

Popularity Level and Role of Actors in the Degree Centrality Network of Eucalyptus Oil Processor Farmers in Waisala Village, West Seram Regency, Maluku Province

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Abstract - Both quantity and quality of production outcomes are determined by the availability of information needed by eucalyptus oil processor farmers for developing their farming business. The dissemination of this information across the farmers is usually done by farmers who have central role in the degree centrality network, and these farmers become the model for other farmers who seek for this information. The objective of this research is to analyze popularity level of actors in the degree centrality network and to identify role of these actors in the dissemination of information related with eucalyptus oil business. Result of research is explained into several words. The popular actors in the degree centrality network, especially on the aspects of production, capital lending, and marketing of production outcomes, are Saman Usemahu, La Junaedi, Abu Habar, La Icu and La Nyong. Role as *opinion leader* are played by those persons, precisely Saman Usemahu, La Junaedi, Abu Habar, La Icu and La Nyong. Meanwhile, roles as *bridge*, *gate keeper*, and *star* are mostly played by La Icu and La Nyong. The implication of this research is that popular actors with central role in the degree centrality network are truly needed to disseminate information about eucalyptus oil business concerning with the aspects of production, capital lending, and marketing of production outcomes to fulfill the livelihood of eucalyptus oil processor farmers.

Keywords - Role of Actors, Degree Centrality Network, Eucalyptus Oil Processor Farmers.

I. INTRODUCTION

A. Background

Information is a set of exchangeable data, which may take a form of ideas, concepts and values used in the communication process by individuals, groups, or societies for the aim of changing the behavior.

The availability of information on demand of farmers may improve their skill and knowledge in farming. In contrast, lack of information may prevent farmers from adopting new innovation to their farming. Indeed, information is the source of credible power to attain higher productivity. The more credible is the information gotten by farmers, the better their knowledge will be. The more informed farmers are mostly becoming the source of

referent information to other farmers in their community environment. These farmers play central role in receiving and sharing information with other farmers. This role is analyzed using the approach of *degree centrality network*, especially when it is related with the exploitation of potentially available natural resources.

Eucalyptus oil is a natural resource that potentially provides economic values to farmers or communities. Eucalyptus oil processor farmers in western part of Seram Regency, Maluku Province, have long ago been in the business of eucalyptus oil refinery. This business is their legacy and they keep it as main source of livelihood because it gives them economic advantages for their families. Eucalyptus oil derivative products have been recognized by local government as one of leading commodities in Maluku.

In average, eucalyptus oil production from West Seram Regency and Buru Island represents the main source of national products with export quality to be delivered to some destination countries. Therefore, it can be said that eucalyptus oil production is very vital to national production because it is proven to be economically valuable.

B. Problem Formulation

Despite the facts that eucalyptus oil is important commodity, and has been cultivated by farmers very long ago, but eucalyptus oil processor farmers still do processing with traditional method and simple equipments. These facts indicate the lacking of information among the eucalyptus oil processor farmers. Previous studies in West Seram Regency found that some problems have impeded eucalyptus oil processor farmers from developing their farming business, and these problems include: lack of education, training and extension about production process; limited information concerning business capital and marketing of production outcomes; and less attention from local government (Souhuwat, R., Ambarawati, I., Arga, I. 2013; Purimahua, 2013; Salaka, 2010; and Kartini, N. Irmayani., 2014). Such problems are worsened by the habit among eucalyptus oil processor farmers to disseminate information only through word-of-mouth and internal network.

In this research context, communication network is understood through the aspect of *degree centrality network*. Indeed, this network helps the author to identify information flow across eucalyptus oil processor farmers and also guides the author to recognize other sources of information concerning eucalyptus oil business. Moreover, this information allows the author to determine popularity level of actors in network. According to Rogers and Kincaid (1981), “the objective of communication network research is to understand the phenomena of relationship among humans in their social environment, and also to identify structure of this relationship and role of actors within it”. Regarding to this statement, the objective of this research, therefore, is to analyze popularity level of actors in the degree centrality network and to identify role of these actors in the dissemination of information related with eucalyptus oil business.

