FROM MICRO TO GLOBAL LEVELS: LESSON FROM PHILOSOPHY OF SUBAK

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ABSTRACT

Presently, agricultural sector has still played a significant role in the economic development within developing countries, including Indonesia. It has undergone a transformation to agribusiness system consisting of commercial and modern agriculture. In Bali, the growth of economic development as a result of tourism growth has given rise to several problems in subak. The objectives of this study are to describe the subak system pertaining to its roles to the economic development, and to describe transfer of local wisdom of subak to global system for achieving the sustainable development goals.

At the micro scale, subak as a system should be regarded as a model to support economic growth within rural and urban areas. It might not be only seen as an organization having irrigation and rice farming activities but should be understood its multi-functions. Rice farming activities has contributed to provide rice production at the rural, district and provincial levels which is very important to the food security program achievement.

Tri hita karana which is a local philosophy of subak has universal values, which can be transferred at the national and global levels. As a local wisdom, the values of tri hita karana are in common with the principles of sustainable development which pay attention to economic, socio-cultural, and environmental aspects. Therefore, subak as one of the social capitals can also be an important and valuable lesson to be developed and adapted to various regions, including in other countries. The government of Indonesia should consider Tri hita karana as a platform in discussing various global issues, such as climate change management and poverty.

Keywords: Subak, tri hita karana, rice farming, global issues

1. Introduction

Agricultural sector has still played a significant role in the economic development within developing countries, including Indonesia (Salako et al, 2015). Some of the roles of the agricultural sector in Indonesia and in other developing countries are providing food for residents in rural and urban areas, providing raw materials for industry; consume industrial products, provide employment opportunities, protect the environment, and provide additional state income from exports (Sedana and Astawa, 2019; Gollin et al, 2002; Khorami et al, 2013). In Indonesia, for example, the agricultural sector is one of the strategic sectors in the national economy, which can be seen from the large contribution to the Gross Domestic Product (GDP). The agricultural sector contributed 12.98% to gross domestic product (GDP) during the second quarter of 2022 (Central Bureau of Statistics, 2022). In addition, it is also seen that the majority of Indonesia's population works in the agricultural sector, such as food crops, horticulture, plantations, animal husbandry, fisheries and forestry.

Presently, the agricultural sector has undergone a transformation towards agribusiness system through the application of commercial and modern agriculture. The introduction and application of agricultural cultivation innovations and technologies including equipment encourages increased productivity and quality of

agricultural products. The agricultural sector also has strong links with the industrial sector, namely the upstream industry which provides agricultural inputs, and the downstream industry which provides increased added value of agricultural products, through the processing and marketing of products. The relationship between agriculture and industry needs to be realized in a strong and synergistic manner.

The management of agriculture in Bali, especially food crops cultivated in paddy fields is entirely carried out through the subak system. The area and members of the subaks in Bali are very varied, from those that are narrow to those that are relatively wide. Currently, the number of subaks and the total area of each subak in each regency in Bali Province is a unit of ha (see table 1).

Table 1 Number of subaks and areas within each regency, Bali Province

No	Regency	Number of subak (unit)	Area (ha)
1	Buleleng	295	8,695
2	Jemberana	73	7,223
3	Badung	118	9,198
4	Bangli	108	2,219
5	Gianyar	511	11,941
6	Tabanan	231	19,888
7	Karangasem	160	6,674
8	Klungkung	42	3,642
9	Denpasar	35	2,157
	Total	71,907	1,573

Source: Data of Satelite Landsat, 2020

As an international tourist destination, the growth of economic development in the province of Bali has given rise to several problems in subak, such as competition for water use and land conversion (rice fields). Competition in water use has been felt by subak because irrigation water sources are also dug by other sectors for household and industrial water needs. The availability of water for irrigation is becoming scarce, so that cropping intensity decreases. Consequently, rice production is getting lower and is a threat to the government's food security program. Land conversion is also difficult to control because of the high demand for land for housing, physical and industrial infrastructure in line with economic development. This condition should be overcome to support the Sustainable Development Goals (SDGs) at every level. *Subak*s in Bali as a micro level has several roles for supporting economic development, not only in terms of rice production but also in rural development and other economic activities and social-cultural things. It assumes that the activities of farmers within *subak* system within the village might have roles in achieving the SDGs in a bigger level, including global level. The objectives of this study are to describe the subak system pertaining to its roles to the economic development, and to describe transfer of local wisdom of subak to global system for achieving the sustainable development goals.

