

The Effect of Risk Communication in Improving Farmers Independence in South Sumatera Province

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Abstract -- Risk communication is part of the communication behavior of farmers in minimizing the risks faced by farmers. Risk communication is hypothesized to be able to increase the independence of farmers to be more competitive, filtered power, and partnership. The purpose of this study was to analyze the level of risk communication and the level of independence of rice farmers and see the dominant factors affecting the level of risk communication and independence of farmers. This study method uses a survey approach with a quantitative approach. This study involved 294 farmers in South Sumatra Province using a randomized clustered randomized data collection technique with a disproportionate technique for members of farmer groups. Data were analyzed using descriptive inferencing analysis with the SmartPLS program 3.2.9. The results showed that (1) the level of farmer risk communication was categorized high, especially in the aspects of persuasion, farmer participation, level of collaboration, and dialogue skills while knowledge was moderate. The independent farmer category with competitiveness, filtering system, and the partnership was moderate. (2) The dominant factors were characteristics, socio-economic, personal characteristics of farmers, level of access to information, level of information quality, and level of characteristics of the institutional environment. Risk communication in increasing farmer independence can be explained by 52% and the rest was influenced by influences outside the model studied.

Keywords – Institutional Support, Information Sources, Farmers.

I. INTRODUCTION

The need for rice, which continues to increase along with the increasing population of Indonesian people, requires additional rice production, but the development of food agriculture, especially paddy fields and moor, has not experienced significant expansion, in fact, it tends to decrease. Land conversion continues every year, with a conversion rate of 96,500 ha per year [1], however, paddy fields are printed annually on average 20-30 thousand ha ([2], [3]). Reference [4] state that the share of rice harvested area in Java Island decreased from 53% in 1980 to 46.3% in 2014. Likewise, the share of production decreased from 62.1% to 51.8% in the same period. The decline in harvested area and rice production is closely related to three main factors, namely the raw area of rice fields, the level of productivity, and the cropping index. In addition to conversion, there are also global climate problems that cause more frequent extreme climates such as La Nina and El Nino which cause damaged rice fields, puso plants, and attacks by pests and diseases.

Special efforts and strategies need to be made to maintain sustainable food self-sufficiency. Increasing the production of strategic foodstuffs, such as rice, maize, and soybeans in the short term are pursued by an intensification of agricultural land both irrigated and sub-optimal (simple irrigated rice, rainfed and swampy rice fields). The problem with sub-optimal land is that productivity is still low.

South Sumatra Province is one of the food barns in Indonesia with a swampland type. South Sumatra itself has swamplands of around 1.3 million ha spread over several delta areas with a total swamp area in Indonesia of 13.3 million ha spread across the islands of Sumatra, Kalimantan, Sulawesi, and Papua [5]. About 278,000 ha of land are utilized as rice-based farming for the province of South Sumatra (Sumsel) ([6], [7]).

Lowland rice is an alternative to meet food needs insufficient local food and contributes 30% of food in South Sumatra Province ([8], [9]). Districts that produce rice food that is lowland and rainfed rice are Ogan Ilir and Banyuasin. Lowland rice production is recorded to be able to produce 5.6

t / ha (low swamp), while the tidal swamp is 4.5 t / ha per planting season.

Reference [10] explains that agricultural business is always faced with risks that can harm farmers both financially and socially. Food production risks bring challenges and opportunities to be able to go through various farming obstacles. These risks consist of technical cultivation, post-harvest, distribution, and marketing, farm management. This risk is a challenge that needs to be faced with the possibility of opening up opportunities for control or reduction of the negative impacts it causes. Reference [11] explained that to minimize risk among farmers using two approaches, namely structural factors including commodity prices, market development, incentives, improvement of rural facilities, job placement, development programs, demand for third parties, availability of work/business opportunities, improved access to productive resources and services in the area. Socio-cultural and natural factors are part of farmers' resources, namely natural resource potential, natural conditions for parents/families to continue their business and farming culture, government policies, commodities, and community trust.

