

THE RESISTANCE OF SUBAK AS A TRADITIONAL IRRIGATION SYSTEM DUE TO THE REGIONAL DEVELOPMENT IN BALI, INDONESIA

Putu Sudira

Fac. Agric. Technology, Gadjah Mada University,
Yogyakarta, 55281, Indonesia.

Phone: 62-274-881458

Fax: 62-274-563542

Email: putusudira@tp.ugm.ac.id

ABSTRACT

Subak is the custom law society having the socio-agricultural religion characteristics, consists of the farmers that cultivate their paddy field by themselves and obtain irrigation water from one or more sources of water.

The study was conducted for 3 (three) years at 3 (three) different condition of subaks. Those are (1) subak Sungsang, located at Kerambitan village, Tabanan regency representing subak which has been affected by intervention of the government, in terms of the rehabilitation of the irrigation structures using permanent one, (ii) subak Juwuk Manis, located at Ubud village, Gianyar regency representing highly affected by tourism and economic development, and (iii) subak Timbul Baru located at Tegallang village, Gianyar regency representing less intervention by government and economic development.

The method used in this study was using questionnaire sheets to collect primary data from the farmers, head of subaks, government officials as well as using depth research where the researchers were living in the study area for more than one month to find out more reliable data. Aside from primary data, the secondary data as the historical one was gathered from the subak institutions and from the government offices.

Results indicated that (i) the intervention of government to the subak was highly accepted by the farmers as long as the new technology introduced by the government were in accordance with the principle of the subak system, (ii) tourism and economic development as part of regional development has both positive and negative impacts, (iii) the strong concept of subak to maintain itself was based on its philosophy – *Tri Hita Karana*.

Key words: subak, traditional irrigation, regional development, tri hita karana

INTRODUCTION

Subak is the area of paddy field obtained irrigation water from one source of water (Pitana, 1993). The more complete definition of *subak* is given by the government of Bali as stated that *subak* is the custom law community having the socio-agricultural religious behavior, consists of the farmers that cultivate their paddy field by themselves and obtain irrigation water from one source of water. The two definitions above, however, do not illustrate the real situation in the field, because there is a possibility of *subak* to find water from more than one source of water. Sutawan, et.al. (1988) indicated *subak* as the organization of the farmers where the paddy field obtains water from the collective source of water belongs to their group having one or more *Pura Bedugul* (temple to pray *Dewi Sri* as the symbol of the *Fertile God*), and it has a large autonomy to manage itself as the organization and also it has the freedom to get in touch with other bodies or institutions.

In the middle of the 19th century, the Indonesian government during the Dutch colonial era had established the big and small infrastructures of irrigation network in Java (Hutapea, 1993). These infrastructures were built to serve the water requirements of private companies, particularly for sugar cane manufacturing. The irrigation network was built by changing the existing traditional irrigation system of paddy field, which has been available and managed by the farmers for centuries. At that time accordingly, the government divided the operational responsibility of the irrigation network where the government is responsible for the operation and maintenance of the main system and the farmers of the tertiary and field levels. Hence, nowadays there are two kinds of the irrigation system in Indonesia, firstly, government-farmer irrigation managed system, and secondly, fully farmers irrigation managed system. *Subak* is the irrigation system categorized following the second criteria as the traditional or communal irrigation system, although the Bali government has already improved some of the main systems and involved in the operation and maintenance of the main system of several *subaks*, such as at Sungsang *subak*.

Subak is a complex traditional irrigation organization in Bali which has been available for more than thousand years. *Subak* as the socio-religio-cultural organization takes an important role in conducting the operation and maintenance of the irrigation network as well as in attaining the prosperity of the members. Aside from that, the role of *subak* is to help the government in conducting agricultural development, particularly the specific program for increasing rice production.

Objectives of the study :

- To find out the effects of irrigation development to the organization of *subak*
- To find out the positive and negative impacts of the economic development to the *subak* system

METHODOLOGY

The study was conducted at three *subaks* in Bali, namely; (a) Sungsang, (b) Juwuk Manis, and (c) Timbul Baru. The selection of these *subaks* is based on different criteria that affects the subak conditions. The first factor which affects the *subak* is that, the most intervention from other institutions on subak, particularly the intervention from the Government, which is represented by Sungsang, the second factor that affects the *subak* is the influences of tourism aspects on the activities of the subak members, which is represented by Juwuk Manis, and the last one is original subak, that is less intervention from other institutions which is represented by Timbul Baru. The data gathered including the primary and the secondary data. The primary data was gathered from (i) the farmers as the members of *subak*, (ii) the leader of *subak*, (iii) one that is still alive who involved in the construction of water tunnel previously, and (iv) the leader of the village levels. The data was gathered using two methods, those are (1) interviewing method using list of questionnaire sheets, and (2) in-depth research where the enumerators gathered data by staying at the study area for long time (one month) in order to have unbiased data. The secondary data was gathered from the office of subak leader, office of agriculture and irrigation in the district sector. The types of data gathered including social, cultural, and technological aspects of the *subak* system.

