

# Close Linkage Between Agriculture and Culture: Case of Bali Indonesia

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## Abstract

Humans are part of natural ecosystems and are greatly dependent on the functioning of natural ecosystems. The Balinese people in meeting their needs depend on the effort to manage the natural environment through agricultural activities. The interaction between the people of Bali with the environment gave birth to the knowledge that eventually shapes the culture of Bali. Balinese culture is derived from agricultural culture. Traditional Balinese people have knowledge of agriculture inherited by their ancestors such as agricultural technology systems, community organizations, and religious ceremonies. Technology systems that exist in traditional farming systems such as irrigation systems, planting pattern arrangements, provision of seeds, control of pests and diseases, including post-harvest handling. This knowledge is generated based on the results of intensive interaction with the nature of Bali. A lot of local knowledge which is known as the "local wisdom" generated through this interaction and is part of Balinese culture. Local knowledge is growing and developing in general inspired by various Hindu religious values. Organization that works to support, preserve and develop local knowledge in the field of agriculture, especially related to the agricultural fields called "Subak" (traditional, social religious irrigation organization). The philosophy underlying the *subak* organization is "Tri Hita Karana" is the welfare generated by a harmonious relationship between man, nature and God. This philosophy was adopted into the culture of Bali and is applied in various aspects of life. Thus, agriculture is associated with many aspects of life, or in other words, agriculture has a close linkage with Balinese culture. This paper describes the multifunctional of agriculture in particular its close linkage with Balinese culture.

**Keywords:** agriculture, Balinese culture, ecosystem

## 1. Introduction

The existence, progress and human welfare is strongly determined by the way how humans interact with the surrounding natural environment. Human interaction with the surrounding natural environment to maintain their existence and improve the quality of life requires people to develop knowledge and technology systems. Systems of knowledge and technology developed for the first time is a system of agricultural knowledge and technology that gave birth to the culture of agriculture. Greek philosopher and historian, Xenophon (427-355 BC; in Sinjal, 2006) states that "Agriculture is the mother and protect all other cultures". When farming went well, other cultures around would be prosperous, when it was abandoned, then all the other cultures would be destroyed".

In conception, the Balinese Hindu philosophy has laid a very noble about how humans should interact and manage natural and its contents as stated in the stanza 135 of Sarasamuscaya. "Seek the welfare of beings therefore it is not any mercy to all creatures, because their existence assured the upholding of "caturwarga" the *dharma*, *artha*, *kama* and *moksha* (Kajeng, 2005). It means that the Balinese should consider the existence and welfare of other living things when you want to achieve physical and spiritual welfare. Human is part of the "biotic" that inhabit this universe and all living things on earth depends on the nature and the environment around it.

As described also in the theory of eco-centrism, humans are not only seen as a social creature, but first must be understood as being the biological and ecological beings. Humans can only live and grow as a human being and full, the creature whose life depends on and is closely related to all other life in the universe. Without nature, no other living creatures, humans will survive, because man is only one entity in the universe. So humans are in nature and are bound and depend on the nature and all its contents (Keraf, 2002).

Therefore, to preserve living creatures, natural surroundings must be preserved. Nature, people and culture of Bali is a unity of inter-related and dependent on each other. Defective nature will not be able to provide welfare for humans and other living things. Therefore nature must be maintained in order to function optimally in a sustainable manner to support the entire life of living beings including humans and their culture.

Farming systems developed by farmers in traditional Balinese farming system is based on observation and experience of many years of community and the surrounding natural environment. They develop knowledge and technology cultivation, livestock, etc. to preserve plants and animals. When viewed from the facts of history, it is evident that the traditional farming systems are developed based on local culture for centuries and it demonstrates its ability to support life and the welfare of farmers from generation to generation. It is undeniable that Bali culture is developed as an actualization of the teachings of Hinduism. A very important role in the creation of the dominant culture of Bali over the livelihood of the population was carried out by farmers.

Organization developed by farmers, namely *Subak* is an organization that provides a lot of contribution to the development of the Balinese culture as a whole. *Subak*, through the concept of *Tri Hita Karana* laid the foundations of Balinese culture is passed down up to the present time. Conception of man's relationship with another man in social life with a variety of democratic principles, culverts cooperation, justice, tolerance, mutual trust, dedication, sacrifice, self-development and so on. Conception of human relationship with nature that contains the various principles of how natural resources such as land, water, plants, animals should be managed in order to provide optimum benefit in a sustainable manner. Conception of man's relationship with God gives the basic principles of how humans should realize the Hindu Balinese sense of gratitude and thanks to the Creator of the Universe and its contents on the life and the life that He has given (Wiana, 2007). It is no exaggeration, when agriculture of Bali could be called "The mother culture of Bali", which gave birth to, raised, maintained and protected the culture of Bali. If we agree that agriculture is the mother culture of Bali, it is appropriate all the components of the community must come together to preserve and protect agriculture and the peasant of Bali to sustain the stable of Balinese culture.