2. Subak as Model for Rural Development: From a Local to the Global

2.1. *Subak* system

Based on the research, *subak* is not only seen as an organization but must be seen as a system. This means that the *subak* system includes several subsystems, namely: (i) physical subsystem (rice fields and irrigation networks); (ii) irrigation subsystem; (iii) agricultural subsystem; (iv) social subsystem; and (v) cultural subsystems (see Figure 1). The five subsystems are interrelated in the rice farming system on the rice field. Sedana et al (2014) states that *subak* is a traditional

irrigation system in Bali that has been managed by water user associations (farmers) since more than a thousand years ago. *Subak* has several specific characteristics related to irrigation management, agriculture, and socio-cultural aspects. Even though the *subak* area is physically within the territory of a village and the farmers come from that village, the administrative management is different from one another because *subak* is an autonomous organization.

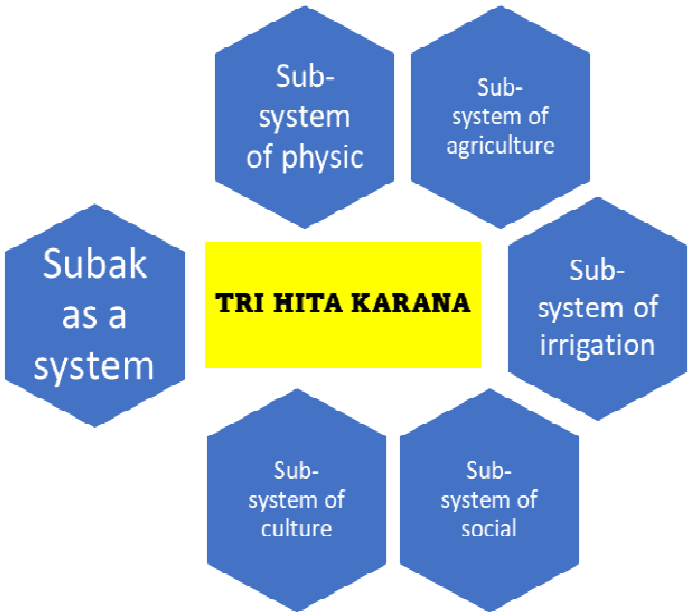

Figure 1 Sub-system within *subak* system
Source: Sedana, 2022

Subak has a specificity in carrying out its activities which are based on the philosophy of tri hita karana which means the three causes of happiness. The three elements are parhyangan which is interpreted as a harmonious relationship between farmers and God; pawongan which means there is a harmonious relationship between farmers and other farmers and outsiders; and palemahan, namely the harmonious relationship between farmers and their environment (Anggana et al, 2022; Sukerada, 2013; Roth and Sedana, 2015). This philosophy is closed to the concept of sustainable development consisting of social and cultural, economic, and environmental components as shown in the Figure 2.

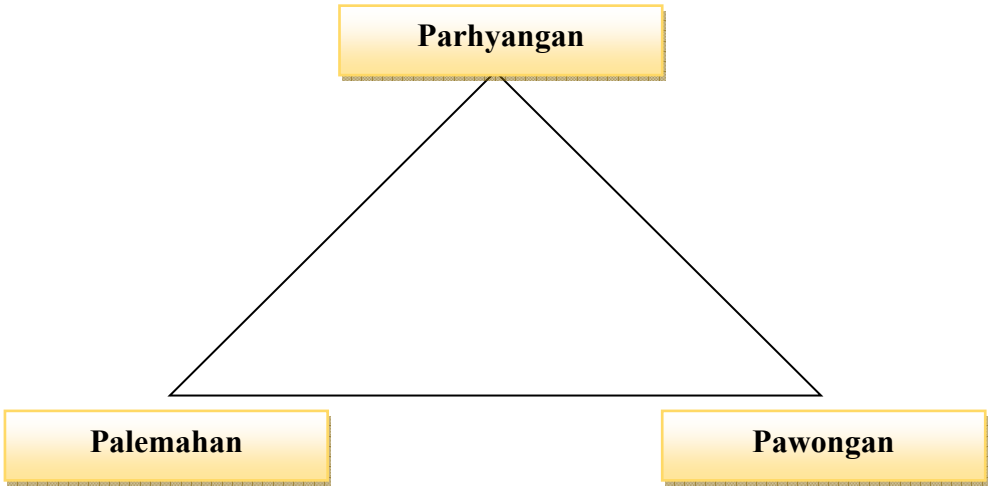

Figure 2 Components of *tri hita karana*
Source: Sedana, 2022.

Implementation of the *tri hita karana* values at the *subak* level is strongly related to the economic achievement through the rice farming activities without neglecting the socio-cultural aspect and its environment. This is indicated by the award provided by the UNESCO in which subak has been acknowledged as a world cultural heritage since 2012. *Subak* as one of the social capitals in Bali contributes some lessons about how to develop economic growth on the basis of socio-cultural component.