RESULTS AND DISCUSSION

The Philosophy of *Subak* Organization

There are several principles the Balinese followed in organizing and running *subak* as social system and an irrigation system. These principles are closely related to their conception of life in this world, as well as to their believe system about the supernatural world. However,

all those principles are based on the main philosophy that is known as “*Tri Hita Karana*” which means “ three causes of happiness”, which consists of three elements : *parhyangan* (supernatural realm), *pawongan* (social realm) and *palemahan* (environmental realm).

Parhyangan is the realm of relations between man and his Creator, *pawongan* is the realm of human or social relations, relations between man and his fellows, while *palemahan* is the realm of relations between man and his natural environment, especially the *sawah* (paddy field). According to the Balinese, the relations within the *Tri Hita Karana* should always be kept balanced and harmonics.

Using the philosophy of *Tri Hita Karana*, means the harmonic relationship among Man-Nature-God, *subak* system is operated for leading to welfare and prosperity of people. This triad principle originally based on the Hindu religion has been used in *subak* system. Using the principles of gravity and water is the gift from the God; *subak* system is a unique system, which bring the farmer communities to the harmony between mankind and nature for nearly 1000 years.

From the standpoint of the triad principle, the meaning of *Tri Hita Karana* is regarded as a hierarchy of three levels of component. In the first level, component of *parhyangan* basically is the cultural values. Component of *pawongan* and *palemahan* is social and technology, respectively. In the second level, component of *parhyangan* becomes rule-in-use and *pawongan* and *palemahan* become organization and rice field, respectively. In the same logic, in the third level *parhyangan* is software and *pawongan* and *palemahan* are organoware and technoware (Sahid, 1999).

Even though the philosophy of *Tri Hita Karana* used in the *subak* system can make harmonic of the community for thousand years, however, regional economic development conducted by the government in the form of irrigation rehabilitation and economic development including tourism development significantly influence the system in both positive and negative impacts.

Subak Organization as The Self Organized System

This is the irony, there are more people considering about the hydrologic, technical, agricultural and economic aspect of the irrigation system instead of taking into account the relation between the farmers and irrigation water. Particularly on the official report of the irrigation project, the people rarely writing the report for the group of the farmers who manage the irrigation network, process of allocating water for the group of the farmers or for individuals, and distribution of water among the farmers within their group.

There are some factors that cause the absence of reporting people participation on the irrigation project activities (Chambers, 1988); first, all people tend to concentrate their attention on the process of capital gains, construction, and area division, so that neglect the exploitation of the system, second, narrow view of the scientists whether for social scientist or engineer not to discuss the integrated of some discipline fields in one scope of the system; third, researchers have to conduct a research to understand what is happening on the lower stage of the administration that is difficult to generalize some of the small cases; and fourth, the behavior of water is really specific, that is the characteristics of flowing, seepage, evaporating and other physical behavior of water spend the time of the physical scientists and engineers to concentrate their research on it, and forget to consider the wider aspects of the irrigation system, such as the people or the farmers who will operate and manage the irrigation network.

According to Albernity (1996), the goal of the irrigation organization is to develop those water resources that are allocated for irrigation and to use them in supporting of agricultural production. For the *subak* organization the objectives will be broader than those mentioned above because *subak* organization also involves the socio-cultural aspects of the farmers. As stated by Ostrom (1992) that users and suppliers of irrigation systems must craft a variety of institutional arrangements to cope with the physical, economic, social, and cultural features of each system.

Some features of *subak* organization as self organized system for the development of irrigated agriculture can be summarized as the following :

First, clearly define both the boundaries of the service area and the individuals or households with rights to use water. At the *subaks* studied the service area and the individuals boundaries are clearly defined. This area is used to determine the amount of water, even the distance from the source of water will be considered to determine the amount of water that can be delivered to the field. Farmers domiciled at the head-end of the system is not allowed to take so much water that may cause the flow of water at the tail-end may be unpredictable and inadequate for agricultural use. *Subak* also considers the soil properties as the basis of water allocation to the field.

