

Social Capital and Farmer Household Food Security in Riau Province

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Abstract

The purpose of this study is to analyze the relation between social capital on farmer household food security in Riau Province. This research conducted in four districts with different characteristics that exist in Indragiri Hilir and Rokan Hilir as representing areas with high agricultural activity, while Kampar and Rokan Hulu represent areas with intermediate agricultural activity. Survey in this study conducted in two periods, in 2013 with Kampar and Indragiri Hilir as many as 114 samples, and in 2014 with Rokan Hulu and Rokan Hilir for 96 samples, so that the total amount is 210 samples of farmer households. The sampling method is done randomly. The analysis of the influence of social capital on farmer household food security using a model of farm household itself by *Ordinary Least Square (OLS)* as analysis tool. The results showed that the variable price of yam, eggs, chicken meat, fish, cooking oil, number of household members and social capital has significant impact on farmer food security, while the variable price of rice, household head age, education level of farmers and income from farming have no significant effect on farmer household food security. Furthermore, the existing social capital in society composed of 4 (four) aspects which are trust, social networks within the supporting structure, norms and values, and the level of participation in the organization which give positive contribution to farmer household food security.

Keywords: social capital, farmer households and food security.

A. INTRODUCTION

The importance of the creation of food security as a mode for strengthening the economic and political stability, guarantee the availability of food at affordable prices and promising to encourage increased production. Fulfillment of sufficient food, both in quantity and quality, safe, equitable and affordable for all households is a central goal of economic development. Related with efforts to overcome hunger (increasing food security) and reduce poverty in rural areas, FAO (2006) emphasized the importance of special efforts in the agricultural sector and rural areas to improve agricultural productivity.

Within the framework of regional autonomy, government and local authorities need to carry out the role of facilitation and interventions which appropriate for the proper functioning of the food security system in an optimal and equitable for all perpetrators, while society as agents of consumption and to improve nutrition, production and distribution of carrying out its activities each efficiently and responsible for the sustainability of the food security system. Commitment, sincerity and exemplary leader determine the level of participation and community spirit in carrying out their duties, which ultimately determines the performance and success of the entire system of food security.

Based on various conditions above, Indonesia needs to improve by promoting the importance of the agricultural sector in order to create economic growth in the country, hence the need for a set of policies on the Indonesian agricultural sector which is more sympathetic to the farmers and also encourage the industrial sector as well as the efforts to realize food security and poverty reduction.

There have been many studies that examined the relationship between social capital, insulation and social support on health, but research on food security has not been studied further on the contribution of social capital which could play in the ability of households to access adequate food. Research and interventions are also needed to determine how to develop and build social capital in the community, while intervention may also be different from one another, e.g. by ethnicity, age and geographical location. For those who want to promote increased access to and use of aid programs could incorporate social capital and connecting with community-based environmental activities.

B. THEORY APPROACH

Burt (1992) more comprehensively defines that social capital is the ability of people to associate (related) to one another and then become a very important force not only for the economic life but also every other aspect of social existence. Fukuyama (1995) defines social capital as a set of values or informal norms shared among members of a group that allows the establishment of cooperation between them. As Cox (1995) defines social capital as a set of human relations process supported by the network, norms, and social trust that allows efficient and effective coordination and cooperation for the benefit and the common good.

Partha and Ismail (1999) defines social capital as the relations created and norms that shape the quality and quantity of social relations in society in a broad spectrum, namely as a social glue that holds together the group members together. Social capital can be defined as the ability of people to work together to achieve common goals, in various groups and organizations (Coleman, 1999). On the same track, Solow (1999) defines social capital as a set of values or norms embodied in behaviors that can promote the ability and capability to cooperate and coordinate to make a major contribution to the sustainability of productivity. Social capital according to Cohen and Prusak (2001), is as every relation which is going on and bound by a trust, interrelatedness of understanding (mutual understanding), and shared values which binds members of the group to create the possibility of joint action could be done efficiently and effectively.

Hasbullah (2006) explains, social capital as everything matters relating to cooperation in the community or nation to reach the capacity of a better life, underpinned by the values and norms that become the main elements such as mutual trust, reciprocity, collective rules in a community or nation, and the like. Social capital could be seen from the aspects of: trust, norms and values and networking. Social capital which growing in today's society is expected to boost the ability of households and access to food. The strong social capital in the community is expected to reduce the hunger risk.

