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From Single to Dual System: Initiating the Model of Wet Rice Field Management to Optimize Staple Food Availability

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Abstract: The family farming system has been tending to fade by the massive paddy-farming land conversion and it needs the alternative model of rice-field management. Therefore, the research aims to initiate the suitable model of farmer institution to optimize staple food availability. The main predictors was the farmer's perception toward farming practice while the within variables are farming unwillingness and land selling tendency. The population is the children of farmer who owned the farming land. Data collection was conducted during June-September 2017 in West Java from one hundred accidental sampling. In the light of multiple regression analysis, the "dual system" management model in which it is a combination between the family and state farming system is mostly the suitable model for the young farmer who has a tendency to leave the paddy-farming practice and has a strong inclination to sell the farming land.

Key words: Farmer's perception, farming unwillingness, land selling tendency, dual farming system, Indonesia, tendency

INTRODUCTION

The family farming system in Indonesia is a strength which had brought out the country to acquire food self-sufficiency in 1980s. The National Development Planning Agency described the dominance of small farmer in Indonesia as the main rice-producers. Referring to the 2003 agricultural census, that the amount of small farmers is about 14 139 895 paddy-farmer (NDPA., 2014). The small farmer actually represented the family farming system in Indonesia in which it is attributed by subsistence farming to meet the need of family and the food crops such as rice and secondary crops are the main products and frequently supported by vegetables and livestock in small scale (Rahardjo, 2014). NDPA (2014) pointed out the control of wetland size for each farmer family in Indonesia is average of 0.69 ha. For more detail in local context, the size of land tenure in Sumatra is about of 0.68 ha, in Java is 0.61 ha; in Bali and Nusa Tenggara are 0.72 ha; in Kalimantan is 0.78 ha; in Sulawesi is 1.32 ha and in Maluku and Papua, the family's land size is about 2.72 ha. However, Susilawati and Maulana revealed the land size of family farming land in Java is about 0.38 ha.

Unfortunately, the family farming system in Indonesia has gotten strong challenge that probably threats its sustainability. The dynamic of development and the population growth which needs the expansion of housing infrastructure and industrial estate has suppressed the family owned land. NDPA (2014) pointed out honestly the decreasing size of family land farming totally from 14 139 895 in 2003 to 8685888 in 2013 in which Indonesia has lost almost a half of its paddy-rice field within 10 years. In local context, the various districts in Java have experienced farm land decreasing. Between 2005-2011 the paddy-field in Magelang, Central Java, dwindled from 37 445 to 37219 ha and the decreasing will get continue based on the high number of land use change proposal in Magelang Land Office (Handari, 2012). By the case of Karanganyar, the each family farming land ownership size has shrunk down from of 0.3 ha in 1988 to 0.296 ha in 2010 (Barokah *et al*., 2012).

The waning of family farming is because of the change of farmer orientation internally beside of the pressure of other development sectors as the external factor. Since 1980s, Garcia (1985) has explained that subsistence farming in the villages of Southeast Asia including Indonesia has started decaying and replaced by market-oriented production. The farmer has been

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changing from the social to economic rationality and the tendency of commercial-capitalistic of their view on farming activity has been increasingly institutionalized in rural communities (Rahardjo, 2014). The farmer's aim of farming land is solely profit oriented. But, unfortunately, the process of farmer changing has taken too far-step. Their view on farming land is not merely the production factor but the land itself is a commodity. The case of farmer in Bali should have to be considered. More than 75% of Tabanan (Bali) farmer was agree and strongly agree that farming land is an economic commodity, the land conversion is able to solve the economic problem (Dwipradnyana, 2014).

