

## Phenomena of Rattan Distribution in Indonesia

<sup>1</sup>Nurlaela K. Dewi, <sup>1</sup>Miming Miharja, <sup>1</sup>P. Pradono and <sup>2</sup>Gatot Yudoko

<sup>1</sup>Institut Teknologi Bandung, School of Architecture, Planning and Policy Development,  
Collage of Logistics Management Indonesia (STIMLOG), Jl. Sariosih No. 54,  
40151 Bandung, Indonesia

<sup>2</sup>School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

---

**Abstract:** The problems of Indonesian rattan related to the policy sets by the government influence the upstream condition as well as the downstream condition of Indonesian rattan industry. The approach taken to solve rattan problems in Indonesia is by using system dynamic approach. Research finding about rattan phenomena in Indonesia raises a discourse that the government policy to prohibit rattan raw materials export turns out to be insignificant in helping the national rattan industry to increase its production and profit. If the trading system is given to the market without government intervention may be competition will seem fairer and the role of government is expected to assist the domestic market by making rattan as a superior product as with batik cloth.

**Key words:** Indonesian rattan, policy, dynamic system, government intervention, batik cloth, assist

---

### INTRODUCTION

The scarcity of raw rattan since the implementation of Regulation of the Minister of Trad No. 35/M Dag/Per/11/2011 lasted only about two years but the impact over time reduces the rattan furniture industry in the downstream such as Padang, Cirebon, Katingan, Palu, Semarang and Surabaya. Current condition of rattan raw materials are already in a state of over-supply whether it is at upstream collectors or at District and city suppliers. The lack of domestic demand for rattan products and furniture does not give rattan industrialization a very good result. Heaps of rattan raw materials at suppliers warehouses make some rattan suppliers expect government to reopen the opportunity to export rattan raw materials but at on the other hand, craftsman or rattan furniture producers expect government to keep its export opportunity remain closed so that they can have the best quality of rattan raw materials and the quality of their furniture will eventually dominate national and international rattan furniture market priyono.

What is the condition of rattan raw materials distribution now a days and the positions of interaction model development of businessmen, decision makers and dynamic complexity based of distribution channel based on the existing theories and models? The objective of this study is to develop interaction model between businessmen, decision makers and distribution channel of rattan raw materials in Indonesia.

**Literature review:** In several previous studies, some researchers stated (Sha and Che, 2006) have to design a network of supply chain for the efficient, effective and strategic production and distribution for the supply chain network to play a key factor in improving customer satisfaction (Yoon, 2007). The question is: how to integrate Supply Chain Management and Revenue Management which often become a problem in manufacture chain system, especially in raw materials procurement, production plan and supply policy for customers in the uncertainty of demand (stochastic). An approach developed by using collaboration technique which focuses on supply integration and demand planning with this model of system dynamic of supply chain components of the three echelons, Tokmanm and Beitelspaches (2011) developing logic service domain to make the organization more creative with the resources that are interconnected with various partners. It takes critical and paradigmatic manner in conducting research which is related to contribution in researching supply chain by providing a more specific explanation about supply chain and logistics associated with dynamic phenomenon. Sidola *et al.* (2012) conducted a research about the impact of information technology toward a chain supply network and distribution organization. A cooperation between suppliers in chain supply network is expected to solve any conflict possibilities between its members and to distribute ever profit obtained with a good manner for every network partner

and how to estimate the marginal cost due to the interests of several parties associated with the supplier network.

Discussing the problem of distribution of rattan raw materials in the supply chain need to approach the system is expected to provide a foundation broader sense of the factors that influence the behavior of the system and provide a basic understanding of the multiple causes of a problem within the framework of the system, a model developed by Philip Beske *et al.* (2012) has the goal to show that the most sustainable supply chain is laid in a dynamic environment. Salles *et al.* (2016) Fuzzy Logic (FL) is a more appropriate tool to express business decisions (policies) accurate with the decision-maker's way of thinking in natural language and perfectly complementary to the System Dynamics (SD) modeling approach. Schildbach and Morari (2016) Scenario-Based Model Predictive Control (SCMPC) is computationally efficient and able to tackle problems of a similar scale as manageable by deterministic optimization. For a large class of Supply Chain Models, SCMPC may therefore offer substantial advantages over robust or stochastic optimization.

