

PINE WOOD PRODUCTS AND SUSTAINABILITY

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Abstrak

Penelitian ini dilakukan untuk menganalisa karakteristik dari kayu pinus yang dimanfaatkan sebagai material untuk berbagai produk, dan kontribusinya terhadap kesinambungan alam (*sustainability*). Pada era Covid-19 semua hal melambat, bidang yang paling berdaya guna untuk masa depan adalah kesinambungan (*sustainability*), digitalisasi (*digitalization*) dan inovasi (*innovation*). Di dalam kesinambungan terdapat upaya untuk memastikan bahwa ada rencana untuk mengurangi resiko dimasa depan dari kerusakan alam. Kayu pinus merupakan kayu yang populer karena dapat digunakan sebagai material dasar untuk berbagai produk. Kayu pinus banyak digunakan sebagai bahan untuk peti kemas, di Indonesia setelah digunakan sebagai peti kemas, kayu dari bekas peti kemas digunakan kembali sebagai bahan utama untuk banyak produk seperti furnitur dan cenderamata. Metoda ini merupakan upaya untuk memperpanjang penggunaan kayu, sehingga dapat memperlambat kebutuhan akan kayu baru dari penebangan pohon. Kayu dari bekas peti kemas umumnya digunakan untuk furniture dan interior. Terdapat beberapa kontraktor interior di Bandung yang fokus dalam menggunakan kayu bekas peti kemas sebagai material utama dalam produksinya. Sisa dari produksi furniture menjadi limbah, karena kayu sisa produksi merupakan potongan kayu kecil dengan berbagai bentuk dan ukuran yang tidak sama. Desain baru dibutuhkan sehingga limbah kayu dapat dikurangi. Tujuan dari penelitian ini adalah desain untuk produk berukuran kecil dari kayu yang dapat dibuat dengan menggunakan material yang berukuran kecil dan beragam. Hal ini diharapkan dapat membantu kontraktor interior untuk memaksimalkan penggunaan kayu dan mempertahankan kesinambungan lingkungan.

Kata kunci : Kayu Pinus, Produk Kecil, Kesinambungan

Abstract

This research was conducted to analyze the characteristic of pine wood that has been used as material for products and its contribution towards sustainability. In the time of Covid-19 everything is slowing down, the areas that are most resourceful to invest in our future are sustainability, digitalization and innovation. Sustainable includes efforts to ensure recovery plan to reduce future risk from climate and nature breakdown. Pine wood is a popular wood as it can be used as basic material for many products. Pine wood is commonly used as wood container or crates, in Indonesia when the function as container ends, wood from container is reuse as main material for many products such as furniture and souvenirs. This method is an effort to prolong the used of wood, so it can slow the demand for new woods from cut down trees. Wood from ex container commonly used for furniture and interior. There are several interior contactor in Bandung that are focused in using pine wood from ex container for their main material in production. The leftover wood from the furniture productions is become waste, since it comes with many different shapes that are not uniform in size. The new design is needed so that less wood is wasted. The aim of this research is the design for small products from wood that can be made from material that are small and random in sizes. This can help the interior contactor to maximize the use of woods and maintain environmental sustainability.

Keywords: Pine Wood, Small Products, Sustainability

INTRODUCTION

Bandung is a city that is currently developing in design, one of them is interior design. High demand for creating the interior and furniture cause workshop of interior and furniture is business that quite developed in Bandung. Materials used for making furniture is quite varied, from new material from manufacture, and also from used material. One of common wood from used material is 'kayu jati belanda' or netherland teak wood. Netherland teak wood is not made from teak, it is actually a name for pine tree-wood that has been used as wood container, also named as 'kayu palet'.

Pine wood from former container or 'kayu palet' is the type of wood that is currently very popular for making furniture. Pine wood has a good quality of used wood and it relatively cheap. Pine wood has its uniqueness in a prominent wood veins that has natural color in white and yellow with delicate texture that look better than other kind of wood as a basic for high value furniture. Pine wood also has very low weights compare to another different types of teak in java that is hard and heavy.

The use of pine wood as the principal material is applied by several interior contractor that has numerous experienced in making furniture. To transform used material, the material need to

be treat by shave, cut, and emery that are normally performed to processes materials until it is ready to use as basic material for furniture.

Furniture made from used pine wood is usually a furniture that accentuates the color and texture of pine wood, so the finishing on furniture usually with natural color so it can expose the yellowish wood veins. Furniture usually made by interior contractor is usually in medium size, for example selling booth, kitchen set, dining table, tv cabinet, workbench and chairs.

