

COCOA MARKETING NETWORK IN THE COUNTRY'S BORDER AREAS

Dewi Elviana^{1,2*}, Yosini Deliana², Iwan Setiawan² and Rita Komaladewi³

¹Faculty of Agriculture, Universitas Padjadjaran, Jatinangor Campus, Sumedang 45363 West Java, Indonesia

²Faculty of Agriculture, Universitas Borneo Tarakan, Amal Lama Campus, East Tarakan 77123 North Kalimantan, Indonesia

²Faculty of Agriculture, Universitas Padjadjaran, Jatinangor Campus, Sumedang 45363 West Java, Indonesia

³Faculty of Economics and Business, Dipati Ukur, West Java Indonesia

Abstract

Indonesia is an agricultural country so it has a very large potential of agricultural resources. And has sea borders with 10 countries including India, Malaysia, Singapore, Thailand, Vietnam, Philippines, Republic of Palau, Australia, Timor Leste, and Papua New Guinea. One of the important border areas in Indonesia is Sebatik Island. The life of the people of this island is a very distinctive life like other border areas between Indonesia and Malaysia. Cocoa farming is a farm that has been cultivated by the people of Sebatik Island for a long time. The intended target market is domestic and overseas (Malaysia). The interaction between cocoa marketers on Sebatik Island is supported by close kinship and long-standing border relations. In the network, you can see who they ask and who they ask about cocoa marketing. The network forms several groups of small information channels within the farmer groups and the structure that composes them. The higher the activity of individual cocoa farmers in communicating with other farmers, the higher the amount of marketing information exchanged. The research objective is to analyze the structure of the communication network of cocoa communication in Sebatik Island, which consists of three central areas, namely the Districts of Central Sebatik, East Sebatik and North Sebatik. The interaction that occurs is related to the search for information about cocoa marketing. There are 202 cocoa farmers as respondents in the research area. The analysis tool uses a Social Network Analysis approach. The results of the analysis show that there are five market players with two types of cocoa marketing channels. In the context of the cocoa marketing network, traders are the central actors and dominate cocoa marketing information. This condition shows that the cocoa marketing aspect is controlled by traders. The implication of the strategy that can be formulated is the integration of market information from all stakeholders involved so as not to harm farmers.

Keywords: Cocoa, border, marketing, channel, communication network

Introduction

Indonesia as the largest archipelagic country in the world has two thirds of its territory in the form of Indonesian seas, namely 6.32 (six point thirty two) million square kilometers (km²) (Pratiwi, 2020), 17,504 (seventeen thousand five hundred four) islands -island (Pudjiastuti, and is

one of the countries that has the second longest coastline in the world after Canada, which is 99,093 (Ninety-Nine thousand and ninety-three square kilometers (km²)) very large. Characteristics Indonesia is the largest archipelagic country in the world which has maritime borders with 10 countries including India, Malaysia, Singapore, Thailand, Vietnam, the Philippines, the Republic of Palau, Australia, Timor Leste, and Papua New Guinea. The Philippines is a country that has many similarities from the geographical conditions, economy, maritime base, agrarian and others (archipelagic country).

Geographical and political factors, these conditions have implications for cross-border cooperation relations. (Cross-border), cross-border coordination and cooperation can arise from trade and/or good neighborly relations between countries. The trade aspect is a key driver of cross-border coordination and cooperation, trade relations are more often successful if some form of coordination is permanent and if local and regional authorities and private sector organizations are involved and work together, across borders to facilitate such trade relations (Paudel, 2018). The flow of people and businesses drives local markets on both sides of the country. Socio-cultural communities are interconnected (Walter, 2014). The economic potential is very open in the border areas, supported by the attachment and kinship between people living in both regions (Azmi et.al, 2017).

One of the important border areas in Indonesia is Sebatik Island. The life of the people of this island is a very distinctive life like other border areas between Indonesia and Malaysia. The border environment of the two regions is formed by the contrasting economic developments between the two countries, geographical proximity, as well as ethnicity and culture. the attachment of residents on both sides of the border (Sarkawi, 2020_History education). Administratively, Sebatik Island is divided into two parts (North and South). This division began with a convention in 1891 between the British and Dutch governments known as the London Convention (Grenzen Borneo Treaty) between the Dutch East Indies (Netderlandsche Indie) and the British protectorate in North Kalimantan (British North Borneo Protected). The population of Sebatik Island consists of various ethnicities, such as Bugis, Tidung, Timorese, Javanese, and others. However, the Bugis are the largest population in the region. generally are farmers; both oil palm and cocoa farmers.

The geographical condition of Sebatik Island is very strategic because it allows for connectivity, interaction and cross-border business activities by the people on the border. Social interaction in border areas is social capital because it has been established for a long time, is very fluid and is not influenced by state administration. Moreover, they have the same ethnicity and kinship ties. Hustin and Wang (2018), that informal trade is generally carried out by people in border areas that do not yet have stable regulations and policies such as what happened on the border of China and North Korea.

