

TRI HITA KARANA: LOCAL WISDOM AND AGRICULTURAL DEVELOPMENT¹

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Abstract

Rice farming has still very important to develop due to the high growth of population. Increasing productivity is the strategic policy to respond the higher demand of food (rice). One of the government policies is green revolution application. In the short term, green revolution had been brought about the good impact for the productivity of rice. However, the negative impacts are also happened due to the high uses of agricultural inputs as a recommendation from the government. In Bali, *subak* as local wisdom has a philosophy called *tri hita karana* which could be guidance for the farmers to have wise cultivation of rice farming. This emphasizes harmony concept in the social interaction among the members of *subak* and sustain harmonious relationship with the God and environment. Having the bad impacts to the environment, government and other stakeholders have become aware of the development sustainability, wherein the paradigm of agricultural development has been changed to be sustainable agricultural development. *Subak* has returned to the *tri hita karana* as a basis for the rice farming. *Subak* should be strengthened and adjusted to the new technology in order to achieve the goals of sustainable agricultural development.

Key words: Rice farming, *subak*, local wisdom, sustainability

1 Introduction

Farming activity has played very important role in the development, especially in developing countries (Gollin, et al 2002). They have emphasized their development into the agricultural development. The agriculture could produce food and other products needed by the people and industries as the raw materials (Olsson, *et al*, 2005; Dim, C., Ezenekwe, 2013). In other side, the sector of agriculture is also needed the products produced by the industries, such agricultural tools, machines and other technologies in order to response the modernization. It means that the sectors of agriculture and industry have interrelated which should be maintained and developed for their link sustainability.

The agriculture, thus, should be strengthened their roles in the national economic development not only for the improved food production, but for making better welfare of farmers and sustaining the ecological aspect. In developing countries, it has multi-functions for the people and the state and environment. These functions consist of the food production and provision to the people, the employment opportunities, and the industries' raw materials production. Besides, agriculture also has function to be consumers of products produced by the industries and protect the natural environment.

Essentially, the agricultural development constitutes the human activities to have optimal utilization of the agricultural resources in the relation to the achievement of development goals.

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These include: (i) strengthening the capacity of human resources and agricultural institutions; (ii) increasing the sustainable use of agricultural resources; (iii) achieving food security and self-sufficiency of rice; (iv) increasing the competitiveness and added value of agricultural products; and (v) developing agricultural businesses to support rural economy. Agricultural development is quite often looked similar to the rural development due to the most of rural people work in the farming activities (Salako, et al, 2015). Agricultural works are also mostly concentrated in the rural areas.

Since 1960s, the population growth in the world has been increased and continued to grow. The high population rate has happened in many developing countries, including Indonesia. The need for food (rice) has increased along with the population growth. The availability of rice had become problem and challenge for the people and government including the private sectors. Due to the farming activities are seasonal in nature; the supply of rice might be reduced within the certain season along the year. During dry season, rice farming could not be done by the entire farmers because the availability of irrigation water becomes decreased. In case of Indonesia, the problem of rice supply had been a big problem before 1984. Therefore, the increased rice production policy must be taken by the government to respond the high demand of rice.

In Bali province, the rice farming activities have been fully managed by the traditional irrigation system, called *subak*. The irrigation management system under the *subak* constitutes the local wisdom which has been existed since more than 1,000 years ago. *Subak* has philosophy called *tri hita karana* which becomes guidance for the individual farmers and group of farmers in implementing the agricultural and irrigation works on the rice farm areas (Pedersen & Dharmiasih, 2015; Roth and Sedana, 2015). *Tri hita karana* is three causes for happiness consisted of *parhyangan* (the harmonious relationship between the people and the God); *pawongan* (the harmonious relationship between the people and other people); and *palemahan* (harmonious relationship between the people and environment). Since the beginning of *subak* established, the three harmonies mentioned above had been adopted by the farmers. Rice farming had been regarded as a way of life and lived culture on the agricultural development. Keeping the environment had been strictly done by *subaks*, in which this could be seen from the existence of rice terraces. The *subaks* could not destruct the land topography for their rice fields even though the size area is very limited or narrow land. They let and adjusted their rice fields in line with the sloping areas. They implemented traditional rice farming practices even though their productivity was relatively low.