The approach taken to solve problems in Indonesian rattan distribution line is by using system dynamic approach. System dynamic is a thorough approach; it thinks systematically where feedback theory and computer simulation are its distinction to decipher the complex problems. Implementation of dynamic system methodology is expected to show the behavior of rattan industry in the real world; therefore, we can get the best solution from a series of experiments conducted through the policy scenarios.

**MATERIALS AND METHODS**

Stages of making a dynamic system model using methodology belongs to Saeed consisting of; identification of a specific behavior pattern (a reference pattern).

**Dynamic hypothesis:** The dynamic hypothesis proposed in this stage is not surely obtained, therefore it needs iteration: a comparison with empirical evidences. Therefore, reformulation needs to be taken to obtain logical and valid hypothesis empirically. Delivery model should be created to separate the internal tendencies and processes which represent the exogenous influence. The model boundary illustrates the analysis coverage with the main focus on the issue at hand. The feedback structure shows a process of variable causality in a closed loop instead of statistical correlation. There are two feedback loops; positive and negative.

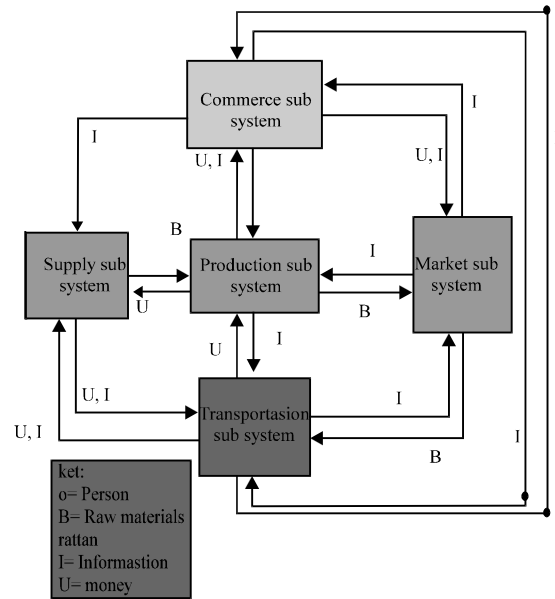


Fig. 1: Diagram the flow distribution system rattan Indonesia Nurlaela

**Testing models and policy analysis:** According to Forrester (1958), the test is classified into three major groups; the first group consists of a model structure examination; structure verification, parameter, extreme condition, margin of sufficiency and consistency of dimension. The second group is closely linked to behavior, member of groups, surprise behavior, extreme policy, margin of sufficiency and sensitivity behavior. The third group consists of the test system improvement, the modified forecasting behavior, margin of sufficiency and policy sensitivity.

The model structure used is Rattan Raw Materials Distribution System in which to illustrate a system condition based on the Global Model (Forrester, 1958) where in this conceptual model there is interaction between the major subsystems forming the model and it is presented in Fig. 1. Here is a brief description for each subsystem:

- The production subsystem serves to generate rattan products
- The supply subsystem serves as a supplier of rattan raw materials
- The transportation subsystem serves as a tool to distribute rattan raw materials
- The market subsystem serves as a market which will provide information about the needs for rattan raw materials and finished products
- The rattan trading subsystem serves to organize businessmen who perform business activities and rattan trade