The plantation sector on Sebatik Island produces a number of main commodities that can be exported to neighboring countries, such as cocoa, oil palm, coconut, and bananas. Farmers and collectors of agricultural products are sold to Tawau by utilizing a network of traders who have

kinship relations with traders in Tawau (Malaysia). The results of research by Rahayu (2015) and Hidayanto (2015) confirm that cocoa has a sustainability status from the economic, ecological and social dimensions so that it has the opportunity to be developed further. This condition is also supported by the results of Mulyo's research (2018), that cocoa commodity has an R/C and Gross Margin/C ratio of 7.47 and 6.47%, respectively, so it is feasible to cultivate. Socio-economically, cocoa has contributed to job creation, farmers' income and welfare, as well as regional income.

Institutionally, interactions between cocoa agribusiness actors have been developed conventionally on Sebatik Island, including interactions with business actors in neighboring countries. Zhang and Xu (2018), that the interactions carried out by farmers both personally and in groups are solely aimed at improving farming and increasing their welfare.

The interaction between cocoa marketers on Sebatik Island is supported by close kinship and longstanding relationships. This is in line with the opinion of Ofolsha et.al. (2022), that social interaction develops because of the relationship between actors/individuals, which may arise due to kinship, affection, cognitive relational characteristics or acquaintances between them. Social networks can foster the capacity to buffer, adapt, and shape change by providing the resources needed to manage external stresses and disturbances. These factors can encourage human ability to initiate social innovation and improve collective action.

Simultaneously, cocoa marketing problems in Sebatik Island have had an impact on the weak bargaining position of farmers. As cocoa producers, farmers get low prices, even though cocoa is marketed to Malaysia. The problem is, although most of the farmers' cocoa products are marketed to Malaysia, because the trade runs informally, it is not yet categorized as export. Cocoa marketing network in Sebatik Island has the potential to be developed. As the main component of the network, market information (selling prices, opportunities and quality standards of cocoa products) becomes an important aspect and becomes the basis for interaction of all cocoa business actors.

A farmer is assumed to be influenced by information and interaction factors in his network in making choices (decisions) in order to maximize the usefulness of his farming. Farmers in Nigeria tend to trust market information through traders and fellow farmers (Ogunleye and Abidogun 2014). Cocoa farmers in Ghana make choices in their farming influenced by their characteristics and their community (Denkyirah et.al., 2016). Kumar (2015), communication communication networks between farmers are very important to intervene regarding information needs. The communication network is important for the interaction and exchange of knowledge among the members of the subsystem and .

Communication and trust are intertwined (Qing Li, 2019) in communication between farmers. Qing Li (2019), in a social network, a group of actors, that is, they tend to create bonds with the business partners of their business partners. One of the main determinants of bonding between actors is the position of their network. In the study of the network (network) refers to the

approach of mathematics through graph theory (graph theory) which describes several objects through points called nodes, crisp links are called edges or links/ties. When applied in social science, nodes are represented by individuals or groups who act as actors who have relationships with other actors or ties. So that a social network can be said as a set of people or groups with some contacts and interactions between them. In a social network analysis there are several basic concepts, namely actors, bonds, social relations, relations between two actors (dyads), three actors (triads), subgroups, groups, relations/relationships and networks (Carrington and Wasserman, 2005).

The communication network formed is a farmer's communication activity in obtaining cocoa marketing information related to price, market demand and quality. In the network, you can see who they ask and who they ask about cocoa marketing. The network forms several groups of small information channels within the farmer groups and the structure that composes them. The higher the activity of individual cocoa farmers in communicating with other farmers, the higher the amount of marketing information exchanged.

The research objective is to analyze the structure of the communication network of cocoa communication in Sebatik Island, which consists of three central areas, namely the Districts of Central Sebatik, East Sebatik and North Sebatik. The interaction that occurs is related to the search for information about cocoa marketing. The context of the information sought is about market prices, cocoa quality and the amount of market demand. Relationships occur between cocoa farmers with each other (friends in the farmer group) and people outside the group (traders) in an effort to fulfill the need for information about cocoa marketing.

Sample Technique And Sample Size

There were 202 cocoa farmers selected for the study using a multi-stage sampling technique. In the first stage, the area of Sebatik Island was chosen intentionally because it is the center of cocoa production in North Kalimantan Province. The second stage, there are five sub-districts and choose three sub-districts that have cocoa farmer groups. The sub-districts are Central Sebatik, East Sebatik and North Sebatik. The third stage, conducted interviews with thirteen cocoa farmer groups. The farmer groups include Sinar Tani, Mega Abadi, Sippakange, Poliwali Borang, Usaha Jaya, May Jaya, Tunas Jaya, Sipakario, Mamminasae, Anak Maspul, Sinar and Lapri.

Instrumentation for data collection

A pre-tested semi-structured questionnaire was developed as an instrument for data collection. The structure of the questions in the data collection instrument is a combination of closed, open, and partially closed questions. The survey was conducted from January – March 2021.

Method

The research uses a descriptive quantitative approach. The technique used is observation, questionnaires, literature study, and interviews by applying the survey method at the location. The

network in this research is a marketing communication network for cocoa farmers. The context of searching for marketing information is carried out in the context of expanding the market for cocoa produced. All nodes (farmers) were all analyzed.