II. METHOD OF RESEARCH

A. Research Approach

Research of communication network or *degree centrality network* usually involves quantitative approach. According to Sugiyono (2015), “quantitative approach is always based

on positivist paradigm, and thus, suitable to be used to examine population or certain sample”.

Quantitative approach, which utilizes *degree centrality network* as a method, is very useful in exploring social facts of the observation objects, and from this, the author gets the detail description concerning the relationship among individuals (eucalyptus oil processor farmers) in network structure and also the roles of central actors within this structure.

The disseminated information is also observed, and the emphasis is given on information concerning eucalyptus oil business activities, such as information about production process, capital lending, and marketing.

B. Location and Time of Research

Research was located in Waisala District, West Seram Regency. This location is justified due to some reasons: (1) this location is one of leading centers for eucalyptus oil production in Maluku Province, in addition to Buru Island; (2) eucalyptus trees in this region contain with sineol (oil substance in eucalyptus leaf) which can dissolve in the oil at range of 50-60 ppm (part per milion); and (3) farmers still use traditional processing method, and have limited information about eucalyptus oil business.

Based on the considerations above, the author attempts to do a research on this region by examining actors with central role in the network of eucalyptus oil processor farmers. Network analysis must be conducted to understand social facts in the farming community, especially among eucalyptus oil processor farmers.

This research shall be very important because it provides many information that can be used by farmers, or even by government in making policies to support farming activity of eucalyptus oil processor farmers in West Seram Regency, especially in Waisala District as the region with potentials of eucalyptus oil natural resources. Research started from October to December 2016.

C. Respondent Determination Method

Respondent determination method in communication network research always begins with population. It is said so because the observation is conducted not only on certain actors in the farming community or certain regions of the sample, but also on relationship among the actors without certain boundaries (Eriyanto, 2014). According to Borgatti and Lopez, K. V. (2011), “communication network research does not have natural boundary and this differs it from other

quantitative research because the focus of communication network research is always given on network but some network members are not the members of research population”.

In any communication network researches, respondent determination involves two approaches, respectively realist and nominalist approaches, and both are used to make specific boundary in the network (Laumann, et.al., 1983). However, in this research context, nominalist approach is used, and the focus is given on relationship among respondents. The analysis unit is eucalyptus oil processor farmers in Waisala District, West Seram Regency, with total of 124 persons (Department of Forestry for Maluku Province, 2014). Census is used as analysis instrument.

D. Type and Source of Data

Type of data in this research is quantitative data. It takes a form of numbers in a parameter of research variable, and this parameter is degree centrality network. The usage of quantitative data is aimed to measure popularity level of certain actors in degree centrality network.

Concerning with the source, data are differentiated into primary and secondary data. Primary data include those about actors (eucalyptus oil processor farmers) and those concerning relationship among the actors. Secondary data are those obtained indirectly from research object (Sumarsono, S. 2004). In this research, the author obtains secondary data from relevant institutions that support the research.

E. Data Collection Technique

Data collection technique determines the quality of the collected data on field. Zuriah, N. (2009) said that “the use of proper technique or instrument of data collection will allow the acquisition of objective data”. According to Bungin, B. (2011), “data collection method is the instrument of research that determines whether research is successful or not”.

Data collection technique in this research is questionnaire, and this technique focuses on questions concerning actors (eucalyptus oil processor farmers) and relationship among the actors. Some questions are given to the subjects in sequence. First is *generator* question asking about names of actors who have relationship in network. Second is *interpreter* question concerning with the intensity of relationship among the actors. Third or final question is *interrelater* question aimed to understand how the relationship among the actors is developed.

F. Data Analysis

Quantitative data are analyzed using computer software of UCINET VI. This software is operated to analyze degree centrality network to find out the number of relationship developed by central actors (eucalyptus oil processor farmers) with other actors in their communication network. The objective of this analysis is to identify actors with the greatest number of relationship with other actors.

