

A Model of Manau Rattan Distribution Cost in Sumatra

Nurlaela K Dewi¹

¹School of Architecture, Planning, and Policy Development, Institut Teknologi Bandung, Indonesia

¹Sekolah Tinggi Manajemen Logistik Indonesia

nurlaelakumaladewi@yahoo.com

P. Pradono², Miming Miharja³

^{2,3}School of Architecture, Planning, and Policy Development, Institut Teknologi Bandung, ITB Bandung, Indonesia

Gatot Yudoko⁴

⁴School of Business and Management, Institut Teknologi Bandung, Indonesia

Abstract— Currently, rattan raw material price is not stable because its price is influenced by the difficulties encountered in rattan raw materials distribution from the upstream to the downstream. Establishing a distribution model will help to improve Indonesian rattan distribution policy within the framework of the dynamic system. It also restores rattan market condition into the mechanism of rattan trading so that rattan businessmen will be more independent and be able to set their own trading system. It is expected that through this policy, they will experience a fairer and more competitive rivalry in this rattan industry.

Keywords : Rattan Supply, Distribution, Policy, Dynamic System

JEL : L10, L11, L91

1. Introduction

Rattan raw material price nowadays is unstable. Many craftsmen and also businessmen complained the expensive price set by suppliers and it has gone up by 30%. Rattan price today primarily affected by rattan raw materials distribution process from the upstream to the downstream which is still difficult. Currently, several rattan producers at Katingan and Mentawai Islands complain about the schedule of pioneer ships managed by Department of Transportation. According to a rattan supplier being interviewed usually, the ships carry rattan raw materials every fortnight, but now the schedule is changed into every week.

From the survey result conducted at Pelindo or Board of Transportation about this pioneer ships schedule, that serve remote areas or remote islands in Indonesia, it is stated that the schedules become random and irregular due to the numbers of passengers and goods carried from the city harbor to the remote areas or islands have decreased each year. On the other side, the condition of the vessels that are often damaged due to schedule maintenance become increasingly long, so the ships operation is limited. [3]

Discussing about rattan raw materials distribution problem in the supply chain requires a systemic approach. Therefore, it is expected that this approach will serve as a basic understanding for a wider comprehension about factors which influence system behavior and also to give a basic understanding about the multiple causes regarding this problem within the framework of the system. In line with this research background, the established research question is to build an application model to help a transportation distribution policy simulation process in the system dynamic frame of rattan raw materials distribution in Indonesia. The objective of this research is to provide an alternative policy that may be implemented in the distribution of rattan raw materials as to obtain the minimum total cost.

2. Literature Review

It is not surprising if the issue about rattan raw materials has become an important matter for the decision makers. From the previous research (see Figure 1 on Rattan Raw Material Distribution Research Position), we comprehend that related to the problem of distribution cost issues in supply chain networks, a model of Rattan Raw Material Total Distribution is required, by reference to previous research conducted by previous research, which will be the basic model for calculating Rattan Raw Materials Distribution cost. In addition, in research on distribution need to how to integrate the supply chain network; While other research conducted to show for research on supply chain need existence of method of qualitative research and quantitative different can be implemented in synergy, but need existence of approach which realistic, critical and paradigmatic in research. In research on forest products suggests that the combined complexity of a human-forest interaction system requires a dynamic system that focuses on a broad view of issues concerning factors affecting forests and their ability to serve economic services to local communities. [12], [13] and [4]. Other research has shown that the most sustainable supply chain is put in a dynamic environment. Finally, research on this need to try to make supply chain design more dynamic and discussing

the distribution of rattan raw materials in the supply chain requires certain systems that are expected to provide a better understanding of the factors that influence system behavior and provide a basic understanding of some of the causes of the problem within the framework of the system [9], [2] Speaking of the supply chain system states that the intense competition in the supply chain business world makes an organization must be dynamically integrated within the network of business networks. The need for integration needs to consider the Product Service (PSS) and the dominant service-logic (SD) of this idea emerging in the supply chain is the leading Supply Chain Supply Service (SODSC) in the creation of added Value to form an integrated solution in a dynamic network for consumers embrace. For the integration of logistics network in the universal interconnection system is divided into two that serve the market and replacement resources. Physical Internet (PI) focuses on the transport of resources and supplies required by the supply model [8] and [13].

