THE ECONOMIC VALUE AND BUSINESS MANAGEMENT OF BAMBOO

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Judul **: The Economic Value and Business Management of Bamboo**

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I. Introduction

Bamboo is a wooden grass belonging to the Bambusoideae family of the Poaceae (Gramineae) family. This ancient wood grass is found in many tropical, subtropical and temperate zones in the world. These are very diverse plants, which have diverse needs with extreme environmental and soil conditions. There are about 90 genera and around 1200 species of bamboo found throughout the world besides Europe and Antarctica (Hossain et al., 2015). Most of the bamboo is found in the forest and is also widely distributed in the outer forest, on agricultural land, river banks, roadsides, and rural areas. Bamboo is a long stick as a non-wood forest product and is sometimes used as wood. Bamboo prices are quite cheap and availability is chosen to be the right choice to meet human needs (Trojan and Xu, 2014).

Bamboo is a catchable plant and some species die, so some species can be adapted to habitats that are far different from optimal conditions (Ha, 2010). Bamboo is becoming popular as wood for the paper, domestic, home, board and charcoal industries (Trojan and Xu, 2014). The people of Asia, Africa, and South America depend on the construction of houses and agriculture and in the countries of Southeast and East Asia bamboo is managed as a vegetable gave bamboo shoots. As a major non-timber forest product and substitute for wood, bamboo is increasingly in demand by ecologists because of its fast and high growth to mitigate climate change. If managed properly, bamboo plantations can conserve soil and air, and increase soil fertility and local conservation as well (Trojan and Xu, 2014).

II. Research Objectives

This article presents an overview of bamboo resources in Indonesia, the management of bamboo plantations and the economic role of products obtained from edible bamboo and bamboo shoots. The importance of the bamboo forest environment is also discussed.

III. Materials and Method

The compilation and compilation material comes from various scientific articles, most of which are published in indexed journals. The information collected is reliable and very new. The introduction contains an introduction to the importance of bamboo throughout the world and in Indonesia; The biggest bamboo producing country in the world; Bamboo in Indonesia; Climate and Edict for Bamboo Growth.

IV. Discussion

4.1 The Largest Bamboo Producing Country

As the most important non-timber forest product and wood substitute, bamboo play an increasingly important role in minimizing the pressure of wood demand on China's forest resources. With a long history of bamboo production and utilization, China is a country with the richest bamboo resources and the largest area of bamboo forests, and the country is the largest bamboo producer in the world followed by Thailand and Indonesia (Arsad, 2015). The Chinese government pays very good attention and supports the development of the bamboo industry by making policies to improve the bamboo industry (Song et al., 2011).

4.2 Bamboo in Indonesia

The area of bamboo plants in Indonesia in 2000 was 2,104,000 ha, consisting of 690,000 hectares of bamboo in the forest area and 1,414,000 hectares in bamboo outside the forest area. Types of bamboo in Indonesia include batung or betung bamboo (*Dindrocalamus asper*), yellow bamboo (*Bambusa volgaris Schard*), thorn bamboo (*Bambusa blumeana Bl*), reed or suluk bamboo (*Gigantochloa levis Merr*), tamiang bamboo (*Schizotachysim blunei Ness*), apus bamboo (*Gigantochloa apus Kurz*), legi bamboo (*Gigantochloa atter*), and Chinese bamboo (*Bambusa multiplex*) (Arsad, 2015).

4.3 The Economic Value and Benefits of Bamboo.

Bamboo plants that grow fast, are renewable, strong, and the high number of applications derived from them gives humans a variety of goods and services. The potential of bamboo is firmly rooted in knowledge and tradition in Asia, South America and Africa, where bamboo has been an integral part of people's lives as far as history is concerned, and has more than a thousand documented uses ranging from building materials to food. The number of uses continues to grow at this time

because advances in industrial engineering allow the processing of bamboo into new forms (Song et al., 2011). Bamboo grows much faster than wood tree species, requiring intensive management and expertise. Harvesting can be done every year without depletion and soil damage; can grow on marginal land that is not suitable for agriculture and easy to grow back; easier to harvest and transport; split easily to weave and thus easy to handle also for women (Trojan and Xu, 2014).

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4.5 Utilization of Bamboo

In general, the use of bamboo is divided into three aspects, namely as non-food products, food products, and conservation. As a commercial product, the bamboo-part that is utilized is the stem part as a substitute for wood. As for food, part that used is bamboo shoots (Troya and Xu, 2014).

