

The Use of Communication Media and the Role of Communication in Farmer Institutions toward Farmers' Capacity Levels in Cocoa Development in Indonesia

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The increase in cocoa production is carried out through the introduction of replanting technology with top grafting technology. The implementation of cocoa replanting is determined by the capacity of farmers. The level of farmer capacity is related to the information acceptance from the communication media used by farmers to access information. In addition, the role of communication in farmer institutions as learning media determines the ability of farmers in the implementation of cocoa replanting. The objectives of this study are (1) to analyse the level of use of communication media, the role of communication in farmer institutions and the capacity level of cocoa farmers; and (2) analyse the influence of communication media used by farmers and the role of communication in farmers 'institutions on the level of farmers' capacity in cocoa development. This research is survey research with a questionnaire as a data collection tool. The research location is East Kolaka Regency, specifically the cocoa farmer members of LEMS in 18 villages spread across four sub-districts purposively. 267 farmers were sampled from a total population of 807 farmers through proportional random sampling. Analysis of research data was conducted descriptively and with Structural Equation Modelling (SEM) analysis with the Generalised Structured Component Analysis (GSCA) method. The results showed that: (1) the level of communication media usage by farmers was in the low category, and the role of communication in farmer institutions and the capacity level of cocoa farmers in each

category was moderate; (2) the use of communication media and the role of communication in farmer institutions significantly influences the level of a farmer's capacity. The influence of the use of communication media on farmer capacity levels will be stronger through communication in farmer institutions. Therefore, the role of communication in farmer institutions needs to be considered in cocoa development through replanting.

Key words: *Communication media, the role of communication, farmer capacity, farmer institutions.*

Introduction

Cocoa is one of the smallholder plantations in East Kolaka Regency. Its productivity continues to decline. In 2018 cocoa productivity in East Kolaka only reached 0.63 tons per hectare (East Kolaka Plantation Office, 2018) and based on survey results decreased in 2019 to 0.3 tons per hectare. One of the causes of the decline in cocoa production by farmers is the old cocoa plant, poor use of plant seeds and cultivation technology that is not in line with maintenance quality standards (Geo & Saediman, 2019). Therefore, one of the efforts made by the government to increase cocoa production is to conduct replanting by the application of top grafting technology. The success of cocoa replanting is determined by the ability or capacity of cocoa farmers to be able to carry out activities that support its development.

Farmer capacity enhancement can be done through a joint learning process among fellow farmers, farmer institutions, agricultural extension workers, cocoa experts and related stakeholders. The aim is to improve the ability of farmers to develop cocoa in accordance with cocoa cultivation quality standards. Learning among farmers, extension workers and related stakeholders can be done in a farmer institution. Farmer institutions can play a role in the communication process to support the shared learning process. The role of communication in farmer institutions allows a shared learning process. Through shared learning, sharing of information and knowledge can occur between farmers and stakeholders regarding information and the problems faced by farmers so that farmers have the ability to deal with their farming problems. This is in accordance with the Law on the Protection and Empowerment of farmers Number 19 of 2013 and Law No. 16 of 2006 on the Agricultural, Fisheries and Forestry Extension System / Sistem Penyuluhan Pertanian, Perikanan dan Kehutanan (SP3K), which focuses on how the increase in human resources can increase the capacity of farmers and their institutions in managing their natural resources towards progress; improving the quality of life in a sustainable, fair and consistent manner according to their aspirations.

Communication in farmer institutions aims to improve cocoa farmers through sharing information and knowledge from the use of communication media both interpersonally and in

mass media (print, as well as electronic / internet). The use of communication media by farmers can be used as a source of information or learning material in a farmer's institution. The existence of learning material in the form of innovation technology that can be accessed by farmers from several media can provide knowledge and skills to farmers through the process of learning together in a farm institution. Communication in farmer institutions plays a role in facilitating network building, social learning and negotiations towards innovation (Leeuwis, 2009). Farmer institutions as a farmer organisation can play a role in bridging the communication process that occurs between stakeholders in the innovation of cocoa development. The existence of farmer institutions can be used as an entry point for the dissemination effort of technological innovations for farmers (Suradisastira, 2008). Farmers who are gathered in farmer institutions are social creatures that cannot be separated from their social environment. Therefore, the behaviour of farmers is not only influenced by biological factors but also by the social conditions that affect their lives. Farmers are not passive people but can actively design and change their environment according to their knowledge. Actively, farmers will look for information according to their needs using various information communication media and, if that is not possible, they will do it according to the experience they already have.