From processing the pine wood into become furniture, there are the remaining pieces of small wood material waste. Pine wood material leftover is disuse and become waste. Pine wood waste consists of pieces of small scale timber that can be reused as new product which can have selling price. The waste wood usually made into a chair or table for their own needs, some are used by workers as firewood. Waste pine wood has potential to be sold as new product which can give contribution for interior contractor and employees, so they can start new business entrepreneurs in the field of small size wood products.

To process wood waste into new products then required a new design, so small businesses can learn about the optimal use of the characteristics and potential of waste material. With the purpose of using all the material that is in the



Fig. 1. Furniture from used pine-wood
(source: Instagram kainahomedeco, 2020)



Fig. 2. Waste wood from furniture production.
(source: survey 2020)

production process. This provides business opportunities for interior and furniture contractor to develop new entrepreneurial from material that would have become waste. Processing waste into new product is an effort to increase the welfare of small business and their employees in the form of new entrepreneurs without requiring additional investment.

LITERATURE REVIEW

Wood Pallet and Sustainability

Population growth in Indonesia resulting in increased demand for timber. Meanwhile, the production of round timber in Indonesia continued to decline. Indonesia statistics forestry of year 1998 found the production of round timber in Indonesia is 21,5 million m³ and down in year 2000 to 20.6 million m³ (The Department of Forestry, 2001). In year 2004, the availability of logwood is only 5.74 million m³ to the needs of wood about 80 million m³. One way to overcome these issues is through substitution of solid wood with the development of particles board. (Data from The Ministry of Forestry, 2013).

Wood is natural materials that need to be preserved. The use of wood must be considered well not to damage the environment in the future. The use of secondhand wood is an effort to slow demand for new timber that is necessary during the production process, so the wood in the future remain maintained.

According to Adi Nugraha, *'sustainability has increasingly become a central concept in reshaping and maintaining our world for ensuring the continuity of today and future lives.'* [1] (Nugraha, 2012, 47).



Fig. 3. Utilize wood pieces for new products.
(source, survey, 2020)

Dwinita Larasati mentioned that *"The most frequently quoted definition of 'sustainable development' is: 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'"* [2] (Larasati, 2006, 25).

Wood pallets or also called netherland teak is actually pine wood that are so popular and widely used around the world for having very nice fiber or hue texture of the wood, and also has a smooth fiber surface. In Indonesia, pine wood better known as netherlands teak. Pine wood is called netherlands teak not because of the wood origin or growing in the Netherlands, but because of its history where wood is noted for used as timber pallet for shipping stuff from abroad. In Indonesia particularly in the Sumatra region, there are many growing pines trees especially Merkusi pine also known as Tusam pine. [5] (<https://crona.co.id/kayu-jati-belanda-kelebihan-dan-kekurangan-dalam-memilih-kayu-jati-belanda/>).

Wood pallets from former container is a secondhand material wood container that has a lot of potential for reuse into different products. It is one of the sustainable effort for natural resource conservation and ecosystem balance.



Fig. 4. **Pile of pallet wood sold along the road of Holis street, Bandung.**
(source: Riana Safitri, 2014: 14)

Wood Pallet Ex Container in Bandung

Currently many industry in product packaging that are producing pallet, box, and wood crate to meet demand from export oriented industries. Every timber product produced have met the standards ISPM # 15 (the water level, skin and dirt free, not perforated and free pest). Wood services packaging providing services to consumers who needs to pack up their products for delivery. Wood packing aims to meet the requirements and ease handling in the process of loading and to maintain the goods remains intact during the delivery. Packing can be box or crate in accordance with the goods condition to be shipped. Good pallets are made from pine woods. Pine wood that is common in the market is composed of two types, local pine wood from Indonesia with yellowish color, and pine wood from Europe with yellowish and reddish color. This type sold at Rp.55.000,- to Rp.60.000,- per unit depend by the quality. Usually pine wood of Europe sold more expensive than local because the wood is better in quality and standards. [3] (Riana Safitri, 2014:13)

The pallet standard sizes and types, determined by several things, among them is the type of packaging, the materials used, the warehouse

for storing pallet, the pallet price etc. But what deserve attention is the material characteristic and chemicals used to support the strength and the power. The price is determined by the size, the type of timber, mashed or not, standard ISPM#15 or local standard, dried or not, and wearing fumigation or not. Although objects using pallet vary in size, usually secondhand pallet we met in the market like the Holis streets is a basic pallet with size 100x120 cm or 120x120 cm. [3] (Riana Safitri, 2014:16)

METHODS

This study used a qualitative approach by the experimental methods. It consists of the research potential and the problem review, gathering information, until create the design for souvenirs.

