TRAINING AND EDUCATION ON THE USE OF WOOD WASTE IN THE FURNITURE INDUSTRY GROUP IN KARANG ANYAR VILLAGE

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Abstract: Wood waste is often found in several home furniture business locations in Langsa City, including in the furniture industry in Karang Anyar Village. The problem so far is that wood waste is not processed and utilized due to a lack of knowledge in processing wood waste into a product that has economic value and wood waste will also have a negative impact on the environment. The aim of this Community Service activity is to educate and provide training to furniture business groups to utilize sawdust waste into economically valuable products such as chipboard and blockboard. The activity method begins by coordinating with partners from the Karang Anyar Village furniture industry group totaling 12 people and then preparing the materials and tools used. The stages of making chipboard and blockboard with dimensions of 40x40x10 from wood waste are then the stage of training and education for the community and monitoring the results of activities. From the results of the activity, training participants received good benefits in understanding waste and the impacts that will arise from waste with a percentage of 45% and 70% with very good grades. However, for waste processing, the training participants only got a very good understanding of 30%. The skill of making particle board from wood waste increased after training by a percentage of 55% and participants benefited from the training by 70% for an excellent score.

Introduction

The furniture industry, also known as the furniture industry, continues to develop along with changes in lifestyle and consumer needs. The development of the furniture business in Indonesia has experienced significant progress in recent years. Factors that influence the development of the furniture industry in Indonesia include stable and increasing economic growth, encouraging the furniture industry to produce more furniture and also supported by people's purchasing power. Apart from that, various quality and design factors cause consumers to want products that are contemporary and popular with the market, so the furniture industry must be able to innovate in producing quality products with more innovative designs. The furniture industry is concerned with the production, sales and distribution of equipment and goods used in households. One of the largest segments in the home furnishings industry is the

production and sale of furniture such as chairs, tables, cupboards and beds. Furniture manufacturers use various materials such as wood, metal and plastic. Of course there will be challenges and problems including competition with imported products, higher production costs due to home businesses and regulatory issues.

The home furnishings and waste industries have a close relationship. Household furniture production can produce waste in various forms, such as material waste, production waste and others. The household furniture industry that uses wood materials will produce wood waste in the form of sawdust waste and wood chips. This waste will have a negative impact on the environment, so efforts are needed to recycle material waste or reuse it in production so as to produce new products that can be utilized. The household furniture industry can be found in several locations in Langsa City, one of which is in Karang Anyer Village, Langsa Baro District. There is a furniture business or home furnishings industry which is a source of livelihood. The existing household furniture business is a business in the woodworking sector, processing wood products into various kinds of products as well as buying and selling various types of wood which can be useful for community needs. In processing wood, wood waste and sawdust waste will be produced from the wood cutting process, wood sanding process and other processes. Sawdust waste in Panglong is usually left to pile up, or burned or thrown away in the back area or around the business premises so that it disturbs the surrounding environment, for example during the rainy season it will cause waterlogging due to obstruction of the flow of water flowing into the drainage. According to OSHA (Occupational Safety and Health Administration) standards, sawdust can cause health problems such as asthma or respiratory problems, eye irritation and watering, a nasal or blocked nose, etc., so it is best to process or recycle sawdust waste, not just pile it up.

One of the wooden furniture businesses is UD. Rizky located in Karang Anyar Village, Langsa Baro District. Langsa Baro, Langsa City, owner Sumeri said that so far the wood waste has not been used, and in order not to disturb the environment, the accumulated sawdust waste has been given away for free and left as it is (Figure 1). The problem so far is that wood waste is not processed and used by business owners, even though if it is used it will produce processed products from wood waste which have sales value, thereby increasing income. Due to their lack of knowledge in processing wood waste into a product that has economic value.

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4 I Wayan Sutarman, “PEMANFAATAN LIMBAH INDUSTRI PENGOLAHAN KAYU DI KOTA DENPASAR (STUDI KASUS PADA CV ADITYA).”
Particle board is an artificial board made from wood dust with the help of synthetic adhesive and then hot pressed so that it has properties like wood, is fire resistant and is a good insulating and acoustic material. According to the National Standards Agency (BSN), Particle board is a wood product produced by hot pressing between a mixture of wood particles or other lignocellulosic materials with organic adhesives and other adhesive materials which are made by horizontal compression with two flat plates. Particleboard has a standard, namely SNI 03-2105-2006 with a particleboard density of 0.40 [gr/cm³] – 0.90 [gr/cm³] while the density of wood powder is 0.08 [gr/cm] and the density of resin is 1.23 [gr/cm].

