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Application of Rotary Screening Technology for the Commercialization of Cocofiber and Cocopeat Products to Boost the Economy in Lhokseumawe City

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ABSTRACT

Indonesia, a tropical country, has abundant coconut plants, with nearly every part of the tree offering various benefits. However, coconut coir (tapeh u in Acehnese) is often discarded or used as low-value fuel. Despite this, tapeh u has great potential to be transformed into high-value products. Cocopeat and cocofiber, its two main components, can be utilized for handicrafts, planting media, household items, and industrial materials. Cocofiber can be used in flower pots, carpets, car seats, and dashboards, while cocopeat serves as an eco-friendly, cost-effective fertilizer. This research aims to optimize tapeh u utilization in North Aceh and Lhokseumawe, enhancing its economic potential and supporting coconut farmers. Using Rotary Screening technology and cocopeat press tools, this study will improve production efficiency. Partnering with PT. Fugha Pratama Mandiri, the research seeks to develop marketable products, leading to increased exports and intellectual property proposals.

Keywords: Coconut, Cocofiber-Cocofiber, Agriculture, Rotary Screening Technology

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INTRODUCTION

Indonesia is a tropical country with agroclimatic conditions that are very supportive for the growth of coconut trees. Based on world statistics, of the 11.6 million hectares of land owned by 32 member countries of the Asia Pacific Coconut Community (APCC), Indonesia is recorded to have the largest productive land in the world of 3.7 million hectares with a total production estimated at 14 billion coconuts per year (Bambang Setiaji, 2011). North Aceh Regency is one of the main coconut producers in Aceh Province. Of the total land area of 60,696 hectares spread across 22 districts/cities in Aceh, the area of coconut plantations in North Aceh reaches 32.63% or 19,808 hectares (BKPM, 2015). However, this huge potential has not been utilized to the fullest. Tapeh u (coconut coir) has only been burned into charcoal or burned so that it has no selling value.

Tapeh u (coconut coir) can be developed into a variety of products, including cocopeat, cocofibre, cocomesh, cocopot, coco fiber board and cococoir. These materials are raw materials in the mattress industry, pots, dry compost and so on. If you only focus on coconut processing on the pulp, the highest coconut price is still a very low income for farmers to live a decent life. One of the efforts to increase the income of coconut farmers is to process all fruit components into high-value products, so that the value of coconut fruit will increase. For example, coconut shells, if processed into shell charcoal and activated charcoal, can increase the economic value of coconuts. So that the economic value of coconut is no longer based on copra (fruit pulp), as in the Philippines, of the total exports (US$ 920 million) 49% of which comes from non-CCO. The price of coconut fiber in the export market is currently USD 385 per ton, while the price of cocopeat is USD 185 per ton.

The processing of coconut coir into cocofiber and cocopiet has a high selling value because for cocofiber, it can be used as a manufacture of household appliances and raw materials for the carpet industry, upholstery, etc. As for cocopiet, it can be used as a planting medium to replace soil that is safer, cheaper, lighter and environmentally friendly. The price of cocopeat and cocofiber in the online market is for cocofiber Rp. 15000 per kg and cocopeat Rp. 10,000 per kg. Currently, the need for cocopeat for ornamental plants in households and agriculture is quite high. When viewed from the potential price of products, this business has great profit potential for the community considering the availability of abundant and cheap raw materials.

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METHOD

Prof. Sugiyono in his book entitled Qualitative, Quantitative, and R&D Research Methods (2013), descriptive data collection activities are activities that seek to tell the solution of existing problems at the present time based on data. Therefore, this descriptive method will also present data, analyze, and interpret, and can also be comparative and correlational. The object of the research is the design and construction of a coconut coir processing machine, namely a Rotary Screening machine so that it functions to separate cocofiber from cocopeat.

This Roatry Screening machine is designed with attention to ergonomic aspects, so that the operation of the machine becomes more comfortable, in addition to the ergonomic aspect of this coconut fiber decomposition machine also pays attention to safety aspects for operators and people around. By paying attention to ergonomic and safety aspects, it will increase the desired work productivity. So it is hoped that the creation of a coconut fiber decomposition machine into cocopeat and cocofiber will be able to speed up the decomposition process, save energy, and still pay attention to the safety factor for operators and people around

The goal to be achieved in this activity is to increase productivity and utilization of tapeh u (coconut coir) as a producer of quality cocofiber and cocopeat products and can improve the economy in the national market and export potential in the international market, as well as help establish cooperation between farmers and consumers in an effort to increase the availability of tapeh u (coconut coir) that produces cocopeat and ready-to-sell cocofiber. Improvements in the field of cocofiber and cocopeat sifting processes that can be done by introducing sieving tools that comply with standards in the field of processing tapeh u (coconut coir). The implementation method offered here is a training method and direct practice using sifting tools that have previously been prepared by the proposer. This activity is planned to involve around DUDI partners. Furthermore, after being equipped with knowledge of how to process tapeh u (coconut coir), it is carried out The implementation of the processing of tapeh u (coconut coir) into cocofiber and cocopeat where the farmers are involved in the implementation of the activity.

