Research Article
DOI : 10.20425/ijts.0iof.9580

International Journal of Tea Science
Vol. 12 (1&2) 2016

The Self-Reliance of Member on Tea Smallholder Farmer Groups in West Java Province, Indonesia

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Abstract: The existence of tea smallholder farmer groups as a social entity has an important and strategic role in realizing the self-reliance of its members on tea farming activity. This study aimed at determining the self-reliance of members on tea smallholder farmer groups in West Java Province, and the factors that influence toward the self-reliance of members on tea smallholder farmer groups in West Java Province. The study used mixed method approach with sequential explanantory strategy. Proportional stratified random sampling with 128 members of tea smallholders farmer group (farmers) or 20% of the sample population with 643 members (farmers) sampling method was used. Quantitative data were analyzed by using path analysis, while qualitative data were analyzed by using triangulation of sources. The study showed that the level of the member's self-reliance of tea smallholder farmer groups as a whole in decision making, initiatives creative and innovative, and solving problems related to the tea farming is in moderate category. The self-reliance of members needs to improve, especially on the initiative, creativity and innovation. From path analysis, member's self-reliance of tea smallholder farmer groups were affected from strongest to weakest by role of tea farmer groups, extension, the availability of capital, farming experience, age, land size, market opportunities, and work motivation. The self-reliance of members on tea smallholder farmer groups *most effectively can be enhanced through the improving the role of tea smallholder farmer groups.*

Keywords: Self-reliance, farmer groups, tea farming, smallholders, West Java

Running title: Reliance of smallholder groups in West Java

Introduction

The conditions of tea agribusiness in West Java Province, Indonesia, which is the center of the largest national tea production with an area 77.75 % of the total acreage of tea in Indonesia is in poor state, especially the tea smallholders plantations which constitute 51.33% of the total area under tea in West Java Province, Indonesia. The productivity of tea leaf from tea farmers is still less than 1 ton/ha/year, at only 871 kg/ha/year. Farm gate prices at tea smallholders level is around IDR 1,600,-/kg, while ideally price of tea shoots are at least IDR 2,000,-/kg to slightly profitable for farmers. Populations of tea plants which are generally not in accordance with the minimum number of technical standards of 10,000 bushes/ha. The population of tea plants is only about 65% of the minimum conditions or 6,500 trees/ha. In addition, many tea growers are converting tea gardens to other commodities such as vegetables or other land uses.

These problems create challenges for the development of tea agribusiness which is has great potential for improvement and development. Various programs to improve the productivity of tea has been implemented aimed at breakthroughs for the improvement and development of tea cultivation by tea smallholders that involve improvement of sub farming systems, quality, processing and marketing. These plantation development programs would be realized they are supported by optimum empowerment of all the potential and if the active all tea agribusiness actors can accesses the resources. The goal of the

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ISSN; 0972-544X (print)

process of development and empowerment is growing the self-reliance of farmers as the main actor of tea farming activities in achieving increased production in terms of improved quantity, quality and continuity.

Self-reliance is one component of individual attitudes in response to the empowerment process[1]. It can use its own resources based on knowledge acquired, working alone and in a self-created environment based on available skills. Self-reliance will enable someone to improve the aspects of quality of life, work, and thought[1, 2]. The self-reliance is also a form of personality totality possessed by every individual as a human resource that enables communities to have a better standard of living. At least there are three indicators of the self-reliance, namely self-reliance on decision making, initiative creative innovative, and solving problem[1, 4, 5].

Tea smallholder farmer groups as main actor on tea agribusiness and as social entity of tea smallholder can be a strategic approach to accelerate the improvement of the self-reliance of its members. Farmer group has four roles, namely learning, production, collaboration, and business units[6, 7]. By joining tea smallholder farmer group, members can solve the problems faced to tea societies individually or as a group of tea, as this can enhance efficiency and be a media for the learning and interaction process for smallholder farmers. Joining the group, it is expected there shall be a change in tea smallholders or member of tea smallholders farmer group behavior toward better quality in tea farming. Furthermore, it may have an impact on the improvement and increased productivity, incomes, and welfare of members of the group.

