood used for non-construction purposes. The majority of consumers (70.54%) prefer teak wood, followed by other types of wood (27.68%), with only a small proportion choosing mahogany (0.89%) and pine (0.89%). This indicates that teak wood is the primary choice for consumers, likely due to its high quality and durability. Meanwhile, mahogany and pine, despite having a very small proportion, may have a more limited or specific market niche.

Most consumers (95.54%) use non-construction wood-based products (furniture), while only a few do not use wooden furniture at all. This suggests that wood remains a favored material for furniture making among most consumers. Factors such as strength, aesthetics, and sustainability of wood likely play a significant role in consumer preference for wooden furniture.

Furthermore, offline shopping methods are more popular, chosen by 78.57% of consumers, while 21.43% opt for online shopping. This indicates that although online shopping is becoming more popular, the majority of consumers still prefer to shop directly in physical stores or outlets. This preference may be influenced by the need for a direct experience with the product before purchase, as well as the desire to see and touch the items firsthand before making a decision. Based on residential variables, the majority of consumers (56.25%) live in urban areas, while 43.75% reside in rural areas.

Figure 44 presents the preferences of respondents in East Java regarding processed wood materials, utilizing an overlapping choice method where respondents could select up to three preferred wood materials. The dominant preference among respondents was Solid Wood, with a proportion of 90.3%. This indicates a strong inclination towards solid wood materials in East Java. Solid wood was the most favored choice, with most respondents seemingly prioritizing its use in their wood processing activities. Other materials, such as Processed Wood, Medium Density Fiberboard (MDF), Laminate, and Wood Composite, accounted for smaller proportions, with percentages of 8.8%, 7.1%, and 2.7%, respectively. This suggests that while there is a primary preference for Solid Wood, there remains some diversity in material choices among some respondents.

Engineered Wood, in particular, was chosen in combination with Solid Wood by some respondents, indicating a willingness to explore options that integrate both traditional and modern materials. The combination of materials, such as solid wood with particleboard, laminate, MDF, veneer/plywood, and wood composite, reflects a tendency among some respondents to opt for composite materials. These combinations may be driven by factors such as cost-effectiveness, availability, or specific functional requirements. Although Solid Wood remains the primary choice, the combination with other materials reflects a dynamic and evolving approach to wood processing.

Laminates, MDF, particleboard, veneer/plywood, and wood composites were individually selected by smaller percentages of respondents, indicating a segmented market with preferences distributed across various wood processing materials. The findings show the popularity of Veneer/Plywood and Particleboard, each favored by a proportion of 13.3%.

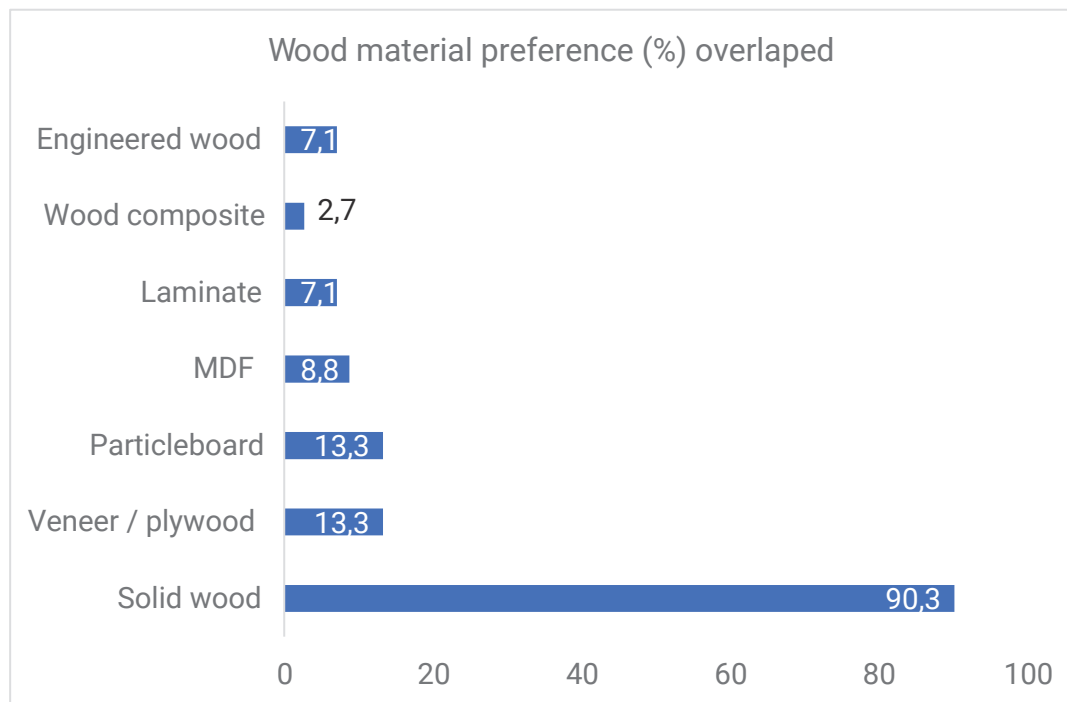


Figure 44 Respondents' preferences for wood materials in East Java

Consumer preferences for solid wood indicate a need for the wood industry to develop premium products that use solid wood as the primary material. However, there is also a segment of consumers who prefer engineered wood products, MDF, laminates, and wood composites, necessitating product diversification within the industry. Additionally, the combination of solid wood with other materials such as particleboard, laminates, and MDF highlights consumer interest in composite materials, underscoring the importance of innovation in the development of composite materials.