The analysis process involve few stages, and in this research context, precisely in the use of communication network approach through degree centrality network, thus these stages must be operated.

1. Database must be made in *edge list* format consisting of name of actors and their relationships/contacts.
2. *Degree centrality* is measured by counting the number of relationship possibly made by one actor with other actor in network. Score 0 shows “no actor contacting or to be contacted”, while Score 1 stands for “there is actor contacting or to be contacted”.
3. After measuring *degree centrality*, then the number of relationship developed by each actor is counted.
4. After counting the number of relationship, then next step is determining who is the actor with the most number of relationship and what role is played by this actor in degree centrality network (*opinion leader, bridge, gate keeper, liason or isolate*). The actor with the most number of relationship is always the most popular of all.
5. When the most popular actor has been identified, it continues with data interpretation to facilitate discussion. The discussion usually talks about measurement and the result of discussion will be used to understand degree centrality network.

III. RESULT AND DISCUSSION

A. Popularity Level of Actors in Degree Centrality Network of Eucalyptus Oil Processor Farmers

Centrality is often used to measure how central or important is the actor in the network of eucalyptus oil processor farmers. According to Scot in Sopiana (2003), *centrality* is the degree where someone develops relationship with other in the system. Therefore, centrality can also be used to measure the excellence of certain individual in the system.

Degree centrality is the number of relationship or linkage given by one actor to other actor in network. It is also indicator measuring the extend of relationship among the actors and the popularity level of certain actor in network (Bonacich quoted by Eriyanto, 2014). Actor with the highest level of degree centrality is one with the most number of relationship with other actors and thus the most popular of all.

Result of measurement with UCINET 6 shows that some actors have the highest level of degree centrality in communication network of eucalyptus oil processor farmers. They are: La Nyong with 82 relationships or contacts, La Icu with 39 relationships or contacts, Saman Usemahu with 30 relationships or contacts, La Junaedi with 26 relationships or contacts, and Abu Habar with 20 relationships or contacts. Other actors only have, in average, 7 relationships or contacts.

La Nyong and La Icu are actors with farming experience of 24 years and playing role as the buyer of eucalyptus oil in the region (in local term, they are called as “*tanata’a*”). *Tanata’a* has the most number of relationship with other actors in eucalyptus oil business. Some reasons stay behind this. First, other actors in eucalyptus oil production often use production equipment only owned by *tanata’a* without rent fee or whatsoever charges.

Secondly, most actors (precisely eucalyptus oil processor farmers) do not have business capital, and when they must proceed their production, they get capital lending from *tanata’a*. Third, for marketing of eucalyptus oil production outcomes, all actors are required to not sell their products to other actors other than *tanata’a*. Fourth, besides having relationship with other actors in network, *tanata’a* actors also do have other contacts outside the network, such as: Actor A (Extension Officer), Actor B (Trader from Buru Island), Actor D (Waisala Village Chief), and E (Department of Industry and Trade for West Seram Regency). These contacts usually provide information relating with eucalyptus oil business. Therefore, although *tanata’a* actor is a not formal leader of the community, but *tanata’a* has always a leverage to influence the decision of other actors in network.

Abu Habar, La Junaedi and Saman Usemahu are actors with great experience of 30 years in eucalyptus oil farming. They have great contribution in disseminating information about eucalyptus oil business to other actors in network. It is said so because they ever attend training about eucalyptus oil business and thus, they have knowledge better than

others. Many other actors develop relationship with them to obtain information concerning techniques of production or processing of eucalyptus oil. Indirectly, these three actors affect the decision made by other factors concerning with techniques of production or processing of eucalyptus oil.