It has not been established if the tea farmer groups can foster self-reliance of its members in the development of tea productivity to enable them to survive and thrive independently. This study aimed to determine the self-reliance of the members of tea smallholder farmer groups in West Java Province and factors that influence the members of tea smallholders farmer groups' self-reliance in West Java province.

Methodology

West Java Province located between 5º 50' - 7º 50' South Latitude and 104º 48' - 108º 48' East Longitude. The highest rainfall occurred in March, which reached 418.7 mm and the lowest occurred on August, with 74 mm. The average wind speed over the year 2014 reached 3.3 knots. The climate of West Java Province is tropical, with average temperature about 17.4-30.7ºC and humidity about 73-84%.

This research used descriptive survey method with mixed method and used sequential explanatory strategy, i.e. research that combines quantitative and qualitative methods in a sequence more inclined to quantitative process[8]. The study was conducted in West Java Province, which is the largest tea producer in Indonesia. The sampling method used proportional stratified random sampling with sample size of 128 members (tea farmers), 20% of whom, were active members on tea smallholder farmer groups in West Java Province.

Quantitative data collection was done by interviewing the respondents using a questionnaire containing questions structured on farmers' perceptions of the self-reliance of members (decision-making, initiative creative innovative, problem solving) were measured using Likert scale scoring. Qualitative data were collected through in-depth interviews with informants and focus group discussion (FGD). Informants in this study were members of farmer groups, the chairmen of farmer groups, the chairman of tea famer group association, and extension worker.

Data were analyzed by path analysis to explain the causal relationship between one variable or multiple variables, the strength of the effect of variables, and to analyze the effective path of variable toward member's self-reliance. Path analysis was analyzed with the help of AMOS software version 21.0. Validity test based on the corrected item-total correction resulted 311 valid items from 329 questions (r_{table} = 0.1449; n = 128). *Cronbach's alpha* test showed all the variables tested were reliable (α> 0.600). Classic assumption test results showed the data distributed normally ((skewnees=-0.408; kurtosis=0.425)< 2:58), without multicollinearity of variables (VIF <5), and auto correlation (-2<Durbin Watson=1.595<2).

Results and Discussions

West Java Province has plantations that are managed by the State Owned Plantations or PTPN Estates (PBN), Private Estates (PBS) and smallholders (PBR). Potential commodities are tea, coconut, oil palm, sugar cane and rubber plantations with a total area of 494,166 ha in the year 2013. The harvested area of tea plantation in West Java Province in 2013 was 94,391 ha, with a tea production of 113,885 tons, and tea productivity of 1.6 tons/ha which still less than 2

tons/ha. Private estates achieved highest productivity followed by PTPN estates and the smallholders had the lowest productivity.

Results showed members had self-reliance on decision-making; initiative, creativity and innovation; and problem solving. Based on the analysis, the level of self-reliance of members of tea farmer groups as a whole in decision making, creative and innovative initiative, solve the problem as well as in the medium category (77%). Distribution of the self-reliance of members based on the type of self-reliance is presented in Figure 1. The achievement of self-reliance of members was highest in decision-making (58%), followed in problem solving (48%) and lowest in the initiatives, creativity and innovation (31%). In general, members still occasionally made their own decisions related to their farms in choosing the tea farm inputs, selecting inputs, selecting tea tools/machines, buying inputs, purchased tea tools/machines, cultivation management ways, and tea marketing. Members still had little initiatives, creativities and innovations in addressing the problems of tea farming, especially in seeking and finding inputs and tools/machines, looking for information on technology, and expanding markets. Most members solved problems of cultivation, post-harvest activities, marketing and related capital, inputs and tools/machines independently.