Figure 45 presents the distribution of furniture design preferences among respondents, expressed as percentages. The data indicate a marked inclination towards modern and stylish furniture (44.24%), reflecting a contemporary aesthetic preference among the surveyed individuals. The next category, classic and traditional designs, represents 32.74% of the respondents, suggesting that a significant portion of the population values classic and conventional furniture styles. In contrast, the custom design category has a relatively lower percentage at 23.01%.

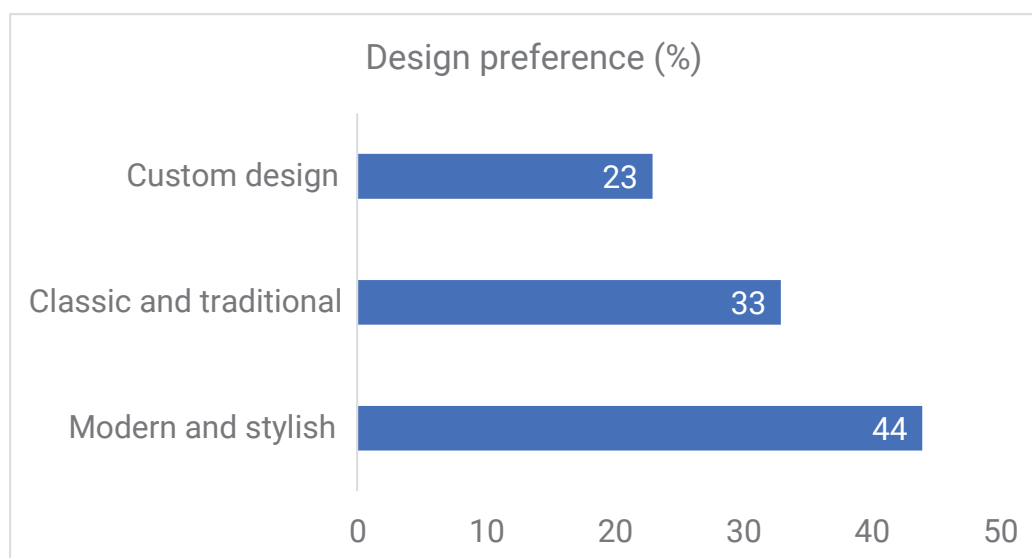


Figure 45 Respondents' preferences for wooden furniture design

In East Java's wood industry, which operates in the furniture sector, a focus on modern and stylish designs can be advantageous. However, given that classic and traditional design categories remain popular among a significant portion of the population, the wood industry should consider including products with classic and traditional designs in their portfolio. Although the percentage of custom designs is lower, it cannot be overlooked, as there remains a subset of respondents interested in custom products.

Figure 46 presents respondents' preferences for various design aspects categorized by priority, with respondents able to select more than one option (overlapped selection). The design aspects include Functional and Vintage Design, Modern and Minimalist Aesthetics, Flexibility, Multifunctionality, Sustainability, Customizability, and Cutting-edge Technology. The majority of choices indicate that flexibility and multifunctionality are primary considerations for consumers when selecting wooden products, with a proportion of 58.4%. This is followed by a 47.8% proportion for modern and minimalist aesthetics, reflecting consumer preference. Sustainability is noted with a proportion of 18.6%, while the use of advanced technology receives 8.8%, and design suitability for custom orders accounts for 7.1%. Only a small segment of consumers considers functionality and traditional aesthetics in their purchase decisions for wooden products. These results suggest that respondents exhibit diverse preferences, with a predominant inclination towards modern and minimalist aesthetics, as well as flexibility and multifunctionality. Sustainability, customizability, and advanced technology also play a role in shaping their design preferences, though to a lesser extent. These findings reflect a nuanced approach to design considerations, balancing contemporary aesthetics with functional features.