Therefore, the use of information communication media and the role of communication in farmer institutions is a process of activities that can encourage capacity building for cocoa farmers. The ability of farmers will increase through the information obtained from communication media in their social environment. Sharing information among farmers and stakeholders with the help of information media enables farmers and related institutions to obtain information more fully and more reliably so that the knowledge, skills and attitudes of farmers can change and affect their capacity in cocoa development (Subagio, 2008). The involvement of communication in farmer institutions will be able to assist the work of extension workers in disseminating information with limited extension workers in the field. Therefore, the instructor/agent must also provide assistance to farmers and farmer institutions in organising farmers and farmer institutions in accessing information through instructor/agent skills by communicating with various communication media and stakeholders (Cahyono, 2014).

The process of learning together in farmer institutions from the information obtained through networks between farmers and mass media (print, electronic) is a medium for the farmers' empowerment (Leewis, 2009). The information available in farmer institutions can be used as a medium for learning among farmers to conduct modified innovations in accordance with the conditions of their farming environment and farmer experience. The results of the social learning process in farmer institutions are used by the government as a basis for making cocoa development policies / programs in increasing cocoa productivity so that the welfare of cocoa farmers can be achieved. This is in line with the Regulation of the Minister of Agriculture of

the Republic of Indonesia Number 67 / Permentan / Sm.050 / 12/2016 on the Development of Farmer Institutions, which states that farmer institutions can help in farmers' learning platforms, cooperation platforms, units for fulfilling the production inputs, capital fertilisation, and marketing the results. In order for this role to be realised, farmer institutions can open communication with all actors to share information through various existing information communication media. The increase in the role of communication in farmer institutions with the use of communication media as information access will enable the process of learning together in accordance with farmers' needs. The occurrence of the shared learning process in farmer institutions enables the sharing of information and knowledge, increasing farmers' knowledge, attitudes and skills, as well as their capacity in developing cocoa. For this reason, this study examines the use of communication media by farmers, the role of communication in farmers' institutions and their capacity in cocoa development. This study also examines how the influence of communication media and the role of communication in farmers' institutions increases a farmer's capacity in sustainable cocoa development.

Methodology

This research involves quantitative research and qualitative data with a survey method. The research location is East Kolaka Regency, Southeast Sulawesi Province, Indonesia in 18 villages that already have farmer institutions, namely the Prosperous Community Economic Institute / Lembaga Ekonomi Masyarakat Sejahtera (LEMS) in four sub-districts: Lambandia Subdistrict, Aere Subdistrict, Poli-polia Subdistrict and Dangia Subdistrict, which were selected purposively as cocoa development areas. The object of this study were cocoa farmer members of LEMS. The number of samples amounted to 267 farmers, who selected from a population of 807 farmers of LEMS using *proportional random sampling*. The method of data collection involved interviews with the selected LEMS members using a prepared questionnaire. In-depth interviews were conducted with each LEMS board through a focused discussion. The categorisation of each research indicator uses a scoring based on a Likert scale with five categories: score 1 is in the very low category, score 2 is in the low category, score 3 is in the medium category, score 4 is in the high category and score 5 is in the very high category. Data analysis uses descriptive analysis and SEM-GSCA analysis. Descriptive analysis is used to explain social phenomena based on percentage and average value. SEM-GSCA analysis was used to determine the effect of each latent variable studied.