**Table 1: Indonesian rattan production quarterly**

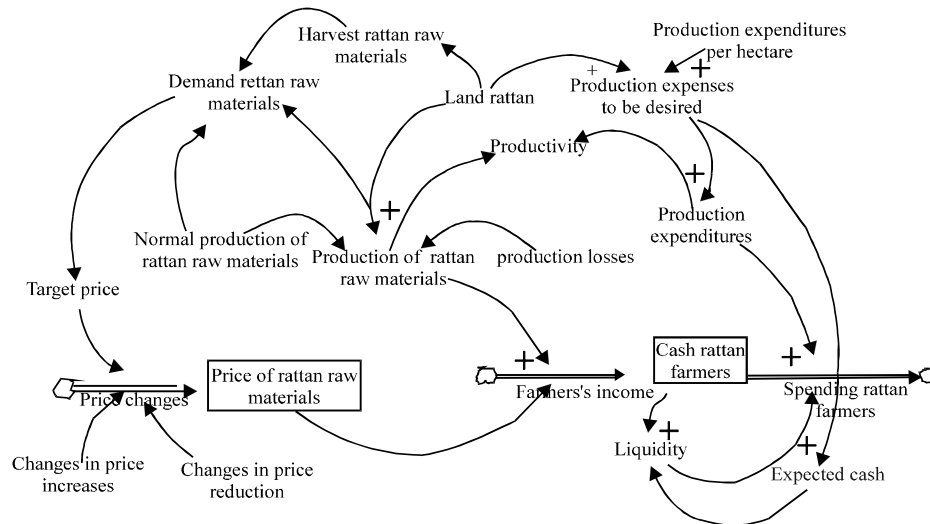
Years	Unit	Quarter I	Quarter II	Quarter III	Quarter IV	Amount
2012	Ton	32.391,60	49.374,95	96.837,91	31.002,98	209.607,44
2013	Ton	97.600,48	79.145,85	19.447,37	48.560,30	244.754,00
2014	Ton	10.634,72	8.156,88	3.260,81	8.939,57	31.000,96
	Trunks	254.557,00	216.909,00	372.970,00	411.796,00	1.256.236,00

Department of Forestry, 2015

**Table 2: Regulation for Rattan Commerce in Indonesia**

Years	Number of Regulation	Contents
1979	SK Mendagkop No. 492/KP/VII/79 Dated 23 July 1979	Prohibition of round rattan export as raw rattan
1986	SK Menperdag No. 274/KP/X/1986 Dated 7 October 1986	Prohibition to export all form of round-shape rattan and semi-finished rattan
1998	SK Memperindag No. 440 /MPP /KP/9/1998	Allowance to export every kind of round rattan and semi-finished rattan
2004	SK Memperindag 355/MPP/Kep/5/2004 Dated 27 May 2004	Prohibition to export round rattan obtained from nature forest; rattan export originating from cultivated rattan is possible
2005	SK Menteri Perdagangan Nomor 12/M-DAG/PER/6/2005	Allowance to export raw rattan and semi-finished rattan
2009	SK Menteri Perdagangan Nomor 36/M-DAG/PER/8/2009	Tighten the rules to export raw rattan and semi-finished rattan by requiring compliance with the domestic industry
2011	SK Menteri Perdagangan Nomor 35/M-DAG/PER/11/2011 Tertanggal 30 Noperber 2011	Prohibition to export raw rattan and semi-finished rattan

Presentation from Director of BPS, Ministry of Forestry in Seminar Revival Rotan Indonesia, 2013



**Fig. 2: Subsystem production rattan raw materials**

The data collection is obtained from survey conducted at Bureau of Forestry and it can be categorized as a non-timber forest product. The collected data show that there is increase for every quarter. According to our source, the increasing rattan product occurs because the Department of Forestry and rattan farmers are succeed in rattan cultivation.