Second, most individuals affected by the operational rules are included in the group that can modify these rules. *Subak* has clear and transparent objectives. It is noticed in the daily and in the subak regulation (*awig-awig*). The operational rules of subak (*awig-awig*) are created by the farmers themselves. The content of *awig-awig* whether written or unwritten are parts of their agreement to be followed. They can modify their rules over time to better fit them to the specific characteristic development.

Third, the farmers who violate operational rules are likely to receive graduated sanctions from the organization, from officials accountable to these farmers, or both. The kind of sanctions for the farmers who violate the rules are already written in the *awig-awig* or be recognized and accepted in the unwritten *awig-awig* by the farmers.

The kinds of sanctions depend on the seriousness and context of the offence. The tasks and rights of the members are clearly defined in the *awig-awig*. The tasks of the members consist of three items, such those (i) physical tasks : to build, maintain and repair the irrigation structure, (ii) socio-economic tasks; to obey the *awig-awig*, conduct the agreement of the meeting, pay the routine payment, carry out the official message from the government which has to be agreed during the meeting, and (iii) religious tasks; all members of *subak* should follow the ritual ceremonies conducted by *subak*. Meanwhile the rights of the members are (i) to get the fairness and equity of water (ii) to choose and to be chosen as the leader of subak, (iii) if they can not attend the mutual aid or help together, they have the right to be represented by other people. The violation done by the members usually can be solved by paying some fine to the organization.

Fourth, the rights of users to devise their own institutions are not challenged by external governmental authorities. Theoretically *subak* as the community customary law or traditional law has the regulation (*awig – awig*) that has to be obeyed by the members. Sometimes unwritten *awig-awig* (called, *perarem*) is easier to understand by the members because it is very simple and concluded during the meeting. As the customary law, the government recognizes it is *de facto* organization but not as *de jure* one. Consequently, leader of subak can not legally open a bank account in the name of organization. In relation to this, it is important to consider the possibility to enhance the existence of subak as *de jure* organization in order to function well.

Subak Organization As The Social Capital Open System

Although subak organization is known has a great autonomy, it does not mean that there is no intervention to subak from other institutions. *Subak* is used by the government as an institution to spread out the government programs, especially the program for agricultural development, such as special intensification for paddy field, rural cooperative unit and others.

In accordance with the policy of the government to increase food production, for the last few decades Bali government has introduced the new prime seed of rice having short growing period. This new technology changes the cropping pattern from rice dry crops become rice-rice-dry crop per year. The government also assists *subak* in repairing the irrigation structures such as improving the dam made from wood material changed with stone concrete material, diversion structure made from coconut wood was changed using special wood, and others. These changes are accepted by *subak* as long as they do not change the existing

irrigation system. These improvements meant to increase the efficiency of the system by reducing leakage happened at the dams and the channels. As indicated at the *subak* studied that more than 30% of losing the water due to the leakage of the channels.

The changing of cropping pattern becomes rice-rice-dry crop seems to be similar to the general cropping pattern occurs for technical irrigation system. The new technology is easily adapted by *subak* as the open system because *subak* has a flexible operational rule that may be changed anytime to suit with the agricultural development.

More than 90% of respondents at *subak* samples indicated that there is no reason to reject the new technology as long as the technology is important to improve their agricultural production.

The advantages of flexible operational rules of *subak* is that *subak* does not manage the operation of the irrigation only, but also manage the method of planting the crops as well as the socio-cultural aspects of the members. For instance, planting rice crop during the rainy season is conducted all together for the whole area, meanwhile during the dry season when the water is limited the planting season is scheduled using the rotation method. The effects of determining the adapted new technology, planting season should be recognized by all members during the *subak* meeting where the meeting is usually carried out before starting the planting period. However the intervention by the government at some *subaks* particularly in constructing of new diversion structures are not suitable for the farmers. The farmers of the *Subak* Sungsang destroyed the diversion structure built by the Bali Irrigation Project because according to the farmers the allocation of water using that structure is not fair. Aside from the unfairness of the allocation water arise, the farmers also recognize that some increasing of agricultural production due to the new irrigation structures is not suitable with the amount of money, manpower, and the time needed to operate the new system. Consequently, the farmers destroyed the new diversion structures and return it to the original one made by the farmers themselves.