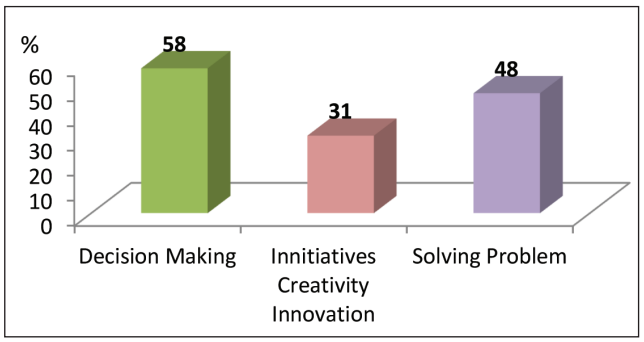

Figure 1: Distribution of self-reliance's members of tea farmer group

Distribution of the member's self-reliance of tea farmer groups based on each indicator are presented in Figures 2, 3, and 4. The members largely made own decisions in buying tea inputs, such as fertilizers and pesticides. The decision making on buying tea tools/machines, such as power sprayers for pest management and tea plucking machines largely depended on group facilitation. Generally, members seldom owned power sprayers and tea plucking machines due to their high prices. Members had no role in decision making regarding tea processing, and development of downstream products. These decisions were wholly dependent on the group. Tea marketing decisions depended on the group leader who managed the selling of fresh tea leaf from its members. Indeed, the group leader was included the determination of farm gate prices.

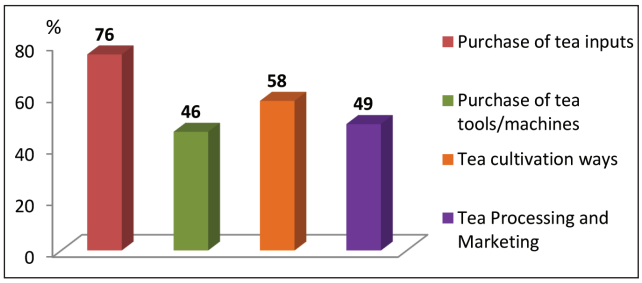

Figure 2: Distribution of self-reliance's members on decision making

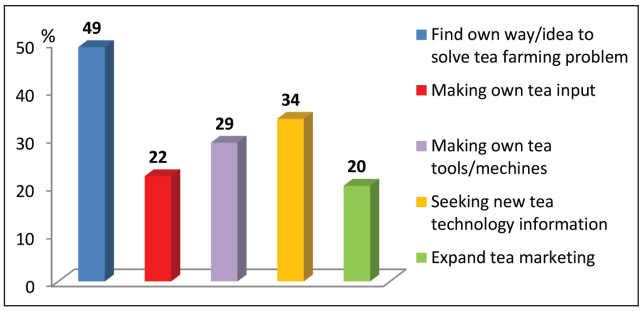

Figure 3: Distribution of self-reliance's members on initiative creative innovative

The members largely determined their own ways/ ideas to solve general tea farming problems (Figure 3). However, they rarely initiated or decided on inputs such as cuttings, bio fertilizers or bio pesticides. This was due to their limited knowledge and low skills they had on technologies. Members tended not to apply fertilizers because of the high production costs, did not own simple tea tools and had no role in expanding tea marketing. Generally members felt they had no power, skills and capital to create, innovate and build local downstream products.

The self-reliance of members on solving problems on tea cultivation was dominated by own initiative indicator (Figure 4), especially in regard to tea planting, fertilizer applications, pruning, and plucking. The lowest problem solving problem was on the ability to manage tea marketing issues. Members had no power to control the tea prices because it depended on the trader prices. Indeed, members had weak bargaining position in marketing process.

