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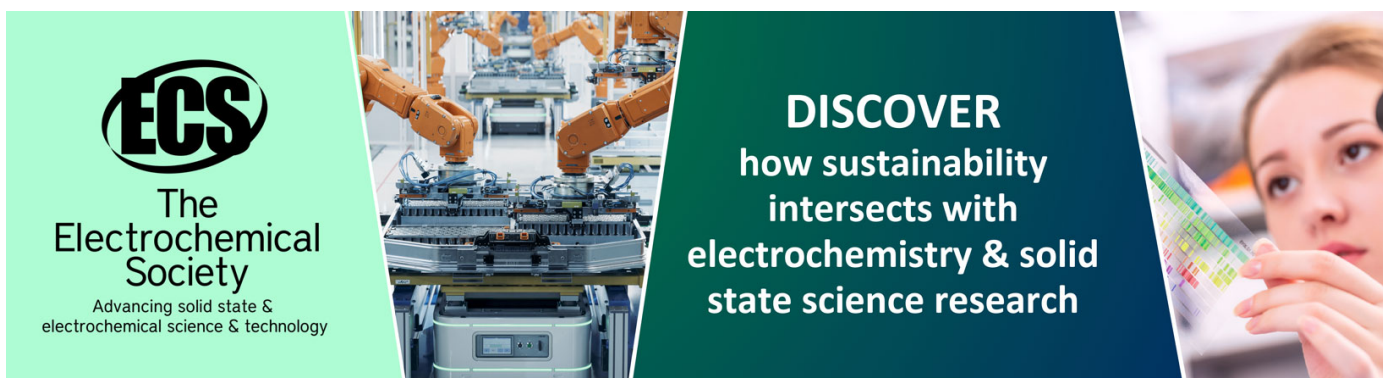
Poverty alleviation system of dryland farm community in karst mountains Gunungkidul, Indonesia

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Poverty alleviation system of dryland farm community in karst mountains Gunungkidul, Indonesia

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Abstract. Poverty is essentially an economic inability to meet the basic food and non-food needs (housing, clothing, education and health). The vulnerability of natural, agro-climate and geographical conditions in which are not suitable for agricultural economic activities, the income of farm community in the karst mountains region is very small. One of the popular dryland karst mountains regions in Java is Gunungkidul that lately has very volatile rainfall and experienced extreme climate changes due to the tropical cyclone. Most farm households are in pre-prosperous condition. The effects of climate change are further exacerbating the conditions of the farm community. In order to overcome the poverty of the dryland farm community in the karst mountains, an appropriate poverty reduction system that comprehensive and easy to implement is necessary. Furthermore, this study aims to design a poverty alleviation system for dryland farm community in the karst mountain region by using focused group discussion (FGD) of farmers, agribusiness actors, government and academic. Mapping problems and solutions were done by classifying field data in the form of minutes and FGD transcripts into a diagram figure. The FGD was focused on the Triple Helix concept which became the basis for designing poverty alleviation systems. The result showed that lack of water is the main problem for the farm community in Gunungkidul. The collaboration among the farm community, government and academic becomes an alternative poverty alleviation system in the study area. In addition, it may implement the integrated farming of plant and livestock with a conservation model based on appropriate innovation technology.

1. Introduction

Poverty as the main national problem and international attention is basically the responsibility of all elements of society to strive to alleviate it. The government has determined poverty reduction to be a national commitment and a top priority. But economic growth in Indonesia is not in line with poverty and economic inequality reduction. The number of poor people in Indonesia has increased by 6,900 people from September 2016 to March 2017 [1].

Most of the rural poor in Indonesia live in Java. Regarding the Poverty Line component consisting of the Food Poverty Line and Non-Food Poverty Line, the role of food commodities is still greater than the role of commodities rather than non-food (housing, clothing, education, and health) [1]. Poor households according to BPS are people whose monthly expenditure is less than IDR 233,740 per capita. In this case, income is the main variable for a household in meeting their basic needs. With a decent income, households can meet their needs in the form of food and non-food. In addition, to act



as food producers, farm households also act as consumers. As a result, rising food prices have a positive impact on farm income (as producers) but also have negative impacts on farmers as the consumers.