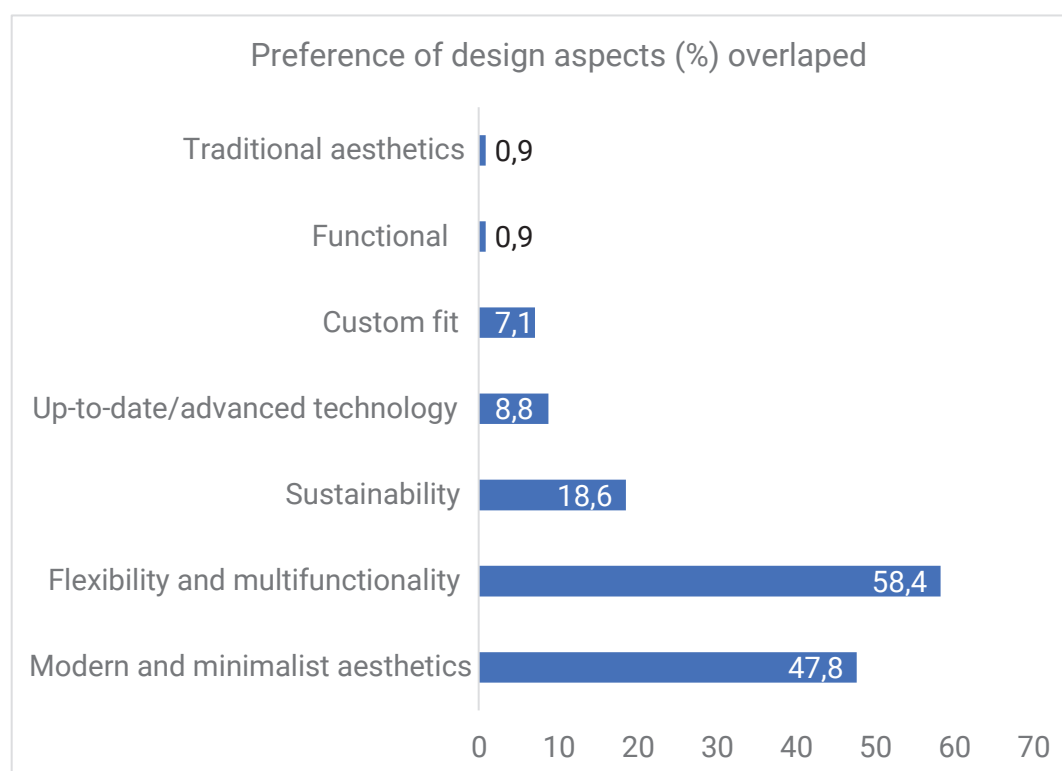


Figure 46 Respondents' preferences on the design aspects of furniture made from processed wood

Furniture manufacturers and craftsmen can focus on developing products with simple, clean, and functional designs that align with the prevailing modern and minimalist aesthetic preferences. Additionally, the development of multifunctional and custom products tailored to customer needs is crucial to meet market demands for flexibility in furniture use. Choosing environmentally friendly materials and integrating cutting-edge technology into designs can also enhance product competitiveness in an increasingly competitive market.

Figure 47 presents the percentage of certifications for two standards: FSC (Forest Stewardship Council) and SVLK (Timber Legality Verification System). These certifications play a crucial role in ensuring sustainable and legal practices in the forestry industry. FSC certification indicates that forests are managed responsibly, considering ecological, social, and economic factors to maintain a healthy balance. On the other hand, SVLK certification indicates the prevalence of timber products verified for legality through the Timber Legality Verification System. This certification is critical in preventing illegal logging and ensuring that timber products available in the market come from legal and traceable sources. The majority of consumers do not pay much attention to certifications when choosing timber products. Nevertheless, nearly half of the consumer base considers SVLK certification when selecting processed timber products, while only a few consider FSC certification.

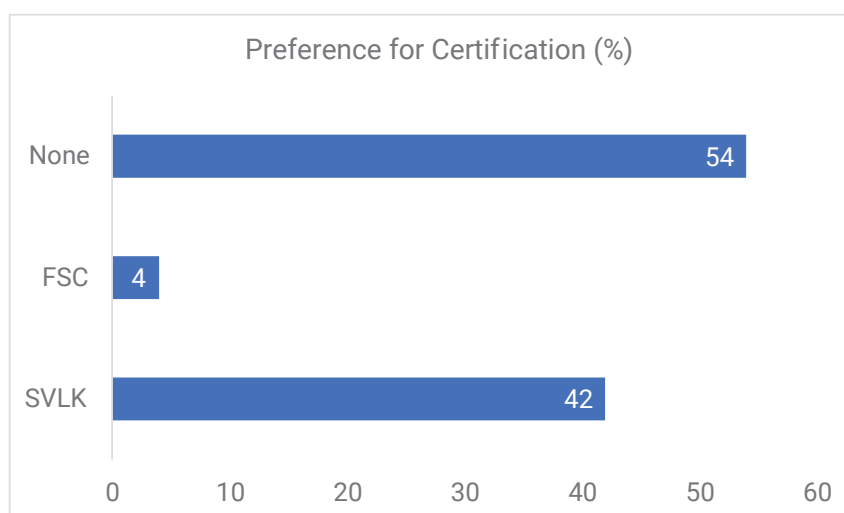


Figure 47 Respondents' preferences for wood product certification

To enhance consumer awareness about wood certification schemes such as SVLK and voluntary schemes, educational campaigns, clear labeling, and certification on products can be implemented. Additionally, technical measures such as collaborating with retail stores to feature these campaigns are also crucial for supporting environmental sustainability and highlighting the importance of wood certification.