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RESULTS AND DISCUSSION

Figure 1 Tapeh U (coconut coir) products Cocofiber and Cocofiber

Indonesia is one of the tropical countries where coconut plants are widely spread. The coconut tree is one of the trees that has benefits in almost all parts of the plant from the roots to the fruit. Both used as foodstuffs, medicines, household appliances, handicraft products and other plant planting media. One part of the coconut tree, namely coconut coir (tapeh u) in Acehnese language, is usually only used as an additional burnt or mosquito repellent, has a low selling value or is even wasted by coconut farmers because it is considered coconut waste. Even though tapeh u itself has great potential to be used into various products that have a high selling value. The use of tapeh u consisting of Cocopeat and Cocofiber can be processed into crafts and planting media. Cocofiber can be processed into household appliances products, flower pots, carpet industry raw materials, car seats and dashboards. Meanwhile, cocopiet itself can be used as a planting medium that is able to fertilize plants that can replace the use of more expensive, environmentally friendly and renewable fertilizers.

The purpose of the implementation of the product through the Domestic Applied Scientific Research Program - PT Vocational is the first is to utilize the potential of tapeh u (coconut coir) that grows in the coastal areas of North Aceh and Lhokseumawe into products that have a high selling value so that they can increase export potential. This increase in economic potential is expected to help increase the income of the community or coconut farmers as producers.

The limitation of this research is to make Rotary Screening technology will be used in this research to see the effectiveness of the cocopeat and cocofiber production process. Rotary Screening machine works by replacing human hands or traditional shredders as a crusher of coconut fibers as well as being able to sort or separate cocopeat. Another technology that will be added as a support for this technology is a press tool for cocopeat. The technology of the funds The products produced will be tested to ensure excellence in terms of effectiveness, quality and market requirements that are the object of research.

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Overview of Main Problems and Solutions

PT Fugha Pratama Mandiri is a company engaged in the production of agricultural products, essential oil production and several other types of production activities in accordance with the Notary Deed Mohammad Afnizar, SH, Sp.N, Deed Number 63.- dated April 30, 2018 and the ratification of the Ministry of Law and Human Rights Number AHU-0023195. AH.01.01 of 2018. This company also has other company legalities such as a Trade Business License (SIUP) with a number. 169/01.14/PK, Business Place Permit (SITU) with number.503/373/11.74, Company Registration Certificate (TDP) with number. 01.14.1.46.00835 and the Company's Taxpayer Identification Number (NPWP) with the number. 84.778.422.0-102.000. The company's main office is located at Jl. Banda Aceh – Medan, No. 36 Buketrata, Blang Mangat District, Lhokseumawe City, Aceh Province – Indonesia.

In the field of cocopeat and cocofiber production, which has just been pioneered, PT FPM is indeed taking advantage of the potential of tapeh u (coconut coir) that is growing in the coastal areas of North Aceh and Lhokseumawe into products that have a high selling value so that they can increase export potential. The newly launched business activities of PT Fugha Pratama Mandiri are the production and processing of cocofiber/cocopeat which includes processing, transportation, storage and trading activities.

As is known, this new business is not fully equipped with adequate production facilities. Especially in the cocopeat production process as a by-product of cocofiber fiber that can be used as other products such as planting media, DUDI partners have obstacles in the screening process that still use manual sieves so that it slows down the production process and uses more manpower.

Therefore, the research team wants to try to help solve the problem of DUDI partners by designing an automatic Ritary Screening tool that can be used for the separation of cocofiber and cocopeat effectively, saving time and effort and very efficient. Rotary Screening machine works by replacing human hands or traditional shredders as a crusher of coconut fibers as well as being able to sort or separate cocopeat. Another technology that will be added as a support for this technology is a press tool for cocopeat. The technology of the funds The products produced will be tested to ensure excellence in terms of effectiveness, quality and market requirements that are the object of research. The research will be carried out with the help and cooperation of DUDI Partners which is a startup company called PT. Fugha Pratama Mandiri. This company is also pioneering a business in the field of coconut coir processing with the aim of increasing its selling value.

The problem of PT. Fugha Pratama Mandiri The obstacle faced by DUDI partners is the limited availability of production equipment. Its productivity, which is only able to produce 10 to 15 kg every 8 hours of work, Considering that

the raw materials for making cocopeat and cocofiber in the form of dried coconut fiber are widely available around the location of this farmer group, cocopeat and cocofiber can be made by themselves. And to speed up the process of decomposing coconut coir into cocopeat and cocofiber, appropriate technology-based equipment that is simple, easy, and safe to operate. The design and manufacture of coconut fiber decomposition equipment into cocopeat and cocofiber products in accordance with the availability of electricity sources at the DUDI partners concerned can be done using a single phase 2 HP 220 V 1440 rpm electric motor. Meanwhile, the production capacity of the tool is 50 kg of cocopeat and cocofiber mixture per hour. Equipment unit operation training, equipment unit maintenance training, management training will also be carried out.

CONCLUSION

The results underscore the effectiveness of the rotary screening machine in enhancing the productivity and quality of coconut fiber and peat products. The economic, social, and environmental benefits achieved through this technology support its broader adoption across coconut-producing regions. Further refinements and innovations could amplify these impacts, ensuring a sustainable and profitable coconut processing industry.

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