Within the changing of farmer's view on farming land, they have to face the fact of small and revenue imbalances between agricultural and other sectors. The 1996 current value indicated the gap between paddy-farming and other economic sectors is about 1:622 for housing estate, 1:500 for industrial estate and 1:14 for the area of tourism. The case of Cianjur indicated the Government's relief of paddy-production means has merely given significant impact for the old farmer to maintain the farming land (Handayanti, 2016). By the fact that staple food production is inevitable practice to fulfil the basic human need, the research aims to initiate suitable model of rice-field management, under the fundamental question about whom will completely responsible to yield the rice for the people: family, state or combination between the both institutions. The research was conducted in Cianjur, West Java, based on the fact that Cianjur is one of paddy-production center that has yielded special quality of rice (Beras Cianjur). However, the Cianjur farming area has been recently under pressure of other development sectors and has probably gotten the experience of massive land use change (Apriyana, 2011) in which it brought out the question of sustainability and probable problem of food scarcity.

The objective of the research: By the above mentioned condition, the research aims to reveal the desired and suitable rice-field management model and to identify its three main predictors which includes: young farmer's view of paddy-cultivation practice, farming unwillingness and the tendency of farming-land selling.

Theory and framework analysis

Identification of farmer's perception, farming unwillingness and land selling tendency in supply chain approach: The farmer's view toward paddy-production process and the tendency to leave the agricultural field could be detected in Supply Chain (SC) approach. Referring to Chim *et al.* (2017), SC is an organization effort to produce and deliver a finished good from supplier's supplier to customer's customer. The optimization of SC process will get succeed to provide right product at the right cost and right time (Chim *et al.*, 2017). Another research revealed, the SC management has significant effect on total production and organizational performance (Nozari and Mojdehi, 2016).

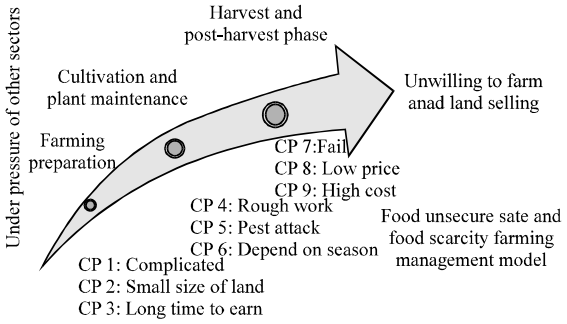

Fig. 1: Identification of farmer perception toward farming process in supply chain approach (Maman *et al.*, 2017a, b)

The deliberation of SC is commonly used in logistic management to optimize product processing, distributing and to identify the risk along the SC process. However, the SC could innovatively be implemented as an approach to optimize certain practice and to detect the risks in related field. Maman *et al.* (2018) got succeed to adopt the SC Model to identify halal risk and its mitigation. The recent research let the SC stages to detect the environmental risk and its mitigation to encourage the mindset of green environmental consciousness (Kit and Jamal, 2017).

Following the SC logic, paddy production is begun by germination and nursery and tillage as a phase of farming preparation in which it is followed by the phase of cultivation and plant maintenance. The final phase is harvesting, post-harvest processing and production selling (Fig. 1). The perception of farmer on the paddy-farming would be identified in each stage of the paddy-production process based on each Control Point (CP).

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Farmer's perception in farming preparation: Referring to classic work of Rogers (1983), but it still becomes a reference, farmer has a tendency to reject a complicated and unobservable yield of innovation. For the children of farmer who has been influenced by urban life, the

paddy-germination, nursery and tillage could be viewed as a complicated practice and hypothetically they will have a negative perception which lead them to leave the paddy-farming. The inclination is strengthened by long time to earn in which the yield is not directly observed (Rogers, 1983). By the logic itself, the propensity of farming unwillingness and wetland selling could not be ignored.

The small size of land could also be a control point to detect the farmer's perception toward paddy-production process. Fujimoto (1996), Neef (1999), Nabangchang and Srisawalak (2008) and supported by NDPA (2014) affirmed that the paddy production in Indonesia is commonly indicated by the small size of land. The paddy-farming activity is inefficient with small revenue. The farmer who are daring to sell the land and changing their profession have earned more, although, it is temporary (Asmara, 2011; Barokah *et al*., 2012). Therefore, small size of land hypothetically could drive the farming unwillingness and land selling under the pressure of other development sectors.