Besides having relationship with actors in communication network, these three actors also have relationship with actors outside communication network, such as: Extension Officer, Waisala Village Chief, Department of Industry and Trade for West Seram Regency, and bank representatives. In average, this relationship does concern more with eucalyptus oil production, mainly related with refining activity. In relation with the bank, these three actors play role as informant to disseminate information about credit lending to other actors in network, but they themselves never apply for credit lending from the bank. Other actors in network take benefit from having relationship with *tanata’a* actors, especially for capital lending from the bank.

As explained above, it can be said that *tanata’a* actors, such as Saman Usemahu, La Junaedi and Abu Habar, are those mostly receiving contact or visit from other actors who seek information about production process, and thus, being *tanata’a* actor makes them the most popular actor of all. To be called as *tanata’a* actor, someone must receive the most number of contact from other actors in network who desire information about production technique, capital lending, and marketing of production outcomes. To be called as popular actor in network requires someone to have capability to influence the decision of other actors concerning eucalyptus oil business.

B. Role of Actors in Degree Centrality Network of Eucalyptus Oil Processor Farmers

Muhamad, A. (1995) asserted, “in communication network, there are few terms used to describe roles or positions of the most important person in network structure, and these roles include *opinion leader*, *gate keeper*, *bridge*, *cosmopolite*, *liason* and *isolate*. Table 1 explains terms that describe role of actors in network of eucalyptus oil processor farmers.

The table shows that the dominant roles of actors in network of eucalyptus oil processor farmers in Waisala District, West Seram Regency, include *opinion leader*, *bridge*, and *gate keeper*.

Tanata’a actors in degree centrality network play roles as *opinion leader*, *bridge* dan *gate keeper*. Being *opinion*

leader, actors regulate rules of game for eucalyptus oil business. All eucalyptus oil processor farmers always listen to *tanata'a* actors before starting their eucalyptus oil farming. Therefore, *tanata'a* actors are always the model for the sustainability of eucalyptus oil business in the region. Besides playing role as *opinion leader*, *tanata'a* actors also have position as *bridge* and *gate keeper*. In *bridge* role, *tanata'a* actors act as connecting bridge between eucalyptus oil processor farmers in the region and traders from Buru Island. These traders are the biggest agent for eucalyptus oil production in Maluku Province. All farmers who want to sell their production outcomes to traders from Buru Island, therefore, must use the service of *tanata'a* actors. Indeed, without the assist of *tanata'a* actors, there will be no relationship between eucalyptus oil processor farmers and traders from Buru Island. Regarding to the role of *gate keeper*, *tanata'a* actors arrange the procedure of how to conduct eucalyptus oil business in the region. All farmers who successfully obtain capital lending or facility for marketing of their production outcomes, must comply with

advices and suggestions. Therefore, these three actors (Abu Habar, La Junaedi, and Usman Usemahu) are considered as playing important role in disseminating information to other eucalyptus oil processor farmers, and the farmers presume this information as benefiting to their knowledge and skill. Thus, farmers recognize these three actors as their model in the region.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

Research concludes that *tanata'a* actors have the highest level of popularity in degree centrality network because they receive the most number of visit from other actors, especially eucalyptus oil processor farmers, who want to be informed about production process, capital lending, and marketing of production outcomes. Three actors, such as Abu Habar, La Junaedi and Saman Usemahu, have high popularity level because they are informed better on production technique.

Table 1. Role of actor and topic discussed in network of eucalyptus oil processor farmers in Waisala District, Year 2016.

Name of Actor	Role	Number of Relationship	Topic Discussed
Abu Habar	Opinion Leader	14	Production Process
La Junaedi	Opinion Leader	26	Production Process
Saman Usemahu	Opinion Leader	30	Production Process
La Icu (<i>tanata'a</i>)	Opinion Leader; Bridge; Gate Keeper	39	Production Process, Capital Lending, and Marketing
La Nyong (<i>tanata'a</i>)	Opinion Leader; Bridge; Gate Keeper	82	Production Process, Capital Lending, and Marketing

Source: Primary data, 2016

requirements given by *tanata'a* actors. One usual requirement is that farmers are disallowed to sell their production outcomes to traders, but instead they must sell it to *tanata'a* actors. The disobedient actors shall be sanctioned, mostly, with the rejection of their proposal for capital lending.