Description production subsystem of the model distribution system rattan today, the production of which occurred an average of 200000-250000 tons/year (Table 1) of the supplier of rattan in the forest obtained the information needs of raw materials of rattan for 1 month, from a monthly average raw material produced is 33tons/month. Rattan raw material supply conditions before their decree. Minister of Trade No. 35/M/DAG/ PER/11/2011 on the prohibition of

export of raw and semi-finished rattan 400,000 tonnes/year is greater than at present. Policy rattan trading system as in Table 2, rattan Indonesian affect market conditions. After building, the model structure as in Fig. 2, the next step is developed a model of system dynamics model formulation as follows:

**Production of rattan raw materials (ton):**

$$P_{rrm} = (D_{rrm}-P_l) \times (L_r \times L_{pr}) \tag{1}$$

Prices of raw materials of rattan (Rupiah/ton):

$$C_p = T_p \times (C_{pi} - C_{pr}) \tag{2}$$

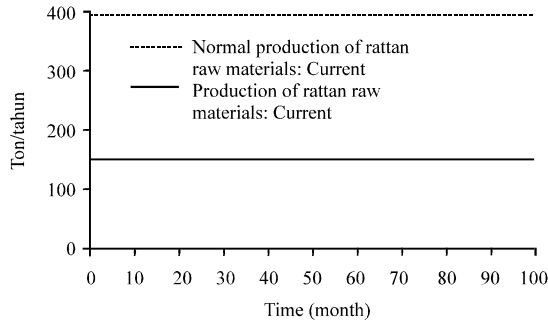


Fig. 3: Production of rattan raw materials

$$P_{mr} = C_p \tag{3}$$

Farmer's income (Rupiah):

$$F_i = P_{rm}/P_{mr} \tag{4}$$

Cash rattan farmers (Rupiah):

$$C_{rf} = R_{fi}-S_{rf} \tag{5}$$

Where:

- $P_{rm}$  = Production of rattan raw materials
- $D_{rm}$  = Demand rattan raw materials
- $P_l$  = Production losses
- $L_r$  = Land rattan
- $L_{pr}$  = Land productivity rattan
- $P_{ed}$  = Production expenses to be desired
- $P_{eph}$  = Production expenditures per hectare
- $P_{mr}$  = Prices of raw materials of rattan
- $C_p$  = Changes in the price
- $T_p$  = Target price
- $C_{pr}$  = Changes in price reduction
- $C_{pi}$  = Changes in price increases
- $F_i$  = Farmer's income
- $C_{rf}$  = Cash rattan farmers
- $R_{fi}$  = Rattan farmer's income
- $S_{rf}$  = Spending rattan farmers

From Fig. 3 shows that the production of rattan Indonesia were previously very big now reduced by nearly half. The phenomenon of reduced production of rattan raw materials for their ban on export of raw rattan, the condition of the transfer of forests into plantations, cultivation of cane which has not yet entered the harvest period and the shift of the profession rattan farmers to rubber, copra, cocoa and coffee.