Results and Discussion

Farmer Characteristics

The characteristics of farmers include age, level of formal education, and experience in farming. The research results showed that the age of most cocoa farmers ranged from 35 - 44 years (56.6 percent) with the age range of the youngest respondent farmers aged 25 years and

the oldest aged at 71 years with an average age of 41.82 years. The level of formal education shows that most cocoa farmers (34.5 percent) have graduated from elementary school, 30.3 percent have received junior high school education and have attended university / perguruan tinggi (PT), but there are still farmers who have never received formal education. Viewed from the level of formal education, it shows that the education level of cocoa farmers in East Kolaka Regency is in the low category, with an average time of formal education that cocoa farmers have taken of 8.56 years (Junior High school /SMP). Another characteristic of farmers is their experience in farming. The research results showed that most (47.9 percent) cocoa farmers had 11-15 years of experience. The range of experience of farmers in cocoa farming in four subdistricts in East Kolaka is between 5-35 years. The description of individual characteristics will influence a person's behaviour in all aspects of life and the environment (Rogers & Shoemaker, 1987).

The Use of Communication Media

The use of communication media (X1) referred to includes: the use of interpersonal communication media (X1.1), print media (X1.2), electronic media (X1.3) and internet media (X1.4) (Table 1). The analysis results of the Confirmatory Factor Analysis (CFA) of the use of communication media by farmers showed a fairly good value, specifically with interpersonal media (0.698), print media (0.907), electronic media (0.911), and internet media (0.911).

Table1: The use of communication media

Aspect	Category (%)					Average
	1	2	3	4	5	
Interpersonal media	1.1	23.2	46.4	24.7	4.5	3.08
Print media	27.0	19.9	29.2	21.0	3.0	2.53
Electronic Media	26.2	21.3	28.1	23.6	0.7	2.51
Internet media	29.2	16.9	33.0	17.6	3.4	2.49
Total Average						2.65

Source: Primary data analysis, 2019

Table 1 shows that the percentage of media use by farmers was mostly in the medium category for all media used (score 3). The use of interpersonal communication media has an average value of 3.08 and is in the medium category. The use of print, electronic and internet communication media by farmers is in the low category (2.53; 2.51; and 2.49). In general, when viewed by the average score, the use of communication media at 2.65 indicates that the use of communication media by farmers is still in the low category. The kinds of communication media that are often used by cocoa farmers in exchanging information or in seeking information are interpersonal communication media in the form of discussions with fellow farmers, group administrators and agricultural extension workers. Farmers still rarely search for information

through print media (brochures, leaflets, magazines, etc.), electronic media (radio, TV, etc.), and internet media (browsing through Google or Yahoo). The choice of using interpersonal media by farmers is supported by the results of Hutagalung (2017), who found that interpersonal communication is a person's choice in communicating information because it is more open in creating relationships and avoiding conflicts. Farmers find it easier to associate and engage in social learning with fellow farmers as co-workers who are considered to have similar attitudes in the field of farming (Morgan, 2011). The research of Yekinni et al., (2019) supports this finding regarding the use of instructor communication methods that direct extension counsellors with farmers in the farmer's house or on the farmer's land as the communication method that is most preferred by farmers. Farmers still rarely use print media, electronic media or the internet in seeking information about cocoa development. There are several considerations for farmers to use communication media to search for information, namely that information easily obtained, is inexpensive and, is in accordance with the environment of farmers. This fact is consistent with the findings of Eko et al., (2000), and Pallas et al., (2016), that farmers will use communication media if they are able to meet the information and motivation needs in the use of these media. The tendency of farmers will shift from conventional media (print media) to electronic media, for example television if the media is easily accessed by farmers (Fatchiya et al, 2016). The findings of Yekinni et al., (2019) found that the still low number of farmers in rural areas using information and communication technology (ICT) in information seeking was influenced by language barriers, costs incurred, and supporting facilities (networks). This condition is in accordance with the fact that the speed is still low. Besides that, another obstacle is the lack of education for farmers regarding the use of electronic media and the internet from agricultural extension workers and from administrators of farmer institutions (LEMS). Conditions are increasingly less supportive if agricultural extension workers do not also understand the use of ICT. It is known that agricultural instructors on the study sites rarely provide guidance and training to farmers on how to use ICT. This finding is supported by the results of a study by Enwelu et al., (2017) that instructors' skills in using ICT are very poor and there is no support from organisations or governments in maintaining ICT equipment.