There have been many studies that examined the relation between social capital, insulation and social support on health, but research on food security has not been studied further about the contribution of social capital on the ability of households to access adequate food. Many studies show a positive relationship between social capital and levels of health (Kawachi, Kennedy, Lochner, and Prothrow-Stith, 1997; Rose, 2000; Runyan et al., 1998) the relation of social capital and a reduction in crime (Sampson, Raudenbush & Earls 1997; Kawachi, Kennedy & Wilkinson, 1999; Kennedy, Kawachi, Prothrow-Stith, Lochner & Gupta, 1998), but to our knowledge not much to investigate the potential relationship between social capital to food security.

This research is conducted by estimating a focus on the variables of social capital and how much social capital variables that exist in society can affect the farmer household food security in Riau Province. The factors that could be expected to affect are: the price of rice, yam, eggs, chicken meat, and fish, cooking oil, the age of household head, education level of farmers, the number of household members, farm income, and social capital.

Based on those, the analysis of such factors which suspected to affect household food security of farmers is very important to do, especially in terms of social capital aspects: trust, social networks and support structures, norms and values, and the level of participation in the organization (networking). Social capital in the community is expected to improve and build the farmer household food security in Riau Province.

Food security is a translation of *food security*, and popularized through the World Food Conference (World Food Conference) organized by the United Nations (FAO) in 1974. In Indonesia, the concept of food security set forth in The Law No.8/2012, whereas food security is a condition of the food fulfillment for the country until the individual which reflected in the availability of adequate food, both in quantity and quality, safe, diverse, nutritious, equitable and affordable and doesn't conflicted with religion, faith and culture, to be able to live healthy, active and productive in a sustainable manner.

The concept of food security at least contains five basic elements: (1) oriented to the needs of households and individuals; (2) food availability and accessibility every time; (3) prioritizing accessibility of food for households and individuals; both physically, as well as socio-economic; (4) aim at the safe nutritional needs; (5) The end goal is a healthy and productive life.

According to DFID (1999) there are five factors such in the form of capital that will determine a sustainability in the activities of the society or community (including the success of agricultural development), namely: (a) natural resources (natural capital), (b) human resources (human capital), (c) physical resources (physical capital), (d) the financial resources (financial capital), (e) social resources (social capital).

The paradigm of food acquisition is supported by three ideas (Simatupang, 2007) :

- a. Food security indicator is individual food security, because food security is the acquisition of sufficient food for each individual, so that food security should be measured in the smallest aggregate dimension which is the individual.
- b. Food availability is a mandatory requirement but does not guarantee the acquisition of sufficient food for each individual.
- c. Food security should be viewed as a hierarchical system; national food security, provinces (districts, local), households and individuals.

The concept of food security as mentioned above can be summarized into four aspects (Faperta Team of IPB 2005, in Sumardjo, 2006):

- a. Food availability: the adequacy of food amount (*food sufficiency*).
- b. Food safety: food that is free from the possibility of biological, chemical and other substances that can disturb, harm and endanger the human condition, as well as guaranteed quality (food quality) that meets the nutrition content and trade standard on foodstuffs and beverages ,
- c. Equitable Food: food distribution system that supports the availability of food at any time and evenly.
- d. Food affordability: the ease of households to obtain food at an affordable price.

A country or region can not be said to have a good food security if one of these elements have not been fulfilled. The availability or adequacy of food and access to food also includes the quality and quantity of foodstuffs so that every individual can be met standards of energy and caloric needs to undertake economic activity and daily life. It is also in line with the concept of Jonnson and Toole regarding food security by using the indicators of the share of food expenditure and energy sufficiency. Jonnson and Toole (1991), adopted by Maxwell *et al* (1996), using the size of the proportion of household expenditure on food and nutrition household consumption as an indicator of household food security as follows.