The analysis was carried out in two stages, namely by measuring the main characteristics, namely centralization and network cohesiveness. Network cohesiveness, measurements made include (1) network density (density), (2) average level of relationship (average degree), (3) level of connectedness (closure/connectedness), (4) frametasi (fragmentation), (5) network diameter and (6) distance. The centrality refers to the position of actors (nodes) in the whole network, how central the actors are in the network, who is the most prominent, determines and has power in the network.

At the system or structure level, the analysis of the whole network is focused on the characteristics of centralization. The centrality refers to the position of actors (nodes) in the whole network, how central the actors are in the network, who is the most prominent, determines and has power in the network (Roberto, 2019). Citing the opinion of Bonacich (1987) in Eriyanto (2014), there are four measures of centrality that can be used, namely degree centrality, closeness, betweenness and eigenvectors.

The supporting variables used are divided into farmer characteristics including age, education, experience and income land status, cocoa land area, and the amount of cocoa production. Sociometric analysis is used to describe the interaction (linkage) between cocoa farmers in the cocoa marketing communication network that is carried out. After obtaining data from sociometric questions, a matrix of relationships between farmers was created. The matrix consists of rows representing the source of the relationship and columns representing the target. The presence or absence of a relationship between business actors is indicated by a binary number. If there is a relationship between farmers, it is represented by the number 1, while if there is no relationship, it is represented by.

The relationship matrix between cocoa farmers was visualized in the form of a sociogram using UCINET IV software, namely social network analysis software developed by Borgatti, et al (2002) in Yulida et al.(2021). In the UCINET IV software, select the Visualize column then Netdraw, until a sociogram of the cocoa farmer marketing communication network is obtained. Based on the sociogram obtained, it can be seen the relationship between farmers through connected lines.

Result And Discussion

Demographic Characteristics Of Cocoa Farmers

Table 2 presents the results of the demographic characteristics of cocoa farmers in the study area. Based on the age of the respondents, they are at the level of productive old age, namely in the age range of 41 - 55 years by 57.1 percent with an average age of 53 years. The average age level indicates a good quality of labor in cocoa production. This will have a positive effect on productivity as younger farmers are more energetic and tend to adopt new technologies

(Denkiryah, 2016). The dominance of male respondents among farmers could be due to the fact that men have greater access to agricultural land than women. This is influenced by the fact that cocoa farming is labor intensive. Therefore, women are unable to fulfill the effort needed to cultivate crops (Ahao et.al, 2020). The results of education show that the literacy rate in the research location is quite high at 86.1 percent. There are still illiterate farmers and few highly educated farmers. The majority of cocoa farmers have farming experience in the study area ranging from 11 to 20 years. Rota et.al. (2021), explained that education contributes to positive and negative effects in the adoption of organic farming. Educated farmers are better able to choose the right materials and techniques than less educated or illiterate farmers, they can also ensure exploitation of the advantages associated with organic methods.

Karipidis *et.al.* (2022), experience is closely related to the length of time a person has been in a job. The longer a person is in a job, the more experience he will gain, especially in cacao cultivation. Sapbamrer et.al. (2021), farmers with more experience in agricultural work are more likely to adopt newer agriculture, due to their wider knowledge and concern for farm quality and its long-term impact. The area of land greatly affects the level of cocoa production. The larger the area of land owned by cocoa farmers, the greater the production results obtained, so it is possible to increase the income of cocoa farmers. Based on the results of the study, the majority of farmers have land areas ranging from 1.7 to 2.8 hectares (68.8 %), with an average land area of 2.57 hectares. The land area is correlated with the majority production volume obtained by farmers. As many as 68.1 percent of farmers produce cocoa production in the range of 288 – 525 kilograms per year with an average production volume of 354.3.

Table 2. Distribution of farmers based on internal characteristics

Variabel	Responses	Frekuensi	Percent	Average
Age (Year)	≤ 40		15.84%	53.2
	41 – 55		57.92%	
	56 – 70		17.33%	
	≥ 70		8.91%	
Gender	Male	150	74.3 %	-
	Female	52	25.7 %	
Level Of Education	No Formal Education	28	13.86%	-
	Primary/JHS	101	50%	
	Middle/SHS	49	24.26%	
	Tertiary/Undergraduate	24	11.88%	
Years Of Farming	< 18.8	96	47.5%	32.8
Experience In Cocoa (Year)	18.8 – 32.5	95	47%	
	> 32.5 - 46.3	6	2.97%	
	> 46.25	5	2.48%	

Land Area Of Cacao (Ha)	0 – 1.6	39	19.31%	2.57
	1.7 - 2.8	101	50%	
	2.9 - 3.9	55	27.23%	
	> 3.9	7	3.47%	
Land Ownership Status	Personally	199	98.5 %	
	rent	3	1.5 %	
Cocoa Production Volume Per Year (Kg)	<= 287.5 kg	29.70%		
	287.5 - 525 kg	61.88%	354,03	
	526 - 762.5	6.44%		
	> 762.5 kg	1.98%		
Farmer's Group	Sinar Tani	41	20.3%	
	Mega Abadi	10	5 %	
	Sippakange	20	9.9 %	
	Poliwali Borang	13	6.4 %	
	Usaha Jaya	10	5 %	
	Semoga Jaya	17	8.4 %	
	Tunas Jaya	20	9.9 %	
	Sipakario	7	3.5 %	
	Mamminasae	18	8.9 %	
	Anak Maspul	24	11.9 %	
	Sinar	7	3.5 %	
	Lapri	3	1.5 %	
Lapangan	12	5.9 %		