Farmer's perception in cultivation and plant maintenance: The rough work of paddy-production is unsuitable for the children of the farmer who has an inclination to behave in urban life style because of the influence of money economy (Rahardjo, 2014). The unwillingness is assumed to get stronger by the fact that farming process is depend on season and the agricultural products is perishable and the low price (Wastra and Mahbubi, 2013). Therefore, the farmer's disappointment could be unavoidable. Dwipradnyana (2014) revealed in his research in Tababan, Bali Indonesia, that more than 75% of farmers agree and strongly agree that paddy-farming could not provide an expected income.

Farmer's perception in harvest and post-harvest: The pest attack in plant maintenance process and the crop failure in harvesting phase are two subjects related each other. The Farmer Field School (FFS) program, although, in a heyday in 1980s is unable to prevent the harvest fail (Feder *et al*., 2004). The low price and high cost of agri-product in the farmer's view would strengthen the disappointment feeling. The small income of the farmer and the imbalance revenue between agricultural and industrial workers could be seen apparently. Krisnamurthi (2006) revealed the revenue of the Agricultural Sector Workers (ASW) in 1970s is mostly equal with the revenue of Industrial Sector Worker (ISW). However, within 30 years, the income of ISW increased three-fold compared to the ASW. The trend is based on the fact that the agricultural sector's contribution to GDP declined from 70% in 1970s to 30% in early 2000s. However, the decreasing contribution of agricultural sector to GDP is not followed by a declining of ASW number. The recent condition is assumed this gap of revenue has widened and the farmer's disappointment gets upward. Therefore, working on paddy farmland has no appeal for farmers or landowners who are profit and business-oriented and could not be avoided the farmer's tendency to leave the paddy farming practice.

Dual system of farming management model: Based on the land tenure system with referring to Smith and Zoft as a legal right of the person to use, process, sell and take advantage of certain parts of the surface of the land, Rahardjo (2014) presented theoretically for model of farming systems: collective, state, capitalistic and family. The important attribute of collective system is nullifying the private and individual ownership of farming land and staple food agri-land is cultivated by the collective community as well as by the state enterprises. By the fact, the collective and the state farming model has a strong relationship each other. The good example of both farming systems were USSR and China farming system in pre-reformation era within 70 years for USSR and 30 years for China. The USSR farming system had gradually shifted from 40% of total farming land cultivated by the state owned company into 68.2% at the time of USSR downfall which indicated the strengthening of state farming system of Soviet Union (Hamm, 2012). However, the management model change of Soviet's farming system was constantly abolishing the private ownership of farming land in which it had the same experience with pre-reform era of China before the both countries have finally tended to the capitalistic system (Hamm, 2012).

Unlike the collective system which negating the individual ownership of farming land, the family farming system has placed its strength on the right of family's or individual's ownership of the agri-land. As previously presented, based on the 2003 Agricultural Census (AC), the Indonesian agricultural area had accumulated 14 206 thousand of paddy-farmer families and 14 147 thousand in the light of 2013 AC (NDPA., 2014; Maman *et al*., 2017). By the huge number of farmers or some time it is so-called as peasants because of the traditional cultivation practices and by simple means of production, the family farming system has automatically been characterized by small size of land, farming is simply to meet the family's needs of staple food and the profit is not the main purpose of the farming (Rahardjo, 2014). This family system has played an important role to place Indonesia as "a state with staple food self-sufficiency in Indonesian farming heydays of 1980s."

The Indonesian government, facing the strong pressure on the family farming system by massive agri-land conversion, look apparently has a strong policy to preserve the historical system of family farming. The government has been providing the subsidy of paddy production means as well as the direct relief of fertilizer to

encourage the farming interest within the farmer inclination to leave the farming activities because of the small revenue. But, unfortunately, based on the case of Cianjur farming area, West Java Indonesia, this government policy has merely succeeded to drive the old farmer interest to maintain the farming practices (Handayanti, 2016) and oppositely has aroused the deep question about its effectiveness to encourage the young farmer tendency to sustain the farming practise in which the young farmer has strongly been influenced by the urban life style.