Tabel 1. Household Food Security Degrees

Energy Consumption per Unit Adult Equivalent	Share of Food Expenditure	
	Low ($< 60\%$ total expenditure)	High ($\geq 60\%$ total expenditure)
Adequate ($> 80\%$ enough energy)	Secure Food	Vulnerable Food
Less ($\leq 80\%$ enough energy)	Less Food	Prone Food

Sumber : Jonnson and Toole, 1991

The concept approaches which used in this study are consumption/food demand and the share of food expenditure. Demand is the amount of goods/services demanded by consumers at various price levels. The demand for goods, other than influenced by price factor, is also influenced by other factors such as income, prices of other related goods, tastes, and others. The consumer's decision to consume the goods aims to provide the highest satisfaction in accordance with their income.

The relation between consumption and income are summarized in Engel's Law, which states that the share of income spent on food tends to decrease if the income increases. This law is based on the discovery of an economist Ernst Engel (1821-1896) in the nineteenth century. Engel's Law has been verified in many studies, and doesn't only apply to specific geographic regions, but also between countries. In fact, Engel's Law is the empirical findings which consistent, so some economists suggest the proportion of income spent on food can be used as an indicator of poverty, i.e. when more than 35% of income spent on food, it's categorized as poor (Nicholson, 2004).

Engel's Law is derived from customer satisfaction theory which states that consumers continue to increase satisfaction in consuming goods with such income constraints. If there is any change on income, so in same price levels, the quantity of consumption will change as well. Such as income increases, and the prices remain, then the amount of each item consumed will increase.

Pyndick and Rubinfeld (1998b) describes the combination of utility maximization associated with each item of income is summarized in the consumption curve of income (*income consumption curve*). Under these conditions, the share of food expenditure of the household expenditure would be lower by increasing incomes, assuming on fixed food prices (Nicholson, 2004). Thus it can be stated that the decline in the share of food

expenditure will increase food security, or can also be expressed with the declining share of food expenditure will improve the well-being because it can consume more non-food items. Farmer households has unique characteristics, it is given that there are a variety of activities, including: consumption, production and supply of labor. All these activities are interrelated and can't be separated from one another.

Farmer households are food producers as well as consumers of agricultural products, where production is consumed, and the rest will be sold as the next farming capital. In general, farmer households have a subsistence nature, though not infrequently as commercial nature. Nakajima (2004) states that the wage rate is determined by the labor market, the farmer households can sell some labor to off-farm, on contrary also purchase a fraction of the workforce from outside for their farming activities. The allocation of labor and working time farm households for farming and non-farming activities actually aim to maximize household utility.

Furthermore, Sadoulet and Janvry (1995) suggested that the decision to consumption, production, leisure or work within the household is done by farm households themselves. Furthermore, to analyze the economic activity of farmer households should use a model of farmer households themselves.

Household economy replication explained that the income is endogenous, and then the consumption decisions can't be released to a production decision. This is in line with the neo-classical economic model, where consumption analysis can't be separated from production decisions which rooted in a separate analysis stage whether the consumer is pure and pristine producer. The decision os household members to work as well as the use of time are closely related to the life cycle of the household.

Singh et al., (1986) developed a model of the household economy, and Becker (1965) constructed the theory of general household economy without specific household activity application. The theory basically relaxes the Marshall model that considers household income is endogenous (*money income held constant*). Singh et al., (1986) noticed that the household budget is *endogenous*, while in Marshall Model the budget is *exogenous*. Therefore, what is done by Singh et al., (1986) and Becker (1965) is basically loosen the assumption used by neo-classical economists in analyzing the economic household behaviors. Chalamwong (1985) developed a model of farmer household by adding control variables of household characteristics such as age, education level and number of household members into the utility function. The demand for food which is the amount of food that prompted households is expected to meet the energy sufficiency and adequacy of quantity. Food demand is proxied by the share of food expenditure, and together with the adequacy of energy used as an indicator to identify the level of household food security.

Food commodity prices, household income, number of household members, and the educational level of the household affects household food demand is proxied by the share of food expenditure. If the food commodity prices rise, the demand for food is concerned is going down, or the share of food expenditure will go down. If any other food commodity prices rise, the demand for supplementary food in question is going down, or the share of food expenditure will go down, and vice versa the request of replacement food. If the household income increases, the demand for food will rise, or the share of food expenditure will go down with increasing income. Income earned by farm households, which will influence the production and consumption of farm households. Food consumption and demand for farm households is also influenced by socio-economic characteristics of the farmer households themselves.

