

# The Implementation Study of Irrigation System Policy Based on Local Wisdom at Buleleng, Bali, Indonesia

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**Abstract** Irrigation systems based on local wisdom “*Subak*” as socio-religious agrarian has been degraded and *Subak* irrigation system performance is important to the concern of government policy to implement the principles of good governance, to encourage the potential and the involvement of *Subak* institutional, to improve agricultural output and welfare of the farming community. Through qualitative methods resulted the research findings that the implementation of irrigation system can be divided into three categories, namely the first, concerning with the policy strategy to construct the *Subak* regulations (well-known as: *awig-awig*), to strengthen the *awig-awig* and to evaluate the system). The Second, consistency in the implementation of *subak* regulation. The Third, there are the constraints faced in the irrigation system that are low educational level of farmer, government role and land conversion. Based on the findings of this research, could proposed the following recommendations: 1) intensive guidance to institutional of *Subak*, 2) strengthening cooperation between the *Subak*, government and private sector by applying the principles of governance which refers to the *Tri Hita Karana* and 3) the establishment of regulations on land use change.

**Keywords** Policy Implementation, Water control system (*Subak*), Local wisdom

## 1. Introduction

The policy become a reference and guidance in an effort to make improvements and to find solutions to a number of social issues. But, the product of public policy, could not reach the root of the problems that desired by the community. Policy reforms on agriculture in Indonesia has been done through a variety of important policies either directly or indirectly dealing with agriculture, in which this policy supports the assumption that the main back up of development sector and the Indonesian economy is agricultural products. However, fortune did not always favor the farming community, and the results of reforms in all fields have not been able to prosper and provide the best service for the community as a citizen's. The construction of agricultural policy mentioned “dominate as a form of production and merchant capital continued to ‘drink the blood of the peasant [1].

Similarly in Bali, hotel development and airport expansion, the increase in plastic waste, waste and air pollution; salination of underground water; agricultural water withdrawal to be sold to the hotel and golf course; conversion of productive land often through pressure and intimidation become tourism facilities; and government

involvement in facilitating projects”. In RPJPD of Bali Province the year of 2005-2025 recognized some of the problems faced by Bali farmers, namely: The average land area cultivated by farmers is very narrow that is under 0.38 ha, effect on the low income of farmers households, the decline in agricultural land reaching 28 ha/years. Most of farmers education level is elementary school result in low agricultural technology mastery, further increase in the scarcity of water for irrigation, even in almost all regency in Bali [2].

However, these conditions, did not make the agricultural sector slumped drastically in Bali, this is caused by the carrying capacity of the institutional system of irrigation, known as *Subak*. *Subak* as an irrigation tool which looks very simple, is one of the most advanced water user farmer organizations in the world. The main purpose of *Subak* is to distribute the water to the rice fields and maintain the temples [3]. Existence of *Subak* as local wisdom needs to be regulated by government regulation which is one product of public policy (No. 9 year 2012).

*Subak* framework contains the values embodied in the concept of local wisdom. “the local wisdom subscribed by the Balinese, that life must be in balance with the environment, and that happiness can only be pursuit if the life is balance, a concept locally known as “*Tri Hita Karana*” [4]. According to Willem Wolters “The *Subak* not only manages water flows, but also functions as a religious organization, performing rituals at the *Subak* water temple.” a religious institutional” [5]. Various concepts and cultural

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values of *Subak* implementation that can be implemented properly is important to achieve the welfare of farmers. Processes related to cultural strategy are covering (building a team); (choosing how to communicate); (eliciting participation); (resolving conflict); and (evaluating performance). These strategies are precisely used in conducting the study on the implementation of government policy on *Subak* which has a consistency in the cultural dimension [6].

## 2. Materials and Methods

This study used a qualitative method, using analysis of interactive models [7]. Location of the study on the irrigation system policy implemented by the *Subak* Lawas and *Subak* Pebantenan at Sukasada sub district Buleleng Regency. The subject matter that are the focus of research is the implementation of Irrigation System which covers: (a) implementation strategy; and (b) *Awig-awig* as an instrument of implementation; and c) the constraints faced in the implementation of the policy.

## 3. Results and Discussion

### 3.1. *Subak* Irrigation Policy Implementation Strategy

The first strategy, developed by *Subak* is arranging the distribution of water through *Subak Gede* (The combined of *subak*) *Panca Merta* and arrange *awig-awig* (*subak* regulations) which is based on Tri Hita Karana, namely (1) “*parhyangan*” ie harmony of human relationship with God concerned with offerings and sacred places, (2) “*pawongan*” is the harmony of man's relationship with humans in this case relating to membership of *Subak*, and (3) “*palemahan*”, namely human harmony with the natural environment, that is the area of irrigation systems and wetlands which become cultivated.