The Indonesian government has also in contrary tended to implement the capitalistic farming system to meet staple food self-sufficiency and to procure quantitatively the paddy tonnage which commensurate the population growth. This inclination has strongly been indicated by its willingness openly to invite the giant enterprises to invest and to play the wide role in staple food cultivation and production. The government planning to adopt the food estate project has proved its ambiguity in food cultivation whether he has had a strong partiality to develop and maintain the small farmers in which it represented the family farming system or tend to facilitate the big-private companies to get advantages from food cultivation project. Referring to Saukat (2010), food estate is an integrated concept of food production development involving agriculture, plantations and even farms located in a vast land area. For Merauke Integrated Food and Energy Estate (MIFEE) program in eastern zone of Indonesia, according to Saukat (2010), the Indonesian Government has allocated 2.49 million land areas for the investors who are interested in participating in food cultivation.

The food estate project is actually mandated by the Law No. 41/2009 about protection of sustainable food agricultural land. The Chapter 4 point 2 of this law has given chance for the corporate to participate in developing Sustainable Food Agricultural Area (SFAA). The food estate project as mentioned above itself is as an SFAA, aimed to protect food agricultural area and to preserve the staple food availability managed by private companies-the local as well as the Foreigner companies. However, the coming of big agribusiness enterprises into the rural area is undesirable among the leaders of farmer group and they have not regarded it as the problem solving of food scarcity and a suitable way to meet food self-sufficiency. The grounded in depth interview with the heads of farmer group revealed the strong willingness of the farmer group to maintain the family ownership of the agri-land in which they could freely manage their land in their own desire: to utilize their land for cultivation or other usage. However, in other side, they have expected the government to guarantee the staple food availability in affordable price-the condition which could not easily be gotten in capitalistic climate. For more clear, the in-depth interview with the heads of farmer group in Cianjur farming area pointed out the three important proposal to solve the tendency of massive land conversion which included: the government should have to issue a regulation to control the increase of agricultural land price, the government should have to bear and guarantee the staple food procurement cost and the government has to regulate fertile agricultural land selling mechanism (Maman *et al*., 2018). In other word, the farmers have had a desire to sustain the family farming system, utilize part of state farming clause and dissociate the implementation of capitalistic system in paddy-cultivation process.

Based on the above government policy and the tendency of farmer groups desire in the local context and the strong assumption that the food availability is inevitable, the research has emphasized on the hypothesis that the negative view of young farmer toward farming practice which has influenced the farming unwillingness and land selling tendency will get strengthening the farmer's desire to combine the family farming system and part of state farming stipulation and this dual system could be a suitable way to meet gradually but certainly staple food self-sufficiency. The theory and framework analysis, to make it more visualized is presented in Fig. 2.

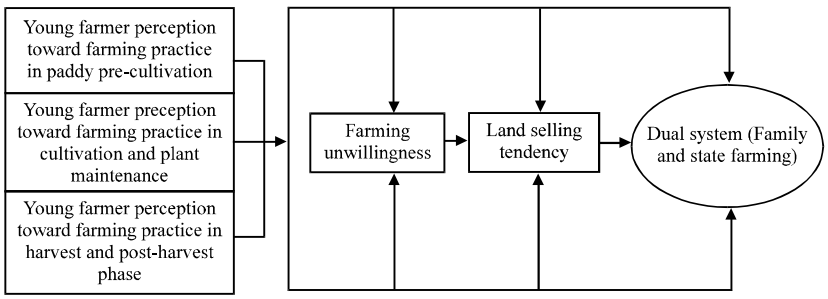

Fig. 2: The theory and framework analysis, to make it more visualized

MATERIALS AND METHODS

Sample and research location: This research is a survey type which aims to conclude the population parameter based on the sample characteristic (Neuman, 1994; Kalof *et al*., 2008). The research sample is the children of the farmer who has gotten senior high school or upper and their parents are paddy-field owner in two sub districts of Gekbrong and Warung Kondang autonomous area of Cianjur, West Java. By the absence of sampling frame, the research adopted the snow-ball sampling in which one respondent gave another subject who in turn he provided the third name and so on. Referring to Dragan and Isaic-Maniu (2013), snowball sampling is adopted for the rare and difficult to identified-population. Technically, Etikan *et al*. (2016) described, the snowball or chain referral sampling was begun with the initial subject as a "seed" through which the first wave was recruited. From the first wave, the research will get the second and the third wave. The first wave of this research subject is a way paver and he was deeply acquired from the agricultural extension staff in the location. Based on this sampling technique, the research accumulated 100 subjects. Based on the assumption of equality of the subject, the 100 sample is sufficient. By implementing the above guidance, the research collected data during June-September 2017.