The research on food security aimed to determine the effect of food prices, household income, characteristics (including age of household head, number of household members, and education level of the household head) on the level of household food security, and then also need to know the relation of social capital on household food security. Social capital associated with the interaction of the household of the surrounding environment.

The households may have the lack of financial or food resources, but the rate of households with higher social capital at risk of hunger are much smaller. The results of this study are expected to provide a useful framework for additional research in the area. This research is necessary to develop social capital and aspects which used to check the greatest impact on household food security especially farm households.

C. METHODOLOGY AND DATA

1. The Scope of Research

This study analyzes the social capital of the food consumption and demand of farmer household in Riau

Province, by taking four (4) districts with different characteristics as the study area, namely: Indragiri Hilir and Rokan Hilir as regional representation with high activity of food crops. While Kampar and Rokan Hulu as regional representation of intermediate food crops activity. From the four districts are then taken several sub-districts as representation of the area which has rice farming activity.

The selection of Riau Province as the study area based on the consideration that the growth of the agricultural sector in Riau Province is higher than the growth of the agricultural sector in Indonesia, in addition based on BPS data in 2015 GDP per capita, Riau Province is the third biggest in Indonesia after Jakarta and East Kalimantan.

2. Type of Data Research

The data used in this study included primary and secondary data. Primary data including the farming activities for one year, covering all aspects of farming activities, namely the use of inputs every business and every season, according to the type, quantity/volume, and price, as well as the results of production, the acceptable price, and the magnitude of farm receipts later supported secondary data through multiple sources and related publications.

In addition, farmers' economic activity data outside the farm include the type of activity, time, place, and the income earned from each activity. In addition, farmers characteristics data that must be recorded included age, formal education, the number of household members, number of household members who work, the extent of ownership of land, and extensive land ownership by type of land held.

3. Methods of Sampling and Number of Farmer Samples

The study conducted on two survey periods, which are 2013 and 2014. In 2013 there are two (2) districts, Indragiri Hilir and Kampar, while in 2014 applied the same thing for Rokan Hilir and Rokan Hulu. Method in the determination or sampling is done randomly. Total number of samples analyzed is 210 farm households consisting of 114 farm households in 2013 and 96 farm households in 2014.

4. Method of Data Analysis

To analyze the factors that affect farmer household food security, it use *Ordinary Least Square (OLS)*. In econometrics (Greene, W.H. 1993 and Gujarati, D.N., 2003) can be written as follows:

$$\ln FS = \ln d_0 + d_1 \ln HBrs + d_2 \ln HUBi + d_3 \ln HTlr + d_4 \ln HAYam + d_5 \ln Hlkan + d_6 \ln HMgr + d_7 \ln UKR + d_8 \ln Dik + d_9 \ln JART + d_{10} \ln I_{RT} + d_{11} \ln SC + \varepsilon$$

Whereas:

FS	= the level of farmer household food security
d	= intercept
d_i	= regression coefficients (estimated parameters) wherein $i = 1$ s/d 11
HBrs	= rice price (Rp/ Kg)
HUBi	= yam price (Rp/ Kg)
HTlr	= egg price (Rp/ Kg)
HAYam	= chicken meat price (Rp/ Kg)
Hlkan	= fish price (Rp/ Kg)
HMgr	= cooking oil price (Rp/ Kg)
UKR	= age of household head (Th)
Dik	= level of farmer education
JART	= the number of household member (person)
I_{UT}	= farm income (Rp)
SC	= social capital
ε	= error term

D. RESULTS AND DISCUSSION

Social capital in this study observed from 4 (four) aspects; trust, social networks within the support structure, norms and values, and the level of participation in the organization. But overall, factors suspected to

affect household food security of farmers in addition to social capital is the price of rice, yam, eggs, chicken, fish, cooking oil, the age of the household head, education level of farmers, the number of household members, and farm income.

Analysis of social capital relation to food security in the model farmer households and estimated using *Ordinary Least Squares (OLS)* method, while the regression results can be seen in table 2.

Table 2. Estimate Result of Social Capital on Farmer Household Food Security in Riau Province.

