

Laminated Bamboo as an Effort to Reduce Wood Consumption

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Abstract. As one of Indonesia's biological resources, bamboo has been a multifunctional type of vegetation. It can be used as material for building construction and for traditional craft that has been supporting the villagers' financial condition. However, due to the development of material technology, bamboo has been left out and replaced by other materials such as concrete, plastic and other composite products which have ecological impact. With lamination technology, bamboo can be considered as 'the future wood' because of its physical potency and its fascinating growth speed. Thus, it can be an alternative substitute for wood because wood has become more and more scarce. However, the effort to reduce wood consumption by using laminated-bamboo based material has not been successful due to the limited socialization on the development of laminated-bamboo-based products. It can be seen from the common use of wood which is still the most preferred material for construction and furniture. This research explored the efforts for producing laminated bamboo based products especially for furniture and architectural aesthetic element that can be used by the community. It was followed by socialization for increasing the community's awareness on the importance of reducing wood consumption.

Keywords: bamboo, laminated, wood, consumption

1 Introduction

Bamboo is a type of plant that has extraordinary diversity. There are approximately 1,000 bamboo species in 80 countries in the world, and around 200 species from 20 countries are found flourishing in Southeast Asia [1]. In Indonesia alone, there are 60 species of bamboo scattered in various regions of the archipelago. This is a natural resource that is very potential to be managed, especially for areas that have bamboo forests because the task of managing bamboo forests and their cultivation is the duty of regional heads and local communities as stipulated by the regional autonomy policy [2]. As raw material, bamboo has long been used to build houses and to make daily necessities, including furniture and home decorations. Traditionally bamboo has also become raw material for handicrafts from generation to generation throughout the archipelago; Java, Bali, Sumatra, Kalimantan, Sulawesi, Nusa Tenggara, Papua [3]. The use of bamboo as raw material for handicrafts is possible because

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of the good nature of bamboo which is easy to work with and has good flexural strength besides being easily available and inexpensive. However, wood is still the prima donna because of its strength, beauty, and processing ease into various products needed by the society.

Consumption and dependence on wood raw materials has in fact caused supply shortages, illegal logging, and worse deforestation that bear global consequences. The rate of forest destruction in Indonesia is among the highest in the world. According to FAO in the Global Forest Resource Assessment 2005, during 2000 to 2005 the damage rate in Indonesia was estimated at 1.9 million hectares per year. So that in overall, Indonesia has lost more than 72% of its total natural forest area and 40% of its forest cover has been destroyed. To improve the condition, a considerable amount of time is needed, because the growing periods of hard wood trees are long, meanwhile the wood consumption always increases rapidly.

2 Literature Review

Considering the potential and benefits of bamboo as a substitute for wood, bamboo should be prioritized over other materials. But in reality this is not the case. This is caused by many factors, including the consumption of wood, rattan, and plastic materials which are relatively more institutionalized than bamboo. Supply of non-bamboo materials such as wood, rattan and plastic materials can still be obtained relatively easily so far. In addition, according to Astana (2001), information on forest products in the form of bamboo itself is still inadequate, including the poor results of research oriented towards agribusiness development. Information constraints and agribusiness product development appear to be still dominant during the development of research, which has not progressed significantly) [2].

Technically, bamboo processing is indeed more difficult than wood. In order to be durable, bamboo must be treated so it is not attacked by powder pests. To make a wide surface area, bamboo must be united and leveled in the form of laminates. Without demands from the public (consumers), the production of laminated bamboo items will not exist, but vice versa, without the product as a trigger, demand will not occur. This proposed study is an attempt to trigger demands through a design innovation (Create Demand through Design) which became the research's State of the Art. This effort is in line with government policy in the construction of a bamboo business model through the development of bamboo processing industry so that there is certainty in the market for bamboo farming to ensure smooth business in the long run) [3].

3 Research Method

This research used a combined method consisting of: 1) Survey method to identify problems in the community that is related to the low consumption of bamboo compared to wood and the design characteristics of wood-based products that can be substituted with laminated bamboo that is in demand by the community. Collecting and selecting small industries (SMEs) that have the potential to develop laminated bamboo products. 2) FGD (Focus Group Discussion) method to get input and opinions related to product design offered by the research team as a result of analysis of previous survey data. 3.) Experimentation to test the production of several prototypes by craftsmen to find out the technical obstacles that arise and determine the appropriate solutions.

4 Results and Discussion

In the Central Java region in particular, there are many traditional bamboo craftsmen, but only a few have produced handicrafts from laminated bamboo. Seeing the shift in consumer tastes and the cultural influence of the use of non-natural products which is getting bigger, laminated bamboo is worthy to be developed as an alternative to wood products to attract consumers.

After successfully making several prototypes in the form of bamboo parquet, bamboo beams, and laminated bamboo panels, the next step is to make a type of prototype of a finished product especially furniture.



Fig. 1. Bamboo Lamination Process (Source : Personal documentation, 2017)

5 Conclusion

From the results of surveys and observations on the production process and products produced, and supported by trials of making laminated products, several points related to the efforts to develop laminated bamboo products in this study can be concluded as follows:

- Most craftsmen (business owners) are able to produce laminated bamboo and some of its applied products.
- The potential business constraints for the development of laminated bamboo products come from two dominant aspects, namely the inadequate ability of artisans and equipment.
- The need to develop appropriate equipment technology adapted to the needs of home industries for laminated bamboo products.

- Introduction, education and training, especially for craftsmen / artisans who carry out the production process need to be conducted to improve skills. For the record, production costs and business problems related to laminated bamboo products have not been included in this research analysis, thus further research is needed to analyze the potential of the economic sector.

References

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