Subak has internal rules and regulations that must be obeyed by members. In terms of cultural aspects, *subak* is very closely related to socio-cultural activities in the life of the Balinese Hindu community. The main affiliation factors for *subak* members are irrigation water and temples. In general, *subak* has five functions, namely: (i) distribute and allocate irrigation water evenly to its members, (ii) carry out operation and maintenance of irrigation systems, (iii) create fundraising; (iv) manage conflicts between members, and (v) perform ritual activities. Ritual activities are carried out based on the stages of rice farming starting from taking water, preparing land, seeding, transferring to harvesting. This activity is a spirit for farming activities and irrigation in the fields.

The *subak* organization structure is very simple and based on the needs. *Subak* is chaired by a chairman, locally called *pekaseh* who is democratically elected by all members. *Pekaseh* is assisted by a secretary and treasurer for administrative matters. In larger *subak*, a sub-subak head should be elected to coordinate activities in each sub-*subak*.

2.2 From Micro to Global: Lessons from Subak

Commonly, the Sustainable Development Goals (SDGs) constitutes the blueprint for the nations in the world to achieve a better life of people, good health and well-being, quality education, gender equity, and more sustainable development for the future. Some of these goals are globally no poverty, zero hunger, clean water and sanitation, create job opportunities for youth, responsible consumption and production, life on land, and partnership, etc.. In Indonesia, the Sustainable Development Goals are the 2030 Agenda which is a sustainable development agreement based on human rights and equality. SDGs have universal, integrative, and inclusive principles, to ensure that no one is left behind or is called no one left behind. Sustainable development could be seen as development that meets the people needs of the present and there is no compromise of the ability of future

generations to fulfill their needs. Implementation of any activity toward the achievement of sustainable development could be started from the small scale or micro level to global level.

In term of micro scale, developing *subak* as a system should be regarded as a model to support economic growth within rural and urban areas. *Subak* might not be only seen as an organization who run irrigation and rice farming activities but should be understood its multi-functions. The functions of *subak* as a system are: (i) providing production; (ii) making income for farmers and family; (iii) supporting rural development; (iv) integrating to the agro-industries; (v) supporting agro-tourism; and (vi) maintain environment. Among the functions should be interrelated to achieve the sustainable development of *subak* system, particularly the members of *subak* (see Figure 3).

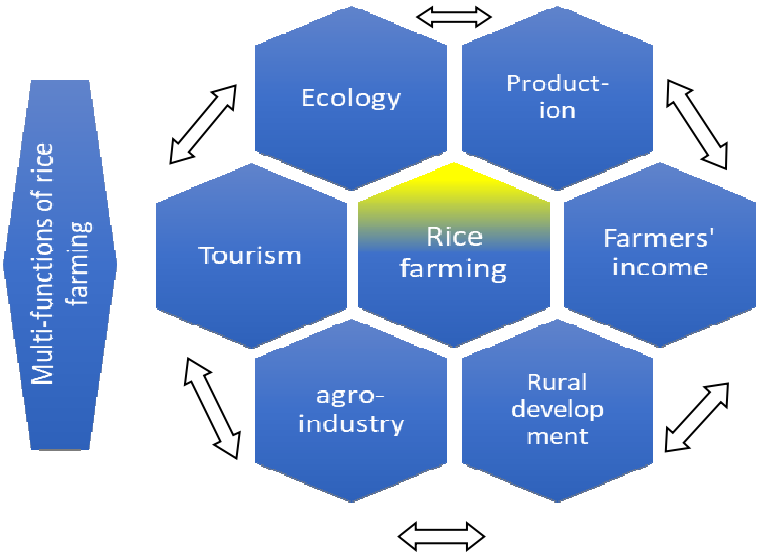

Figure 3 Multi-functions of subak
Source: Sedana, 2022.

Considering functions of *subak* as indicated in the Figure 2, it could be seen that rice farming activities under the *subak* system might bring significant influences in terms of the social, cultural, economic, and environmental aspect. Rice farming activities has contributed to provide rice production at the rural, district and provincial levels. This is very required by the state and government for achieving the food security program. Government should provide the agricultural inputs for the production phase and strengthen the capacities of farmers in the relation to the agricultural technologies, such as nursery, fertilizing, integrated management for pest and diseases and other things. The good agricultural practices at the farmer level could bring about the increased productivity and quality. Thus, the prices of rice produced by farmers could be higher and increase the farmers income. The traditional irrigation system implemented by *subak* has highly contributed to have proper cropping patterns, planting schedule and water borrowing system among the members for ensuring production process on the rice field. This system could be transferred to the other places with some modification dependent on the social and cultural aspects of the people.

In practical things, management of rice farming at the subak level is expected to increase farmers' income, reduce poverty and no hunger, etc. in the rural area as part of SDGs. The activities which might be done are (i) create more stable

incomes gained from the rice field; (ii) strengthen and empower women to have access to quality education for children; (iii) increase investment to generate economic growth and reduced inequality; (iv) support farmers in the agricultural technology application for making better productivity and quality; (v) strengthen subak to be able to adapt to climate change and to preserve life on land; and (vi) establish proper partnerships locally and globally to achieve sustainable cooperation and business.