Most of the cocoa sales made by farmers on Sebatik Island are still in bulk or dry cocoa (raw material) and are sold to collectors and exporters. Cocoa market participants are connected through product flows, money flows and information flows. The product flow in the network is in the form of cocoa beans, which begins as input for production at the farmer level, then produces products in the form of wet picked cocoa to become dry cocoa beans which are the raw material for processed cocoa. Money flows are transactions that occur between actors, namely the existence of money flowing from Indonesian wholesalers, exporters, and farmers. The flow of products and money can run well if the flow of information between actors is well established. The flow of information is abstract (intangible) because it is the basis for making decisions on the size of the material flow and the flow of money in the network. Attributes of marketing information in the form of information on prices, buyers and quality of cocoa products.

As in many other agricultural markets, the cocoa market is characterized by many marketing agents (Ogunleye and Oladeji, 2007) all of whom play an important role in the marketing chain (Bowersox, 2002). As in many other agricultural markets, the cocoa market is

characterized by many marketing agents (Ogunleye and Oladeji, 2007) all of whom play an important role in the marketing chain (Bowersox, 2002).

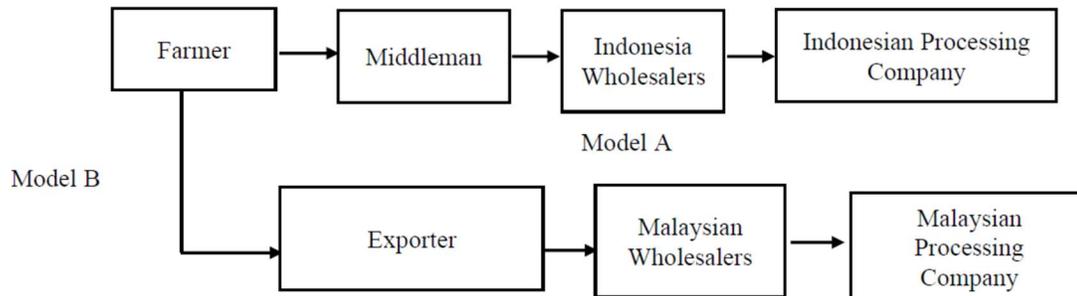


Figure 2. Cocoa Marketing Channels in Sebatik Island

In channel A, farmers sell their cocoa products to collectors on Sebatik Island. There are 60 percent of farmers selling cocoa to middlemen. The target market is the Sulawesi (Indonesia) market, so that the collectors sell their products to wholesalers from Sulawesi. Cocoa sales are carried out through the Port of Bambangan (Sebatik) to be transported and sold to a cocoa processing factory in Sulawesi. In channel B, farmers sell to collectors who also act as exporters in Sebatik. This is because the target market is the Malaysian market. There are 40 percent of cocoa farmers who sell cocoa through exporters. Exporters sell their cocoa products to wholesalers (importers) in Tawau through the Port of Lopong (Tawau). The products are sold to cocoa processing factories in the territory of the State of Sabah, Malaysia.

In market structure, there are more cocoa farmers on Sebatik Island than buyers, so the market structure is oligopsony (imperfect competition market). Prazeres et.al., (2021), stated that if the number of farmers as a whole is greater than that of collectors, wholesalers and exporters, the smaller the number of marketing institutions, resulting in an oligopsony market. Kotler and Keller (2016), explain that the oligopsony market is a form of market in which two or more buyers (generally business actors) dominate the market in terms of receiving supplies, or acting as the sole buyer of goods/services in a commodity market. In this market, buyers are business actors who buy raw materials and then resell them to final consumers. Buyers have a big role in determining the price of goods in the market. Collecting traders are controlled by certain wholesalers. This condition resulted in the formation of a hidden oligopsony market, which even though it looked like a perfectly competitive market because of the large number of middlemen, the price was actually controlled by wholesalers (Tresnasari, 2013). In theory (Crawford, 1997), oligopsony has a weakness because the price received by producers is often controlled by traders who have monopsony power (mastering the market). This condition causes producers (cocoa farmers) to tend to accept low prices. In the marketing of commodities that are monopsony/oligopsony, farmers do not have bargaining power.

Cocoa Marketing Network Cohesiveness

Nababan (2021), explains that cohesiveness is a force that encourages group members to stay in the group and prevents them from leaving the group. Cohesiveness is considered as the forces that cause members to stay in a group, such as liking for other members in the group and the desire to maintain and increase status by being a member of the right group. Cohesiveness is the extent to which the members of a group are willing to cooperate. As a boundary, cohesive can separate the roles of each of its members, and their adherence to the group can lead them to work together in groups to achieve common goals.