Other actors in degree centrality network with central roles are Abu Habar, La Junaedi, and Usman Usemahu. Their role is being opinion leader. They play this role because they are informed about production technique of eucalyptus oil, and they share it with other actors who need

Tanata'a actors also play roles as *opinion leader* and *gate keeper*. However, the most important role played in degree centrality network is *bridge* or connector. Without *tanata'a* actors as the bridge, thus, the network of eucalyptus oil processor farmers may not be developed.

B. Suggestion

Based on the result of research, it is suggested that eucalyptus oil business in Waisala District, West Seram Regency, shall run well as expected when *tanata'a* actors are involved. Other actors can be consulted as long as they have high popularity level and play roles as *opinion leader*,

bridge, and gate keeper among eucalyptus oil processor farmers.

Local government must take responsibility to increase the welfare of people in the region. The government shall also give attention and support to ensure the success of development activities, particularly concerning with business sustainability of eucalyptus oil processor farmers.

REFERENCES

- [1] Borgatti S., & Lopez-Kidwell Virginie. (2011). Network Theory. In J. Scott, & P. J. Carrington (Ed.), *The SAGE Handbook of Social Network Analysis* (hal. 167-179). Singapore: Sage Publications.
- [2] Bungin, Burhan. 2011. *Qualitative Research*. Jakarta: Kencana Predana Media Group.
- [3] Department of Forestry for Maluku Province. 2014. *Balance Sheet of Regional Special Natural Resources, Maluku Province: The Cooperation between PUSPICS UGM, and Local Government of Maluku Province*.
- [4] Eriyanto (2014). *Analysis on Communication Network*. Jakarta: Prenadamedia Group.
- [5] Kartini, N. I. (2014). *The Impact of Community Empowerment on The Development of Eucalyptus Oil Agribusiness: Case Study at Community Learning Activity Center (PKBM) of Sari Arum in Waeapo District, Buru Regency. Proceeding of the 2014 National Seminar, UNMAS PRESS*.
- [6] Laumann, E., Marsden, P. & Prensky, D. (1983). *Applied Network Analysis* (pp. 18-34). Beverly Hills, CA: Sage.
- [7] Muhammad, A. (1995). *Organizational Communication*. Bumi Aksara. Jakarta
- [8] Purimahua (2013). *The Analysis on Determination of The Leading Non-Wood Forest Commodities and Its Developmental Strategy in West Seram Regency, Maluku Province*. Thesis. Ambon: Postgraduate Program of Pattimura University.
- [9] Rogers, E., M and D.L. Kincaid (1981). *Communication Networks: Toward A New Paradigm for Research*. The Free Press, New York.
- [10] Souhuwat, R., (2013). *The Prospect of Eucalyptus Oil Agribusiness Development in West Seram District, West Seram Regency. Journal of Agribusiness Management*, Vol.1, No. 1, May 2013.
- [11] Salaka (2010). *Policy Strategy of the Marketing of Non-Wood Forest Commodities in West Seram Regency, Maluku Province*. <http://ejournal.fordamof.org/ejournal-litbang/index.php/JAKK/article/view/2526/194>.
- [12] Sugiyono (2015). *Methodology of Quantitative, Qualitative, and R&D Researches*. Bandung: Alfabeta.
- [13] Sonny Sumarsono. 2004. *Methodology of Research on Human Resource*. Jember: Graha Ilmu.
- [14] Sopiana. 2003. *The Relationship of Characteristic of Farmers and Their Communication Network with Sugarcane Farming Behavior: Case Study in Transmigration Area of Tanah Village*.
- [15] Zuriah Nuzul. 2009. *Methodology of Social Research on Theory-Practice Education*. Jakarta: PT Bumi Aksara.