Variable (1)	Parameter (2)	Regression Coefficient (3)	Error Standard (4)	t-ratio (5)
Constans	d ₀	9,5055***	0,4639	20,489
Rice Price	d ₁	-0,0125 ^{NS}	0,0256	-0, 489
Yam Price	d ₂	-0,1096***	0,0244	-4,491
Egg Price	d ₃	-0,1312***	0,0356	-3,681
Chicken Price	d ₄	-0,0447**	0,0252	-1,776
Fish Price	d ₅	-0,1122***	0,0153	-7,324
Cooking Oil Price	d ₆	-0,0555***	0,0199	-2,791
Age of Household Head	d ₇	0,0812 ^{NS}	0,0566	1,434
Level of Farmer Education	d ₈	0,0180 ^{NS}	0,0339	0,531
Number of Household Member	d ₉	0,0553***	0,0229	2,416
Farmer Income	d ₁₀	0,0084 ^{NS}	0,0155	0,543
Social Capital	d ₁₁	0,0572***	0,0204	2,798
Coefficient of Determination (R ²)			0,8380	
F-count				93,169***
Number of Sample (n)			210	

Source : Processed Primary Data

Description :

***	= significantly in error 1%	t-tabel 1%	= 2,358
**	= significantly in error 5%	t-tabel 5%	= 1,980
*	= significantly in error 10%	t-tabel 10%	= 1,658
NS	= non significantly in error 10%	F-tabel 1%	= 3,920

The test of model accuracy is based on the coefficient of determination (R²) of 0.8380 indicates that approximately 83.80% variation of household food security of farmers in Riau Province able to be explained by the variable price of rice, yam, eggs, chicken meat, fish, cooking oil, the age of household head, education level of farmers, the number of household members, farm income and social capital while the remaining 16.20% is explained by other variables outside the model.

The overall test value of such variables (F-count) showed that the value of F-count (93.169) is greater than F-table (3.920) on the error rate of 1%. This indicates that the variable price of rice, yam, eggs, chicken meat, fish, cooking oil, the age of household head, education level of farmers, the number of household members, farm income and social capital together significantly affected farmer household food security of Riau Province on the 99% trust level.

The variables suspected to affect farmer household food security which have significant influence with the positive coefficient is the number of household members and social capital. As for the variable price of rice, yam, eggs, chicken meat, fish, and cooking oil to produce the negative coefficient towards farmer household food security in the Province. From the 11 variables suspected to affect farmer household food security, known that significantly variables are the price of yam, eggs, chicken meat, fish, cooking oil, the number of household members and social capital. The variables of rice price, the age of the household head, level of education of farmers and farm income didn't significantly affect farmer household food security Riau Province.

From Table 2 above, the variable price of yam shows the real effect and significant at 99% confidence level with a negative coefficient sign. This suggests that if the price of yam rise by 1%, assuming other variables in the model remains the farmer household food security decreased by 0.1096%. Furthermore, the variable of egg prices significantly marked negative coefficient on farmer household food security at 99% confidence level, this means that if the price of eggs in the market rise by 1%, assuming other variables in the model remains the farmer household food security will decrease by 0.1312%. Furthermore, the price of chicken meat was highly

significant and had a significant negative coefficient value at 95% confidence level. This suggests that if the price of chicken meat in the market rise by 1%, assuming other variables in the model remains, so the farmer household food security will decrease 0.0447%.

Furthermore, the fish price has very real and significant influence with a negative coefficient value at 99% confidence level. This suggests price fish in the market rise by 1%, assuming other variables in the model remains, so the farmer household food security will decrease 0.1122%. Hereafter, the cooking oil price has very real and significant effect with a negative coefficient value at 99% confidence level. This suggests that the cooking oil price in the market rise by 1%, assuming other variables in the model remains, the farmer household food security will decrease by 0.0555%. The variable of food prices will affect household food access, wherein rising prices but doesn't offset the increase in revenue will result in low purchasing power. Therefore, the Government's policy to control the staple considered very necessary for the stability of society.

The variable characteristics of farmer households, which is the number of household members have real effect on the confidence level of 99% and signified positive. This shows that the age of the household head increase by 1%, assuming other variables in the model remains, the farmer household food security rise 0.0553%. Kifli *et al* (2015) stated that the number of household members have significant effect on household welfare but with a negative correlation. It is quite logical considering the many needs that must be fulfilled when a household has many members.