*Subak Gede* divide the area of water distribution into 3 parts, the first division is called *Ngulu* (the first), given to *Subak Lawas Bayan* and *Subak Anyar Lapang*. The second division is *Mawogin* (the mid) beginning on January 1st to April 30th that received an allocation is *Subak Pebantenan dayang* which could serve as control the behavior of farmers through the process of spiritual and religious of *Subak Cengana*, while in the latter division is called *Ngesep* (the last) obtained by *Subak Anyar Ambengan* and *Subak Lawas Ambengan* from May 1st to October 1st. This division consistently performed every year throughout the growing season of paddy, and if it does not have a turn will be given *pungkatan* water (additional water) every Sunday by the *Subak* which received a turn of water. The next process is continued to the *subak* respectively, that is *Subak Lawas* and *Subak Pebantenan* forming units smaller organization called *tempekan*.

The process of arrangements and distribution of this water, free from the influence of state intervention, in which the farming community began with search for a source of water,

create a channel and overseeing and also maintain irrigation canals, shape of the building is largely semi-technical. In contrast to the results of research conducted that in view of the administrative rule the *Subak* is still hidden behind the formalities and arrangements created by state in the development and management of irrigation [8].

As a second strategy is to strengthen the function of *awig-awig*, based on experience and a long journey the community to conduct arrangements and restrictions on the behavior of individuals within the limits of decency and norms that can be received by individuals and other groups. As a form of culture and knowledge possessed and protected, always developed so that local communities have a strong bargaining position against the state, then the values contained in the knowledge was standardized and formulated in the form of regulations in order to manage resources, in order to obtain the benefits of a fair and mutually beneficial, require the involvement of the owners of these local knowledge, it can support the research [9].

Through the method of access and benefit sharing (ABS) the community conducting 1) establish identification of values and applicable authority, 2) an inventory of local knowledge and 3) establish appropriate arrangements and procedures. Arrangement in the form of *awig-awig* cannot be run automatically, and continued in the absence of efforts that led to the enforcement and strengthening *awig-awig*. In terms of strengthening *awig-awig* conducted several steps. The first, taking a formal process that is approval from local officials, intended to gain legitimacy and strengthening the law not only can be applied to members, but should also be known and understood by the general public, which is in direct contact and have an interest in the existence of the *Subak*. The second, strengthening is synchronization rules of *Subak* with other *Subak*, and with *Subak Gede*, thus in the application of the rules there is a similarity implementation for the *Subaks* in contact, or which will carry out cooperation in a larger scale. The third step is the application of *awig-awig*, evaluation of the implementation and adjustments, which can be carried out through the medium of the regular meeting, called *sangkepan*. If there were violations committed by members, as well as other parties, discrepancies in the rules with the development of the existing problems were evaluated every 35 days, which could carry out the implementation of sanctions and revisions in order to steer the form of rules that are not rigid and can be adapted to the development of the existing problems, and aims to produce better policies in the future.

The third strategy, carry out an evaluation meeting regularly, the implementation of *Paruman* or *Sangkepan* regularly every 35 days, on the two *Subaks* provide benefits among other. There is a process of decision making directly and democracy, through a process of public learning, and efforts to increase the sense of ownership and high responsibility of the members, setting the local level involvement in sustainable water management [10]. Also in which the water users, work effectively through democracy in water management, by using the power of actors on the

grassroots [11]. The involvement of all members in the decision-making process for the implementation and monitoring *awig-awig* as the main instrument of *Subak* policy can be understood as a public empowerment in order to build the capacity of members "capacity building" which can support the activities of *Subak* and management of agricultural systems which they handle.

As a fourth strategy is to develop organizational and business. The era of open management system of natural resources, on the agricultural sector and particularly water management, not only can be directed towards efficient and effective agricultural water management, but also leads to local community activities in the form of food resilience, maintaining the quality of the environment and livelihoods [12]. In this case *Subak* not only conduct activities that has to do with the distribution of water, but it extends to the sources or the broader life opportunities, in order to maintain the quality of the environment and the lives of farmers. There are various groups, either formed directly by *Subak* such as *tempekan* (the smallest part of *Subak*), livestock group, KWT (*kelompok wanita tani*/group of women farmers), *Simantri* (*sistem pertanian terintegrasi*/integrated farming system), *Gapoktan* (*gabungan kelompok tani*/the combined group of farmers) and Farmers Cooperative, or a group formed by the association members themselves, such as *suka-duka* (social groups), *skaamanyi* (harvest group), *skaamula* (planting group), *skaasanthi* (the choir group) is an attempt to be able to accelerate the achievement of business growth and the welfare of farmers in all fields.

