



POTENTIAL DEVELOPMENT OF SHEET RUBBER AS AN ECONOMIC COMMODITY IN CENTRAL KALIMANTAN

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ABSTRACT

*This paper aims to identify the potential of rubber as a natural material for economic commodities for Central Kalimantan in particular. Rubber was introduced since the Dutch colonial period, planted in the Bogor Botanical Gardens as a collection and became a plantation crop in 1864. The first types of rubber planted were *Ficus elastica* and *Havea brazilliensis* rubbers which were spread on the islands of Java and Sumatra. Indonesia is one of the rubber producing countries in Southeast Asia, where in 1956 it was able to reach the peak of the glory of rubber plantations as a mainstay of economic support. The required studies include the history of rubber plantations in Indonesia, natural rubber species, cultivation techniques, their use as industrial raw materials, and the results of previous studies.*

Keywords: rubber, cultivation, industrial raw materials, economic potential

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1. INTRODUCTION

Agriculture includes the sub-sector of plantation, forestry, horticulture, animal husbandry and fisheries, Mubyarto (1994). Plantation sub-sector is the dominant sub-sector as a source of foreign exchange through export and import activities, with a contribution to GDP of 3.47%. One of the leading commodities of estate crops is natural rubber, which is a long-term plantation commodity derived from Para Tree (*Heava braziliensis*) that can be utilized by its sap. Common characteristics of trees with a height of between 15-25 meters, has a root fibers through the ground to a depth of 1-2 meters, lateral roots that spread up to 10 meters, round stems

accompanied by thick brownish white bark, spiral-shaped leaves alternately intermittent and dark green hair, round fruit seeds, the inside of the fruit is white and has a hard outer layer.

The strategic role of rubber is felt by consumer countries with an interest in the sustainability of rubber supply and the desire for lower rubber prices. On the other hand, producing countries want higher rubber prices, so the importance of a mutually beneficial price balance for consumer countries and rubber producing countries. Indonesia has a great interest in changes and the balance of rubber prices, because international rubber prices affect rubber prices at the regional level, the Directorate General of Plantations (2017). Indonesia's strength in developing production lies in the availability of sufficient and fertile tropical land accompanied by a population background as a farmer. Opportunities are open from the demand side, triggering the development of the rubber economy. This paper aims to identify the potential of rubber as a natural material for economic commodities for Central Kalimantan in particular.

2. ECONOMIC POTENTIAL OF RUBBER

2.1. Rubber History

The rubber plant was discovered in 1493 by Michele de Cuneo during an expedition to the Americas. Sap from trees *Para* that grow wild in the forests of the interior of America use the local population to be made into balls, footwear and water containers. An Italian diplomat, Andre Navagioro described a rubber ball with a flexible and clear nature, in a book published in mainland Europe. Rubber began to be investigated by scientists by separating the rubber elements into three parts, namely sus, candles and light and clear material. The Peruvian Expedition Team found a rubber plant that the sap can take by injuring the bark of the plant which is then named the *Havea* plant (Anwar, 2006).

The benefits of rubber develop in the botanical world as one of the industrial plantations, especially in tropical countries. In 1839, Charles Goodyear discovered a method of vulcanizing rubber and then showed other rubber properties that could be used on a daily basis such as making tires that support the automotive industry, so that demand for rubber raw materials increased. The development of rubber on the Asian Continent was pioneered by The Royal Botanic Gardens in the Kew area. London, where the seeds of the rubber are taken to be planted in various areas such as the Royal Botanic Garden in Sri Lanka, the Penang Botanic Garden in Malaysia, the Bogor Botanic Garden in Indonesia.

Indonesia is one of the rubber producing countries in Southeast Asia, where in 1956 it was able to reach the peak of the glory of rubber plantations as a mainstay of economic support. Rubber was introduced since the Dutch colonial period, planted in the Bogor Botanical Gardens as a collection and became a plantation crop in 1864. The first types of rubber planted were Rambung or *Ficus elastica* and *Havea brazilliensis* rubbers which were spread on the islands of Java and Sumatra.