The Role of Communication in Farmer Institutions

The role of communication in the farmer institutions (Y1) reviewed includes access to information (Y1.1), information mediation (Y1.2), information communication methods (Y1.3), the effectiveness of information communication (Y1.4) and information incentives (Y1.5) (Table 2). The results of the Confirmatory Factor Analysis (CFA) analysis of the role of communication in farmer institutions simultaneously has a fairly good role as seen from its role in accessing information (0.828) information mediation (0.850), information communication methods (0.765), effectiveness of information communication (0.780), and information incentives (0.786).

Table 2: The role of communication in farmer institutions

Aspect	Category (%)					Average
	1	2	3	4	5	
Information access	2.2	35.2	36.7	22.8	3.0	2.89
Information mediation	1.1	35.2	34.5	24.7	4.5	2.96
Information communication method	0.4	21.3	49.4	24.3	4.5	3.11
Effectiveness of information communication	0.4	22.8	47.6	25.8	3.4	3.09
Information incentives	0.4	24.7	47.6	22.8	4.5	3.06
Total Average						3.02

Source: Primary data analysis, 2019

Table 2 illustrates that the percentage of communication in farmer institutions regarding information access, information mediation, information communication methods, the effectiveness of information communication and information incentives for most farmers is in the medium category (score 3). If seen from the average value of information access and information mediation, it is still quite low with an average score of 2.89 and 2.96, while the role in the application of methods, effectiveness and information incentives is in the medium category (score above 3). However, the total average value amounted to 3.02, which categorises the role of communication in farmer institutions in the medium category (sufficient role). The role of communication in farmer institutions is low in access to information and information mediation, while the role in information methods and the effectiveness of information communication and information incentives are quite good but need to be improved. The low role of farmer institutional communication in information mediation is related to a farmer's behaviour (Lin & Peng, 2010). The role of farmers in information access which is still low is a fundamental problem faced by small farmers (Cahyono, 2014; Agunga, Cahyono, Buck, & Scheer, 2016). The role of communication in LEMS in information access can be determined among fellow farmers. Farmers who succeed in farming are used as resource persons in each LEMS meeting to provide the latest information to other farmers from their experience in cocoa farming so far. The involvement of fellow farmers is easier to build and maintain in learning together because they already have the same style and attitude towards the issue to be discussed (Morgan, 2011). In addition, information searching can also be done by inviting cocoa experts to come to LEMS to share information with farmers. To be able to realise this, LEMS institutions must have programs / activities that can be followed by farmers. Through the role of LEMS as a source of information for farmers, LEMS can indirectly play a role in information mediation for cocoa farmers. This role becomes important, considering that not all information obtained by farmers is understood and able to be carried out by farmers. Therefore, LEMS can be a medium of information and learning media through mediation of information from field extension agents using counselling methods, training related to nurseries, technical cultivation

of cocoa, postharvest and farm management. As a forum for institutional learning, farmers can apply social learning methods through interactive innovation communication in every problem faced by farmers (Leeuwis, 2009). Institutions can collaborate with other supporting institutions to increase the intensity of farmers' learning (Yumi et al., 2011). The convergence communication model can be applied in learning so that it enables LEMS to be a medium of communication and social learning for farmers through its role as a forum for discussion for all actors in cocoa development. The application of the convergence communication model can be carried out so that cooperation synergy with other economic actors can be enabled to realise modern agriculture (Rangkuti, 2010).

Farmer's Capacity Level

The level of farmer capacity (Y2) involves the ability to manage farming resources (Y2.1), the ability to organise farming (Y2.2), the ability to adapt innovation to the farming environment (Y2.3), and the ability to evaluate innovations (Y2.4) (Table 3). The results of the Confirmatory Factor Analysis (CFA) of the level of capacity of farmers indicates a fairly good level of capacity, as seen from the ability to manage farming resources (0.719), the ability to organise cocoa farming (0.856), the ability to adapt innovation in a farming environment (0.715), and the ability to conduct innovations evaluation (0.694).