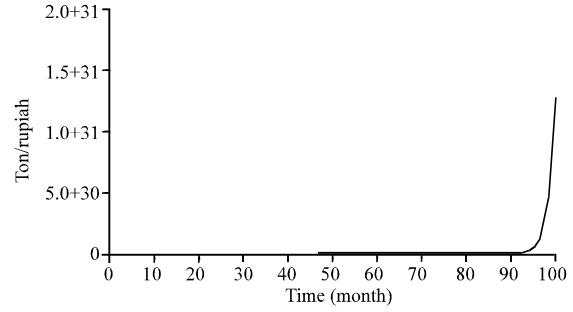


Fig. 4: Prices of raw materials of rattan

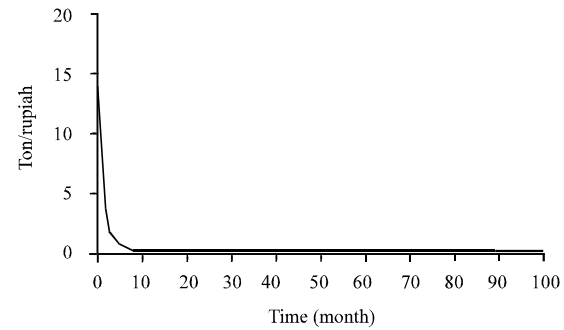


Fig. 5: Farmer's income

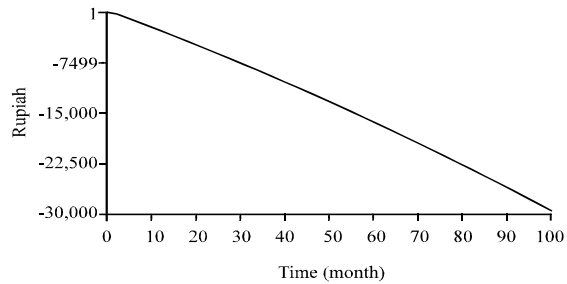


Fig. 6: Cash rattan farmers

From Fig. 4, it appears that the price chart rattan raw material has increased due to lack of raw material supply and distribution conditions difficult from upstream to downstream. Figure 5 shows the decline of the opinion rattan farmers Indonesia (Fig. 6) shows that the decreased cash rattan farmers high and nearly deficit.

## RESULTS AND DISCUSSION

In some literature including (Makins *et al.*, 2012). In order to cope with a challenges of the global and dynamic environment; transforming the company into a more focus and on the core competition and gradual outsourcing, (Ozatagan, 2011) organization realizes that improving

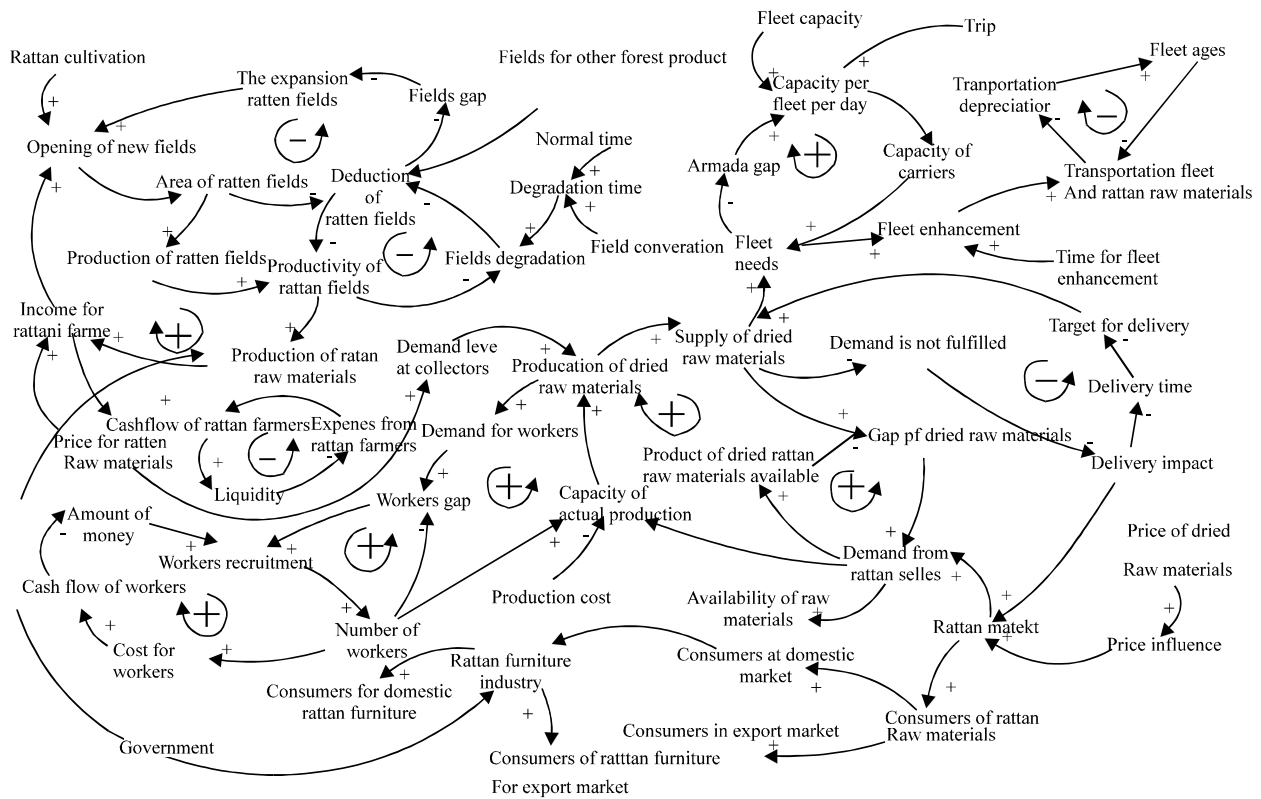


Fig. 7: Causal loop diagram of Indonesian rattan distribution

internal efficiency alone would not be sufficient on the contrary, they should strengthen the external relationship with suppliers and their main customers.

