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Irrigation System Implementation Implications of Renewable Subak Land on Rice Field in Bali

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Abstrac

Subak as an organization of traditional irrigation system in Bali, at this time because there is a tendency to be concerned about its sustainability has declined. There are several factors, one of which is decreasing the quantity and quality of irrigation water. At first the farmers of Subak members never questioned the state of irrigation water because its use has not been so complex and the numbers are still plentiful. Along with the resulting development of irrigation water for agricultural purposes the number is increasing slightly. In this regard, the need to restructure Subak irrigation system in irrigate (rice), without having implications for the reduction of rice production per unit area. This study focuses to address the problems outlined in the following three questions. 1) How implications of the application of renewable irrigation system on rice production. 2) How implications renewable irrigation system implementation to environment. 3) How implications of the application on renewable irrigation system in social environment among farmers? From this research can be summarized as follows. First, the application of renewable irrigation system (irrigation system is disconnected / intermittent irrigation) on both of subak in Bali, Subak of Gunung Sari subak on Jatiluwih village and Wangaya Betan Subak on Mengesta village, have significant implications for the increased production of wet rice, nearly twice folding of 4-5 tons a hectare to 7-8 tons a hectare. Also the implementation of this renewable irrigation system (irrigation system is disconnected / intermittent irrigation) are cost of production, if labor and time farmers in the value of money. Second, the adoption of irrigation systems interrupted (intermittent irrigation) both at Wangaya Betan Subak and Gunungsari Subak evidently has implications for improving the

condition of the land, improvements ecosystems fields, and the environment in general Third, the implementation of irrigation systems interrupted (intermittent irrigation) both in Subak Wangaya Betan and in Subak Gunungsari was able to suppress of conflict in competition for water utilization, so that the social environment in the community can be conducive.

Keywords: Watering disconnected, rice production, the environment, social environment.

Implicaciones de la implementación del sistema de riego de las tierras renovables de Subak en el campo de arroz en Bali

Resumen

1. Introduction

Subak as an organization of traditional irrigation system in Bali, at this time because there is a tendency to be concerned about its sustainability has declined. There are several factors that affect, among others, the occurrence of land conversion led to the narrowing rice acreage (Subak), the desire of young people to work in the agricultural sector is very low, the flow of modernization and almost all aspects of society beset technological change is quite high, and the decrease the quantity and quality of irrigation water. If these problems are not addressed the possibility of Bali is not only going to lose one of the unique culture, but also will have broad impact on the environment on the island of Bali (Surata, 1999; Lansing et al., 2001).

Sedana (1999) also expressed similar things, that the quantity and quality of irrigation water is now declining. At first the farmers of Subak members never questioned the state of irrigation water because the numbers are still abundant and their use is not so complex. However, along with the development of both rural and urban areas, the necessities of water is increasing and then there is competition of water use in various sectors, agriculture , farms, tourism, construction, and domestic demand (household). The conditions

resulted in farmers feel the lack of both quantity and quality on irrigation water itself caused by the dumping of industrial waste that can no longer be tolerated. In connection with this, Subak as a traditional organization in Bali, must restructure the irrigation system to irrigate rice field. It must be adjusted again to the state of irrigation water decreasing in number, without having implications for the reduction of rice production per unit area. Thus the traditional irrigation system to water control system needs to be reconstructed and adjusted for the increasingly limited availability of water, by applying a model renewable in irrigation systems, but the optimum production and to avoid conflicts over water among farmers.

Yuliana (2012) has conducted preliminary field observations directly to both of Subak as Wangaya Betan Subak and Gunungsari Subak, which has implemented a renewable irrigation system in farming. Some of the water control system in farming patterns have to strive for the preservation of water resources can be sustainable and maintained properly, by regulating the distribution pattern of irrigation water to rice fields as efficiently as possible. Related to that in the first year of research has found a model for the use of irrigation water resources, towards a more efficient use in paddy fields, especially the rice crop in both of irrigated water control system disconnected (intermittent irrigation). In this context there are still issues of interest to be studied related to the implementation of irrigation interrupted (intermittent irrigation) is, as formulated in several research questions as follows. 1) How the implications of renewable irrigation application on rice production. 2) How the implications of renewable irrigation application in the environment. 3) How the implications of renewable irrigation application at system on the social environment among farmers?

2. Research Methods

The approach used in this study is a qualitative research, with regard to the research, the emphasis is not on measurements but the descriptive analysis is thick (Bungin, 2006). The study was conducted on Gunungsari Subak, on Jatiluwih village and Wangaya Betan Subak, on Mengesta village, in Tabanan district of Bali Province. The chosen of Gunungsari and Wangaya Betan Subak as a research location, is not in spite from the uniqueness that has occurred preservation of water resources. Types of data collected in this study is qualitative data that is backed by quantitative data as supporting data. The data collected in this study were derived from field data and document study. Data was analyzed using a qualitative analysis, through a three-stage process: data reduction, data presentation and conclusion.