These groups bring dimension of "economic and social" which enables farm households generate "income" which sufficient to support an increase in farm household income [13] and be able to explore the potential and provide adequate access to family farmers, in the economic field and social community services. Various economic activities can be carried out by these organizations, such as savings and loans, livestock management, composting, and other inputs consumptive needs, which is very helpful farm families needs. This is calling as "complimentary inputs", such as irrigation, fertilization, pest "insecticides", credit and other agricultural development [14]. Then it also can called as "capital equipment". In the field of social community services is no less important, in the administration of mutual assistance personnel, which can be a labor and materials for the needs of religious ceremonies, always runs continuously in the form of a group called *skaasuka-duka* [15].

### 3.2. *Awig-awig* as an Instrument of Policy Implementation of Irrigation Systems

The existence of *Subak* which is politically has broad autonomy in regulating the pattern of life and territorial needs to be maintained and preserved, which can encourage people's lives in harmony within the dimensions of space, time and a sense of devotion to the Creator of the universe. The implementation of *awig-awig* (*Subak* regulations) for those who violate always be associated with a spiritual approach and sanctions to the reduction of water use rights.

Dimensions which can be displayed and secured in *awig-awig* are (1) names and regional boundaries, (2) the intention and purpose of the establishment of the *Subak* organization and also the goals and objectives established *Subak* policy through deliberative decision-making mechanisms and bottom up model; (3) concerning with the governance of membership include decision making, recruitment and dismissal of members, appointment / designation and responsibilities of management, the delivery of information and communication patterns, *Subak* assets and facilities that must be accountable and treated by members; (4) implementation of religious activities, regarding with the responsibility of a number of temples, the implementation of the ceremony at the existing temple, and other implementation of religious activities including the ceremony which was held privately in the home of each member, which requires the involvement of all elements of *Subak*.

As the most important thing arranged in *awig-awig* are the issue of the governance of *Subak*, the governance of working area and relations between the regions rice fields nearby, the distribution and water management, cultivation and planting rules, pest and disease control efforts and the rules related to animal husbandry in the area of rice fields, which essentially does not damage the plant, or interfere with any other environment in the area of agricultural land. Various problems weather will arise and or already occurred also become applied materials in *awig-awig*, the handling to the various violations of the rules, through the application of sanctions and the process of problems handling are clearly in *awig-awig*. Dimensions of motivation and form of encouragement for holding it, always defined and recognized in *awig-awig*, this have an impact on increasing motivation and function of *awig-awig* foster goodwill with on farmers and can avoid a fine [16]. Aspects to be conveyed and applied in this *awig-awig* are (1) there is an existence of guarantee of certainty about the pattern of distribution of rights and obligations for each member involved; (2) there is an existence of guidelines for action and conduct activities in *Subak* or the pattern of everyday life in terms of farm management, which always refers to the common interest and based on belief and trust in the Lord Almighty; (3) as a measure of progress requirements for cooperation and partnerships with outside parties or to access the various programs developed by the government. And (4) Build adherence rate to all members and officials, even other parties which believe that the process that occurred and conducted by *Subak* is always linked with the belief in God the Almighty, for example for settlements that using former rice field always perform ceremony activities as a form ask for permission conversion of paddy land become housing which conducted in *Pura Subak*.

*Subak* rules both written and unwritten which still applied, is a rationalization from various hereditary rules which getting adjustments during the running period. In this case referred to as "powerful institutional rules" is a manifestation of the myth or belief which has always tried to be

rationalized in the life of the group, mainly involved in agricultural land wet [17]. On the other hand in order to achieve successful implementation of policies there are several factors which affect, among others: (1) factors related to the problem being addressed, (2) “non-statutory variables” non-legal factors or rules; this case sometimes more advanced in practice implemented by *Subak* and members of *Subak*; (3) the ability of understanding on the implementation structure. In this terms of the third factor, the comprehension of *awig-awig* is very important for administrators, and continuously socialization efforts through the application of rules, intensive communication patterns through the media of *sangkepan* and administrators involvement in various activities of members [18].

### 3.3. The Constraints in the Implementation of Policy

The first constraint faced by *Subak* and its members is: level of education and age of farmers which is not support the viability of farmers. Mindset farmers are difficult to develop and adapt on each program developed by the government, government assistance in the form of infrastructure to support the advancement of *Subak* cannot be managed independently, such as rice milling machines assistance for 300 million rupiah to *Panca Winangun* combined group of farmers, handed over to the private sector *UD Sari Nadi* which is in fact is not a member of *Subak*. Thus the purpose of government assistance to support the acceleration of progress and achievement of the welfare of farmers, enjoyed by private parties, and cannot contribute significantly to advancement of farmers who are members of *subak* organization. Similarly in the development of Farmers Cooperative, based on the findings there are a number of issues that led to Farmer cooperative, both *Panca Winangun* Farmer Cooperative and *Sejahtera Tani* Farmer Cooperative, not develop properly in this case due to several factors as follows:

- 1) The weakness of administrator resource capability, either in terms of financial management or management of members, limited time of administrators (part-time job).
- 2) From the side of membership conducted through a system of representation and contributions paid through the budget of *Subak* and the Business Profits earned is obtained by *Subak* not farmers as members of cooperatives, thereby a sense of belonging and a desire to learn cooperatives from *Subak* members is low;
- 3) The low ability of cooperatives in serving the members, can be seen from the budget provided, administrators resource who serve, service time (open only Monday and Thursday), even *Sejahtera Tani* Farmer Cooperative, only opened at the time distribute subsidized fertilizer;
- 4) Knowledge and awareness of members about the cooperatives are still low;
- 5) Many providers of financial services which

compete with farmer cooperatives.