Field plots made by the farmers, serve as natural ponds or small dams to hold the rain water before the water flows into water bodies such as rivers, lakes. The function of this field is very important because it can reduce the peak flood discharge at the downstream of a watershed. Rice terraces with embankment serves to hold the water in the plot, so that soil erosion can be significantly reduced. Erosion of soil from a paddy field is lower than 2 tones / ha / year, and is roughly as low as the erosion of primary forest.

The beauty of the countryside with panoramic expanse of fertile agricultural land with a variety of activities on it, such as the activity of plowing, planting, hoeing, harvesting, various religious activities related to the fields was the inspiration for the paintings and objects of world famous painters who work in Bali. In addition, agricultural land environment is also a habitat for many species of birds, insects, small animals and microorganisms as they provide abundant food for life and their multification, as well as a beautiful tourist attraction that can be enjoyed by tourists.

Balinese Hindu community ancestors bequeathed various local wisdoms, such as the conceptions of an appreciation of plants and animals. Every 210 days (6 months in Balinese calendar) Hindu community conduct an offering specifically intended to plants, the day falls on Saturday (*Saniscara wuku Wariga*) and the day is well-known as "*Tumpek Uduh* or *Tumpek Bubuh*." At *Tumpek Uduh* or *Tumpek Bubuh*, the Balinese Hindu communities make upakara (offerings) with one of its components is "marrow porridge" (porridge of glutinous rice is given a natural green color of the *Kayu Sugih* leaves, sprinkled with grated coconut and given brown sugar (palm sugar). *Tumpek Uduh* not a day to worship the plant, but the day to ask God (*Ida Sang Hyang Widhi Wasa*) that via the plant, humans could be given the prosperity and safety and kept away from disasters.

## 2. Significance of Agriculture for Community Life

Agriculture is not merely the production activities as part of economic activity, but more than that, agriculture has multiple functions or multifunctional. Understanding of multifunctional agriculture is very important at all levels of society, so that there is overwhelming agreement on the role and functions of agriculture in its broadest sense, then determine a reasonable attitude and behavior towards agriculture and farmers.

Agriculture serves to support all forms of life, not just as providers of food, clothing and shelter for the needs of human life, but also plays an important role in the conservation of natural resources, supporting the economy in crisis; maintain social values and culture of rural as well as a support system of harmonious life all the time. In summary, agriculture serves to 1) maintain an environment such as: preventing flooding, controlling soil erosion, maintain soil water supply, absorb carbon, or serves as an air freshener, absorbing organic waste, maintaining biodiversity, 2) preserve the traditions, culture and social life of rural, 3) provider of employment, 4) The basis for food security and national stability, and 5) the basis for economic growth (contributing approximately 18% Bali gross regional domestic product (GRDP) in 2010 (Salikin, 2003; Reijntjes *et al.*, 1999; Wibowo, 2000; Badan Pusat Statistik Bali, 2011). Unfortunately, up to the present day multifunctional of agriculture has not been addressed or are still not fully understood by most people, or if they understood but it is often neglected.

The possibility of this fact is due to the existing market system has not taken into account the costs and benefits provided by farming on the environment and preservation of cultural values of Bali. Policies also tend to focus on activities that have short-term economic benefits and have not been touched multifunctional agriculture. Marginalization of agriculture and farmers until recently, are partly due to a lack of understanding of the multifunctional of agriculture (Suprpta, 2005).

People not only use plants, but use different types of animals ranging from ruminants such as cows, buffaloes, goats, chickens birds, ducks and the like, various kinds of fish in both freshwater and at sea to meet the demand for animal protein. Animal protein is needed by humans for growth and development in order to live healthily. Creations and innovations to take advantage of animals for the sake of human life bring about the culture of husbandry and fisheries. Plants are very useful for many kinds of animals, on the contrary animals are

very useful, not only for humans but also for plants. For example, in the process of pollination to produce fruit or seeds, different types of plants greatly have the process on insect activity that frequently visits the flowers. Various types of small animals in the soil and micro-organism in the soil are very useful to decompose organic material and release various types of soil nutrients as nutrients for plants. Some animals such as cattle and buffalo are also used for land preparation, although today the use of cattle for land preparation has been gradually replaced by tractors. There are at least 85 animals from four legged animals such as cattle, goats, buffalo, pigs, dogs, birds, freshwater fish in the river and in the rice fields, fish; forest animals and various types of insect or animal species inventoried as offering component for the community Hindu Bali (Institute for Community Service of Udayana University, 2007).

Thus the importance of animals to humans, so the Balinese Hindu society held a special ceremony for the animals on day 210 days that comes on Saturday of *Uye* (*Saniscara Uye*), known as the day *Tumpek Kandang*. On the day of *Tumpek Kandang*, various types of offering done to invoke the safety of various types of animals that can grow faster, healthier and bring prosperity to the people.