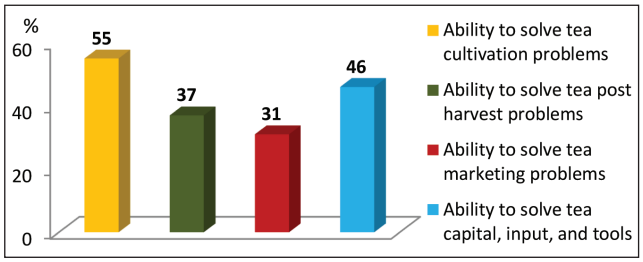

Figure 4: Distribution of self-reliance's members on solving problem

The higher ranked grade group, showed more self-reliance in decision making, creativity, innovative initiatives and solving problems (Figure 5). The lowest level of member's self-reliance was in beginner class because most of the processes were left entirely to the group. Members of the beginner groups depended on the group leader's decision and the extension worker. The beginner group members generally did not decide or solve problems related to tea farming independently. In contrast to the level of independence of members of the middle (madya) class, members of farmer groups tended to be able to use the group as a source of information to assist them in making the decision, taking the initiative to create, innovate and solve problems related to tea farming. So, not all problems requiring decision making were submitted to the group. Only decision-making and solving of few problems, for example, the development of downstream businesses that required the involvement of a group where all the members joined to decide on collective action within the framework of togetherness were referred to the group. Member's self-reliance in the middle lands (51%) and in the low lands (51%) was higher than the member's self-reliance in the uplands (42%) (Figure 6). This could be due to the fact that in the middle and low land, members generally had more access to resources and were able to access information on resources, capital, and market opportunities.

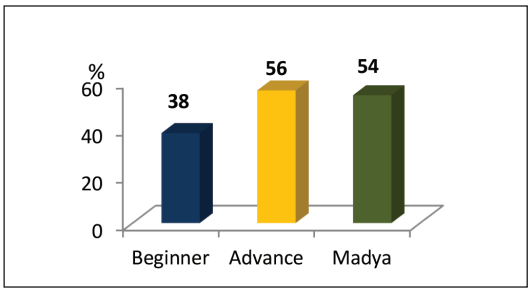

Figure 5: Distribution of self-reliance's members based on group class

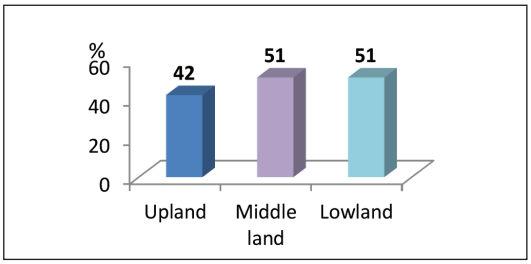

Figure 6: Distribution of self-reliance's members based on altitude difference

The farmer crops cultivated other diverse crops ranging from annual plants (tree crops, spices, timber) and seasonal crops (food and horticulture) in their tea gardens. Organizational culture in the public of middle and low land were relatively more developed and diverse. involvement in different activities could accelerate interaction and exchange of information and knowledge. Consequently, it can be a medium of solving problems for members of the tea farming. Composition of migrants in the middle and low land were also higher and general population in the middle and low land had easier mobility from one place to another. Competition or economic competition that occurred in the middle and low land were higher which caused people to become more dynamic farmers because of the diversity of income sources (agriculture, animal husbandry, fisheries, trade, carpentry, industry and services). The sources of income of farmers (members) in the middle and low land were therefore more diversified.

Model 1 from the path analysis showed the result did not satisfy the goodness of fit criteria. It was therefore necessary to modify first by removing the factors that did not have the critical value ratio (CR) variable (CR > 1.63) and p values < 0.10 from each factors. These factors included level of education, level of cosmopolitan, plant population, and soil fertility. Model 2 shown in Figure 7 indicated acceptable goodness of fit. It is indicated by output probability value (p) of model was not significance 1.62 (p> 0.05). Ho accepted and H_1 rejected. So, there was no difference in models with hypotheses with data. The model had good fit, and this was also supported by the other value of goodness of fit criteria (RMSEA = 0048; GFI = 0.953; AGFI = 0899; TLI = 0969; NFI = 0.929; CFI = 0994).