Making wooden boards from wood powder waste requires a wood powder press machine. The sawdust press machine is designed to be simple at an affordable price so that in the future it can be used for small or medium to low scale community businesses and can also be used by MSMEs engaged in the processing of sawdust waste. The system on the wood powder press machine is made manually and the dimensions of the dies or molds are made according to market needs so of course it will benefit wood craftsmen or SMEs who process wood powder waste.

Chipboard and Blockboard is a part of particle board that can be modified and reused to make valuable household furniture products so that it can increase income. Chipboard and Blockboard are two types of boards that are often used in the furniture and construction industries. Chipboard or also known as particle board is a type of board made from wood dust as a basic material, then processed into fine powder and compacted with adhesive and high pressure to become dense and sturdy particle board. Blockboard is a type of wooden board consisting of an arrangement of pieces of wooden blocks placed parallel and glued together with adhesive.

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6. Aristya Sukma Aji, *Nilai Serapan Bunyi (Noise Absorption Coefficient) Dari Komposit Serbuk Gergaji Kayu Sengon Dengan Matrik Alami* (Universitas Islam Indonesia, 2011), http://dx.doi.org/10.1038/ni.1913%0Ahttp://dx.doi.org/10.1016/j.dci.2013.08.014%0Ahttp://dx.doi.org/10.1186/s13071-016-1819-4%0Ahttp://dx.doi.org/10.1016/j.actatropica.2017.02.006%0Ahttp://dx.doi.org/10.1038/s41598-017-09955-y%0Ahttp://dx.doi.org/10.1016/%0A
8. Badan Standarisasi Nasional (BSN).
a special adhesive so that they do not break down easily and stick together. Blockboard has good strength and stability because the wood structure makes it stronger and more durable.

The aim of this Community Service (PKM) activity is to educate and train business groups to utilize sawdust waste into chipboard and blockboard. The benefit of this PKM is obtaining training and knowledge in processing wood waste into raw materials and products. UD furniture business. Rizky can process wood dust waste into chipboard (particle board from wood powder waste) or blockboard (laminated board from wood chip waste) which can then be produced by local residents to be processed into various products such as decorative tables, chairs, and so on. Another benefit is getting education regarding waste processing and utilizing waste into economically valuable products.

Method
Implementation method

The implementation method involves education and training on the use of wood waste into chipboard and blockboard. The stages carried out are conducting a location survey and coordinating with partners as input in carrying out PKM activities that are beneficial to partners; Identify and classify types of wood waste that can be used in making chipboard and blockboard; Providing education about the characteristics of wood waste and factors that influence its quality as a basic material for chipboard and blockboard. Explanation of the steps for producing chipboard from wood waste, including processing sawdust, compacting with adhesive and pressing with high pressure; Introduction to the adhesive used and the correct composition for its use; Explanation of blockboard construction including arranging wooden blocks, use of adhesive and pressing to form a sturdy blockboard; Discussion about choosing the right type of wood for blockboard cores. Training on techniques and procedures used in the production of quality chipboard and blockboard; Understanding of applicable quality standards and requirements; Introduction to the advantages and benefits of using chipboard and blockboard from wood waste including sustainability, waste reduction, and resource efficiency. Training on techniques and procedures used in the production of quality chipboard and blockboard; Understanding of applicable quality standards and requirements; Introduction to the advantages and benefits of using chipboard and blockboard from wood waste including sustainability, waste reduction, and resource efficiency. Training on techniques and procedures used in the production of quality chipboard and blockboard; Understanding of applicable quality standards and requirements; Introduction to the advantages and benefits of using chipboard and blockboard from wood waste including sustainability, waste reduction, and resource efficiency.

Partner Profile

This community service was carried out in Karang Anyar Village, Langsa Baro District, Langsa City. PKM's partner is UD. Rizky by involving the furniture business group. The basis for collecting this data is that in the Karang Anyar Village area, there are many furniture and wooden businesses, and almost all panglong produce a lot of wood waste including sawdust and pieces of wood blocks. The partner location (Figure 2.) is in Karang Anyar Village, Langsa Baro District, Langsa City. The distance from Universitas Samudra to the Mitra location is approximately 5.3 km with a travel time of around 13 minutes.

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12 Badan Standarisasi Nasional (BSN), *STANDAR NASIONAL INDONESIA (SNI) TENTANG PAPAN PARTIKEL*.
Work Procedures

The work procedure is divided into 4 stages which are shown, namely:
1. Preparation phase
   Coordinating with partners, preparing materials and tools used and coordinating with the
   PKM implementation team
2. Stage of preparing training materials
   Prepare training materials
3. Stages of making chipboard and blockboard from wood powder waste and wood chips.
4. Stages of making blockboards from waste wooden blocks
5. Training stages for Partners and several panglong wood business owners around partners regarding the process of making chipboard and blockboard sawdust boards.