Research Methods

The research start with identify the research object, which is ex pine wood. And then analyze the potential form and function of pine wood. Continue with formulate the design methods. Apply the design method of the products. And lastly produce design of souvenirs from ex pine woods.

Survey Methods

The survey in the field, consist of documenting activity and sample materials with photos and sketches, identified the potential shapes of pine wood. Interview with experts, which is design product expert, and upcycling experts, about undertaking on the used wood. Have data on product design and the use of timber from non-governmental organizations and other sources.

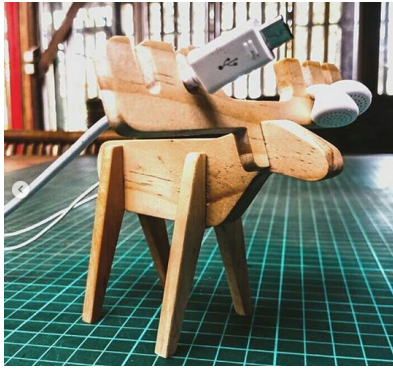


Fig. 5. Cable holder inspired by animal, create from pine wood waste (source: Instagram Bukatana, 2020)



Fig. 7. Stationary design inspired by traditional furniture of Lisung (source: Savitri, 2018)

RESULTS AND DISCUSSION

Alternative Design of Wood Pallet

The pine tree, regarded as soft tree which means the wood is softer than other timber varieties. Pine trees growing worldwide. Pine wood is strong wood and resistant to shock, made pine tree the good choice for making furniture. Pine wood more likely easy to process during the making of furniture because it is softer. Furniture from pine wood has been used for a long time. Traditionally, pine wood used for colonial style, rural, and craftsman furniture. It slowly changed, pine wood nowadays used for various styles furniture, including contemporary style. [5] (<https://crona.co.id/kayu-jati-belanda-kelebihan-dan-kekurangan-dalam-memilih-kayu-jati-belanda/2020>).



Fig. 6. Candle holder from pine wood waste (source: Instagram Bukatana, 2020)

The research is an attempt to acquire alternative design of pine wood. The target of this activity is an alternative design of souvenirs product from waste material of pine wood. Also to know the predominance character of ex pine wood, so material can be used more optimize and serves to reduce the waste. A new design made is for the small size products of pine wood waste which has selling value, as stationery, souvenirs, interior decoration and toys. Design shall be easy to remake with using left over material that cannot be uniform in sizes. To create a remake with easy, hence design drawing must consisting of a work drawing, three dimensional drawing, and further, the prototype.

Here are some sample of products from Bukatana design research. The first product is stationary made from waste material of pine wood. The product is small and easy to make by craftsman as well as it is easy to assembly by user.

The second product is a candle holder made from small pieces of pallet wood. The pattern on the product showed that it is made from leftover material that is not uniform in sizes, hence it is not lower its aesthetic and selling value.

The third product is the stationary made from pine wood. It is from the previous research in

2018 that aim to create products inspired by traditional furniture and object.

Souvenirs for Families from Wood Pallet

Wood pallet form leftover of production is the wood pallet in a various measure. Hence analysis of the product design were conducted with several product of wood with small sizes. At the moment, the local market has already many

various products of wood with many function. The analysis is not just pine wood, but analysis of many kinds of wood, as an inspiration of form and design. Application in pine wood products will be done once the form and design appropriate is acquired.

Situation due to pandemic covid19 caused many families doing more activity at home. Products to be made should accommodate these

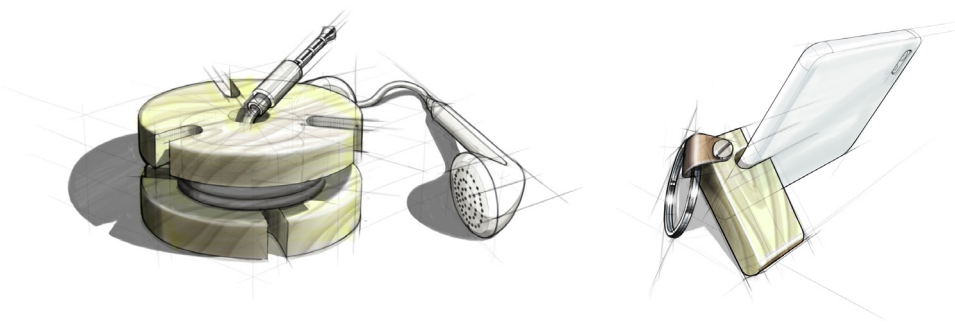


Fig. 8. Cable binder and handphone holder
(source: doc, 2020)