Based on Table 1, the variables that directly influenced (from strongest to weakest) the member's

self-reliance on farmer groups were the role of tea farmer groups (0.685), the availability of capital (0.288), extension (0.167), land area (0.107), opportunities market (-0.094), and motivation (0.085). Variables role of farmer groups, availability of capital, extension, land size, and work motivation had significant ($p \leq 0.05$) effect on member's self-reliance. Thus, the higher the role of farmer groups, more available of capital, better extension, more land size, and higher work motivation, the higher the member's self-reliance would higher. Variable market opportunities negatively ($p \leq 0.05$) affected the member's self-reliance. Consequently, the lower or more limited the market opportunities, the member's self-reliance will be higher. This was contrary to the hypothesis which formulated that greater or more opened the market opportunities, the member's self-reliance will be higher. In fact, market opportunities for tea farmers was limited and lacking impartiality. The policies lacked farmer inputs in setting price of smallholder tea. The farmers were not involved in the development of markets or downstream product markets. Indeed, the smallholders had limited information about market opportunities. Under these conditions, members need to work collectively with the group to create markets or innovate strategies for value addition through developing simple or traditional processing technologies for downstream products.

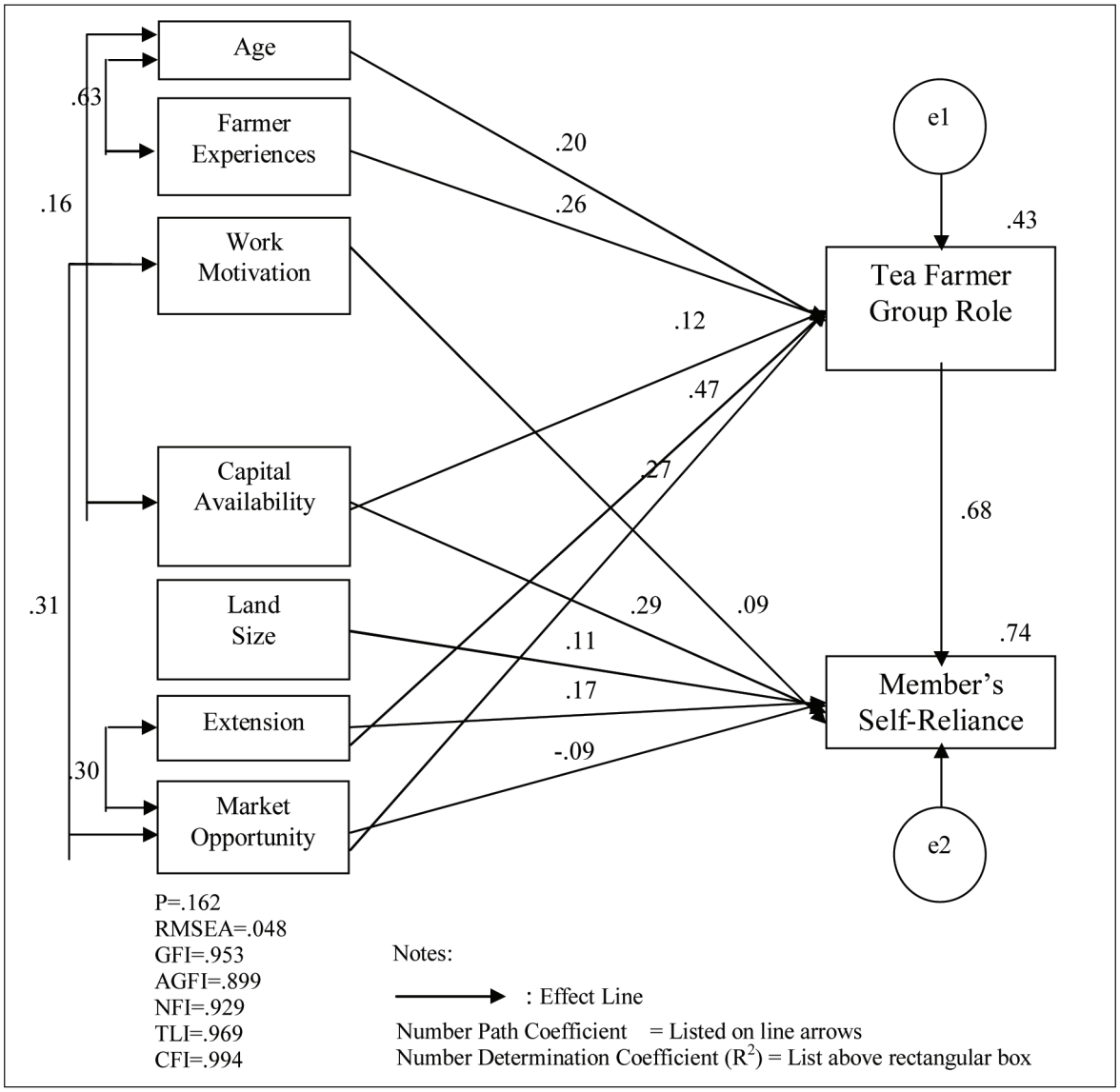

Figure 7: Model 2. Path diagram of the effect of factors to member's self-reliance of tea farmer group

The joint influence of independent variables:- role of farmer groups, the availability of capital, extension, land size, market opportunity, and work motivation on member's self-reliance was 0.736 (squared multiple correlations (R^2/ coefficient of determination). This means that the variability of the member's self-reliance can be explained by the role of farmer groups, the availability of capital, extension, land size, market opportunities, and work motivation of 73.6%, while the remaining 26.4% is influenced by other variables outside the model being researched.