Table 3: Farmer's capacity level

Aspect	Category (%)					Average
	1	2	3	4	5	
The ability to manage farming resources	0.4	10.9	52.8	28.1	7.9	3.32
The ability to organise farming	2.2	28.8	33.7	26.6	8.6	3.10
The ability to adapt innovation to the farming environment	2.6	12.7	40.4	39.0	5.2	3.31
The ability to evaluate innovation	1.5	11.2	48.7	30.3	8.2	3.32
Total Average						3.26

Source: Primary data analysis, 2019

Table 3 shows that the percentage of farmers' capacity level in the cocoa development in the four studied aspects is in the medium category (score 3). The total average value of 3.26 indicates that the level of capacity of the cocoa farmers is in the moderate category (medium). This means that farmers already have the ability to manage farming resources, the ability to organise farming, the ability to adopt innovations in the farming environment, and the ability to evaluate the farming. The ability in farming management and organisation is related to the farming planning problems made by farmers. Hermanto (1993) states that farm planning shows a series of time and resource allocation arrangements and the costs of the plan. Institutions can be developed into joint venture groups in fulfilling capital, production inputs and markets

(Arimbawa et al., 2016). There are several considerations of farmers in farm management, including: (a) technological aspects; (b) price changes; (C) an increase in the number of producers; (d) quality of agricultural land; (e) health awareness; (f) climate change; and (g) farm costs; as well as (h) lifestyle changes (Soekartawi, 2003). An ability that cocoa farmers also need to have is the ability to conduct innovation adaptation. In the context of innovation adaptation, it is not only capital and labour factors that are the main barriers but innovation factors themselves, as not all innovations can be adopted by farmers (Noviyanti & Cahyono, 2016; Malahayatin, & Cahyono, 2017; Safitri, & Cahyono, 2017). The process of adaptation of technological innovation in the development can work if the communication among the actors (farmers, local groups and technological engineers) runs well (Inggrida et al., 2017). Therefore, the ability of cocoa farmers needs to be improved by increasing training through the communication of information to increase farmers' knowledge and skills in discussion materials with other farmers. The results of the discussion can provide assessments and input information on problems that are currently or will be faced by farmers in cocoa development. The success of farmers in cocoa development through their capabilities is expected to attract the interest of the younger generation to jump into farming. Without good results in agriculture it is unlikely that the younger generation will want to be involved in agriculture.