Variable, operational definition and measurement: The variables of the research, the operational definition and measurement are presented in Table 1.

Range of variable: Based on the four stages of Likert-scale measurement, the range of variable is as following (Sitopu, 2014):

$$\text{Range} = \frac{\text{The highest score of Likert scale-The lowest score of Likert scale}}{\text{The used Likert scale}}$$

Based on the formula, the range of young farmer's perception toward paddy-farming practice, farming unwillingness and the tendency of farming land selling is 4-1/3 = 1. Consequently, the above three variable is categorized into the lowest (1.0-2,0), moderate/non-commitment (2.0-30) and high (3.0-4.0).

Data analysis: The research used three stages of simple and multiple regression analysis which included the effect of: farmer perception toward farming unwillingness, the farming unwillingness to the tendency of land selling and the effect of farmer's perception, the farming unwillingness and tendency of land selling to the desire of dual system of paddy-farming management model. The regression analysis model is following:

$$Y = a+b_1X_1+b_2X_2+b_3X_3+e \quad (1)$$

Which:

Y_1 = Tendency of farming unwillingness
X_1 = Young farmer perception toward farming practice in paddy pre-cultivation
X_2 = Young farmer perception toward farming practice in cultivation and plant maintenance
X_3 = Young farmer perception toward paddy-farming in harvest and post-harvest phase

$$Y = a+b_1X_1+e \quad (2)$$

Which:

Y_1 = Tendency of farming land selling
X_1 = Farming unwillingness

Table 1: Research variable, operational definition and measurement

Variables/Sub variable	Operational definition	The position
Perception toward paddy-farming practice	Young farmer's view on farming practice in pre-cultivation, in four stages of Likert-scale	Independent variable
Farmer's perception on paddy-farming preparation	Young farmer's response to the paddy-farming practice in cultivation and plant maintenance in four stages of Likert-scale	Independent variable
Farmer's perception on cultivation and plant maintenance		
Farmer's perception on harvest and post-harvest phase	The response of young farmer to statements in four stages of Likert-scale indicates their view on paddy-farming in harvest and post-harvest	Independent variable
Tendency of farming unwillingness	The young farmer's response to the statements indicated their inclination to leave paddy-farming, in four stages of Likert-scale	Within variable
Tendency of farming land-selling	The response of young farmer to the statement in four stages of Likert-scale indicates their inclination to sell the farming land	Within variable
Dual system farming management model	The response of young farmer to the statement indicated their desire to combine family and state farming system model, in four stages of Likert scale	Dependent variable

$$Y = a+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+e \quad (3)$$

Where:

Y_1 = Dual system Management model of staple food procurement
X_1 = Young farmer perception toward farming practice in paddy pre-cultivation
X_2 = Young farmer perception toward farming practice in cultivation and plant maintenance
X_3 = Young farmer perception toward paddy-farming in harvest and post-harvest phase
X_4 = Farming unwillingness
X_5 = Tendency of farming land selling

RESULTS AND DISCUSSION

Respondent characteristics: The focus of the research is young farmers in Gekbrong and Warung Kondang, the two sub districts in Cianjur autonomous region. The Respondents are wet paddy-field-owners and the majority is the young age, between 17-25 yeas and unmarried. Male is the main respondents in which the number is more than 75%. The education level of respondent is relatively high, more of them (60%) get experienced in senior high school. The respondents commonly have job outside the paddy-farming and their parents are also not merely farmer but had the job outside agricultural sectors Table 2.