Table 1: Estimation coefficient path value of the effect of factors to member's self-reliance of tea farmer groups

Effect between variables			Path Coef.	Regression Coef.	S.E.	C.R.	P	Ket
Group Role	<---	Age	.203	.749	.327	2.287	.022	**
Group Role	<---	Farmer experience	.260	1.083	.367	2.948	.003	***
Group Role	<---	Capital availability	.122	.492	.287	1.747	.081	*
Group Role	<---	Extension	.467	1.400	.214	6.528	***	***
Group Role	<---	Market opportunity	.267	1.142	.309	3.692	***	***
Member's self-reliance	<---	Group Role	.685	.350	.030	11.713	***	***
Member's self-reliance	<---	Capital availability	.288	.594	.098	6.053	***	***
Member's self-reliance	<---	Land size	.107	.536	2.013	2.254	.024	**
Member's self-reliance	<---	Extension	.167	2.57	.085	3.018	.003	***
Member's self-reliance	<---	Market opportunity	-.094	-.207	.120	-1.730	.084	*
Member's self-reliance	<---	Work motivation	.085	.107	.062	1.729	.084	*

Coefficient of Determination (*Squared Multiple Correlation*) :
Group Role = 0.428
Member's Self-reliance = 0.736

Notes:

*	= Significant on α = 10%	CR α = 1%; on +/- 2.57
**	= Significant on α = 5 %	CR α = 5%; on +/- 1.96
***	= Significant on α = 1%	CR α = 10%; on +/- 1.63

From path analysis (Table 2), the factors that directly and indirectly influenced (from strongest to weakest) the member's self-reliance, were the role of farmer groups (0.685), extension (0.487), the availability of capital (0.371), farmer experiences (0.178), age (0.139), land size (0.107), market opportunity (0.088), and work motivation (0.085). The magnitude of the coefficient values gave an idea of the effectiveness of the variable to increase member's self-reliance (Table 2). The most effective path to increase the member's self-reliance of tea farmer groups was the role of farmer groups, amounting to 68.5%. This was consistent with that proposal by Mardikanto[9] and Suyatna[10] that group processes are rapid routes to diffusion of innovations. Market orientation in the form of inputs and outputs (products) of farmers can be improved through group processes as extension efforts can effectively reach members through group processes. The group functions as a medium of information transfer and provision of services for its members more effectively.