One of the program as government policy which had been implemented in 1970s was green revolution. The green revolution is the fundamental changes in the application of agricultural innovation and technology for rice cultivation that began in the 1950s to 1980s in many developing countries, especially in Asia. The main objective of green revolution is to increase the rice productivity through the improved technologies. Many results of researches acknowledge that green revolution could bring good impact for the rice productivity and contribute to the self-sufficiency of rice at the national level. In other side, however, the green revolution program had made negative impacts for the environment, social and economic aspects. Concerning to this condition, this paper would briefly describe the program of green revolution in Indonesia, role of local wisdom (*tri hita karana*) in supporting the sustainability of agricultural development, especially in rice farming.

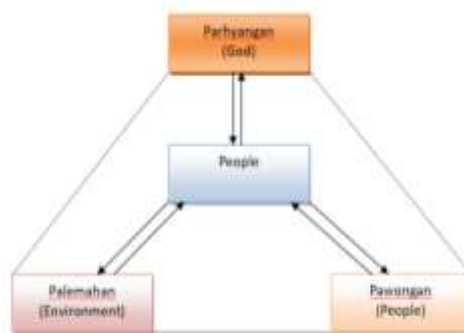
2 Subak system and Agricultural Program

2.1 Subak system as local wisdom

Subak constitutes one of the Bali's cultures which has the uniqueness in farming activities on the rice field. The uniqueness of *subak* is presented in the ritual activities on rice farming and social interaction among the members. This has acknowledged as the interesting thing culture to be known by the visitors. *Subak* as an irrigation society manages the irrigation water for crops cultivation on the rice field (Jha & Schoenfelder, 2011; Lorenzen, 2015). The culture of rice farming in Bali is based on the *tri hita karana* philosophy (Ramstedt, 2014; Pedersen & Dharmiasih, 2015). It refers to the harmony of relationships between the people and God and relates to the religious activities, called *parhyangan*, harmonious relationship among the people in the social interaction, called the *pawongan*, and the harmony of relationship between the people and environment, called *palemahan*. The relationships among the three are presented in the Figure 1.

Pitana (2010) also mentioned that *subak* is regarded as a traditional institution which supports the Balinese culture. The philosophy of *tri hita karana* is being a guidance for the *subak*'s member to ensure the stability and dynamic interaction among the themselves in conducting the agricultural and irrigation aspects and sustainability of physical, social, and economic environments under the appreciation of religious values. It means that *tri hita karana* could be an effective tool to solve the problems relating to social-environmental aspects of *subak* system (Roth and Sedana, 2015).

Figure 1
Philosophy of tri hita karana



The three components of *tri hita karana* are the universal values which should be kept by farmers as members of *subak*. This philosophy has developed in order to make the harmonious relationship among the farmers in the various activities on rice fields. Religious value has created the farmers to cultivate their farm lands based on the beliefs of God. Ritual activities have been performed by the farmers in line with stages of rice cultivation started from the water preparation, land preparation until harvesting.

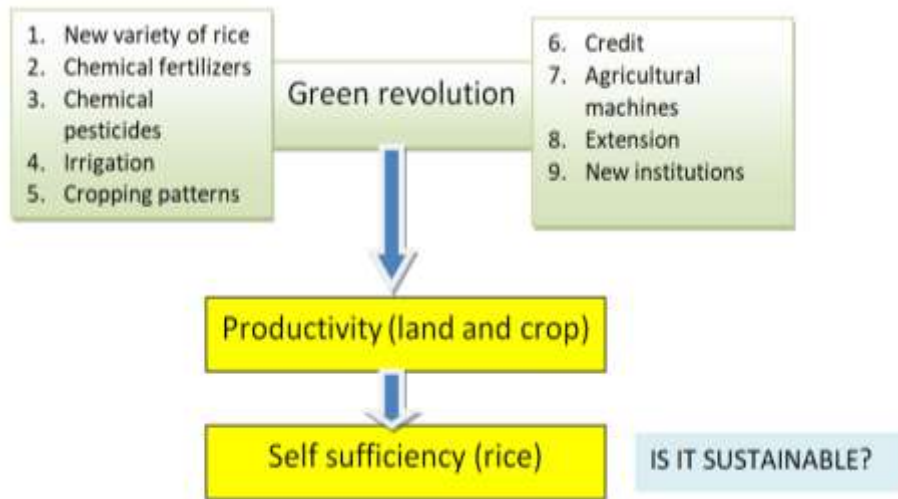
2.2 Green Revolution and its Impacts

Principally, there are four strategic things that are applied in the relation to the green revolution in Indonesia. Firstly, the irrigation system for water supply is very important to construct and establish by the government in order to ensure the irrigation water availability for

rice farming. The second, the optimal use of chemical fertilizers for increasing the productivity of land rice crop. In the green revolution, the use of chemical had been done by the farmers as a recommendation from the agricultural extension workers. The basic fertilizers which must be proportionally used by the farmers are Urea, SP 36 and KCl. Thirdly, use pesticides by adjusting the level of pest attacks. Similar to the fertilizers, the government had also recommended chemical pesticides to farmers which should be applied to protect and control the pest and diseases of rice. There were many kinds of pesticides were introduced and recommended by the government staff. The fourth, the use of better quality of rice seed in the form of superior varieties or high yield varieties.