The young farmer in which their parents own the rice field will inherit the farmer status. The agricultural sustainability and staple food availability would majorly depend upon their readiness and their willingness to maintain the paddy-farming. By such reason, the research was eager to browse their perception toward paddy farming practice from pre-cultivation activities to the harvest and post-harvest phase and the impact of their perception toward the tendency of farming unwillingness and land selling. If the young farmer is unwilling to cultivate their land and had a strong tendency to sell their land, the question is what kind of management model of rice production process and what kind of farmer institution is suitable with the situation. The question was the focus of the research.

Perception toward paddy-farming practice: The perception toward paddy-farming practice is divided into three stages in supply chain approach, consist of: pre-cultivation, cultivation and plant maintenance and harvest and post-harvest phase. The farmer's view on pre-cultivation activities are measured in Likert scale based on the farmer response to the 6 statements which includes: paddy seed-breeding needs to spend an enormous energy, paddy seed-breeding is uneasy for the beginner, paddy-seed breeding is tiresome enough, I feel hesitate to work on the rice field because it needs a long time to earn, I feel lack on spirit to farm because by small land, paddy farming is unprofitable and I feel hesitate to cultivate the paddy farming because by narrow land, the paddy farming is insufficient to meet the needs of life. By six indicators, the majority of respondents take the place of moderate in the non-commitment zone. They are not strongly interested in paddy farming but they are not clearly refusing to work on their own land.

Table 2: Respondents distribution based on social characteristics

Characteristic/Category	Frequency	Percentage
Age (years)		
17-25	68	68
26-35	32	32
Gander		
Male	78	78
Female	22	22
Education level		
Junior high school	38	38
Senior high school	60	60
Diploma/graduate	2	2
Marital status		
Married	31	31
Unmarried	69	69
Job outside agriculture	19	19
Other farming		
Civil servant	1	1
Private company worker	7	7
Merchant	14	14
Others	59	59
Parent's job outside	45	45
Paddy-farming		
Other farming		
Civil servant	2	2
Private company Worker	11	11
Merchant	22	22
Others	20	20

Related to the above indicators, the perception of farming practice in cultivation and plant maintenance process is also measured in Likert scale by five indicators which included: tillage is rough work unsuitable for the educated person, paddy cultivation is muddy and less respectable, pest and plant disease control need much time while the yield is small, pest and plant disease observation does not guarantee to prevent pest and plant disease attack, I feel less spirit to work on paddy field because there is not a proper way to prevent drought and flooding. By such statement, fortunately, the majority of the respondents (68%) are also in moderate position. The respondent who has the low perception and has a negative view on paddy farming practice is relatively small, no more than 31% (Table 2).

The young farmer's view on farming practice in harvest and post-harvest phase is also relatively worrisome. The moderate position in which the young farmers took the zone of non-commitment got the majority, 68% (Table 2). The young farmer who clearly had the positive perception was merely 1% while the low perception is fulfilled by 31 respondents (31%). The perception is based on five

Table 3: Young farmer distribution based on perception toward paddy cultivation practice

Perception toward paddy-farming/Category	Frequency	Percentage
Perception in pre-cultivation		
High	9	9
Moderate	63	63
Low	28	28
Perception in cultivation and plant maintenance		
High	1	1
Moderate	68	68
Low	31	31
Perception in harvest and post-harvest phase		
High	21	21
Moderate	68	68
Low	11	11

indicators: the yield of paddy farming product is imbalanced with the dedicated man power and energy, the yield of paddy-farming is impossible to be the main income, the paddy production cost is still too expensive for the farmer, the profit margin between cost and production is still too small, the absence of adequate assurance of harvest failure and the absence of pension for dedicated farmer. The moderate position is strongly dangerous. The respondents could easily change to the negative and in opposite the respondents has also the probability to turn into positive perception, depend on which one is the stronger, the negative or the positive persuasion.