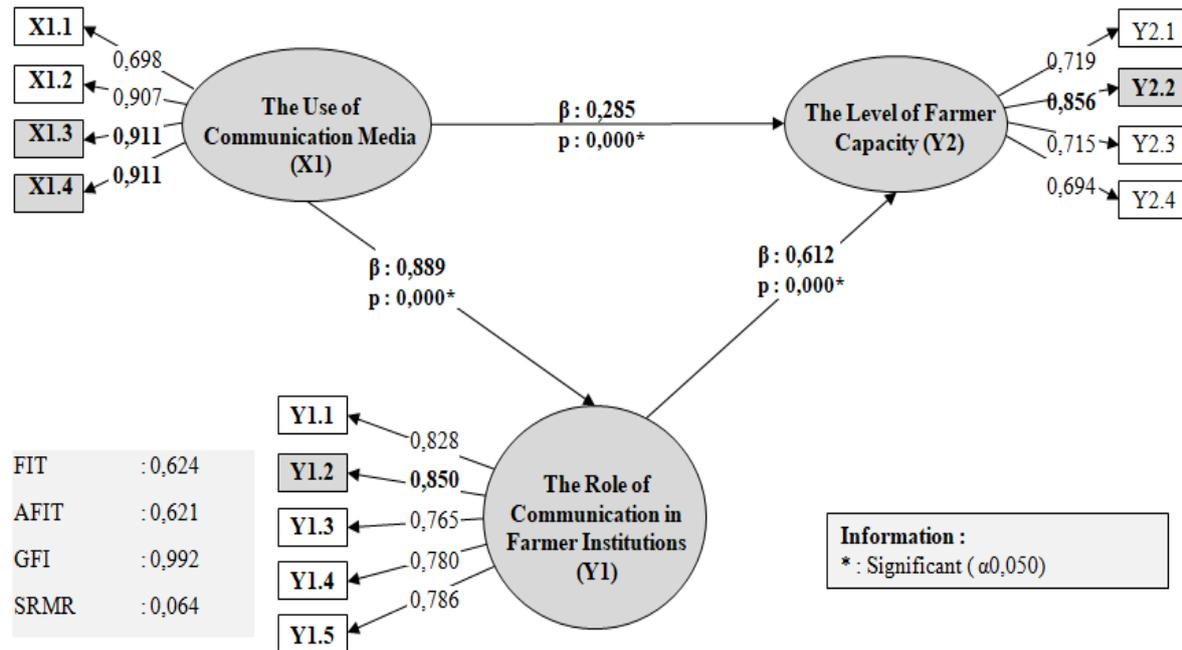
Some factors that influence the low capacity of farmers are the lack of compatibility between existing innovations with the real needs of farmers, low levels of education, a less supportive farming environment, farmers' limitations in mastering economic assets, attachment to traditions and low support from surrounding communities (Subagio, 2008; Anantanyu et al., 2009). Efforts to increase capacity generate added value with the existence of the improvement of farmers' abilities, access to technology, access to markets, and access to farming cooperation partners. Each farmer has the potential to be able to develop their capacity (Sumardjo, 2012). Yunita, (2011) states that, to increase capacity, farmers need to strengthen the social environment through the utilisation of institutional potential, institutional management, fostering and developing cooperation between farmers in groups and with farmers outside the group, implementing group rules in accordance with mutual agreement, the preservation of social values of positive culture, and providing facilities to farmers to get information according to their needs.

The Determinant Factors of Farmer Capacity Levels

Analysis of determinant factors of farmer's capacity level in developing cocoa using SEM-GSCA analysis. The first step is to conduct a measurement analysis on the exogenous and endogenous variables and obtain the value of the loading factor (LF) ≥ 0.50 (Valid), and AVE value ≥ 0.50 (valid) for all indicator variables. The results of the calculation of reliability show that all Cronbach Reliability (CR) values ≥ 0.70 (Reliable) (Figure 1). Thus, it is concluded that all of these exogenous and endogenous latent variables have good and reliable indicators.

The indicators that best form the use of communication media variable (X1) are X1.3 (electronic media) and X1.4 (internet media) with the highest LF of 0.911, respectively. The best indicator forming the variable of communication role in farmer institutions is Y1.2 (information mediation) with an LF value of 0.850, and the best indicator forming the variable of farmer capacity level (Y2) is Y2.2 (the ability to organise a farm) with an LF value of 0.856.

Figure 1. Influence among research variables



Based on the analysis of structural models (Figure 1) it is known that the level of farmer capacity (Y2) is directly affected by the use of communication media (X1) and the role of communication in farmer institutions (Y1). The use of communication media (X1) and the role of communication in farmer institutions directly and positively (significantly) affect the level of farmer capacity (Y2) with path coefficient values respectively equal to 0.285 ($p: 0,000$) and 0.612 ($p: 0,000$) at alpha 0.05. Based on the value of the path coefficient, it is known that the most dominant level of farmers' capacity is influenced by the role of communication in farmer institutions compared to the use of communication media when viewed from the magnitude of the path coefficient value. Figure 1 also shows the indirect relationship of variables. The indirect effect of the use of communication media variable (X1) on the level of farmer capacity (Y2) through the role of communication in farmer institutions (Y1) is equal to 0.544. This is as a result of the multiplication of the effect of the use of communication media variable (X1) on the variable of the role of communication in farmer institutions, which amounted to 0.889, and the influence of the communication role variable (Y1) on the farmer capacity level variable (Y2) of 0.612. This means that the influence of the use of communication media on farmer capacity levels through the role of communication in farmer institutions has a greater influence

than the direct influence of the use of communication media on farmer capacity levels. These results indicate that the role of communication in farmer institutions in increasing the capacity of cocoa farmers needs to be considered. The fit test of the whole model with an analysis on the GOF statistics generated by the program, in this case the GSCA, is good. Based on the GOF measurement guidelines and GOF statistical results, the model is declared appropriate for use with a FIT value > 0.500, AFIT value > 0.500, GFI value > 0.900 and SRMR value < 0.080 (Figure 1).