The price of rice and substitute commodities affects the real income of farm households [2]. Similarly, other study found that farm household income influenced by the price of rice, education, off-farm income and assets owned by the farmer households [3]. Unlike those researches that used farm households in the lowlands sample, this study intends to subject farm households in karst mountain region as it is necessary to design the poverty alleviation system since the low farm household income in the karst mountain region due to the agro-climate and geographical conditions in which are not suitable for agricultural economic activities. Although including dry areas, the rainfall in the study area is very volatile and lately has experienced extreme climate changes due to the tropical cyclone which is devastating [4]. The effects of climate change are further exacerbating the conditions of the farm community who have not realized yet the consequences of climate change and have not adopted the change of technology and farming systems that response to the climate change.

The promotion of poverty alleviation efforts in dryland areas, called "unproductive land for agricultural cultivation" program, especially in the karst mountain region has experienced extreme climate change, which is very urgent. Karst is a form of the earth's surface which is generally characterized by a closed depression (closed depression), surface drainage, and cave. Climatic regimes, thick colluvial deposits have been accumulated in some karst depression, they were resulting from the deposition of soil sediments and other material from the slopes [5]. This area is formed mainly by dissolution of rocks, mostly limestone so that almost certainly the agricultural land in the karst mountains is dry land with rainfed rice systems.

In recent time, poverty eradication solutions are still struggling with poverty reduction programs and have not used a synergized and integrated system in tackling the root causes of poverty. One solution to poverty reduction is to encourage migration and diversification of livelihoods and require strong participation from people to get out of poverty [6].

Strengthening entrepreneurship of the poor can also be an alternative to get out of poverty [7]. Off-farm jobs were playing an important role in reducing poverty in rural areas because small-scale farmers can increase household income [8]. Dryland farm communities in the karst mountain region are a representation of the rural poor who are difficult to overcome both depth and the severity of poverty. The farm community is a typical community, producer, and consumer of food. It is very interesting if the poverty alleviation system in this community group is successfully designed and implemented properly. Thus, it can become a pilot project for poverty problems in other regions.

Poverty alleviation programs are usually carried out by providing capital assistance in various forms to the poor so that they can change their economic conditions. This poverty alleviation strategy can be solved based on a theory that views poor people as passive, and with assistance beyond poverty. But, it is necessary to realize that the poor do not only experience problems of lack of capital but also vulnerability and powerlessness [9]. In line with the shifting of courtesy regarding the nature of poverty, an important strategy that is then carried out is to empower poor households in various ways that can be classified as a capacity building.

The strategy of empowering poor household members with a capacity building approach relies only on improvements at the individual and household levels, therefore, their benefits can be felt less communally. Another way that needs to be done is to approach the local community, by using local institutions, namely social security mechanisms that exist in the local community to alleviate poverty. This strategy called poverty alleviation based on local community institutions [10]. This strategy is widely applied in poor areas that have limited access to other regions. By using an institutional approach, empowering poor households can be more effective and directed. This is in line with the previous studies Uphoff [11] and Sitorus et al. [12] states that poverty alleviation strategies with the concept of creative socio-cultural energy will be an internal force at the locality level (community) such as *nagari*, *lorong*, villages and neighborhood groups or citizenship. The concept of creative social energy refers to three aspects, namely: (a) agreed basic ideas about a positive goal, (b) agreed

expectations or ideals about being able to achieve that goal, and (c) friendship in an effort to achieve that goal. Social energy is found in units of locality in the form of institutions that are oriented towards mutual welfare.

In the triple helix, the results of university academic research are expected not only to serve the needs of science itself but also as a solution to the government's problems in determining policies and regulations relating to the business community. The government needs to provide a positive stimulus that can stimulate the growth and development of business investment while encouraging business atmosphere. The method is to reduce restrictions that complicate the development and innovation of doing business, protect business innovation works, and implement government regulations relating to business ethics so as to create healthy business competition. On the other hand, the industry also has an obligation to contribute in creating a good business climate, such as implementing business ethics, committing to corporate social responsibility, and becoming a partner of the government to support national economic growth [13].