Tendency of farming unwillingness and land selling: Fortunately, the research revealed the data about the unwillingness level of paddy farming in which the data gladden us. The young farmer in Cianjur have has a strong tendency to prevent and maintain the paddy farming sustainability, at least for the land owner farmer. Within the 100 young farmer respondents, 54% has had a low of farming unwillingness level and the consequence they have had a low tendency to leave paddy-agricultural sector. The moderate position or the place of non-commitment attitude was merely took 34% of the whole respondents. The land owner farmer who has had a strong tendency to leave the paddy farming sectors is relatively small, no more than 12% (Table 3).

The above mentioned of farming unwillingness level was measured by the young farmer's response in four stages of Likert scale to the 6 statements in which it included: Factory worker is more worthy than rice farming, government employee is more honorable than paddy farming, trader is more respectable than paddy farming, paddy farming is suitable merely for the lack skill person, if there is a chance, I will choose another job instead of working on rice field and I feel disgrace in society to work on paddy farming because of my high school graduation.

Relevant with low level of farming unwillingness, the inclination of paddy farming land selling is also weak. The research measured the propensity of land selling tendency by young farmer's response to the eight statements in four stages of Likert scale. The eights statement is consist of: rice field is a commodity that can be traded, rice fields are assets that can be sold when prices rise, rice fields selling is a solution to the farmer's financial problems, If prices rise, the rice fields can be sold and can buy back the field at other cheaper places, rice fields are more profitable if it is used as housing, rice fields are more profitable if it is used as factories, rice fields are more useful to be used as roads, offices and shops and rice fields can be sold to be used as venture capital.

Based on such indicators, the majority of respondent (60%) got the moderate position in which it is worrisome. It means the tendency of farming land selling is depend upon the condition. When the land price has been increasing, the land selling inclination is high. While for the Cianjur land farming condition, the demand of the land is relatively high because of the dynamic of development has caused the increasing need of infrastructure, office, housing and industrial estate. For the young farmer who has placed the non-commitment zone, the high demand of land is worrisome condition for farming sustainability.

In addition, the research revealed 13% of respondents who has a low commitment to maintain their ownership of the land. The respondent who has actually had a high commitment to hold, maintain and to cultivate the farming land is merely 13% from 100 respondents. Based on the above condition, the rice field in two areas of Gekbrong and Warung Kondang in autonomous region of Cianjur are under pressure of other development sectors. There is a deep question about the land farming sustainability and it actually needs a systematic problem solving which benefited for all sides, the farmer as well as the industrial holders.

The effect of farmer perception toward farming unwillingness: The two sub variables of perception toward paddy-farming practice which included the young farmer's response to the farming activities in pre-cultivation and in cultivation and plant maintenance gave significant impact to the tendency of land selling. While, the three sub variables of young farmer perception toward paddy-farming practice in paddy pre-cultivation, in paddy cultivation & plant maintenance and in harvest & post-harvest phase did not have the significant effect to the farming unwillingness (Table 4).

However, by the fact that the research revealed the strong effect of farming unwillingness to the land selling inclination, it also means that the perception toward the farming practice has had the effect to the farming unwillingness. As mentioned above, the majority of the young farmer occupied the non-commitment zone of

Table 4: Young farmer distribution based on farming unwillingness and tendency of land selling

Young farmer tendency/Categories	Frequency	Percentage
Rice farming unwillingness		
High	12	12
Moderate	34	34
Low	54	54
Land selling		
High	13	13
Moderate	60	60
Low	27	27

Table 5: The variable toward farming unwillingness and land selling

	Farming unwillingness		Land selling tendency	
Perception toward farming practice	Coefficient	Sig.	Coefficient	Sig.
Pre-cultivation	0.142	0.178	0.223	0.023*
Cultivation and plant maintenance	0.001	0.996	0.260	0.029*
Harvest and post-harvest phase	0.181	0.181	0.089	0.436
Farming unwillingness	-	-	0.424	0.000**

*Significant values; **Very significant value

Table 6: Factors toward the dual system model of farmer's institution

	Dual system	
Variables	Coef.	Sig.
Farmer perception toward paddy farming practice in pre-cultivation	0.005	0.960
Farmer perception toward paddy farming practice in cultivation and plant maintenance	0.578	0.565
Farmer perception toward paddy farming practice in harvest and post-harvest phase	0.172	0.132
Young farmer's tendency of paddy-farming unwillingness	0.425	0.000**
Land selling tendency of young farmer	0.350	0.002**

*Significant values; **Very significant value

farming unwillingness and the effect of farmer perception will get appear if it is sharply browsed. In addition, it should be emphasized that the farming unwillingness is a strong predictor to the inclination of farming land selling (Table 4).