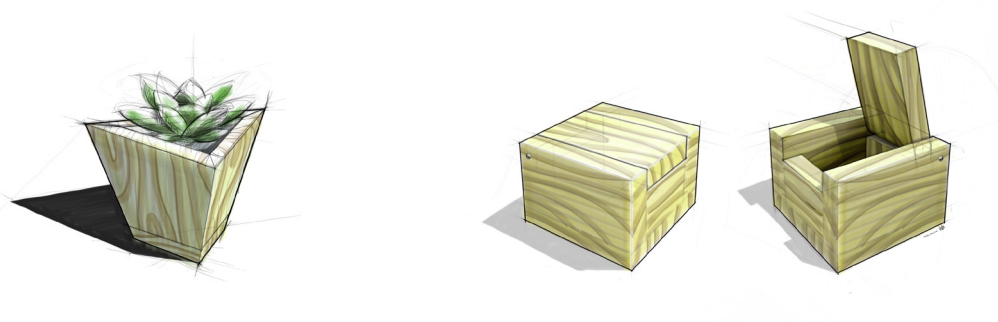


Fig. 9. Plant pot and container box
(source: doc, 2020)

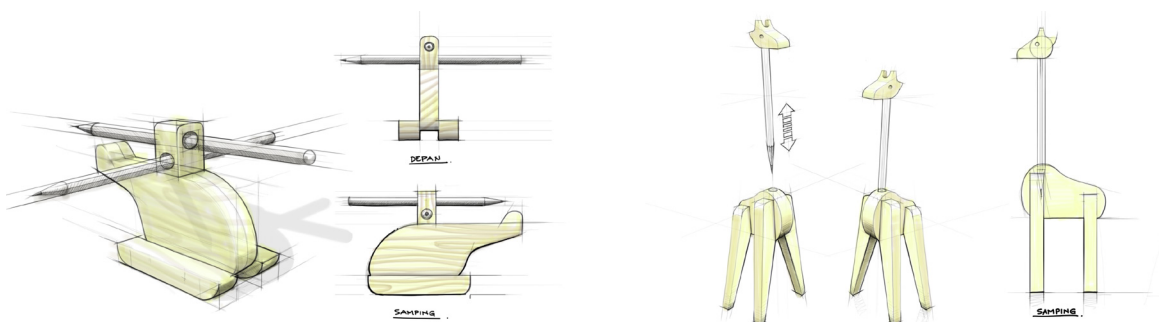


Fig. 10. Pencil holder inspired by helicopter and giraffe
(source: doc, 2020)

daily activities. Based on an analysis of form and function in the market, the product user were divided into three large categories, which is products to father, products for mother, and products for children. The three products can be packaged up into one package of souvenir. The package can be given as a gift for those who stay at home.

Souvenir for Father. The design for father is consist of objects to help daily activity while using electronic devices. The first product is cable binder that is inspired by yo-yo, a toy consisting of an axle connected to two disks. The second product is handphone holder that also functioned as key chain.

Souvenir for Mother. The first product for mother is a small pot for plants, it is a unique triangle pot that can be put indoor as interior decoration. The second product is a simple container box. It can be used to store jewelry or any other small objects.

Souvenir for Children. The souvenir for children is design to be able to attract both boys and girls. The products are pencil holders, it can be an interactive toys as it must be assembly by children with the help of pencils. The first product is a helicopter that require pencils as its propeller shaft. The second product is a pencil holder inspired by giraffe.

CONCLUSIONS

The use of wood pallet is common in the production of furniture. The leftover wood from the production is become useless and become waste. This waste is consist of small size wood that can actually use as material for the new products that is small in size. The product can have aesthetic and selling value. It is only need a good design to

capture the material characteristic so it can transform the waste into become souvenirs products. To enhance the selling value, the products must be design to accommodate the current activity. During covid19, most family doing activity from home, so the products must be applicable to use by family at home. It can be design as a gift package for family as consolation to stay at home.

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