Therefore policies that have been developed to support the policy of irrigation systems through the development of financial services, ineffective and potentially lead to new problems, such as bad debt handling, which can add the workload of *Subak* administrators, on the other hand the existence of farmer cooperatives have not been written in *awig-awig Subak* at the both areas of research. From the above description can be formulated that government policy in *Subak* strengthening through the formation of farmer cooperatives have not reached the goal effectively.

As the second issue, is eroded and the declining role of government as a result of the elimination of the function of *Sedahan Agung* (government institutions which deal with various issues of *subak* at the regency level) based on local regulation No.2/PD/DPRD/1972, about Bali Irrigation System. The authority of this *Sedahan Agung*, also related with the budget proposal, whether are used for the benefit of *Sedahan Agung* duties, or the interests of the existing of *subak* in its territory, thereby the role of *Sedahan Agung* for the benefit of *Subak* is very important, and complete and also one gate. While the reality of *Subak* management right now handled separately, from agencies which exist in the regency.

The last issue, is conversion of land at the *Subak Lawas* and *Subak Pebantenan* at Sukasada Subdistrict, each year increased, primarily into residential or land plots, causing the *Subak* membership become reduced which can result in, the budget collection capabilities and personnel that can be empowered to manage the needs of the *Subak* and irrigation system. Shared responsibility in managing, territory and water resources through joint liability (collective share), become heavy when the number of farmers who are active in carrying out the obligations of mutual assistance or contribute to the budget become less. Thus the implementation of irrigation policy have problems, in achieving goals effectively, In this case can be seen that is public policy encountered many obstacles caused by public policies implemented in the region which relatively unlimited (public) [19]. When viewed from this *Subak* case the policy applies only to limited area, it means was unable to reach when dealing with the public area or outside the area boundary of *subak*, such as the case with land plot, house boundaries, water users which are not members of *subak*, bound members for cultivated land, but when the cultivated land has been lost what could be done by *Subak*, the debts of the former members of *subak* from the land which switched function is not paid, due to the difficulty of implementing *Subak* sanctions.

## 4. Conclusions

*Subak* irrigation system policy implementation, based on the *Tri Hita Karana*, three causes of welfare which is a local wisdom possessed by the people of Bali, namely the harmony of human relationship with his God called

*prahyangan*; second, the harmony of human relationship with another human being called *pawongan* and the harmony of human relationship with their environment called *palemahan*. These three concepts form the basis of policy strategy formulation of *Subak* irrigation. As for the strategy developed in the irrigation system are 1) forming *Subak Gede Panca Merta* and construct the *awig-awig*; 2) strengthen the *awig-awig*; (3) perform regular evaluation meeting; and 4) perform organizational development and micro economy business. Policy instruments in the form *awig-awig* (*Subak* regulations) which is based on the results of a joint decision, through a process of deliberation directed to protect all the works conducted by the *Subak* and its members, which covers 1) recognition and preservation of the value structure; 2) The pattern arrangement of water distribution and cropping patterns; 3) forming the orderliness of the members; 4) encouraging the participation of members and 5) prevention and control of the conflict. However in the *Subak* irrigation policy implementation, there are three constraints, ie low ability of the *Subak* members in absorbing the technology due to low levels of education and the knowledge possessed by the members, The second, the loss of *Sedahan Agung* institution (irrigation management committees at the regency level) causing various problems faced by the *Subak* unhandled and as the third constraints is the conversion of agricultural lands every year, effect on the number of members of *Subak* and the ability to manage the *Subak* irrigation system.

Reflections on the results of research on public policy in the future, is the realization of policy based on harmony, that is human harmony on belief and trust, which can foster a sense of fun, peace of mind, confidence, the level of essential compliance regarding with spiritual morality. Supported by the harmony of human relationship with human being, should be understood as a moral movement which is based on the development of social and cultural capital, which has dimension of mutual respect, mutual assistance, cooperation and respect for the dignity of human life, which aimed to achieve the third harmony, that is the human relationship with the natural environment, which is the whole purpose of the policy is aimed on an effort to preserve the environment, which will always be able to demonstrate the benefit for all human life and other creatures.

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