The results of Kifli and Saputri research (2016) showed that households with food consumption pattern are fulfilled (75.61%), including household food security. The bivariate results have a PR value of 3.7 and there is a meaningful relation. The interpretation of these results is that the pattern of the family household food consumption are not fulfilled that caused 3.7 times more likely become food secure. Number of family members will directly increase consumption and demand for food, more and more members of the household, the greater the household food needs.

Even further, statistically, the variables of social capital showed a significant effect on farmer household food security in Riau Province. The influence of social capital is very significant to farmer household food security at 99% on trust level with a positive sign. It shows that if the values of social capital increased by 1%, assuming other variables in the model remain, then the farmer household food security increased by 0.0572%. This indicates that social capital is constructed of 4 (four) aspects; trust, social networks within the supporting structure, norms and values, as well as the level of participation in the organization which give positive contribution to farmer household food security in Riau Province.

The social capital from the aspect of trust measured from 10 constructs, i.e.: good relations with other communities in the village, generally most people are trustworthy, always think positively of others, a sense of security to the environment hometown, both for residents and people from outside the village, people in the neighborhood can be trusted, a visit to a neighboring house, likes to give help to others, incidents such as fights, theft or other criminal activities in the village, the level of trust in political parties, politicians, police and civil servants to act for the public good and the level of trust in the church/mosque. As explained by Fukuyama (1995), trust is the hope, which grows up in a society that is shown by the behavior honest, orderly, and cooperation based on the norms that are shared.

The social capital is measured from the aspect of social networks and support structures is also measured from 10 constructs, i.e.: the frequency of contact with family and friends (outside the household), to visit residents of illness, visits to a neighboring house, love to give help, even though they do not know anyone asking for help, neighbors also commonly visited at home, helping if there are people who are grieving, keep abreast of information through the mass media, the influence of other tribes on the lives of the people in the village, acquaintances outside the village, and can relate/communicate with them though far from home. Putnam (1995) argued that social networks are closely will strengthen the feeling of cooperation among its members as well as the benefits from that participation.

Furthermore, the social capital of the aspects of norms and values drawn from 10 constructs, i.e.: the desire to be appreciated, always appreciate the work of others, when hurt other people, then I have to reciprocate, a certain moment definitely need help from another, a certain moment other people definitely needs help, everyone will reap the results of their actions, the existence is expected in the group, help given, then won the trust of the group, cooperation in opening the gardens, and eat together in a traditional feast is important for togetherness. Onyx (1996), explains that healthy people tend to have sturdy social networks. People know and meet other people. They then build strong inter-relations, both formal and informal.

While the social capital of the aspects of the level of participation in the organization as measured from 6 constructs, i.e.: participation in dues/donations to the organization, attendance at meetings of the organization, the participation of expression in meetings, involvement in decision-making in the organization, active in the organization activities, and freedom of expression/speaking in the meeting also made a positive contribution to the level of farmer household food security. Along with Putnam (1995), the existence of good social capital is characterized by the existence of solid social institutions; social capital evokes a harmonious society.

Overall constructs making up social capital in the community need to be promoted and developed in social interaction in the community because it gives a positive and significant effect on the improvement of farmer household food security in Riau Province.

E. CONCLUSION AND POLICY RECOMMENDATIONS

1. Conclusions

Based on the results of research on social capital to farmer household food security in Riau Province, it can be concluded:

- a. The variable prices of potato, eggs, chicken meat, fish, cooking oil, have significant influence with a negative coefficient sign while the number of household members and social capital has significant influence with a positive coefficient sign on household food security.
- b. The social capital in a society built on four (4) aspects, namely: trust, social networks within the supporting structure, norms and values, and the level of participation in the organization have a significant impact and give positive contribution to the improvement of farmer household food security.

2. Policy Recommendations

- a. The Government of Riau Province should improve the performance of agricultural sector in order to enhance the contribution and growth in an effort to provide food supply for the community.
- b. Integrative planning of the agricultural sector in Riau Province and to build cooperation and active participation of the community in improving the welfare development with the provision of social capital developed in the community.

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