A modeling study on the supply of rattan raw materials with dynamic systems approach is expected to make the model more dynamic by making some suggested scenarios in order to achieve the most efficient model according to the demands of employers and decision makers.

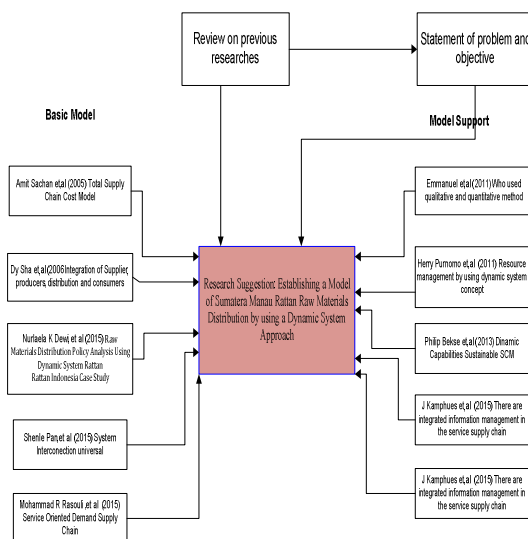


Figure 1. Literature Review

3. Research Methodology

Model development of the distribution supply problems rattan manau Sumatra completed by using a dynamic system that assumes that the world consists of a closed system, dominated by the feedback, non-linear functions, there is a grace period time delayed. This model is suited for applications on a system that is characterized by a certain dynamic pattern and a long time horizon, so it is useful to solve problems that have characteristics of dynamic, meaning that the question of time-varying quantities, and solve problems in connection with the feedback. Discussion and

assessment of the condition of this study using Vensim, a computer simulations help.

The stage of completion:

1. Data Collection

The type of data that is required in this study consists of two types of primary data and secondary data. Primary data is data obtained through direct observation or interviews. As for the secondary data obtained through the company's internal historical data and records or a predetermined standard local governments and enterprises.

2. Construction Program

Construction program is based on the flow chart, in this study the construction program is done with language designed specifically for Dynamic Systems

3. Model Validation

Validation of the model is done so that the model is made valid and all the variables are interconnected with each other so that the scenario that will be proposed in accordance with the characteristics of the distribution system of rattan raw materials in Indonesia. Validation of the model's behavior would be very helpful in assessing the suitability of the model, the model of consistency, and utility and effectiveness of behavioral model validation can be done by: a. Test reproductive behavior, b. Test the prediction of behavior and c. Statistic test

4. Preparation of Scenarios

Valid on models with the improved structure of the policy can be used to build several different alternative scenarios in the future. [5] "Differences in policy and system parameters can be taken into consideration and the impact on the response of the dynamic model, so the scenario for the future can be formulated".

4. The Mechanism of Rattan Raw Materials Supply Chain in Sumatra

The mechanism of rattan raw materials supply chain is naturally developed by its supplier agents. In developing countries such as Indonesia, this mechanism is characterized by the weak forestry products and market composition. Both factors will determine sustainability of supply chain mechanism. The weakness in raw materials produced from the forest and agricultural products, such as perishable, seasonal, abundant with a relatively small value, inconsistent, and others will affect the marketing mechanism, often causing fluctuating price which will harm farmers as producers [2].

Below is a brief description of each subsystem in the model of Sumatera Manau rattan raw materials supply chain:

Table 1 Production Of Raw Material Rattan In Sumatra

Year	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Amo ut
2012	Ton	127.07	92.31	634,16	74,48	928,02
2013	Ton	11230	12954	14470	15098	53752.08
2014	Ton	5525	1200	0.47	3750	10475.47
	Batang	70578	109784	107271	58078	345709
2015	Ton	6324	5215			
	Batang	15231	16321			