Concerning the multi-functions of subak as cited above, the alternative efforts done by the *subak*, government, and other stakeholders should be integrated and synergized among the efoorts (see Figure 4).

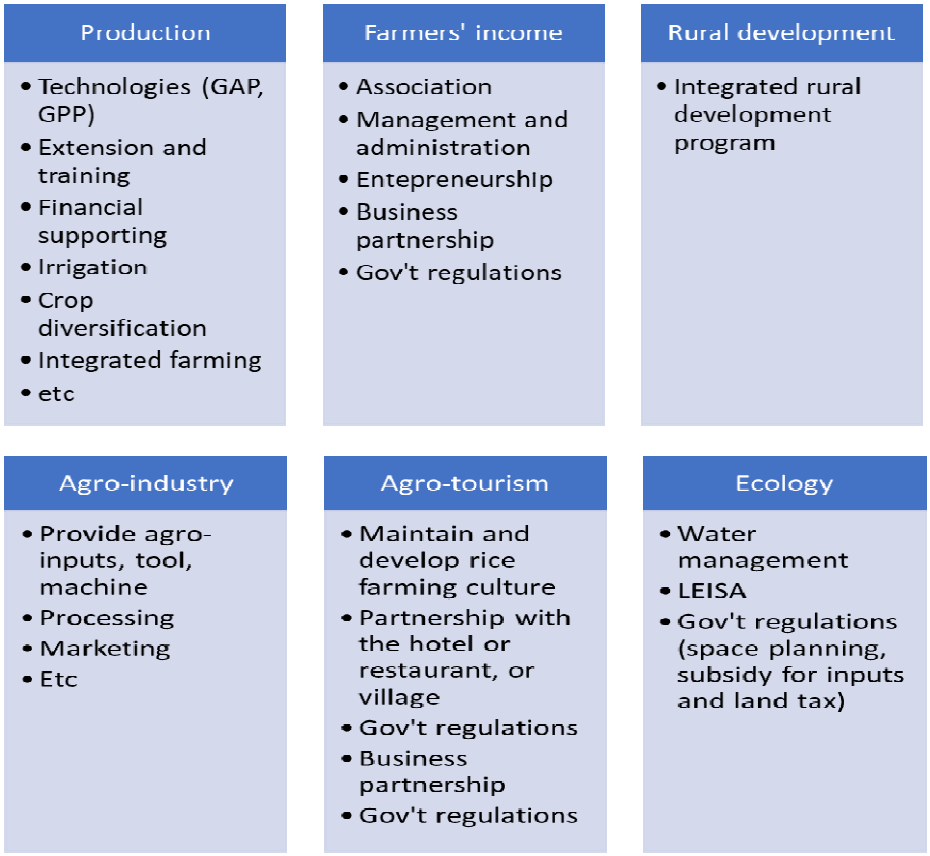

Figure 4 Alternative efforts to develop subak: from the micro to global
Source: Sedana, 2022.

Integrated efforts could be described that the increased productivity and quality require supports from technologies, policies at the village, regency, provincial and national levels, industries, and tourism development. These efforts contribute to increase farmers' income and purchasing power. This means that the economic growth in the village to the national level could be accelerated.

Tri hita karana is a local philosophy that is applied to *subak* which has universal values, so that the application that has been carried out so far can be transferred at the national and global levels. As a local wisdom, the values of tri hita karana are in common with the principles of sustainable development which pay attention to economic, socio-cultural, and environmental aspects (pitana, 2010). Therefore, its application in the subak system can be an important and valuable lesson to be developed and adapted to various regions, including in other countries. Tri Hita

Karana might become Indonesia's platform in discussing various global issues, such as climate change management and poverty.

Closing Remarks

Subak has philosophy of *tri hita karana* consisting of three elements, namely *parhyangan*; *pawongan*; and *palemahan*. This philosophy is closed to the concept of sustainable development consisting of social and cultural, economic, and environmental components. At the micro level, *subak* as a system could be regarded as a model to support economic growth due to its multi-functions, relating to production; income of farmers and family; rural development; agro-industries; agro-tourism; and environment.. Rice farming activities has contributed to provide rice production at the rural, district and provincial levels which is very important to the food security program achievement.

Tri hita karana which is a local philosophy of *subak* has universal values, which can be transferred at the national and global levels. As a local wisdom, the values of *tri hita karana* are closed related to the principles of sustainable development comprising economic, socio-cultural, and environmental aspects. S*ubak* as one of the social capitals can also be an important and valuable lesson to be developed and adapted to various regions, including in other countries. Therefore, *tri hita karana* should be a platform taken by the government to discuss various global issues.

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