No	Indicator	Value
1	(Node)	213
2	(Ties)	1043
3	(Density)	0,023
4	(Deg Centralization)	0,296
5	(Average Degree)	4,89
6	(Closure)	0,55
7	(Connetedness)	0,072
8	(Fragmentation)	0,982
10	(Distance)	2,2

Source: Primary Data Processed, 2022.

The results of the complete network analysis on Sebatik Island, showed that there were 213 actors consisting of 208 members of farmers and 5 traders. There are 9 cocoa farmers outside the farmer group but they often communicate and do marketing at the research location so that they are taken as one of the actors of the communication network in this study.

The communication network formed has communication ties or relationships with a fairly low density level of 2.3 percent and this value is lower than the value of the degree of centralization which is 29.6 percent. This value shows that the cocoa marketing communication network on Sebatik Island is less cohesive among the actors. Cocoa farmers tend to rarely meet due to their busy activities. Communication and interaction generally occurs when there is a farmer group meeting or village meeting. The condition of the settlements that are quite far apart also has an influence on the communication network carried out by cocoa farmers.

Weak communication is caused by the remote location. The conditions of settlements and plantations in the study area are quite far apart. cause network communication is low. However, the value of the average level of the relationship between requests for information (average degree) shows a fairly large value, which is 4.89 percent. The condition of cocoa farmers is that although communication is weak, their curiosity about price and marketing information is quite high. Because if you don't find a place to sell cocoa, it will have an impact on your income.

Cocoa marketing communication network tends to fragmentation among actors, it can be seen from the fragmentation value of 98.2 percent. This assessment shows that there are groups seeking and disseminating information about marketing location information. Cocoa farmers on Sebatik Island also only get information about marketing from a few people and groups.

The level of closure between them is quite high, namely 56.3 percent. The closeness of the relationship is quite high resulting in the estrangement of the relationship. Most cocoa farmers only focus on information from their own group, therefore the level of cover-up is quite high. Each group only informs about cocoa marketing and prices only to members of the group and does not inform outside the group. This condition is seen from the low value of connectedness, which is 7.2 percent. When viewed from the average distance, an actor only needs to communicate through 2 people who are in the same group as the actor. Cocoa marketing actors on Sebatik Island prioritize the number of other relationships with actors outside their group.

Actor Centrality in Cocoa Marketing Communication Network in Sebatik Island

Other actors (nodes) in a network tend to focus on one actor (node). The results of the centrality analysis will produce findings of who is the dominant actor who determines the sustainability of a network, both at the level (degree), closeness (closeness), intermediary (betweenness) and eigenvector (eigenvector). A network of all existing positions may be owned by one actor, but in general they are owned by a number of actors. Actors in a network occupy different positions. There are actors who are popular and become sources of reference (degree), actors who are close to all other actors (closeness), act as intermediaries (betweenness) and eigenvectors (eigenvector) (Everett and Johnson, 2013).

Degree Centrality

Is the number of links to and from the actor. The higher the centrality value, the better the Berto (2019) node will be. Harlina et al. (2018), the more relationships an actor has with other actors, the more likely that actor is important and has the opportunity to influence and access existing resources. Degree centrality is also a global centrality that shows how well connected actors are with their environment. The combination of the outdegree centrality and indegree centrality values, individual trader number 37 (Purple Circle) has the highest score of all actors in the network. This can be interpreted that the individual has a great influence in terms of conveying and receiving information from other farmers. Furthermore, this actor has an important position in terms of collaboration among farmers

The actor who has the highest degree centrality value is 111 and 29. The actor is a big collector on Sebatik Island. Brands act as sources of information and friends to discuss cocoa marketing information. Cocoa farmers sell their crops through this actor because they often interact and are considered to have a commitment to buy their crops at the prevailing price. This creates a

sense of trust among farmers. a combination of outdegree and indegree, that individual farmers #9 Kasmawati and #37 Hj.Mariabe have the highest degrees of all farmers in the network. This can be interpreted that the individual has a great influence in terms of conveying and receiving information from other farmers. Furthermore, these farmers have an important position in terms of collaboration among farmers.