Figure 48 illustrates the distribution of furniture purchases across various locations in East Java, categorized into three main sources: artisans, furniture stores, and online shops. The highest percentage of furniture purchases is found in furniture stores, accounting for 61.06%. This indicates that the majority of consumers in East Java prefer to buy furniture through specialized retail outlets that focus on furniture sales. Artisans contribute to a relatively lower percentage of furniture purchases, at 29.20%. This suggests that most consumers still value the expertise and personal touch offered by skilled artisans when purchasing furniture. In contrast, online stores represent a smaller market share, at 9.73%.

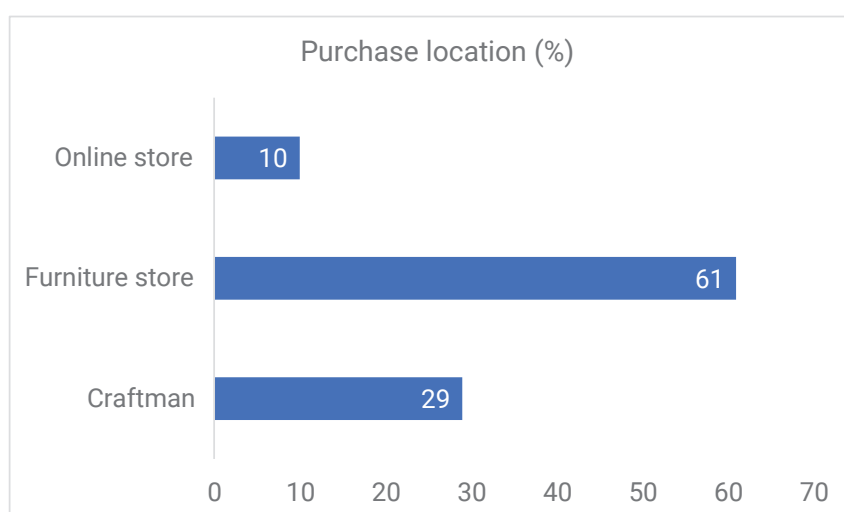


Figure 48 Furniture stores accessed by respondents

Overall, the data reveal a diverse trend in the East Java furniture market, characterized by a substantial reliance on traditional furniture stores, a significant presence of skilled craftsmen, and an emerging trend toward online furniture purchases. Based on these findings, wood processing companies might consider measures such as product diversification and partnerships with traditional furniture stores.

Figure 49 illustrates respondents' perceptions of various aspects of wooden furniture in the East Java market. This analysis includes the price of the furniture, quality, design, seller location, and level of innovation. Regarding furniture price, the majority of respondents (56.637%) consider the price to be "Moderate," while 34.513% perceive it as "Expensive." A smaller percentage view it as "Cheap" (4.425%), and the same percentage considers it "Very Expensive." When evaluating the quality of wooden furniture in the market, most respondents (53.982%) rate it as "Good," with a significant percentage rating it as "Moderate" (33.628%). A smaller proportion views the quality as "Very Good" (10.619%), and only 1.77% consider it "Poor." Concerning the design or model of the wooden furniture, the majority of respondents (56.637%) find it "Attractive," while 33.628% consider it "Moderate." A smaller percentage rates it as "Very Attractive" (8.85%), and only 0.885% view it as "Poor." When evaluating seller location, most respondents (61.062%) find the distance to be "Moderate," while 31.858% consider it "Close." A small percentage views it as "Far" (3.54%), "Very Close" (2.655%), and only 0.885% consider it "Poor." In terms of innovation, nearly half of the respondents (47.788%) regard the wooden furniture in the market as "Innovative," while 38.053% consider it "Moderate." A smaller proportion sees it as "Less Innovative" (5.31%), "Not Innovative" (7.965%), and a very small percentage (0.885%) view it as "Very Innovative." In the final question, respondents were asked about the necessity of strategic measures for conveying information about innovation and the wooden furniture market in East Java. The majority of respondents (43.363%) consider it "Very Necessary," while 38.053% find it "Necessary." A smaller percentage view it as "Moderately Necessary" (15.929%), "Not Necessary" (0.885%), and "Not at All Necessary" (1.77%).