In facing the globalization era, in which Indonesia should be opened to the entering of agricultural production from abroad, *subak* as the farmers organization should increase their manpower ability to overcome the problems that may arise. However the farmers of *subak* have some constrains in facing the globalization era such as small size of the area owned by the farmers, limited access to find credit from the bank, and low bargaining system of the agricultural product (Sutawan, 1998). They will not have the capability to overcome the free market during the era of globalization when they do their activities individually. They have to do their works collectively in order to increase their bargaining power. *Subak* is expected to enhance its role not only for increasing agricultural production but also increasing manpower professionalism toward agricultural business oriented. The government law (UU. No. 12/1992) about the cropping culture system, gave the freedom to the farmers to plant their crops whatever they want to. This is the chance for the farmers collectively cultivate their land commercially and tend to the agricultural business oriented. Some farmers of *Sungsang subak* have carried out the UU No. 12/1992 that the crops they plant based on the commercial price of the crop in the market. It can be said that *subak* is responsive to the present and future needs of the farmers. Therefore, it has the flexibility necessary to address chance, particularly to fulfill the basic need of human being.

The Influences of Regional Development to Subak Organization

The influence of regional development to *subak* organization will be based on philosophy of *subak* and the characteristics of *subak* organization at different conditions of *subak* system.

Positive effects

- As the social opened system, all *subak* studied accept new concept of technology introduced to the farmers.

- Farmers relatively open to any changes of new social values, particularly the effort to increase their income.
- Development of irrigation system to the subak organization increase the performance and the efficiency of the operation and maintenance of the subak system.
- Economic development, particularly on tourism development has the great effects on the increasing of the farmer's income.

Negative effects

- Regional development tend to increase the income of the people. As it known that the income of Balinese mostly is coming from tourism activities, so it is clear to be seen that reducing the command area of subak Juwuk Manis from year to year is caused by transferring the function of land from agricultural sector to tourism sector. Subak Juwuk Manis is located at Ubud district where the tourism activities extremely develop in this place.
- Even land area of subak is decreasing, but the spirit of subak organization illustrated by *Tri Hita Karana* is still running well.

CONCLUSION

Although subak organization is known has a great autonomy, it does not mean that there is no intervention from other institutions. *Subak* is used by the government as an institution to spread out the government programs, especially the program for agricultural development such as social intensification for paddy field, rural cooperative unit, and others. As long as the intervention given by other institutions contribute the benefits to the farmers, subak as an open system will easily adapt the new technology.

As the socio-relegio-cultural organization, the status of *subak* should be improved in terms of its law status. It is the very important thing, to have more transaction activities with other institutions. Without having officially law status, it is difficult to carry out the economic transaction such as finding credits from the bank, open the account number at the bank and became the sub contractor for the repairing of *subak* irrigation network.

Subak as the self-organized system and social capital open system give the opportunity for the development of irrigated agriculture

The negative impacts of regional development to subak is that, clearly define reducing effective land area of *subak* to become other uses like hotel, art shop, etc. However, job opportunity on the other hand will also increase.

Even though, decreasing the land area of subak system due to the regional development, but it does not decrease the spirit of the organization to maintain its principles *Tri Hita Karana*.

REFERENCES

- Albernity C.L 1996. The institutional framework for irrigation. Proceeding of IIMI workshop in Chiang Mai, Thailand 1- 5 Nov 1993
- Chambers R 1988. Konsep-konsep dasar dalam organisasi irigasi. Irigasi : Kelembagaan dan Ekonomi, Yayasan Obor Indonesia
- Hutapea SR 1993, Petani dan Irigasi : Perubahan dan dampak terhadap kerjasama petani. Denpasar 14-18 Februari 1993.
- Mubyarto and Daniel W.Bromley, 2002. A Development alternative for Indonesia, Gadjah Mada University Press, Yogyakarta Indonesia.

- Ostrom E 1992. Crafting institutions for self-governing irrigation systems. Institute for Contemporary Studies San Frasco, USA.
- Pitana 1993. Subak, sistem irigasi di Bali. Upada Sastra, Denpasar.
- Sahid Susanto 1999. Culturally based water resources management for sustainable irrigated agriculture p.11-26 in Sahid S (Ed). A study of the subak as an indigenous cultural, social, and technological system to establish a culturally based integrated water resources management Faculty of Agric. Technology, Gadjah Mada University, Yogyakarta.
- Sudira Putu 1993, Peranserta petani dalam pembangunan irigasi dan masalahnya di Indonesia Aditya Madya, Yogyakarta.
- Sudira Putu 1999. The Merit of traditional irrigated technology for sustainability of subak system p 61-72 in Sahid S (Ed). A study of the subak as an indigenous cultural, social, and technological system to establish a culturally based integrated water resources management Faculty of Agric. Technology, Gadjah Mada University, Yogyakarta.
- Sutawan N 1998. Peranan subak di era reformasi. *Dinamika petani*, journal vol 32 (4-6)
- Windia W 1993. Intervensi pemerintah terhadap subak sistem irigasi tradisional di Bali. Upada Sastra, Denpasar