The government had focused on the improvement of technologies to increase the productivity of rice crop. The Ministry of Agriculture had been supported by the other ministries, such as The Public Works, The Cooperative, Finance, and The Industry. Green revolution had been done in the form of agricultural intensification as a method for making intensive rice cultivation which is also known as *panca usahatani* (five practices of rice farming). These involved selecting good seeds, good soil management, fertilizing, having proper irrigation, and eradicating pests and disease. At the same time, the government of Indonesia had also made the program of agricultural intensification as a method to expand the rice fields by opening new land. Diversification of agricultural practice had been also implemented as a method to make a variety of plant species in a land with an intercropping system. By employing the agricultural diversification, staple crop failures can be prevented and overcome. The implementation of green revolution is shown in the Figure 1.

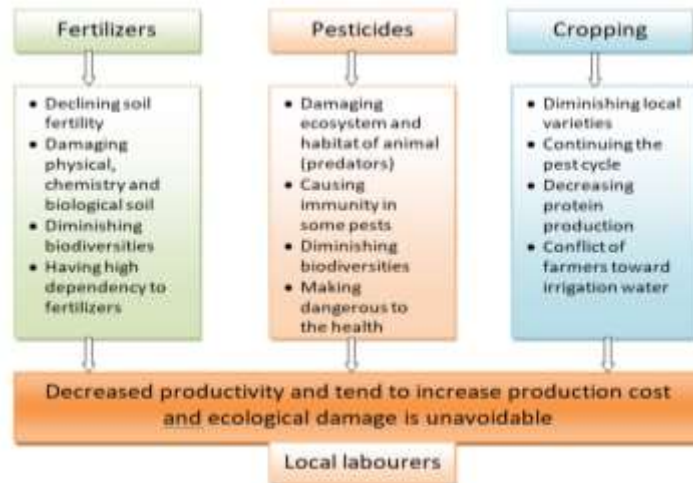
Figure 1
The implementation of green revolution



The productivity of agricultural crops has been increased since the new agricultural technologies introduced and applied, such as using the high yield varieties, chemical fertilizers and pesticide, mechanization supported by the government policies for the maximized production (Chapagain, et al, 2011). The tangible result is the achievement of self-sufficiency (sufficient supply) of rice in several countries that had always been shortage of food supplies, such as India, Bangladesh, China, Vietnam, Thailand, and Indonesia. However, the negative effects for the physical environment which contributes to the reduced production and the lower

quality of human health and safety. These include the depletion of topsoil, green house gas emissions, water pollution, air pollution, decrease of biodiversity, and groundwater contamination as presented in the Figure 2.