Risk communication is part of the communication process that occurs to farmers with the aim of increasing farmer independence so that they are able to continue the sustainability of the farms being managed. Farmer communication skills are important in the application of communication for adaptation to managed farms to improve the sustainability of their agricultural businesses [12]. Reference [13] states that the application of risk communication needs to pay attention to (1) knowledge of risk, both awareness and understanding with respect to risk analysis of each party involved, consistency and openness in risk management decision making and implementation, data and a strong foundation in deciding, suggested risk management; (2) persuasion in increasing effectiveness and efficiency in the risk analysis process; (3) participation in information and education in implementing risk management; (4) ability to work together between stakeholders; (5) dialogue which is a forum for open cooperation on knowledge, attitudes, values, practices, and perceptions of risks in relation to the risks faced. The ability of farmers who are still weak in terms of cultivation techniques, managerial, and increase in business scale is a factor causing the independence of weak farmers ([14, [15]). In addition, the limited ability of farmers to find, collect and explore information has an impact on decision making that does not support the sustainability of farms being managed ([16], [17], [18], [19]).

This study looked at the risk communication behavior and the independence of farmers in running swamp rice farming. Swamp rice development with minimal productivity needs to be improved by looking at the aspects that are the dominant factors of farmers. The objectives of this study were (1) to analyze the level of risk communication and the level of

independence; (2) to analyze the dominant factors affecting risk communication on the level of swamp rice independence.

II. RESEARCH METHODS

The research approach uses a quantitative and strengthened by a qualitative approach. Quantitative data using a questionnaire instrument and qualitative data using unstructured interviews and observations of communication activities in the research village. The research was conducted from December 2018 to September 2019. Data were collected by survey in two districts, namely Ogan Ilir and Banyuasin Districts. Ogan Ilir District is located in two sub-districts (Rantau Panjang and Sungai Pinang Districts) and Banyuasin District (Muara Sugihan and Rimau Island Districts). The total sample used was 294 people consisting of 75 people from the Ogan Ilir Regency and 219 people from the Banyuasin Regency. Samples were obtained from data on the number of farmer group members in each district. Samples were randomly selected (cluster sampling) to members of farmer groups and farmer group administrators were taken purposively. The total population of the Banyuasin Regency is 53,625 farmers and Ogan Ilir Regency is 24,600 farmers who are members of farmer groups. The research data consisted of primary data and secondary data. The primary data collection technique is carried out with questions in the questionnaire, in general, using a choice of rating perceptions (rating) from number 1 (lowest) to 4 (highest) with closed questions and open questions and direct observation in the field. Secondary data were obtained from the Ministry of Agriculture, the Agricultural Service, the Central Bureau of Statistics, the Agricultural Extension Center which became the reference and reference in this study. The collected data were analyzed descriptively and inferential tests. The data analysis technique used in the first stage is a descriptive statistical analysis for all variables. Inferential analysis to test the research hypothesis Partial Least Square (PLS) using the SmartPLS 3.2 program.

III. RESULTS AND DISCUSSION

3.1. Level of Risk Communication in Paddy Farmer Independence

The level of risk communication is the degree of communication that farmers have through the instrumentation of knowledge, persuasion, participation, level of cooperation, and dialogue in developing swamp rice agricultural commodities. There are five level instruments for risk communication and only dialogue has differences in the two districts. Dialogue is an interaction that is built-in communication to improve the quality of agricultural commodities and reduce the value that can damage commodities, in this case, the risks faced by farmers. Dialogue indicators are interpreted as varied value structures, thus showing that the capabilities of farmers in building networks, information, problem-solving, and farmer learning abilities in creating value will be represented through the production commodities produced. This is shown in Table 1.

Table 1. Distribution of the level of risk communication in South Sumatra Province

Level of risk communication	Indicator	Banyuasin Regency (%) n=219	Ogan Ilir Regency (%) n=75	Total n=294	Different Test (T-Test) (2- Tailed) p<0,05
Knowledge	Low (0-33)	0,0	0,0	0,0	0,612
	Moderate (34-67)	32,4	42,7	35,0	
	High (68-100)	67,6	57,3	65,0	
	Mean	67,4	67,8	67,5	
Persuasion	Low (0-33)	0,0	0,0	0,0	0,127
	Moderate (34-67)	42,9	50,7	44,9	
	High (68-100)	57,1	49,3	55,1	
	Mean	71,1	69,5	70,7	
Participation	Low (0-33)	0,0	0,0	0,0	0,106
	Moderate (34-67)	11,0	16	12,2	
	High (68-100)	89,0	84	87,8	
	Mean	82,3	80,4	81,8	
Average score Level of Cooperation Ability	Low (0-33)	0,0	0,0	0,0	0,909
	Moderate (34-67)	12,8	33,3	18,0	
	High (68-100)	87,2	66,7	82,0	
	Mean	79,6	79,7	79,7	
Dialog	Low (0-33)	0,0	0,0	0,0	0,000**
	Moderate (34-67)	4,1	0,0	3,1	
	High (68-100)	95,9	100,0	96,9	
	Mean	83,5	86,7	84,3	