This Triple Helix concept can be used for community empowerment programs by balancing the roles of the three parties, namely academics, government and business people, continuously and dynamically. The three parties cannot move on their own. Therefore a synergistic and balanced collaboration are needed. The concept of Triple Helix applied in empowering the community's intention to produce cocoa [14]. In this study, dryland farm communities in the Karst Mountains are placed as the main subjects that play an important role in determining the change in their own standard of living. Farm community play role as an industry or business actor in term of the agricultural sector. The purpose of this research is to design a poverty alleviation system in dryland farm community in Karst Mountain by applying the triple helix concept.

2. Material and methods

This study used descriptive analysis techniques, which provide an overview of phenomena, explain the relationship between variables, make predictions, historical analysis and get the meaning and implications of a problem that is solved [15]. Data was collected, arranged and finally analyzed.

This study was conducted in Girisubo Sub-district, Gunungkidul District, Yogyakarta Special Province, Indonesia. The condition of the environment and the farming community in the study area is presented in Figures 1-3. While secondary data was obtained from the Central Bureau of Statistics (BPS), Local Government, Agriculture Service, and related agencies.

In order to design poverty alleviation systems, mapping and focus group discussions were conducted on farmers, agribusiness actors, consumers, and government. Mapping problems and solutions are done by classifying field data in the form of minutes and focus group transcripts into a diagram. In parallel, discussion participants were also asked to formulate subjectively the problems faced, so that all discussion participants could deliver their opinions. This is important to avoid the domination of opinions from certain discussion participants. This conditioning aimed to capture the disguised input or not delivered in the discussion process, as well as used to formulate the problem of the study. Therefore, the FGD participants were invited to determine the problem and simultaneously categorize the problems faced in the field. The FGD was held on July 22, 2018, attended by 50 participants included the government, community leaders, universities (UNS), economic actors, and farm communities in Girisubo Sub-district. The FGD was focused on the Triple Helix concept which became the basis for designing poverty alleviation systems.



Figure 1. Hamlet roads in Girisubo Sub-district



Figure 2. Agricultural and environmental areas of the Hamlet in Girisubo Sub-district



Figure 3. Inhabitants' house in Girisubo Sub-district

3. Results and discussion

Modification of Triple helix is one solution to the constraints faced by dryland farmers in the karst mountain region in their agricultural production with extreme climate change. Triple helix facilitates the creation of mutualism collaboration between the three parties were involved. It is expected that a more open and mutually beneficial relationship will be made between academics and the government, academics with business people, and business people with the government. In this study, the farm community as a business element in term of agricultural economic activity.

Furthermore, the decomposing process was carried out by the researcher to focus the biggest/dominant attention of the FGD participants. Then it was classified according to the scale of the

problem which was considered dominant by the FGD participants. The results of the focus group discussion diagram can be seen in Figure 4.