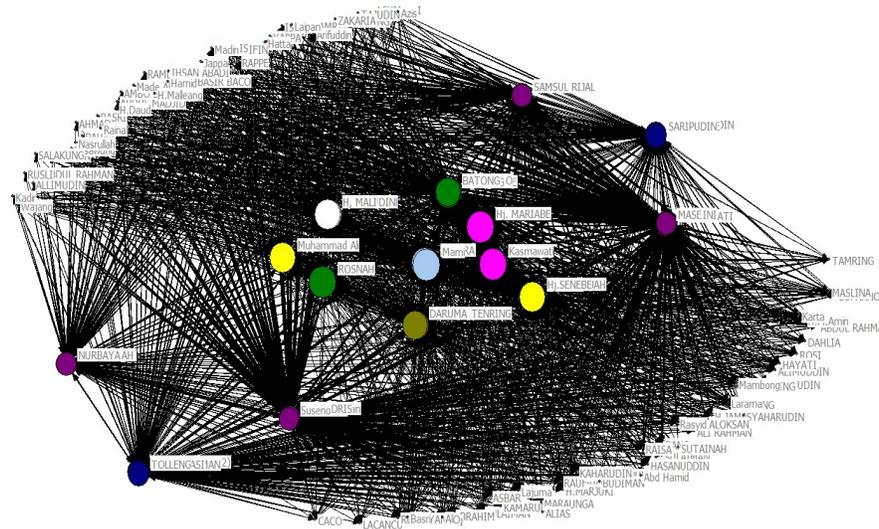
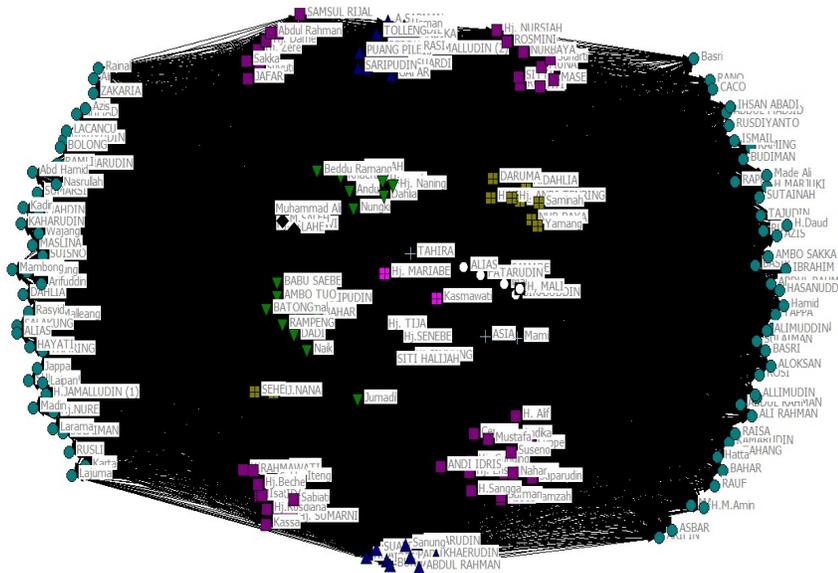


Figure 1. Sociogram Of Individuals Berdasarkan Degree Centrality

In Figure 1 it can be seen that the network obtained from the relationship between individuals is symbolized by a circle symbol that sends and receives information. While the pink circle symbol can communicate with 200 other farmers, while the other colors are less than 200 farmers. Overall the communication network formed is a centralized network where individual # 9 and individual # 37 have the largest degree centrality value.

Closeness Centrality

Closeness centrality is used to measure which actor is the fastest in reaching all other actors in the network, either directly or indirectly. The results of the measurement of the highest closeness centrality value are used to identify actors who act as bridges. Bridges are group members or inner cliques that connect the group with other group members (Jiang et.al., 2020). Calculations result that actors No. 9 and 37 have a high affinity with other farmers. These results indicate that the two actors have a short distance from other farmers in the network. In other words the ability to disseminate information can be faster for many individuals.



Figur 2. Sociogram Of Individuals Berdasarkan Closeness Centrality

In Figure 2 it can be seen that the network obtained from the relationship between individuals is symbolized by the symbol of a rectangle and a circle that transmits and receives information. symbol; the pink rectangle can communicate with 200 other farmers, while the other colors are less than 200 farmers. Overall, the closeness of farmers formed is a centralized network where individual #9 and individual #37 have the largest closeness centrality value.

Betweenness Centrality

The degree of intermediary (betweenness centrality) is defined as a measure of a person's level of interest based on his ability to connect many people in a social network (Shopia and Sakti, 2020). Eriyanto (2014), asserts that the centrality of intermediary shows the position of an actor as an intermediary (betweenness) of the relationship between one actor and another. The betweenness centrality value is used to identify actors who act as brokers or gate keepers. Brokers (gate keepers) are actors who intermediary from one actor's relationship to another, so that they have the ability to control and filter the flow of information before it is distributed to other actors. (Berto, 2019). The results of the calculation of betweenness centrality of several individuals / farmers. The calculation results that Individuals No. 9 and 37 have a very strategic position among other farmers. The smaller the betweenness value, the farmer has an unimportant position in a network. Individuals 9 and 37 are intermediary relationships for several actors who establish contact with them. Because of their ability to manage cocoa marketing information in the network, they act as brokers (gate keepers).

Experts believe that the position of intermediary (betweenness) is considered the most important position. Actors who have high scores in intermediary are seen as the most important actors in the network. There are three reasons, namely (1) actors can determine membership of a network because it connects two different groups in the network, (2) can control and manipulate

information because all communication and information must pass through it and (3) allow to take the most advantageous position compared to actors. others (Everrett and Johnson, 2013).