Toward the "dual system" of paddy production management model: This research furtherly tried to explore the effect of the farmer's perception on the farming practice (in paddy pre-cultivation, cultivation and plants maintenance and harvest and post-harvest phase), tendency of farming unwillingness and land selling tendency toward the desire of "dual system" management model of rice production and procurements. In the light of multiple regression analysis, the research pointed out that young farmer's tendency of paddy-farming unwillingness and land selling inclination of young farmer have become strong impetus to the "dual system" of paddy-production management model (Table 5 and 6). The "dual system" in this context is a combination model of family farming and state farming. In the family farming system, the staple food production and procurement are laid completely in the shoulder of family farmer while for the state farming system, the role of the government is a center for staple food provision by utilizing the state owned land.

For the "dual system," therefore, the state actively plays the role in staple food production in which it is characterized by the existence of state owned paddy-field, the institution to control the paddy-production and distribution tightly to the consumers in the form of state owned company, the institution could clearly make a partnership pattern with the farmer group in paddy-production process (germination, cultivation, plant maintenance and post-harvest processing) and the institution could also buy the fertile rice filed sold by the owners. Within the system itself, the state (government) should also, encourage the family farmer to maintain their own farming land and to yield the best quality of rice by providing the latest research and innovation, agricultural extension, subsidy giving (price subsidy as well as the means paddy-production aids), watershed innovation and infrastructure of irrigation development. But fortunately, the government has not at all had a right to force the farmer to preserve their land utilized for the farming function. The ultimate decision about land utilization should entirely in the hand of the farmer based on the assumption that the land farming is the individual and private ownership.

For more clear, the young farmer expectation toward the "dual system" was operationally indicated by the response of young farmer to the five statements in 4 stages of Liker scale in which it included: the owner of the rice field is entirely entitled to plant it with rice, other plants or sell it according to the needs of farmers, the government is entitled to buy the farmer's rice fields at agreed prices, rice procurement is a government's obligation but farmers may cultivate rice voluntarily, the government should form state-owned rice fields on state-owned land which should not be converted and the government has the right to encourage farmers to cultivate rice but should not force farmers to grow it. Based on such indicators, the "dual system" model was proved as an alternative model for the young farmer who has strong inclination to leave the faddy farming and to sell their farming land.

For Indonesia, the implementation the dual system of farming management model is not difficult. The government could probably utilize the state-owned land to develop rice field cultivated and managed completely by the government hierarchically from the central to local government. According to the Ministry of Agriculture in the years of 2012 indonesia still have unused land about 14,252,383 ha which was spread all Indonesia regions (CADAIS., 2013).

In addition, this policy is also in line with the MoA's planning to expand the new rice-field (Anonymouse, 2013). However, the new paddy land should not be submitted to the farmer group but it is entirely cultivated by the government in cooperation with the farmer group in partnership pattern benefited for all sides, the government as well the farmer group. For this aims, the government should form the supporting institution specialized to control the center of rice production, to distribute the product, to predict probable yield and the need and to conduct a close cooperation with the tenant farmer.

The model itself should also, delivers the full support for the farmer who are cultivating their own land such as agricultural extension, subsidy and direct aids for the farmer based on their needs.

CONCLUSION

When the children of the farmer has a strong tendency to leave the paddy-farming and have a strong inclination of farming-land selling, the combination between family farming and state farming system management model (dual system) could innovatively a suitable choice based on the young farmer desire as the consequence of tendency to work at outside farming land. This dual model of state and family farming could easily be implemented but it needs a systematized strategic planning for a certain periods.

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