Figure 2
Negative impacts of green revolution implementation

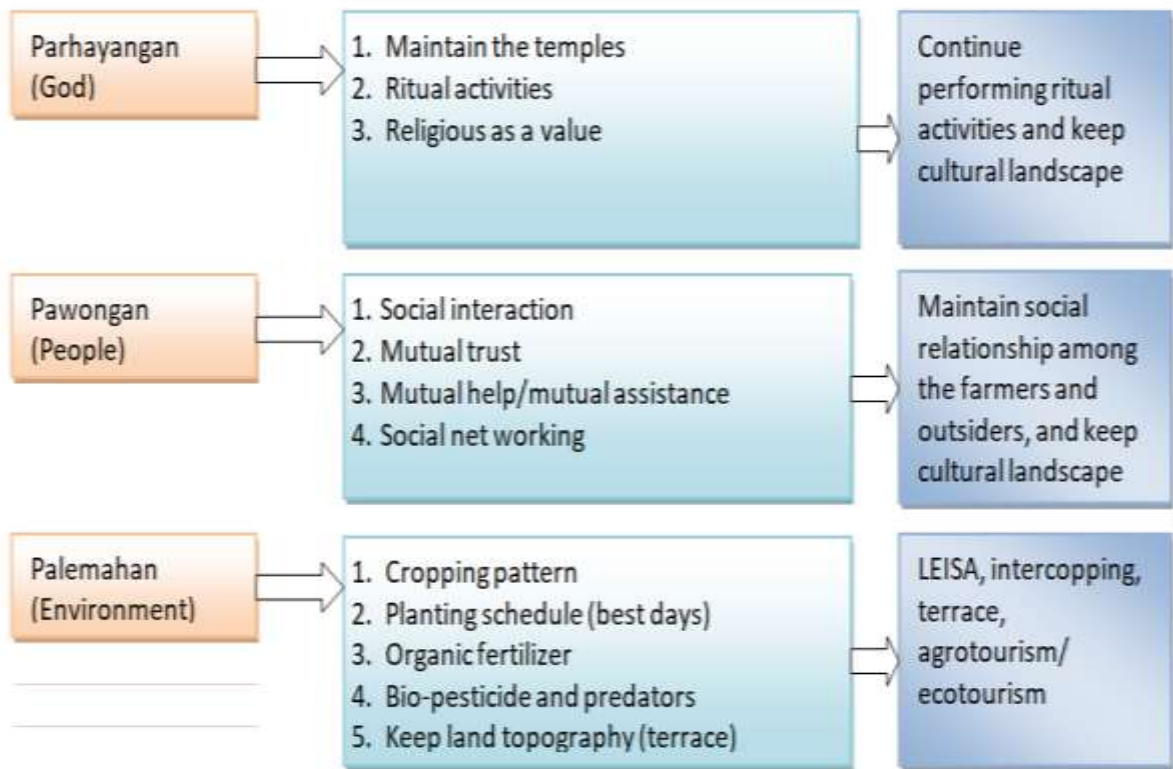


The negative impacts of green revolution should be overcome in order to regenerate development goals. The sustainable agricultural development was initiated to implement as an integrated system of the practices between the plant and animal to achieve the guaranty of human needs for food and cloth, improve and sustain the better quality of environment and natural resources, and improve the quality life of farmers and society as a whole through the economic viability of farming.

2.3 Subak and Sustainable Agricultural Development

Agricultural sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. Therefore, long-term stewardship of both natural and human resources is of equal importance to short-term economic gain. Stewardship of human resources includes consideration of social responsibilities such as working and living conditions of laborers, the needs of rural communities, and consumer health and safety both in the present and the future. Stewardship of land and natural resources involves maintaining or enhancing the quality of these resources and using them in ways that allow them to be regenerated for the future. Stewardship considerations must also address concerns about animal welfare in farm enterprises that include livestock.

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Sustainable agriculture integrates three main goals – environmental health, economic profitability, and social equity. The sustainable farming practices which have redone by *subaks* are crops rotation and crops diversification; application of integrated pest management through field school program; application of livestock and crops integration; and management of *subaks* landscape by having agro-tourism or eco-tourism.

Crops rotation is actually the traditional method applied by farmers to protect and control the pest and disease attacks. Besides, application of crops rotation has been proven by farmers as *subak*'s member to bring many benefits. These could make healthier soil and higher productivity of crops. *Subaks* have internal regulation to manage the rotation of crops along a year including the cropping patterns, selection of seed and schedules of planting. For the cropping patterns and planting schedules, *subaks* always consider the irrigation water availability.

In order to strengthen the *subak* as local organization with its local wisdom, government should encourage the participation of *subak* and promote capacity of *subak*'s management boards and other farmers in the programs of sustainable agricultural development and rural development. Moreover, they should be facilitated to get easier access to technologies, finance, other resources, and marketing to ensure their economic incentive. Government is expected to provide support services to the *subak* through the extension and training programs regarding the Low External Inputs for Sustainable Agriculture. In order to achieve the sustainable agricultural development, *subak* should be strengthened and adjusted to the new agricultural technologies based on the *tri hita karana*.

3. Conclusion

Subak as local wisdom has a significant role in the rice farming activities in Bali. It is an irrigation society which runs the irrigation water management for cultivating the crops on rice field. The philosophy of *subak* is called *tri hita karana* which emphasizes the concept of harmony in the social interaction among the members and sustain harmonious relationship with the God and environment. During the green revolution implemented, *subak* changed its patterns on the cultural farming due to the government recommended to apply new agricultural technologies, such as the uses of chemical fertilizers, pesticides and intensive cropping intensity. This has negative impacts on the soil, water, air, biodiversity, and others.

The awareness of government and other stakeholder regarding the sustainability of development, the paradigm of agricultural development has been changed to be sustainable agricultural development. *Subak* returns to the previous agricultural patterns which are based on the *tri hita karana* or back to nature. For this sustainable agricultural development, *subak* should be strengthened and adjusted to the new technology, not to change it.

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