Note: ** p <0.05 (has a significant difference at the 95% level in the T-Test)

Knowledge is the ability in the form of understanding of the skills of farmers in cultivating rice so that they are able to overcome the obstacles they have in the cultivation process. The knowledge possessed by medium and high farmers in both districts where farmers are familiar with rice farming that has been working for decades. However, the current knowledge of farmers is helped by technology and the invention of technological packages in cultivation. All technology packages are received by farmers with information packages through group and direct outreach. Farmers' knowledge is obtained from tighten science (deep and thorough observation of an object) as well as asking extension workers and peers and continued by trying to produce an expected production. Farmers in Banyuasin and Ogan Ilir Regencies, in the process of obtaining almost the same knowledge and applying it, are derived from experience and learning and asking extension workers and fellow farmers.

Persuasion is the second instrument in the observed dependent variable. Persuasion is an emotional impetus and the approach taken by a group or institution to encourage farmers to seek information, process information, and convince farmers that their actions can increase farmers' capabilities. Persuasion is related to farmer psychology in determining farmers' attitudes in adopting new knowledge

and technology. The resulting persuasion was moderate and high in both districts. Persuasion is carried out by peers, farmer groups, agricultural extension workers, and the media which provide a picture of the belief and truth about the farming that is being carried out well.

Participation is a farmer's action in accepting and being active in an existing program in the village regarding his farm development and village development. Participation is positive at medium and high levels, which means that farmers are active and involved in every meeting and discussing the program. Even though they have a leader who is able to direct and take over, farmers are still involved in every process of these activities. A strong participatory process is during village meetings discussing the village development budget at the end of each year as a village development proposal.

The level of cooperation ability as part of the observations in this study had a high and moderate score with an average score of 79.7. This is directly proportional to persuasion, participation, and level of cooperation ability. Villagers will do everything if they already have the belief that is good and right, and are invited to be involved in every stage and will follow the cooperation according to their expectations. The ability of farmers in the two districts shows that the desire of farmers to progress is very high but is constrained by various factors, both their capacity and institutional support.

Reference [20] state that the ability to communicate risk is strongly influenced by the capacity of farmers in the group and the ability of farmers to link and match the problems faced by farmers. Reference [21] see that the ability of individuals to confirm the information and involve themselves in activities can give farmers the ability to minimize the risks faced in rice farming.

3.2. Independence of Farmers

The level of farmer independence is all the ability of farmers to increase their capabilities so that they are able to push themselves to the value of competitiveness (competing), filtering power (informative), and partnership (egalitarian or equivalent). The three instruments of competitiveness, filter, and partnership are used as tools to analyze the variables of farmer independence. The value obtained shows that power

is of medium and high value. This means that the farmers in Ogan Ilir Regency and Banyuasin Regency are able to match the abilities of farmers in Java, Kalimantan, and Sulawesi. This optimism is also the hope of the central and local governments in building development programs that increase the amount of production. During the research, South Sumatra Province was designated as the third-largest food supplier after Java Island. Several programs that encourage this are the use of idle land as productive land to be processed into rice production value. Programs that involve direct farmers will always be remembered by farmers to make an impression and become the pride of farmers as agents of national development. The description of the distribution of the level of farmer independence can be seen in Table 2.