4.5.1 Bamboo as Non-Food Product

Using wood as a material, specifically for buildings and household needs is increasing. This is not offset by an increase in the amount of wood, so that bamboo stems can be made as an inexpensive alternative for the use of construction, scaffolding, furniture, crafts, fishing rods, musical instruments, floors, and roofs. The use of bamboo for these products,

generally through the process of laminated bamboo, composite bamboo, and fiberboard. Examples of bamboo that can be used are *Bambusa lapidea, B. sinospinosa, and B. intermedia* (Troya and Xu, 2014).

Bamboo is widely used as a house building. This causes bamboo to be easily made, environmentally friendly, has strengths related to fast-growing wood, easily dismantled, and can be transported at a cheaper price compared to wood (Lobikov, et al, 2007). Bamboo losses as building construction are special requirements for bamboo construction and bamboo shrinkage is higher than wood because the surface is easily curved, a good working process is needed so that the surface of the bamboo is flat (Srimanthi, et al, 2016).

Bamboo as pulp and paper. Bamboo fiber can produce paper with a high tear index that resembles wood. However, the tensile strength of the paper is not as good as wood. This can be overcome by improving the quality of bamboo pulp. Examples of bamboo used are *Fargesia nitide, F. robusta, F. yunnanensis, and F. denudata* (Troya and Xu, 2014).

Bamboo as fuel. Bamboo can be used as charcoal and gas. Bamboo charcoal can be used for cooking fuel. This charcoal is more environmentally friendly and sustainable with charcoal obtained from minerals. Bamboo charcoal can be extracted from various parts of bamboo, however, Balinese, Indonesian people, make charcoal from bamboo waste, including rhizomes, books, small branches, and bamboo industry waste. In addition, the yield obtained from bamboo charcoal is higher than that of coconut charcoal. This is because bamboo contains high silica. The price of bamboo charcoal is Rp. 60,000 per sack. It produces 5 sacks in 2 days, which means that it generates Rp. 300,000. Waste needed for Rp. 30,000 to make one sack of charcoal. This shows that in a day, the bamboo maker gets Rp. 75,000. This income is higher than the salaries of workers who are only Rp. 60,000 per day (Sujarwo, 2017). Bamboo can be used as a substitute for petroleum (Lobovikov, et al, 2007).

4.5.2 Bamboo as Food

Bamboo shoots are used as food, specifically as a vegetable. Examples of bamboo used are *Chimonobambusa yinnanesnis, C. delicatus, C. pallens,* and *C. giganteus*. Bamboo shoots are often found during the rainy season. Good bamboo shoot management, namely by choosing bamboo shoots that are ready to harvest and not exploiting them all, so that there are those that grow as mature bamboo. Bamboo shoots are sold at Rp 2,000 per 250 gr (Bali market sales). China has

developed technology for the use of bamboo shoots as fresh bamboo shoots, dry bamboo shoots, and canned bamboo shoots which are sold throughout the world. The processed bamboo products made are bamboo candy, bamboo juice made from bamboo, and bamboo vinegar. Bamboo vinegar can be used as a biofertilizer and bioinsecticide (Troya and Xu, 2014).

The nutrient content of bamboo shoots is 88.8% air, 3.9% protein, 0.5% fat, 5.7% carbohydrate, and 1.1% minerals. High fiber in bamboo shoots can cause low cholesterol and can be avoided by colon cancer. The chemical contents of bamboo extracts are vitamins, amino acids, flavonoids, phenols, and various organic acids. In addition, bamboo also contains micronutrients such as chromium, zinc, manganese, iron, magnesium, nickel, cobalt, copper, and potassium, which can use normal blood pressure (Mejia, et al, 2009).

Bamboo as medicine. Yellow bamboo can be used as a liver drug because it contains high potassium and antioxidants. Bambusa arundinaceae has anti-inflammatory, antioxidant and anti-diabetes functions. Its roots have anti-inflammatory as a stop wound and arthritis. The leaves contain anticoagulants, can treat hemoptysis, also as an antibacterial. Bamboo shoots have health advantages such as diet, overcoming various cardiovascular, digestive, and antioxidant diseases (Hoosan, et al, 2015).

4.5.3 Bamboo as Conservation and Ecology

Bamboo has ecological benefits. Bamboo forests are useful as a substitute for air and soil, air purification, habitat for animals, and food providers for animals that are members of sustainable bamboo forest ecosystems. Bamboo has regenerative capacity and strong roots, so bamboo can be planted through lakes or river banks which can improve the quality and conservation of water and soil (Troya and Xu, 2014). Bamboo as a substitute for example in the Bali Botanic Garden published by Gigantochloa species. Bamboo is used as a support because it can absorb 90% of rainwater compared to other trees which are only able to 35-40% (Sujarwo, 2017).

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