Table 2: The Estimation Result of Direct and Indirect Effect between Independence and Dependence Variables and Among Independence Variables

Effect between variables			Direct Effect	Indirect Effect	Total Effect
Group Role	<---	Age	.203	.000	.203
Group Role	<---	Farmer experience	.260	.000	.260
Group Role	<---	Capital availability	.122	.000	.122
Group Role	<---	Extension	.467	.000	.467
Group Role	<---	Market opportunity	.267	.000	.267

Effect between variables			Direct Effect	Indirect Effect	Total Effect
Member's self-reliance	<---	Group Role	.685	.000	.685
Member's self-reliance	<---	Capital availability	.288	.083	.371
Member's self-reliance	<---	Land size	.107	.000	.107
Member's self-reliance	<---	Extension	.167	.320	.487
Member's self-reliance	<---	Market opportunity	-.094	.183	.088
Member's self-reliance	<---	Work motivation	.085	.000	.085
Member's self-reliance	<---	Age	.000	.139	.139
Member's self-reliance	<---	Farmer Experiences	.000	.178	.178

Functioning roles of farmer groups to improve the self-reliance of its members also became the embodiment of the process of empowerment of tea farmers which in turn built stronger community of plantations. As proposed by Adjid[11], in order to achieve the self-reliance of members to tea farming, the functioning role of the group should be pursued in harmony, always in a state of dynamic and mutually supportive manner requiring stimulus and motivation of the process of social interaction to strengthen the farming community itself.

Increasing member's self-reliance of tea farmer group in decision making, initiative, creative, innovative, and solving problems related to the tea farming in the province of West Java can be improved by increasing the role of farmer groups, extension performance, availability of capital, openness tea market opportunities, land optimization, and increase work motivation of member (Figure 7). This can be done by improving the extension performance, disclosure of tea market opportunities, availability of capital, and the optimization of productive and experienced old members on tea farming.