Table 2. Distribution of the level of farmer independence in South Sumatra Province

Farmer independence	Indicator	Banyuasin Regency (%) n=219	Ogan Ilir Regency (%) n= 75	Total n=294	Different Test (T- Test) (2- Tailed) p<0,05
Competitiveness	Low (0-33)	0,0	0,0	0,0	0,559
	Moderate (34-67)	60,7	28,0	52,4	
	High (68-100)	39,3	72,0	47,6	
	Mean	65,2	74,1	67,5	
Filtering power	Low (0-33)	0,5	0,0	0,3	0,000**
	Moderate (34-67)	99,5	100,0	99,7	
	High (68-100)	0,0	0,0	0,0	
	Mean	52,1	58,0	52,1	
Partnership	Low (0-33)	0,0	0,0	0,0	0,004**
	Moderate (34-67)	57,5	100	68,4	
	High (68-100)	42,5	0,0	31,6	
	Mean	66,8	64,7	66,2	

Note: ** p <0.05 (has a significant difference at the 95% level in the T-Test)

Competitiveness is the ability of farmers to manage commodities into a market value of quality, usable, and usable. The resulting competitiveness is categorized as medium and high. Competitiveness is a capacity built by various parties, not only farmers but also support from group institutions, extension workers, markets as well as researchers and universities. Filtering power is the ability of farmers to obtain information that can increase the commodities cultivated by farmers. The filter power of farmers is closely related to how and how farmers obtain information through direct and indirect media, conventional and non-conventional. This method is the farmer's capacity in using his ability to find out, explore, evaluate, and draw conclusions from the information package. Farmers are still passively utilizing information and have not been able to

develop themselves and market their products through available media on the internet and social media. Product marketing is created from the support of rice collectors or entrepreneurs who sell to consumers directly or to large markets. This ability is not owned by farmers because it requires a lot of power and capital. The majority of farmers are only able to create production starting from land processing to harvesting. After that, it is cultivated by another subsystem that has been cut off by the farmer himself. The filter power of farmers currently still needs further support and assistance from various agricultural institutions, especially the government and the private sector.

The partnership is the equivalent formed from a trust, mutual need, and benefits for both parties. The partnership power of farmers is currently in the medium category. This

can be explained that the farmers have good accepting and analyzing abilities. Rice production is not only for generating monetary value but also as a value for family food security. The partnership ability of farmers can be seen from the yields of farmers who are able to produce 4-5 tonnes/ha which is the general standard of swamp rice. The technology package will be able to increase farmers' grain production, but it is still not evenly distributed in South Sumatera Province. This pairing of farmers can be seen during meetings between districts, provinces, and nationally. This pairing is not possible for only a single farmer, but also government and private institutions as business innovators are strong institutions capable of helping and mobilizing farmers. The partnership power is significantly different in the two districts. This difference is from the number of commodities produced in the Banyuasin Regency, precisely in Muara Sugihan District and Pulau Rimbau, which have quite high commodities compared to the Ogan Ilir Regency. This is due to the different cultivated land area. Reference [22] and [23] sees the low independence of farmers in South Sumatera Province which makes it difficult for farmers to progress and repeat the failures that have been done from year to year. This is due to supporting factors in the form of availability of business facilities, access to information, availability of business capital, availability of transportation, land feasibility, and not optimal market access; and the capacity of farmers is still low. Reference [15] states that farmers must be able to exploit the potential of themselves and their groups to realize cooperation to achieve the expected targets.

3.3. Factors Affecting Risk Communication on Farmer Independence

The factors affecting risk communication in increasing swamp rice farmer independence are the socio-economic characteristics of farmers, farmer personal characteristics, the level of access to farmer information, the quality level of agricultural information sources, the level of institutional environmental characteristics, and the level of risk communication. The results of the analysis show that the socio-economic characteristics are shaped by the level of cosmopolitanism and employment status. The personal characteristics of farmers consist of the level of self-confidence and risk courage. The level of access to farmer information is influenced by access to conventional media, innovation institutions, and innovator farmers. The level of

quality of farmer information sources is shaped by the credibility of the information, the quality of the information, the usefulness of the information, and the affordability of information. The characteristic level of institutional support is shaped by policy support, village government-owned enterprises, agricultural companies, extension support, marketing support, and infrastructure support. The level of risk communication is influenced by knowledge, participation, and dialogue. The level of independence is influenced by competitiveness and filterability.

Mathematical model of farmer independence level (y_2) = $0.380 * \text{Farmer socio-economic characteristics} + 0.0052 * \text{farmer personal characteristics} + 0.1023 * \text{farmer information access level} + 0.0720 * \text{quality level of agricultural information sources} + 0.472 * \text{level of environmental support characteristics institutional} + 0.085 * \text{Risk Communication level} + 0.48$; with the confidence value range R^2 : 0.520. This model moves simultaneously to influence one another. Each increase of each latent variable increases the level of farmer independence 52% (directly and indirectly). The model of risk communication in increasing farmer independence in South Sumatera Province can be seen in Figure 1.