6. Stages of education and assistance to the people of Karang Anyer Village regarding processed products that can be made from particle board which can increase economic income.

**Results and Discussion**

This community service was carried out in Karang Anyer Village, Langsa Baro District, Langsa City. PKM’s partner is UD. Rizky (Figure 5), by involving furniture business groups. The basis for collecting this data is that in the Karang Anyer Village area there are many furniture and wooden panglong businesses and almost all panglong there produce a lot of wood waste including sawdust and pieces of wood blocks. The work procedure is divided into 4 stages which are shown, namely:

1. Preparation stage, coordinating with partners, preparing materials and tools used and coordinating with the PKM implementation team.
2. Stage of preparing training materials, preparing training materials
3. Stages of making chipboard and blockboard from wood waste
4. Training and Education Stage for the Community.

Partner participation in implementing PKM starts from the initial stage by being willing to collaborate with the PKM team and be responsible for implementing the PKM program until it is sustainable. Partners are responsible for the raw material procurement stage for sawdust waste by collecting sawdust and filtering at the Panglong location. Then in training on making chipboard and blockboard, coordinating with the team during the implementation of PKM and providing the necessary materials if needed, such as planned training and socialization locations.
The results of the training and education program organized by the Samudra University Service Team, aims to encourage the use of environmentally friendly wood waste in the manufacture of wood fiber boards and hopes to reduce the environmental impact of the production and use of chipboard and blockboard. Utilization of wood waste has become a major concern in efforts to maintain environmental sustainability and support the local economy. The results of this training and education showed that training participants received good benefits in understanding waste and the impacts that would arise from waste with a percentage of 45% and 70% with very good scores (figure 7). However, for waste processing, the training participants only got a very good understanding of 30%.
Wood waste, including sawdust, small pieces of wood, and production residues, has for years often been thrown away or burned, which has had a negative impact on the environment. However, awareness of the importance of using wood waste as a valuable resource has increased and various innovations and projects have been implemented in various regions in Indonesia to maximize the benefits of wood waste. The market potential for processed products from wood waste such as chipboard and blockboard can be of interest to the public because they contain artistic and aesthetic value. Product marketing is also very easy through the use of social media and e-commerce which are already familiar to the public.

The materials needed to make chipboard are wood dust that has been filtered using a sand filter, fox glue, and alcohol. To make a chipboard measuring 40x40x10 cm, you need 300 grams of sawdust that has been filtered and then mixed with 300 grams of Fox glue which has been diluted with 100 ml of alcohol. Once mixed thoroughly, put it in a mold and press it using a simple press for 5 minutes, then take it out and dry it in the sun for 4 days to remove the water content and the wooden board is ready to be made into craft products or furniture such as tables, Bungan board shelves and other craft products.

The results of this program have been very positive. Many training participants have applied the knowledge they gained to develop new products that are more innovative and environmentally friendly. As demand for sustainable wood products continues to increase, training and education on chipboard and blockboard manufacturing will continue to be an important factor in driving the growth and development of a responsible and innovative wood industry.

Even though the Community Service (PKM) program has many benefits, there are several disadvantages and weaknesses that need to be considered, namely limited resources due to budget, time, and human resources. In addition, there are limitations in the dissemination of information which has not yet reached all parties. Partners face obstacles in developing sustainable chipboard and blockboard production due to the unavailability of adequate resources. Apart from that, market challenges are also a special concern because competition with other products produced by manufacturing will cause a decrease in partners' interest in producing. The quality of chipboard and blockboard produced is still for home industry...
production which does not yet have good quality control. The difficulty of marketing processed products from wood waste may require digital marketing strategies and partners must adapt. Although there are shortcomings and weaknesses in the PKM program, these steps are a positive step towards more sustainable wood waste management in the furniture industry.

Conclusion
The development of the furniture industry in Indonesia has increased thanks to stable economic growth and increasing people's purchasing power. However, the problem of wood waste in the furniture industry has a negative impact on the environment. Through the Community Service (PKM) program, training and education have been provided to local partners to overcome the problem of wood waste by turning it into economically valuable products, namely chipboard and blockboard. These efforts help improve participants' environmental skills and awareness, as well as promote more sustainable use of wood waste. Limited resources, the dissemination of information that has not reached all parties as well as market challenges, and the quality of chipboard and blockboard produced as well as marketing difficulties are shortcomings that require digital marketing strategies and partners must adapt. However, the market potential for these products is also wide open, allowing for the growth of a more innovative and environmentally friendly furniture industry in the future.

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Bibliography


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