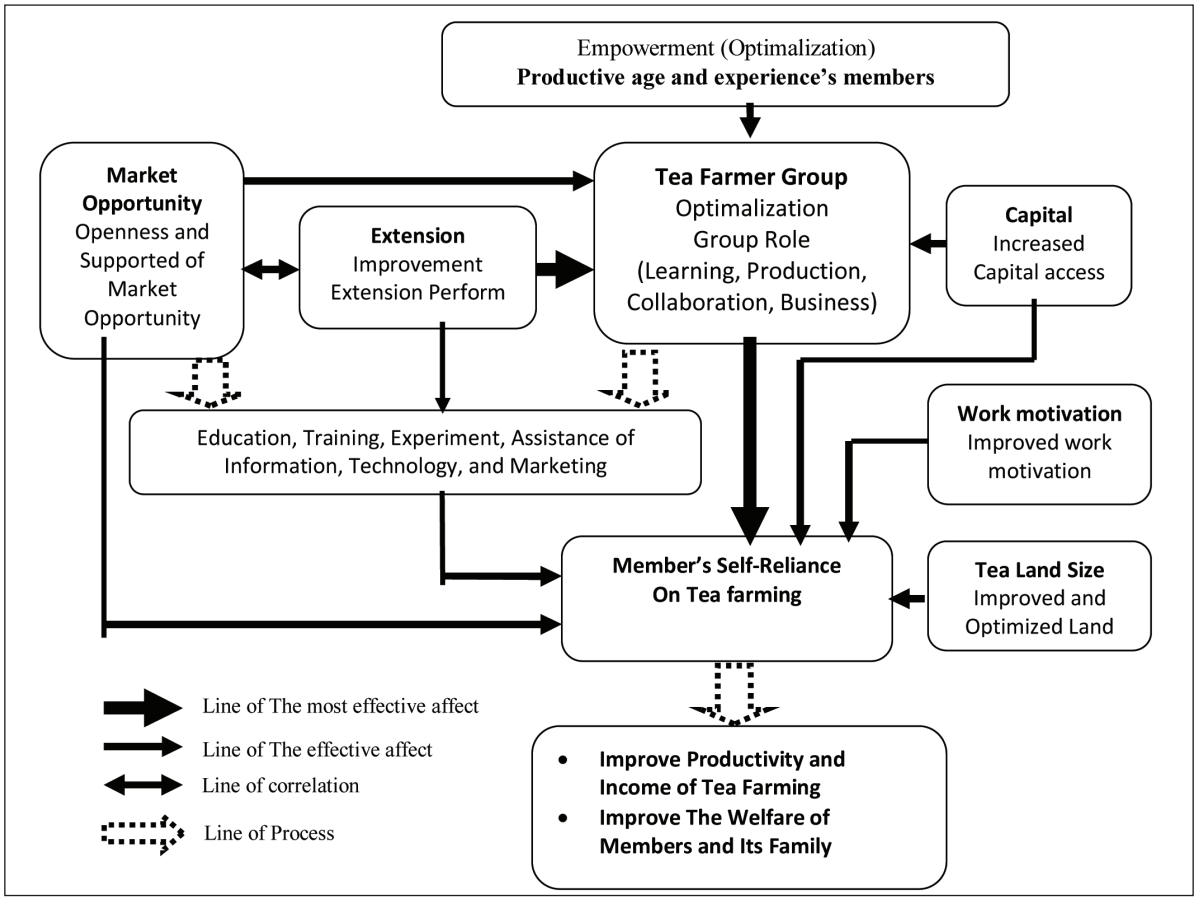

Figure 7: Model of the effort in improving the member's self-reliance of tea smallholder farmer group in West Java Province

Conclusions and Recommendations

In decision making and problem solving related to tea farming activities were sometimes carried out by the members, but at times left entirely to the decision of the group. In tea farming, members rarely had the initiative, creative, and innovative ways to develop tea farming. The self-reliance of members was influenced by the role of tea farmer groups, extension activities, availability of capital, farmer experiences, age, land size, market opportunity, and work motivation. Market opportunities negatively affected self-reliance of members on tea smallholder farmer groups, meaning the smaller the market opportunities, the member's self-reliance will increase. The lack of the market opportunity for products tea farmers today has driven the members to creative and innovative to created market of local tea products for increasing the value added tea products. The efforts to improve the member's self-reliance can be achieved through increasing roles of farmer groups, which can be realized through the intensive extension activities.

It is recommended that policies need to be developed to increase the role of tea farmer groups in improving the smallholder tea farmers especially those in productive age to enhance learning, production, collaboration and business media. There is need of strengthening performance of farmers through improved extension services and assistance of tea farmer groups to motivate members ij acquiring knowledge on land management, development of collaboration, marketing and downstream businesses of tea. Farmers and farmer groups need increased access to capital in the form of loans/business credits. More disclosures should be made on market opportunities, especially on market policies, prices and programs that support tea smallholders plantation. Finally, there is need for communication, coordination, and intensive cooperation between the Government (Department of Plantation, Department of Agriculture, and the Department of Forestry) and research institutes or universities in order to jointly undertake research and extension activities.

Acknowledgment

The author gratefully thank to Graduate School of Gadjah Mada University and Extension and Communication Development Program Study that has given opportunity for author to study here. Also gratefully thank to my supervisors Prof. Sunarru Samsi Hariadi and Subejo, SP., M.Sc., Ph.D that greatly supported during the study. The author gratefully thank to Research Institute for Tea and Cinchona, Indonesia who has facilitated this research and also to Dr. A. Imron Rosyadi for great discussion. The author thank to Tri Maruto Aji, SP., M.Sc. and extension workers in field who assisted and facilitated in data collection. Greatfully thank to tea farmers for share the great experiences about tea farmings and tea institutions. The author also thank to reviewers for their so called-insight.

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