Table 1 portrays the West Sumatra cane production since the enactment of Regulation of the Minister of Trade No. 35 / M-Dag / Per / 11 / 2011 tentang ban on export of raw materials and semi-finished goods of Indonesian forest products. The production of first and second year shows impact of cane just to kind of rattan Irit and Sega sold in units Ton while rattan manau sold in units Trunk is not produced because of the price conditions that are not stable also a reduction in land rattan due to the shift of farmers' livelihoods rattan to other forest products, and it is reflected in the model 2 below

In the picture above describes the phenomenon of Sumatra manau farmers whose income is influenced by several factors, namely land rattan, productivity, production expenditures for rattan and household spending is high enough

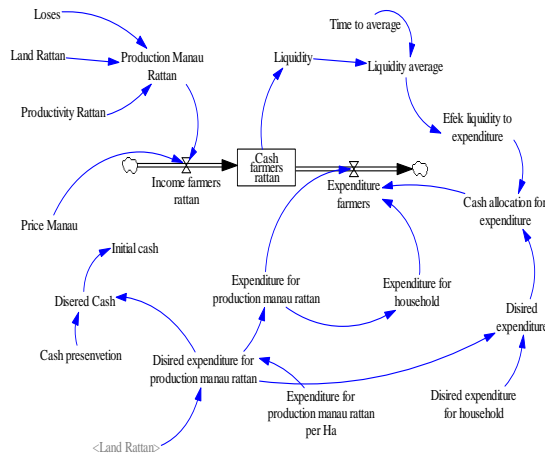


Fig 2 Subsystem Farmers Rattan

After building the model structure as in figure 2, the next step is developed a model of system dynamics model formulation as follows

Formulation

- CFMR = IFR – EF..... (1)
- IFR = PM – PMR (2)
- EFR = EFH + EFPMR + CAFÉ (3)
- PMR = (LR * PR) – L (4)
- MWIS = MWES – MHITSFG (5)
- MWES = MIN(TMCTS, MWPIH) (6)
- TIHM = Min(MP,TCR) (7)
- TMCTS = (CP – MWIS)/FT + MHITSFG (8)
- CHFR = AF – DT (9)
- FDR = MTT/CPFPD (10)

Where :

- CFMR : Cash Farmers Manau Rattan
- IFR : Income Farmers Rattan
- EFR :: Expenditure Farmers Rattan
- PM :: Price Manau
- PMR : Production Manau Rattan
- EFH : Expenditure For Household
- EFPMR : Expenditure For Production Manau Rattan
- CAFE : Cash Allocation For Expenditure
- LR : Land Rattan
- RP : Rattan Production
- L : Loses
- MWIS : Manau Wet In Supplier
- MHITSFG : Manau Haulage Industry To Semi Finished Good
- MWES : Manau Wet Entrance Supplier
- TMCTS : The Maximum Capacity Of The Supplier
- MWPIH : Manau Wet Pile In The Harbor
- MP : Manau to be Transported
- TCR : Transport Capacity Rattan
- CP : Capacity Supplier
- FT : Full Time
- CHFR : Cane Haul Fleet Rattan
- AF : Accretion Fleet
- DT : Depreciation Transport
- FDR : Fleet Demand Rattan
- CPFPD : Capacity Per Floor Per Day

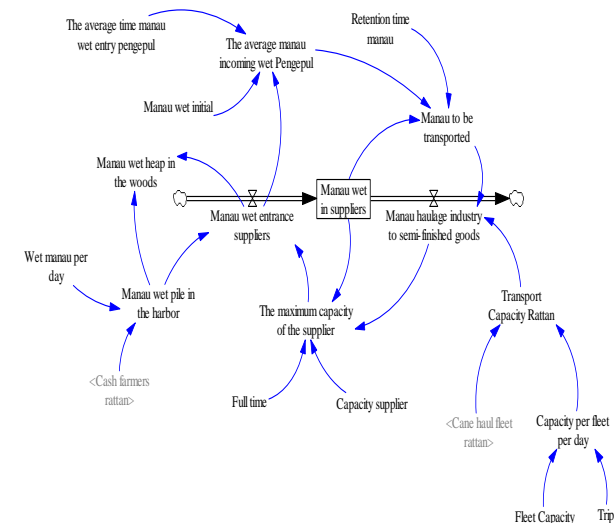


Fig 3 Sub System Supply Manau

The image above describes supply manau Sumatra collectors who are affected by the production of rattan farmers manau, the amount of daily production output of rattan manau wet at any port on the edge of the forest and how maximum capacity of rattan raw material supplier manau