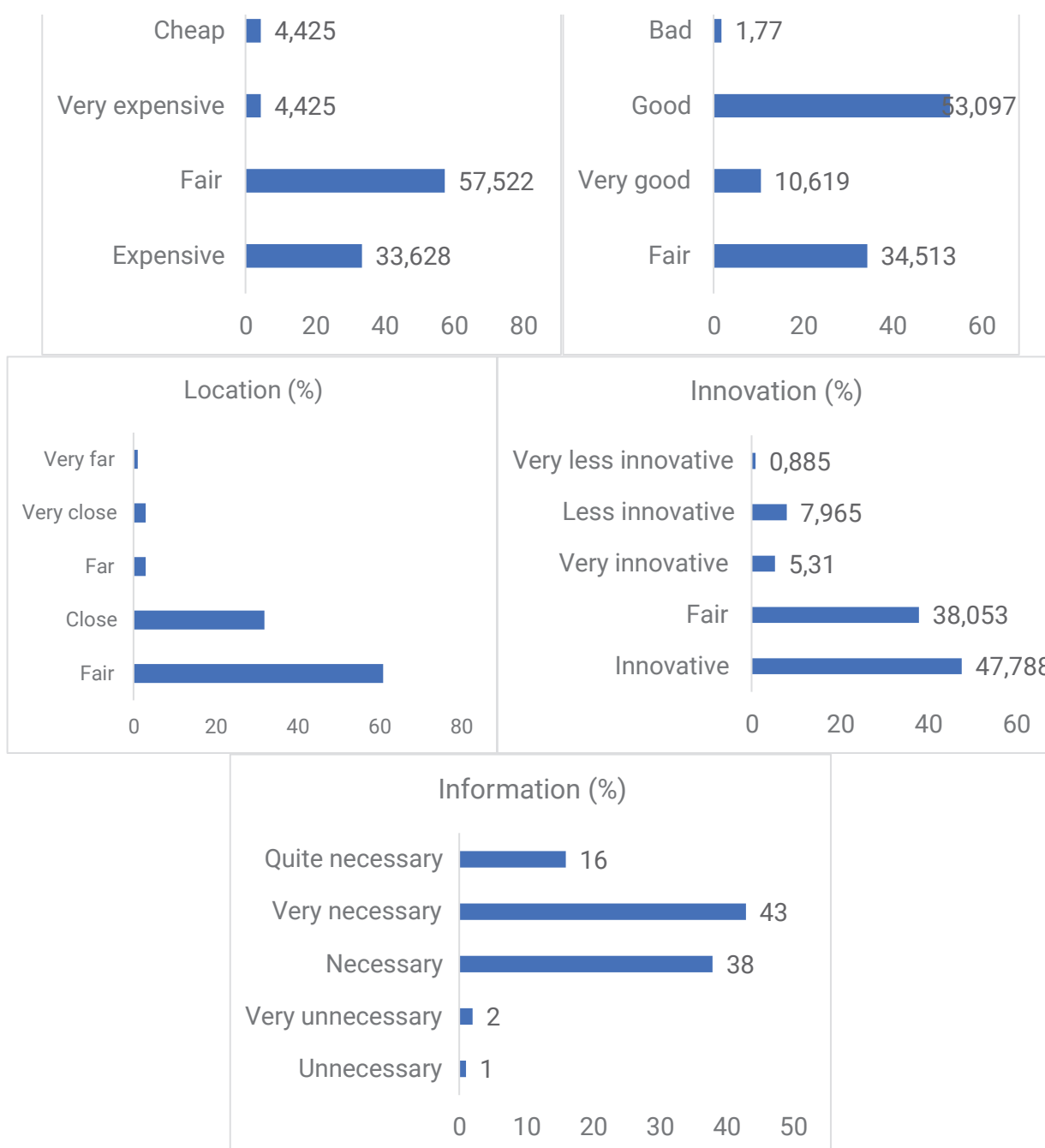


Figure 49 Respondents' perceptions of price, quality, location, and innovation in furniture

Table 7 highlights a comprehensive overview of respondent perceptions on strategic steps to educate the community regarding wood-processed products. The various strategies encompass a wide range of approaches, each contributing to a holistic and multifaceted educational initiative. These strategies can be broadly categorized into environmental policies, collaboration with educational institutions, utilization of online and offline channels, participation in wood product exhibitions and festivals, development of online educational materials, mass media awareness, and workshops and training programs. One notable aspect highlighted in the data is the recognition of environmentally friendly and sustainable market policies, with one respondent (0.89%) emphasizing the importance of systemic rewards for

sustainable wood product buyers, such as tax incentives. This suggests a growing awareness of the need to align economic incentives with environmentally conscious consumer behavior, reinforcing the notion that sustainable practices can be financially beneficial. Collaboration with schools and universities emerges as a prominent theme, with 4.43% of respondents emphasizing its importance. This signifies a recognition of the educational sector's pivotal role in disseminating knowledge about wood-processed products. The collaboration not only extends to schools and universities but also involves workshops and training programs, indicating a desire to engage with both formal and informal educational settings. The combination of online and offline approaches is suggested by 0.89% of respondents, acknowledging the diverse ways in which information can be disseminated. In the digital age, leveraging online platforms for education is seen as complementary to traditional offline methods, ensuring a wider reach and greater impact. Wood product exhibitions and festivals emerge as a highly favored strategy, with a substantial 28.32% of respondents endorsing this approach. This indicates a belief in the power of hands-on experiences and direct interactions with wood products to educate and engage the community. Furthermore, the combination of exhibitions and festivals with collaboration, online materials, and other approaches suggests a holistic event-based strategy.