Balinese Hindu religious life cannot be separated from the agricultural and farming activities. Prostrate devotion and gratitude of Balinese Hindu society in general are carried out through various forms of religious ceremony, in which each religious ceremony is made in a means of "*Banten*" or offering. If you see the elements of offerings, it briefly comprises of the universe elements that is the product of agricultural activity. There are elements of the plants (roots, stems, leaves, fruits, flowers, seeds); there are elements of the animal (in the form of live animals, meat, eggs). According to a study conducted by the Institute for Public Service at Udayana University since 2001, at least as many as 280 plant species inventoried that are used as a means of offerings. The most common components of fruits and should be there is a banana (*Musa paradisiaca*). To the needs of at least 130,000 tons of bananas per year is needed for the purposes of making offerings in Bali. In addition to banana, rice (*Oryza sativa*) and coconut (*Cocos nucifera*) are another compulsory agricultural products for preparation of offering in Balinese Hindu's life (Fig.1). So farms and farmers' play important role for the life of the Balinese people, including maintaining nature and culture of Bali.



Figure 1. Three main agricultural products that are compulsory to maintain Balinese culture  
A. Rice (*Oryza sativa*), B. Coconut (*Cocos nucifera*), C. Banana (*Musa paradisiaca*)

### 3. Bali Agricultural Condition

Bali has an area of approximately 5,636 km<sup>2</sup>, inhabited by about 4.2 million people (BPS Bali, 2016). Total agricultural land in Bali is 353,802 ha, consisting of 80,063 ha paddy field and 273,739 dry land. The total number of farmers' in 2015 is 520,775 or approximately 22.40% of the total workforce in Bali in 2015 (BPS Bali, 2016). The number of farmers is continually decreased year by year as presented in Table 1. In a period of 2010 to 2015, the number of farmers in Bali decreased by 22.52%. This data indicated that the attractiveness of agricultural sector is undergoing decrease. In line with the decrease of the number of farmers, the contribution of agricultural sector to the Bali gross regional domestic product (GRDP) is also undergoing decreased as presented in Table 2. Contribution of agricultural sector to the Bali GRDP in 2010 was 17.17%, and sharply decreased to 14.82% in 2015.

On the other hand, number of Balinese people who are working in services sector i.e. trading, hotel and restaurant tend to increase year by year as presented in Table 2. Accordingly, the contribution of trading, hotel and restaurant sector to the Bali GRDP is undergoing increase. This phenomena suggested that Balinese people are prefer to choose services sector as their job. This phenomenon is normal, because people are tend to work with less physical burden with more income. However, if this condition is continually happened, Bali's agriculture would be threaten and in turn would threaten Balinese culture as well.

Several factors are thought to be related to the decrease of the contribution of agricultural sector to the GRDP of Bali year by year. Among others, some are described here.

Table 1. Number of farmers and working forces engage in trade, hotel and restaurant in Bali in a period of 2009 to 2015

Employment	2010	2011	2012	2013	2014	2015
Farmers	672,200	565,500	573,300	547,750	528,570	520,770
Work in trading, hotel and restaurant	571,270	577,060	620,080	616,610	658,310	768,080

Source : Badan Pusat Statistik Bali (2016)

Table 2. Shares of agricultural sector, and hotel and restaurant to the Bali gross regional domestic product (GRDP) in a period of 2010 to 2015

Economic sectors	2010	2011	2012	2013	2014	2015
Agriculture	17.17%	16.23%	15.70%	15.22%	14.65%	14.82%
Trading, hotel and restaurant	27.82%	28.25%	28.83%	29.86%	31.37%	31.20%

Source : Badan Pusat Statistik Bali (2016)

Average agricultural land area cultivated by the farmer of Bali is very narrow, only 0.38 ha per farmer. With such a narrow area, it is very difficult to increase farmers' income and welfare when only relies on traditional farming systems. The narrowness of the average ownership of land, the disruption of plant pests and diseases and natural disaster (drought or flood), low education, low mastery and access to technology, low capacity of the capital and access to capital, low agricultural prices and tends to fluctuate quite sharply and the lack of access and market information led to the welfare of farmers' incomes and relatively continuous decline. This condition is exacerbated by the increasing prices of inputs in the form of seeds, fertilizers and pesticides along with the rising cost of living led to the exchange of agricultural products are declining and the ability of the farmers declining from year to year. In the period of the 1960s to the 1980s, many farmers are able to send their children to school from the farm. Many Bachelors, Doctors, and even the Professor were the son of farmers, living and attending school of agricultural products produced by their parents. This is very rare condition found in the present. Let alone to send their children to college, to meet the day-to-day life (clothing, housing and health) of most farmers are still difficulties and most of them are still classified as poor people.