Rubber Plant Classification:

Kingdom: Plantae

Subkingdom: Tracheobionta

Division: Magnoliophyta

Class: Rosidae

Order: Euphorbiales

Family: Euphorbiaceae

Genus: *Havea*

Species: *Havea brazilliensis* (Anwar, 2006).

The rapid development of rubber plantations has finally made countries in Asia, particularly Southeast Asia, the number one rubber producer in the world, surpassing rubber production in American countries. Rubber production in Southeast Asia in 1900 was only 1.1% of the total world rubber production. In 1915 developed to 68.5% of world rubber production of 116,500 tons. The development of rubber plants in Indonesia reached its peak in the period before World War II until 1956. Rubber plantations were introduced in Indonesia in 1864 and began to be planted in the East Sumatra region in 1902 and on Java Island in 1906 (Liu et al, 2016).

The area of natural rubber plantations in Central Kalimantan Province in 2017 was 351,992.19 hectares with production reaching 127,556.42 tons. Based on secondary data from the Central Kalimantan Provincial Plantation Office (2018), the production of rubber produced in Central Kalimantan has improved in line with the need for water for rubber plants and the efforts to decimate rubber by the community in an effort to improve the quality of rubber regulated in the Ministry of Agriculture Republic of Indonesia regulations related to policies rubber processing.

2.2. Types of Natural Rubber

There are two types of rubber namely natural rubber and synthetic rubber. Natural rubber has elastic strength or resilient power, easy processing, and not easy to heat while synthetic rubber is resistant to various chemicals and prices tend to be stable. Types of natural rubber include: 1) Rubber processing material (Bokar), a type of garden latex rubber and garden latex wadding obtained from rubber trees, divided into four namely garden latex, wind sheet, thin slab, and fresh lump; 2) Conventional rubber, ie rubber treated with natural latex material which has a type of rubber sheet and crepe; 3) Concentrated latex, a type of rubber in the form of concentrated liquid, not in the form of sheets or solids, used for the manufacture of thin and high-quality rubber materials; 4) Block rubber or Block Rubber is a type of reman rubber that has been dried and refined into bandages of specified size; 5) Technical specifications rubber or Crumb Rubber is a type of rubber made to maintain the technical quality guarantee of natural rubber with technical specifications formed in small lumps of the same weight and size as well as having laboratory test certificates; 6) Rubber ready for processing or Tire Rubber is a type of natural rubber that is processed into semi-finished goods; 7) Reclaimed Rubber is rubber that is reprocessed from used rubber goods such as tires (Anwar, 2006).

2.3. Rubber Plant Cultivation Techniques

Rubber cultivation techniques with the application of standards / recommendations are needed to produce rubber with good quality and increase rubber production thereby increasing selling prices, including using superior seeds, monoculture spacing with a size of 2 x 7 meters, or with intercropping of rubber with planting distance size 4 x 3 Meters.

The aspect of plant maintenance is very influential on rubber productivity, including activities; 1) Weeding, aims to avoid crop competition in nutrient extraction; 2) Replanting is the activity of replacing a dead plant with a 2 year old plant to maintain the plant population; 3) Branch and shoot induction and removal are removed until the plant reaches a height of 1.80 meters to get a good tapping area; 4) Fertilization for maintenance, growth, and productivity improvement; 5) Disease control, one of which is white root fungus caused by *Rigidoporus lignosus*; 6) Regulate the technical pattern of planting rubber plants by providing intercropping patterns; 7) Paying attention to tapping time aims to open the latex vessels in the pohom skin so that the latex easily flows.