The main factor of the determinant of the capacity level of cocoa farmers is the role of communication in farmer institutions. This finding is supported by the results of research by Adawiyah et al., (2017) that the role of group communication in the Pajale program affects the ability of farmers to adopt technological innovations. The research of Batoa et al., (2018) also found that the role of farmer institutions in disseminating regulations on the use of pesticides affects the behaviour of farmers in the use of pesticides. Jane's research results (2011) support the finding that information management by institutions / companies can play a role in enhancing the capability of technology adoption through the application of 3D, namely discover, develop, and disseminate. Local institutions can play a role in increasing farmers' food access so that farmers can increase production capacity (Limi et al., 2018). In the context of farmer and extension institutions, extension agency / institution as farmers 'coaching can play a role in bridging communication to increase farmers' participation and their ability in sustainable food development (Zulfiningrum et al, 2019). Farmer capacity enhancement will be better if supported by the use of communication media through the role of communication in farmer institutions. In the agribusiness context, the behaviour of farmers in developing their capacity is influenced by the characteristics of the agribusiness media either from the availability, affordability and suitability of the media with the farmers' needs (Oktavia, 2019). Farmers who are accustomed to using communication media, both interpersonal media and mass media (print and electronic / internet), for access to information, would allow for discussion among the farmers. Discussions can be facilitated in farmer institutions (LEMS). LEMS can play a role in information management and information mediation to further determine the method or way of implementing information or knowledge obtained based on mutual agreement with farmers in a discussion forum at LEMS. The results of the joint discussion can improve farmers' knowledge and skills as well as attitudes in cocoa development. Implementation of knowledge as a result of discussion can be applied on farmers' land. The process of joint learning in farmer institutions from information accessed by farmers through information media takes place continuously as a learning cycle. Social learning in its various forms requires time to achieve results (Fang et al., 2019). The learning process can take place in farmer institutions, farmers can access information, training and counselling significantly so that could increase their capacity (Herawati et al., 2017; Limi et al., 2018). Farmer learning activities in groups can occur if there is teaching material. Teaching materials can be accessed by farmers using communication media either in print, electronics and through

the internet and from the experience of other farmers. Therefore, the use of communication media by farmers becomes important in information searching and in the role of institutional communication as mediating the information obtained by farmers. The research results showed that farmers were still low in accessing information using mass media. This finding is consistent with the results of Sonbait's (2011) research that the slow development of animal husbandry in Manokwari is caused by the low use of communication media by farmers as a source of information. Kilmanun and Serom (2018) found that the media often used by farmers was interpersonal media through training and field visits, and then television. The least used was radio media. Electronic media (television) and the internet are widely used by farmers only as a medium of entertainment and not as a source of learning (Adawiyah et al., (2017). The low use of electronic media and the internet by farmers is also caused by the absence of training or assistance to farmers related to the use of communication media as a source of information for farmers.

Conclusion and Suggestion

Based on the results and discussion, it can be concluded that: (1) the use of communication media by farmers is in the low category, especially in the use of print, electronic and internet media. The role of communication in farmer institutions and the capacity level of cocoa farmers respectively is in the medium category; (2) the use of communication media and the role of communication in farmer institutions together have a significant effect on the level of farmer's capacity. The influence of the use of communication media on farmer capacity levels will be stronger through communication in farmer institutions. Therefore, the role of communication in farmer institutions needs to be increased by increasing the use of communication media, especially electronic media and the internet by farmers in cocoa development, through cocoa replanting with top grafting technology.

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