Image of agriculture and farmers continue to experience deterioration. Farmers are identical with the figure of an old man, poor, shabby, and resigned to fate. When the government abolished subsidies on fertilizers and pesticides, which trigger an increase the retail price of fertilizer, while the selling price of agricultural products is stagnant. Work as a farmer by most people is considered to be the kind of work with the lowest social status. For example, there is a saying among the people of Bali are "*tani kelen*" is a phrase that are mocking someone who is perceived as less advanced, or the simple old-fashioned. Using the word "peasant" for the expression to mock can certainly be interpreted as an insult, not a profession of respect for farmers. This profile is certainly very far from the plume, so most young people do not want to inherit their parents work. Parents direct their daughters and sons not to work in the agricultural sector.

Conditions as mentioned above are a very serious threat to the survival of agriculture in Bali. As long as farmers and their family are not prosperous and have not been able to get out of poverty, for the length of the time agricultural development can be said to have not been successful so there needs to be continuous real effort to revitalize agriculture of Bali.

#### 4. How to Promote Agriculture

In the history of human civilization, there is no nation in the world can be large and sustained without the support of agriculture. Until now, the advanced industrial countries such as Japan, South Korea, the United States and European countries still preserve the agriculture.

If we agree that agriculture is very important for the Balinese people, nature and culture of Bali, the farm should be built in order to move forward. Many argue that Indonesian agriculture has not developed, compared with neighboring countries in Southeast Asia. Yes, this is indeed a reality, and thus we must give priority to work on a planned manner, and truly massive. To develop agriculture cannot be simply imposed on the department of agriculture with the farmers, but must be supported by all sectors of development such as infrastructure, transportation, education, energy, industry, banking, commerce, law, research, and the preferential option for the agricultural community and farmers. Agriculture has not developed, as other sectors directly related to the agricultural development have not been optimally developed. The sectors have not been able to synergize with the agricultural sector, even becomes a burden on the agricultural sector.

Every effort should be made to build and raise farm. Revitalization of agriculture should be conducted in a planned, in earnest and to encourage large-scale infrastructure development, human resource development, capital investment that focused on agriculture, from cultivation to industry and marketing. We need more attention on developing farm roads, irrigation networks, ports that support the marketing, storage facilities and so on. We need to build advanced seed production system, to produce superior seeds independently. Local initiatives to produce fertilizers and pesticides based on local raw materials need to be continually nurtured and

encouraged. Agricultural research should be intensified to produce agricultural science and technology to be competitive and in accordance with the requirements and conditions of Bali. Agricultural extension needs to be intensified so that farmers have a companion in solving agricultural problems directly at the field level. Regulation in the field of industry, commerce and finance should protect and stimulate the agricultural sector. Incentive scheme in the provision of agricultural investment with low interest rates is needed to encourage investment in agriculture, since agricultural development will not succeed if the investment in agriculture is less enthusiastic.

### 5. Early education on Agriculture

When the author was in high school (around 1974) there were school programs that cater to gardening or farming activities which are called creed days. To support these activities, the school developed the school garden. Through the school garden pupils were taught to be familiar with plants and crops, and taught how to give raise to, how to plant, how to nurture it, harvest it and how to cultivate it until it can be consumed. The pupils experience themselves, how to process and severity of farming and gardening to produce food stuff. How sweat running must pass to produce food. Through the school garden the pupils know about the season, when to plant what, to farming success. Unfortunately, the activities of the school garden and the creed day have long no longer been held. Not infrequently children are not familiar with the environment, are less familiar to plant species, and ultimately less appreciate its benefits. Even the pupils not understand how the agricultural products were produced from the sweat running farmer. It's good that school gardens and agriculture education program to be revived to an understanding of the crop, livestock and farming methods and, more importantly understand and appreciate the multifunctional of agriculture to maintain the continuity of life since an early age. "Home Stay" program in the farmer family to provide direct experience to the students early and provide opportunities for them to feel how hard and at once noble to be farmer as applied to farming in the country of Japan, seems to be necessarily adopted in Bali. Knowledge and understanding of the true will result in a correct and proper attitude towards agriculture and farmers in the end we expect to behave in a correct, proper and fair to agriculture and farmers.

### 6. Conclusion

Throughout human life, they depend on plants and animals, during which people depend on agriculture and farmers. Agriculture should be seen as a sector that has a multifunctional, not only economic function that produces food, clothing and shelter but also has the function of ecological and social functions of cultural and social politics. Hence, agriculture must be constructed so that Bali is more advanced and can provide a decent life for farmers as the main actor. Early education to children of multifunctional agriculture for the preservation of all life in nature and in preserving Balinese culture needs to be done in a structured, so that they have the right knowledge about agriculture for the next act and behave in a fair on agriculture and farmers.

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