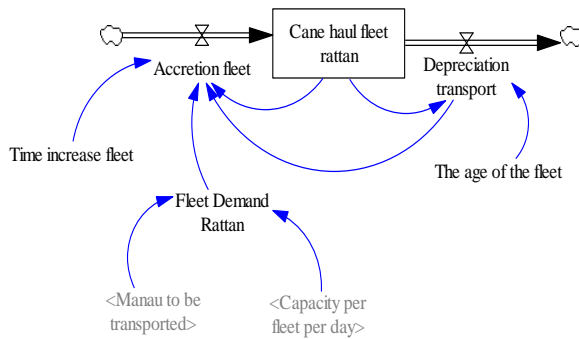


Fig 4 Subsystem Transport

Describe the carrying capacity of the fleet cane per day taking into consideration the age of the freight

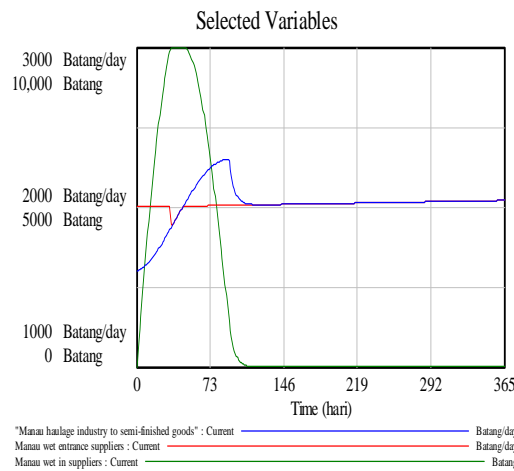


Fig 5 results manau rattan supply subsystem

Shows the results of the model between variables manau wet in suppliers, manau wet on wet manau suppliers and be transported into semi-finished rattan goods industry

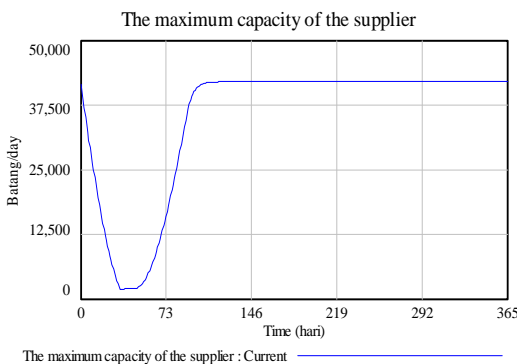


Fig 6 Maximum capacity Rattan Supplier Manau

Pictures that show maximum capacity of supplier decreasing and permanent increase in this case due to the successful cultivation of wicker manau

Wet rattan production in 2014 and 2015 in rattan producing areas manau in Mentawai Islands showed a significant increase, but because the

cultivation of cane by the forest department and rattan farmers manau successful, also because the pressure needs rattan farmers, making the production of raw materials rattan raw go up, this is illustrated by the results of the model sub manau supply system in figure 6 showing the entry of raw materials in a number of collectors rattan manau make maximum capacity cane suppliers.