Reference [24] explained from their findings that communication that occurred intensively and openly was able to give farmers an increased level of awareness of the farming they were cultivating. Reference [18] added that farmer behavior in information is influenced by farmer characteristics, environmental factors, the potential for internet-based and conventional information. The communication factor is influenced by individual characteristics and institutional support. So that the ability to establish relationships will have a significant and positive effect on the independence of farmers. This is reflected in the ability to manage farmer communication [25]. Reference [26] state that there is a need for upstream and downstream institutional support in the provision of agricultural services so that each role of agricultural institutions can build agricultural synergy. Increasing farmer independence requires a characteristic of farmers who have mastery of information and communication skills supported by institutions that play an active role. The risk communication model that is built in increasing the independence of farmers in South Sumatera Province is in Figure 1.

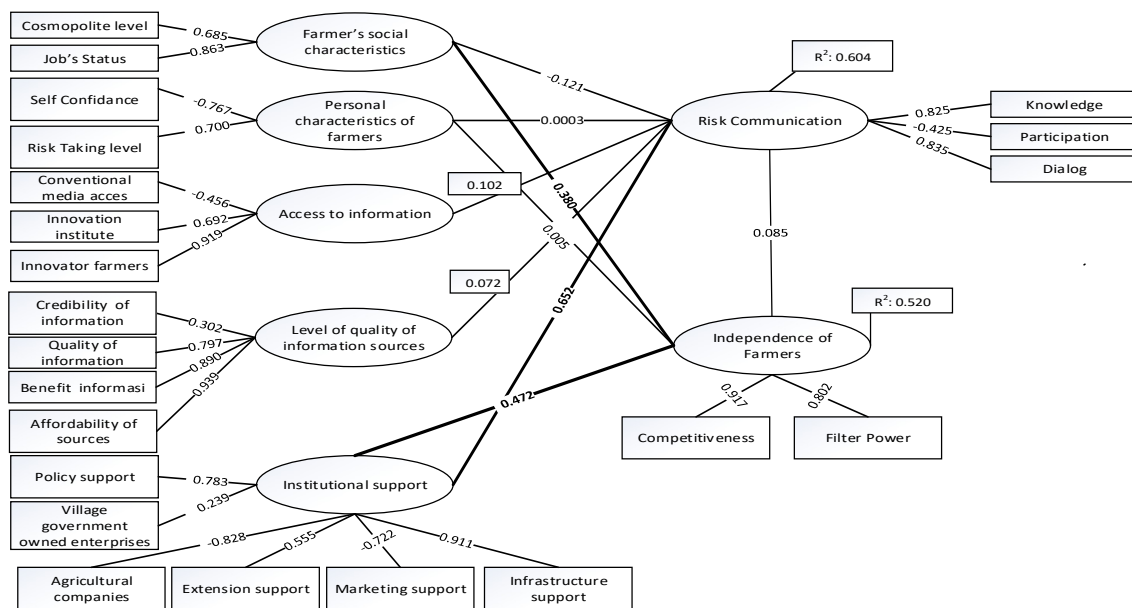


Figure 1. Model of risk communication strategy in increasing farmer independence in South Sumatera Province

IV. CONCLUSION

The level of farmer risk communication is classified as anticipatory, where farmers' knowledge, persuasion from various environments, participation in various agricultural activities, level of cooperation ability, dialogue builds farmer's ability is well able to apply modern agriculture. The level of independence of farmers is classified as independent with competitiveness, filtering power, and partnership power that can increase the capacity of farmers in managing their farms.

The level of risk communication on the level of farmer independence is influenced by the socio-economic characteristics of farmers, farmer personal characteristics, the level of access to agricultural information, the quality level of information sources, and the level of institutional support for the environment. Farmer risk communication skills require a variety of farmer characteristics approaches through groups, agricultural information, and agricultural institutions.

IMPLICATIONS

The implication of this research is (1) Improve farmer risk communication skills by providing input knowledge and skills in increasing farmer capacity in rice farming management. (2) Restructuring agricultural institutions to increase the exchange rate for agricultural production at the farm level. (3) Utilizing communication networks and innovation institutions in disseminating and disseminating agricultural information and information. (4) Communication networks between agricultural institutions are important to be assessed through studies on risk communication and farmer independence.

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