Figure 7 shows the causal loop diagram model below we can see that there are interactions between every subsystem that results in product of rattan raw materials output at the upstream which is influenced by the behavior of rattan farmers, land use, rattan land expansion, the successful cultivation of rattan and shift of rattan land for other forest products.

The result of supply subsystem is highly dependent on production subsystem achieved by farmers both in dry and wet conditions. This supply subsystem also depends on demand or market condition from the downstream industry for rattan furniture in Indonesia. Currently, the supply condition is abundant it means that the impact of government policy about prohibition to export rattan raw materials creates this over-supply condition. Production of rattan raw materials every year is ranging from 200-250 thousand tons/year while uptake in down stream industry is in the range of 30 thousand tons/year. Transportation subsystem is a means of supporting the distribution for rattan raw materials from upstream to downstream. Numbers of fleet

capacity and payload capacity are strongly influenced by the needs of fleets required to distribute subsystem supply to rattan product downstream industry.

The rattan market subsystem both for dried raw materials and in the shape of rattan furniture products is available in the rattan market organized by the suppliers or big traders. The rattan trading subsystem organizes rattan trading from the upstream to the down stream with the Government Policy Since 1979. This regulation affecting rattan trading in Indonesia.

**CONCLUSION**

The result of this research about rattan phenomena in Indonesia raises a discourse that government policy about prohibition to export rattan raw materials does not significantly help businessmen in the national rattan industry to increase production and profit. If this trading system is to be organized by market without any intervention from the government, it is possible that we may see a fairer competition and the government is expected to assist domestic market by making rattan as one of our superior products as with batik cloth.

**REFERENCES**

- Beske, P., 2012. Dynamic capabilities and sustainable supply chain management. *Intl. J. Phys. Distribution Logistics Manage.*, 42: 372-387.
- Forrester, J., 1958. Industrial dynamic: A major breakthrough for decision makers. *Harvard Bus. Rev.*, 8: 67-96.
- Makins, Q., D. Nagao and N. Bennett, 2012. Enterprise alignment and inertia risks during transformation. *Inf. Knowl. Syst. Manage.*, 11: 151-168.
- Ozatan, G., 2011. Dynamics of value chain governance: Increasing supplier competence and changing power relations in the periphery of automotive production evidence from bursa, Turkey. *Eur. Plann. Stud.*, 19: 77-95.
- Salles, D.D.C., A.C.G. Neto and L.G. Marujo, 2016. Using fuzzy logic to implement decision policies in system dynamics models. *Expert Syst. Appl.*, 55: 172-183.
- Schildbach, G. and M. Morari, 2016. Scenario-based model predictive control for multi-echelon supply chain management. *Eur. J. Oper. Res.*, 252: 540-549.
- Sha, D.Y. and Z.H. Che, 2006. Supply chain network design: Partner selection and production/distribution planning using a systematic model. *J. Operational Res. Soc.*, 57: 52-62.
- Sidola, A., P. Kumar and D. Kumar, 2012. System dynamics investigation of information technology in small and medium enterprise supply chain. *J. Adv. Manage. Res.*, 9: 199-207.
- Tokman, M. and L.S. Beitelspacher, 2011. Supply chain networks and service-dominant logic: Suggestions for future research. *Intl. J. Phys. Distribution Logistics Manage.*, 41: 717-726.
- Yoon, M.G., 2007. Capacity control and distribution problem for manufactures in supply chain networks. *Asia Pac. Manage. Rev.*, 12: 267-275.