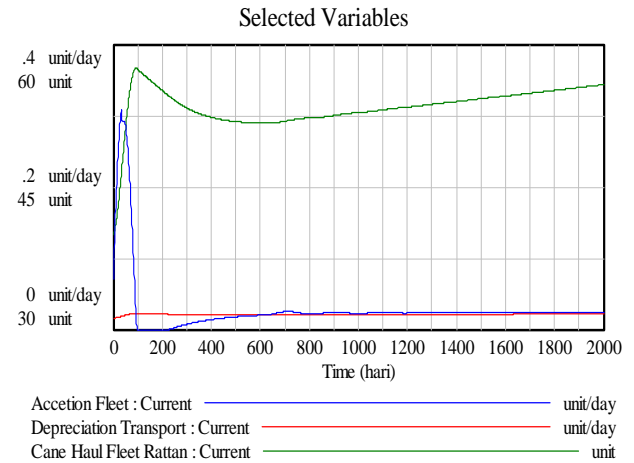


Fig 7 Results modify rattan transport

The model results were previously rattan haul fleet fluctuated use becomes more usable from the results of the model shown in Figure 7 need transportation to transport forest products showed increased quite high. In addition to its successful cultivation of forests as well as improvements in forest management that has been efficiently create demand for transportation in the upstream resource-producing forest products, especially rattan raw material comes from the Mentawai Islands have increased high. Needs pioneering ship that can transport forest products already cannot be avoided should immediately be provided in order to transport the raw materials with a large enough volume so that it can suppress the price of raw materials in the market.

Figure 8 is one of the raw materials production process rattan manau. Rattan manau wet entry in the processing industry of intermediate goods in advance the drying under the sun to dry, hereinafter fried using diesel oil to make it into a durable material.



Fig 8 Manau Rattan on Drying Processes

The dried material in peel with a peel and subsequent process tool filter or natural coloring to add to the beauty of raw materials rattan manau.



Fig 9 Quality Rattan Numer One Manau Sumatra

Figure 9 is showing the rattan manau ready to export and have undergone a process of industrial production in the intermediate goods in Gadui area Jl. Bagalung Pitameh Lubuk Raya Padang. Manau is a kind of Calamus Manan that has a diameter of 10-15 cm is rattan export quality durable and is the world's number one cane.

5. Discussion

Current condition of the transport ship pilot who serves remote island regions was minimal schedule so that the collectors using small vessels with limited capacity and are quite expensive to transport rattan raw materials of the island of Siberut Kep. Mentawai so that there are the rattan manau prices are very expensive and are not absorbed in the downstream industry rattan.

The government's role is only to provide transport facilities and infrastructure which can be used by farmers, collectors and wholesalers to be able to send rattan manau forest products, to industrial semi-finished goods in the provincial capital of West Sumatra and downstream industrial furniture rattan export quality on the island of Java.

Rattan raw material supply problems manau erratic require a dynamic supply planning.[13] study focuses on the level of resources transportation and inventory required by the current supply model and the physical Internet system to serve the market with stock policy (Q, R). Starting with two models of supply and with the definition of the cost model, as well as inventory policies, work based on computer simulations.

Distribution networks are subjected to an increasing dynamic. The ability to adapt to dynamic influences is, therefore, of great importance for the competitiveness of companies. In order to respond to increasing dynamic influences on the supply chain, a service-oriented planning approach for inventory management was developed [6]. The most important asset is the provision of an integrated information management with an open system design that ensures a flexible expansion by integrating additional planning modules.

These subsystems inter act one another, such as production subsystem is closely related with the supply subsystem, and the market subsystem which gives information about demand for raw materials and rattan finished product in its activities. This subsystem is affected mostly by the rattan market mechanism which has many middlemen causes the rattan price to be unsteady. Transportation/distribution subsystem is a tool to distribute rattan raw materials and its finished products to the end user.

Rattan trading subsystem as a manau rattan business activity in Sumatra Indonesia, the number one country in the world to produce rattan, has a flow of goods and service from the point of production to the point of consumer. A policy that may be implemented to lower its price is to return the rattan trading mechanism to the market without any intervention from the government. Therefore, its competition will be fairer and more competitive. The ideal conditions expected for rattan raw materials distribution are the steady price, supply continuity, sufficient supply volume and in time raw materials delivery, by returning goods to the market, will eventually transform businessmen's manner in this industry to survive themselves.

6. Conclusion

The steady price for rattan raw materials is certainly expected by all businessmen in this national rattan processing. However, its price is still very fluctuating, although there is an abundance or over supply of raw materials at the upstream. This phenomenon does not guarantee for its price to be improved. The transportation condition in Sumatra Indonesia that serves remote areas and islands is an important task for the government to fix it. The existence of government policy to prohibit export shows that this regulation does not have a significant impact on the national rattan industrialization. Restoring market trading mechanism is expected to enable rattan businessmen to be more independent and

also capable to organize their own business. It is likely that this restoration policy can create a fairer and more competitive rivalry in this industry.

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