The development of online educational materials is recognized by 2.66% of respondents, emphasizing the importance of digital resources in reaching a broader audience. This aligns with the contemporary trend of utilizing technology for education and underscores the potential of online platforms to facilitate self-paced learning. Mass media awareness is highlighted by 4.43% of respondents, indicating an understanding of the influential role that media plays in shaping public perceptions. The combination of mass media awareness with other strategies suggests a desire to leverage media channels for a more integrated and impactful educational campaign. Workshops and training programs are endorsed by 13.27% of respondents, showcasing a commitment to hands-on, immersive learning experiences. The combination of workshops with other strategies, such as exhibitions, collaboration, and online materials, suggests a comprehensive and interactive approach to education. A noteworthy finding is the emphasis on collaboration across multiple strategies. Respondents frequently combine workshops, mass media awareness, collaboration with educational institutions, wood product exhibitions, and online materials, showcasing a preference for integrated and synergistic efforts in community education.

Table 7. Respondent perception on strategic steps in educating the community regarding wood-processed products

Respondent Perception	Frequency	Percentages
Environmentally friendly and sustainable market policies (e.g., sustainable wood product buyers receive systemic rewards, such as tax incentives)	1	0.89
Collaboration with schools and universities	5	4.43
Combination of online and offline approaches	1	0.89
Wood product exhibitions and festivals	32	28.32
Wood product exhibitions and festivals, collaboration with schools and universities	1	0.89
Wood product exhibitions and festivals, collaboration with schools and universities, and development of online educational materials	1	0.89

Respondent Perception	Frequency	Percentages
Wood product exhibitions and festivals, development of online educational materials	1	0.89
Development of online educational materials	3	2.66
Public awareness through mass media	5	4.43
Mass media awareness, and collaboration with schools and universities	1	0.89
Mass media awareness, collaboration with schools and universities, and development of online educational materials	1	0.89
Mass media awareness, wood product exhibitions, and festivals	3	2.66
Mass media awareness, wood product exhibitions and festivals, and collaboration with schools and universities	1	0.89
Mass media awareness, wood product exhibitions and festivals, collaboration with schools and universities, and development of online educational materials	2	1.77
Mass media awareness, wood product exhibitions, and festivals, and development of online educational materials	3	2.66
Mass media awareness, wood product exhibitions, and festivals, development of online educational materials, panel discussions, and seminars	1	0.89
Mass media awareness, and development of online educational materials	2	1.77
Workshops and training	15	13.27
Workshops and training, wood product exhibitions and festivals	2	1.77
Workshops and training, wood product exhibitions and festivals, panel discussions and seminars	2	1.77
Workshops and training, wood product exhibitions and festivals, and collaboration with schools and universities	4	3.54
Workshops and training, wood product exhibitions and festivals, collaboration with schools and universities, and development of online educational materials	2	1.77
Workshops and training, wood product exhibitions and festivals, and the development of online educational materials	2	1.77
Workshops and training, mass media awareness	1	0.89
Workshops and training, mass media awareness, and collaboration with schools and universities	2	1.77
Workshops and training, mass media awareness, wood product exhibitions, and festivals	4	3.54
Workshops and training, mass media awareness, wood product exhibitions and festivals, and collaboration with schools and universities	2	1.77
Workshops and training, mass media awareness, wood product exhibitions and festivals, collaboration with schools and universities, development of online educational materials, panel discussions and seminars	10	8.85
Workshops and training, mass media awareness, wood product exhibitions and festivals, collaboration with schools and universities, development of online educational materials, and innovation competitions	1	0.89
Workshops and training, socialization through mass media, wood product exhibitions and festivals, online educational material development, panel discussions, and seminars	2	1.77

3.4.3. Recommendation for increasing wood product consumption

The study's findings are relevant to both industry practitioners and policymakers. Consumer preference is seen in the significant tendency towards classic materials, especially solid wood. Nonetheless, the variety of options that have been noted, including some that include engineered wood, points to a changing strategy within the wood processing sector. The study highlights the need to accommodate a wide range of consumer preferences in the field of furniture design. Noticeable trends include a strong inclination towards modern and trendy aesthetics, a noticeable interest in classic designs, and a preference for customized solutions. Furthermore, the presence of a strong tendency towards contemporary aesthetics in modern hardwood product design, notwithstanding a tiny segment's disinterest, emphasizes the importance of producers balancing traditional and modern features in their goods. From a policy standpoint, it is recommended that innovative wood processing be supported, industry players should collaborate, and comprehensive educational programs that cater to the diverse interests of the community should be implemented. These suggestions, which highlight the need for flexibility and sustainability in the sector, are in line with a sophisticated awareness of the dynamic terrain in both wood processing and furniture design.