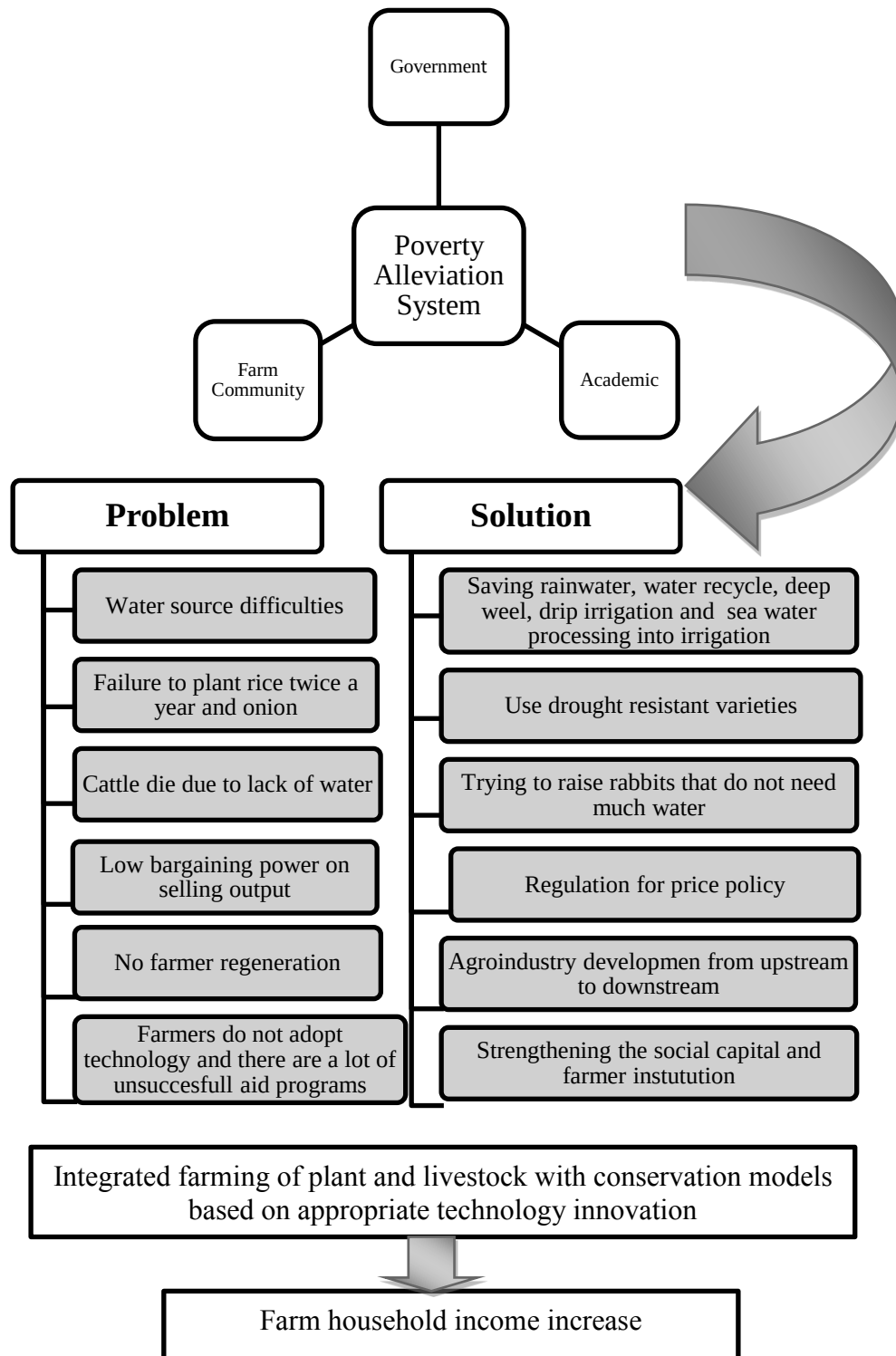


Figure 4. Diagram for result of focus group discussion

The difficulties of water source take dominant attention from FGD participant. Lack of water results the failure of experimental farming of some commodities and many livestock to die. This finding is in line with Choenkwan et al. [16]. The scarcity of surface water is the main constraint in developing economic activities in Karst Mountain, particularly for agriculture and livestock. There are some alternatives strategies that may implement such as saving rainwater in the rainy season called ‘*embung*’, water recycle, deep well, drip irrigation and seawater processing into irrigation. In addition, farmers should try to use drought-resistant varieties recommended by seed institute. Fruit annual crop and forestry trees are good for growing since those types are resistant to extreme climate condition. Raising rabbit could be the alternative livestock due to it does not need much water and easy to breed.

Farm communities in Karst Mountain need to strengthen their institutional and social capital to increase their bargaining position to determine output price and to encourage each other for adopting innovation technology. Furthermore, they can manage saving, loan and aid as financial access as well. In order to attract young people in farming activities, developing agroindustry from upstream to downstream is important. In other words, it strongly recommended for farm community in Karst Mountain to implement an integrated farming of plant and livestock with conservation models based on appropriate technology innovation. As a result, the household income would increase, and poverty in dryland Karst Mountain would decline.

4. Conclusion

Conquering the extreme climate change and nature of Karst Mountain in Gunungkidul District is very difficult and complicated. Farm community needs to adopt change technology and farming system to respond and adjust the climate change [17]. Furthermore, Triple Helix concept in the poverty reduction system could be an appropriate strategy since it is comprehensive and easy to implement. This strategy empowers poor farm household with a capacity building approach relies only on improvement at the community. The three parties, namely academics, government and farm community may improve the economic activities in the dryland Karst Mountain by balancing the roles of the three continuously and dynamically.

Acknowledgments

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