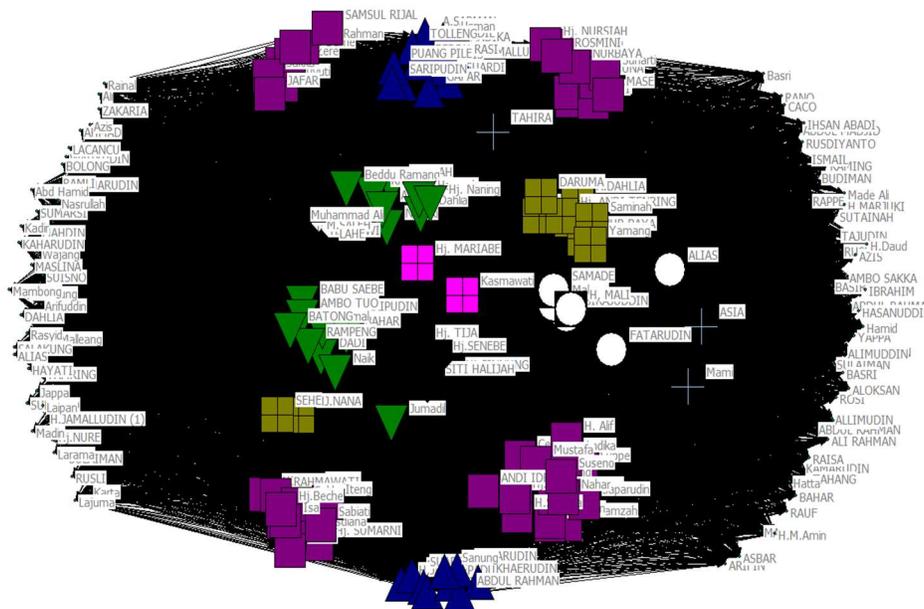


Figure 3. Sociogram of individuals berdasarkan Betweenness centrality

In Figure 3 it can be seen that the network obtained from the relationship between individuals is symbolized by the symbol of a rectangle and a circle which is an important position in a network. While the pink rectangle symbol is a very strategic position of the other 200 farmers, while the other colors are less than 200 farmers. Overall, the closeness of farmers formed is a centralized network where individual #9 and individual #37 have the largest value betweenness centrality, so that it can be stated as the most strategic position among other farmers.

Conclusion

Analysis of the communication network structure shows that the communication relationship that occurs in farmer groups is not evenly distributed, the flow of information is still dominated by two important actors, which are few in number, namely actor no. 37. Information dissemination will be effective by utilizing actors who act as intermediaries. The tendency of farmers to communicate is based on considerations of trust, proximity to residence, production input needs and experience of information sources.

Cocoa marketing communication network among farmers is in the form of a radial network. The network tends to be open so as to facilitate the communication process and can develop. Based on the centralization analysis, there are actors who act as traders who dominate and are popular in the dissemination of marketing information. These conditions indicate that information on price, quality and quantity of cocoa is controlled by traders.

The strategic implications that can be formulated are (1) integration of marketing information from all relevant stakeholders so as not to harm farmers and (2) strengthening

communication networks between all cocoa marketing actors so as not to bring up actors who dominate the information.

A lot of research on marketing has been done, both from the aspect of the cocoa marketing system and flow. However, studies on cocoa marketing in the context of communication networks and farmer decision-making in border areas are still rarely conducted. The research carried out is holistic and community-based, so that the new contribution obtained is the contribution of novelty to the body of knowledge of cocoa product marketing (body of knowledge) which is the basis of marketing, namely new knowledge (new reliable knowledge) in the form of marketing communication networks for agricultural commodities in the region. islands and borders (front porch) of the country

The research results, although not statistically representative, are expected to lead to further research with a larger sample. The important issue is how the strategy and context of the integrated cooperation between the two countries give rise to cross-border trade that is mutually beneficial to market participants from the two countries.

Acknowledgements

We would like to thank all members of the cocoa farmer group, Badan Penyuluhan Pertanian, Faculty of Agriculture, University of Padjadjaran and Faculty of Agriculture, University of Borneo Tarakan for their help and support in the process of completing this research.

REFERENCE

1. Ahoa, E., Kassahun, A., Tekinerdogan, B., & Verdouw, C. (2021). Analyzing and designing business processes in the Ghana cocoa supply chain for supporting inclusiveness. *Sustainability (Switzerland)*, 13(22). <https://doi.org/10.3390/su132212440>
2. Andry Alamsyah. Introduction To Social Network Analysis: Concept And Practice. Sadari Press Bandung
3. Bowersox, D. J., J.Closs, D., & Cooper, M. B. (2002). *Supply Chain Logistic Management* (Ninth). The McGraw-HilIrwin Series.
4. Denkyirah, E. K., Okoffo, E. D., Adu, D. T., Aziz, A. A., Ofori, A., & Denkyirah, E. K. (2016). Modeling Ghanaian Cocoa Farmers' Decision To Use Pesticide And Frequency Of Application: The Case Of Brong Ahafo Region. *Springerplus*, 5(1). <https://doi.org/10.1186/S40064-016-2779-Z>
5. Eriyanto. 2014. Communication Network Analysis Of New Strategies In Research In Communication And Other Social Sciences. Jakarta: Kencana.
6. Hastings, J. V., & Wang, Y. (2018). Informal Trade Along The China-North Korea Border. *Journal Of East Asian Studies*, 18(2), 181–203. <https://doi.org/10.1017/Jea.2018.4>