The findings of this study are relevant to industry practitioners and policymakers in the forestry and wood processing sectors. Wood industry stakeholders can enhance their competitiveness by taking specific actions based on these findings. Firstly, they might consider diversifying their product offerings by providing various types of wood, including processed wood, to cater to the diverse consumer preferences for both solid wood and traditional materials. Secondly, it is advisable to design products that incorporate both traditional and modern elements, aligning with trends towards contemporary and classical designs as well as customization desires. Educational campaigns for consumers regarding the benefits and variety of wood materials could also improve consumer understanding. Furthermore, industry players are encouraged to continue innovating in wood processing while maintaining product sustainability and diversity, in line with contemporary and traditional trends. Collaboration within the industry, along with further market research to understand consumer trends and preferences, could also serve as strategic steps toward achieving long-term success in the domestic wood market.

In improving processed wood products in the form of furniture wood, craft wood, and construction wood, respondents provide recommendations for increasing the type of quality wood so that it has a long service life at an affordable price for the middle-class community. In addition, the development of innovation for products also needs to be improved by creating attractive and functional designs. The recommendation is to educate the public that using wood products is not an activity that destroys forests but plays a role in protecting the environment. In addition, it is also necessary to hold promotional media to develop processed wood productivity such as through social media and product exhibition events, which are held on a weekly frequency.

IV. CONCLUSIONS AND RECOMMENDATION

4.1. Conclusion

1. Respondents in West Java Province are mostly in the 26-45 year age group and are dominated by females with a high school education level. Their income is generally less than IDR 5 million/month with a private employee job type. The results of the study show that wooden building materials are still in demand by the majority of people in West Java, but substitute products are also in demand. If production efficiency and innovation of wooden building material products are not immediately improved, it seems that substitute products will become tough competitors in the future. For craft products, respondents stated that they were interested to very interested in wooden craft products with a price range of IDR 1,000,000 - 3,000,000. While for furniture products, the design that respondents are interested in is solid wood furniture and in the price range of IDR 1,000,000 - 6,000,000. The payment method chosen by respondents in purchasing wooden products and their substitutes is dominated by the cash payment method. Respondents in West Java chose processed wood products because they have the advantage of a more beautiful appearance and are environmentally friendly. Meanwhile, the most prominent weaknesses of using processed wood products are that they are susceptible to termites and are not fire resistant.
2. Respondents in Banten and DKI Jakarta are mostly in the 26-45 year age group with a female gender dominance and high school education level. The income of the community is generally in the range of less than IDR 5 million/month and IDR 5 - 10 million/month and generally work as private employees. Wooden furniture products are still in demand as they are interested in using wood as a construction and craft material. Respondents in Banten and DKI Jakarta are more interested in using wood than substitute goods, especially types of goods with cheap prices and easy to find because of the price and ease of access to get the product. In Banten Province, the price range for wooden furniture products is from IDR 1,000,000 - 6,000,000 and the opposite is true for respondents in DKI Jakarta with a price range of less than IDR 1,000,000 and IDR 3,000,000 - 6,000,000. For wooden crafts, respondents are willing to pay less than IDR 1,000,000 in Banten Province and IDR 1,000,000 - 3,000,000 in DKI Jakarta. Respondents in Banten choose engineered wood products because they have a more beautiful and environmentally friendly appearance and in DKI Jakarta choose engineered wood products because they are environmentally friendly and stronger. The payment method chosen by respondents in Banten and DKI Jakarta is dominated by the cash payment method.
3. Buyers are dominated by productive age, namely in the age range of 41-65 years with a dominance of elementary school-high school

graduates and diploma graduates with the type of work dominated by entrepreneurs/business owners. Respondents have a preference for replacing wooden products which are dominated by furniture followed by building materials and home decorations. The highest considerations or factors for choosing wood substitute products are practicality followed by price, ease of purchase, model, durability, ease of maintenance, beautiful appearance, and renewable materials. Respondents prefer teak wood followed by mahogany wood. The highest willingness to pay for respondents is in the range of IDR. 1-5 million with a preference for direct purchase methods in stores. The preferred design conditions of wood substitute products are knock down and assembly forms. While for wood products, preferences related to durability are dominated by models, beauty, price, practicality, ease of maintenance, renewable materials, and ease of purchase. Consumer perceptions show that domestic products are quite promising and have good competitiveness compared to imported products.