2.4. Benefits of Rubber as an Industrial Material

Rubber is a plant that is widely cultivated by farmers because rubber has become a profitable type of plantation commodity as a form of investment sought. Rubber plants have promising advantages as a type of cultivated plant with relatively fast plant growth, rapid harvesting, easy and simple maintenance, grow in a long period of time, have seeds used as propagation and branches that can be used as processed materials. This plant type is similar to the types of plants from the research of Alpian et al. (2018) and Ludang and Mangkoedihardjo (2009). The following are the benefits of natural rubber which are the raw material for making tires, the raw material for making connecting devices and vibration retaining, as an insulator, as a metal wrap material (Masliani, et al., 2018).

Rubber is processed to help various activities in daily life, ranging from household products, cooking utensils, home furnishings, work equipment to industrial equipment. The following are products of natural rubber processing products including tires, rubber, rubber flooring, rubber shoes, rubber pipes, household appliances and offices, such as adhesive, water hose, large engine and small engine drive belts, and stationery. Other benefits of rubber plants are the use of rubber tree trunks and the use of rubber seeds as food (Gautama, 2015).

3. PRIOR RESEARCH REVIEW

Wahyuni (2013), in a study entitled "Factors Affecting Dangke Selling Prices in Cendana District, Enrekang Regency". Research using multiple linear regression analysis. The results of the study are simultaneously factors that influence the selling price of dangke are the cost of production, demand, location and production. Partially the factors that influence the selling price of dangke in Cendana District, Enrekang Regency are location factors.

Ananto (2010), in the research method used is multiple correlation analysis, Revealed Comparative Advantage (RCA) and Trade Specialization Index (ISP). RCA analysis results from 2004-2008 > 1 (one), meaning that Indonesia has a fairly good export performance, it can also be said to have a comparative advantage, then ISP analysis results show that Indonesia in the international market is an exporter of palm oil, because ISP value for commodities palm oil > 0 (zero), so Indonesia tends to export more than imports.

Mudji and Mudjilah (2003) in a study entitled "The Role of Profitability, Interest Rates, Inflation and Exchange Rates in Affecting the Indonesian Capital Market During the Economic Crisis". The independent variable is the company's profitability, interest rates, inflation rates and currency exchange rates while the dependent variable is the stock price. The analytical tool used is regression, where the results of the study state that empirically it is proven that profitability, interest rates, inflation and exchange rates together significantly influence stock prices during an economic crisis and empirically prove that partially interest rates have a significant effect negative and the exchange rate of the rupiah against the US dollar has a significant positive effect on stock prices during the economic crisis.

Safriansyah (2010) entitled "Growth Rate and Competitiveness Analysis of Competitive Exports in South Kalimantan Province". The research method used is Revealed Comparative Advantage and Trade Specialization Index (ISP). The results obtained are 2 (two) superior commodities / products that have a level of competitiveness based on the RCA analysis tool for the same commodity in Indonesia. This product is indicated by an RCA index of greater than 1 The commodity is a Timber Product and a Mining Product. The five superior commodities / products of South Kalimantan Province have a level of competitiveness based on the analysis tool of the Trade Specialization Index (ISP) of the same commodity in Indonesia.

Anggit (2012), on "Analysis of Indonesia's Crude Palm Oil (CPO) Competitiveness in International Markets". This study analyzes export volume trends in 1991-2010 associative forecasting methods, namely linear regression analysis and analyzes the competitiveness of

CPO using Revealed Comparative Advantage (RCA) comparative advantage analysis and competitive advantage analysis using the Trade Specialization Index analysis (ISP). The results showed that the trend of Indonesia's crude palm oil export volume in the next three years increased, in 2013 amounting to 10,360,656 kg, in 2014 amounting to 10,824,992 kg, and in 2015 amounting to 11,289,328 kg. The competitiveness of Indonesia's crude palm oil in the international market, has a competitive advantage with ISPs approaching 1 which is 0.95 and has a low comparative advantage in the international market with an RCA index of 0.85.

4. CONCLUSION

Based on the potential analysis and previous studies, it is clear that the economic potential of rubber can be further developed. Particularly the study of price differences between farm level and industry level, and price determining factors at farm level.

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