7. Hastings, J. V., & Wang, Y. (2018). Informal Trade Along The China-North Korea Border. *Journal Of East Asian Studies*, 18(2), 181–203. <https://doi.org/10.1017/Jea.2018.4>
8. Hidayanto, M., S., S., Yahya, S., & Amien, L. I. (2016). Analysis of the Sustainability of Community Cocoa Plantation in the Border Area of Sebatik Island, Nunukan Regency, East Kalimantan Province. *Journal of Agroecconomics*, 27(2), 213. <https://doi.org/10.21082/Jae.V27n2.2009.213-229>
9. Jiang, X., Wu, Q., Wang, L., Jiang, B., & Ma, X. (2022). Research On The Impact Of Clan Network On Farmers' Entrepreneurial Income—The Case Of China. *Frontiers In Psychology*, 13, 1–15. <https://doi.org/10.3389/fpsyg.2022.951421>
10. Karipidis, P., & Karypidou, S. (2021). Factors That Impact Farmers' Organic Conversion Decisions. *Sustainability (Switzerland)*, 13(9), 1–25. <https://doi.org/10.3390/Su13094715>
11. Keller, J., Jung, M., & Lasch, R. (2022). Sustainability Governance: Insights From A Cocoa Supply Chain. *Sustainability*, 14(17), 10763. <https://doi.org/10.3390/Su141710763>
12. Kézai, P. K., Dömötör, M., & Fekete, D. (2022). Economic Development Opportunities In The Hungarian-Slovakian Cross-Border Area – Szigetköz And Csallóköz (Žitný Ostrov) According To Development Documents And Local Stakeholders Perceptions. *Deturope*, 14(1), 87–110. <https://doi.org/10.32725/Det.2022.005>
13. Kotler, P., & Keller, K. L. (2016). *Marketing Management* (Stephanie Wall (Ed.); Global Edi, Vol. 15). Pearson.
14. Kumar, R. (2013). India-Nepal Open Border: Springboard For Opportunities. *International Studies*, 50(1–2), 165–183. <https://doi.org/10.1177/0020881716654406>
15. Lenou Nkouedjo, L., Mathe, S., Fon, D. E., Geitzenauer, M., & Awah Manga, A. (2020). Cocoa marketing chain in developing countries: How do formal-informal linkages ensure its sustainability in Cameroon? *Geoforum*, 117(October 2019), 61–70. <https://doi.org/10.1016/j.geoforum.2020.09.005>
16. Lin, T., Ko, A. P., Than, M. M., Catacutan, D. C., Finlayson, R. F., & Isaac, M. E. (2021). Farmer Social Networks: The Role Of Advice Ties And Organizational Leadership In Agroforestry Adoption. *Plos ONE*, 16(8 August), 1–18. <https://doi.org/10.1371/Journal.Pone.0255987>
17. Nababan, J. (2021). *Analysis of Communication Networks and Group Cohesiveness in Cooperatives in the Office of Small and Medium Enterprises Cooperatives in North Tapanuli Regency*. North Sumatra University Press
18. Ofolsha, M. D., Kenee, F. B., Bimirew, D. A., Tefera, T. L., & Wedajo, A. S. (2022). The Effect Of Social Networks On Smallholder Farmers' Decision To Join Farmer-Base Seed

- Producer Cooperatives (Fbse): The Case Of Hararghe, Oromia, Ethiopia. *Sustainability (Switzerland)*, 14(10). <https://doi.org/10.3390/Su14105838>
19. Ogunleye, K. Y., & Oladeji, J. O. (2007). Choice Of Cocoa Market Channels Among Cocoa Farmers In ILA Local Government Area Of Osun State , Nigeria Department Of Agricultural Economics And Extension , Faculty Of Agricultural Sciences ,. Middle-East Journal Of Scientific Research, 2(1), 14–20.
 20. Paudel, U. R., & Devkota, N. (2018). Socio-Economic Influences On Small Business Performance In Nepal–India Open Border: Evidence From Cross-Sectional Analysis. *Economics And Sociology*, 11(4), 11–30. <https://doi.org/10.14254/2071-789X.2018/11-4/1>
 21. Pratiwi, D. K. (2020). Marine Security In The Indonesian Border Area As A Form Of State Sovereignty Protection. *SUPREMASI Journal Of Law*, 3(1), 32–57. <https://doi.org/10.36441/Supremasi.V3i1.122>
 22. Prazeres, I., Lucas, M. R., & Marta-Costa, A. (2022). Organic Cocoa Value Chain Sustainability: The Perception Of São Tomé And Príncipe’s Stakeholders. *Sustainability (Switzerland)*, 14(1), 1–18. <https://doi.org/10.3390/Su14010136>
 23. Rota, C., Pugliese, P., Elnady, M., & Zanasi, C. (2021). Article Measuring Egyptian Farmers’ Attitude Towards Staying Organic. *Sustainability (Switzerland)*, 13(14), 1–23. <https://doi.org/10.3390/Su13147978>
 24. Sapbamrer, R., & Thammachai, A. (2021). A Systematic Review Of Factors Influencing Farmers’ Adoption Of Organic Farming. *Sustainability (Switzerland)*, 13(7). <https://doi.org/10.3390/Su13073842>
 25. Walther, O. (2014). Border Markets: An Introduction. *Articulo Journal Of Urban Research*, 10, <https://articulo.revues.org/2532>.