3. Buyers are dominated by productive age, namely in the age range of 41-65 years with a dominance of elementary school-high school graduates and diploma graduates with the type of work dominated by entrepreneurs/business owners. Respondents have a preference for replacing wood products dominated by furniture followed by building materials and home decoration. The highest consideration or factor in selecting wood substitute products is practicality followed by price, ease of purchase, model, durability, ease of maintenance, beautiful appearance, and renewable materials. Respondents prefer teak wood followed by mahogany wood. The highest willingness to pay of respondents is in the range of IDR 1-5 million with a preference for direct purchase methods in stores. The preferred design conditions of wood substitute products are knockdown and assembly forms. Meanwhile, for wood products, preferences are dominated by durability followed by model, beauty, price, practicality, ease of maintenance, renewable materials, and ease of purchase. Consumer perception shows that domestic products are quite promising and have good competitiveness compared to imported products.
4. Strong consumer preference for solid wood in East Java reflects a strong tendency towards traditional themes. Meanwhile, the variety of choices, including combinations with composite wood and other materials, shows a dynamic and evolving approach to wood processing in the region. In addition, the majority of consumers show a preference for modern furniture, classic designs, and custom designs, with a pronounced tendency towards contemporary design models. There is a dominant tendency to combine modern aesthetics with functionality, with most consumers preferring wood products that are modern, minimalist, and characterized by flexibility and multi-function. Consumers in East Java tend to prefer certified wood products, especially those with SVLK. However, some forestry industry sectors are still not certified, indicating potential for improving sustainable forestry practices. Physical furniture stores are still the main choice for consumers, although there is a growing trend towards online furniture purchases. On average, consumers consider the price of furniture in East Java to be quite affordable, with good quality and attractive designs. The dominant preference for solid wood among consumers in East Java reflects a strong inclination towards traditional materials, while the variety of choices, including combinations with engineered wood and other materials, demonstrates a dynamic and evolving approach to wood processing in the region. In addition, most consumers prefer modern and stylish furniture, showing a substantial interest in classic designs, as well as a marked desire for personalized designs. In

the design of modern wood products, there is a clear trend towards contemporary aesthetics. A balanced approach between modern style and functionality is indicated by the diversity of consumer design preferences, with modern and minimalist aesthetics being the most preferred, as well as flexibility and multi-functionality.

4.2. Recommendation

The findings of this study are relevant to industry practitioners and policymakers. Consumer preferences are seen to have a significant bias towards traditional materials, particularly solid wood. However, the diversity of choices recorded, including some involving engineered wood, suggests a shift in strategies within the wood processing sector. The study highlights the need to accommodate diverse consumer preferences in furniture design. Notable trends include a strong inclination towards modern and trendy aesthetics, a marked interest in classic designs, and a preference for personalized solutions. Furthermore, the strong inclination towards contemporary aesthetics in modern wood product design, despite a small segment of disinterest, highlights the importance of manufacturers balancing traditional and modern features in their products. From a policy perspective, it is recommended that innovative wood processing be encouraged, industry players work together, and comprehensive education programs that cater to the diverse interests of the community be implemented. These recommendations highlight the need for flexibility and sustainability in the sector, along with a sophisticated awareness of the dynamics in wood processing and furniture design. Wood industry stakeholders can improve their competitiveness by taking specific actions based on these findings. First, they can consider diversifying their product offerings by providing a range of wood species, including engineered wood, to meet the varying consumer preferences for both solid wood and traditional materials. Second, it is recommended to design products that combine traditional and modern elements, in line with contemporary and classic design trends and the desire for customization. Consumer education campaigns on the benefits and variations of wood materials can also increase consumer understanding. In addition, industry players are encouraged to continue to innovate in wood processing while maintaining product sustainability and diversity, in line with contemporary and traditional trends. Collaboration within the industry, along with further market research to understand consumer trends and preferences, can also be a strategic step towards achieving long-term success in the domestic wood market.

REFERENCE

Dumairy. 1996. *Perekonomian Indonesia*. Jakarta (ID).

Fathia et al. Consumer attitude and willingness to pay for organic rice. *Indonesian Journal of Business and Entrepreneurship*. Vol 4(1): 11 – 12.

Jamaludin. 2007. *Pengantar Desain Mebel*. Bandung(ID): Kiblat.

Kotler Philip. 1997. *Manajemen Pemasaran Analisis Perencanaan, Implementasi dan Pengendalian (terjemahan Jaka Wasana)*. Jakarta (ID): Salemba Empat

Pratama MA. 2010. Preferensi konsumen dan strategi pemasaran mebel kayu (Studi kasus di Jakarta Selatan). [Skripsi]. Bogor (ID): Institut Pertanian Bogor.

Saptutyningsih Endah. 2007. Faktor-faktor yang berpengaruh terhadap *willingness to pay* untuk perbaikan kualitas air Sungai Code di Kota Yogyakarta. *Jurnal Ekonomi dan Pembangunan*. Vol 8(2): 171 – 182.

Wulandari et al. 2022. Faktor-faktor yang mempengaruhi tenaga kerja industri kayu olahan di Kota Langsa. *Jurnal Ilmu Komputer, Ekonomi dan Manajeen (JIKEM)*. Vol 2(1):229 – 237.



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