3. Results and Discussion

3.1 Implications Implementation of Renewable Water System Against Rice Production

Application of renewable irrigation system (irrigation system is disconnected / intermittent irrigation) in the second Subak in Bali, Subak Gunung Sari village and Subak Jatiluwih Wangaya Mengesta Betan in the village, have significant implications for the increase in rice production. Increased rice production is very important for the implementation of renewable irrigation system (irrigation system is disconnected / intermittent irrigation) in order to remain sustainable. Without an increase in rice production significantly, it is possible that farmers will leave this renewable irrigation system. Increased rice production significantly recognized by farmers in both these Subak. Increased rice production by applying these renewable irrigation system, reflected in the statement of the farmers themselves. From interviews with one of the informants that Mr. Ketut Ketut Riksa (56 years old), one of the farmers in Subak Wangaya Betan, Mengesta, Village of Penebel, Tabanan Bali, as follows.

"... I think the possibility of the farmers to switch back to the old irrigation system was not possible / likely, because of what is offered by renewable irrigation system is more profitable, such as the use of water-saving, energy-saving with, saving time so that the cost of production low, as well as rice production increased almost two-fold. When returning to the old irrigation system it's hard because of the availability of water for rice is also limited due to competition water consumption in all sectors, so that we feel grateful for the existence of this new irrigation system .... "(Interview, May 2015).

Based on interviews with informant above, it is known that if any of irrigation water in rice fields priced with value for money, then there has been a decrease in production costs due to the efficient use of irrigation water. On the other hand there has been a saving for manpower and time, because the flooding is only done 2-3 times only during rice production (depending on the variety planted), so that it can be said that the implementation of the irrigation system is renewable (irrigation system is disconnected / intermittent irrigation) are cost of production, if labor and time farmers on the value of money.

Besides the production cost savings, as already described above, then by applying renewable irrigation system (irrigation system is disconnected / intermittent irrigation) happens also to increase rice production by nearly 50%. Based on interviews with one of the informants that Mr. Nyoman Suarya (58 years old) former pekaseh (leader of subak) of Wangaya Betan subak,on Mengesta Village, Penebel, Tabanan, Bali, stated as follows.

"... If the first wet rice production that we (the farmers) produced during agricultural implement by applying the traditional irrigation system (bathes the plants continuously) is about 4-5 tons. While the current by applying renewable irrigation farming systems, production increases ranging between 7-8 tonnes of grain per hectare wet .... "(Interview, May 2015).

Similar statements relating to it is submitted also by Mr. Ketut Riksa (56 years old), which states that the production of grain wet rose nearly doubled from 4-5 tonnes per hectare to 7-8 tons a hectare, by applying the irrigation systems of renewable.

Based on the description of the informant above, either by Mr. Nyoman Suarya as well as by Mr. Ketut Interrogation grain production wet when implementing agriculture by applying a system of traditional Riksa (bathes the plants continuously) in the second Subak, both of Wangaya Betan and Gunungsari Subak is about 4-5 tons. While the current by applying irrigation renewable (irrigation system is disconnected / intermittent irrigation) system farming, the production increases ranging between 7-8 tons of wet rice per hectare, this depends on the conditions of the land (class of land), uptake of assistive technology applied , as well as the presence of pests and plant diseases. Based on the increase in wet rice production a hectare, which is caused by the application of renewable irrigation system (irrigation system is disconnected / intermittent irrigation), it can be assumed to also have an increase in income for farmers. Application of renewable irrigation systems in both Subak, Wangaya betan and Gunungsari subak implicated to increase farmers' income, not only from increased production a hectare planted, but also occurs financing savings in the production process.

According to Yuliana (in Yuliana, 2015) of lowland rice cultivation using irrigation techniques are interrupted (intermittent irrigation), with unity without reducing the productivity of the land area, indicating that the rice plants are not water plants, but the growth is require. Rice plants is that the growth of land plants require water, but not rice plants grown in a stagnant state, such as conventional rice cultivation techniques (traditional). Furthermore Yuliana (in Yuliana, 2015) also states that grow rice in waterlogged soils (intermittent irrigation), allowing the soil to provide more oxygen than in a stagnant state. Increasing the availability of oxygen in the soil, allowing the plant to absorb oxygen more optimal in respirasinya process. Besides allegedly caused respiratory process run by the absorption of water, the rice plants are planted in a state that is not flooded, causing the roots can grow better, bigger and more powerful, so the implication sequel is a plant can absorb nutrients as much as possible (well).

Rice plants are not water plants, but it requires water, therefore the provision of

water in rice plants through irrigation systems should be done at the right time, ie when the rice plants need water in large amounts (the flowering period until the ripe grain milk). The provision of water at the wrong time result in less favorable to rice plants because because the events of respiration (breathing) plant will be disrupted. On the other hand the presence of water is left stagnant in paddy plot becomes less useful and wasted, either through seepage, infiltration, evaporation, especially can not be utilized by other farmers who need water at the same time. While water resources in this decade increasingly scarce due to deforestisasi arbitrary, global climate warming, the use of water which drain the water of the river from its source, the increasing use of boreholes to drain and lowering the level of ground water as well as the competition to those on the water good for tourism , farms, and others, all play an important role in both the conservation of water resources, as well as the availability of itself, so that the water is getting expensive. Water use, must be done economically and efficiently as possible, including in rice cultivation. Therefore, all parties should be able to use water properly, which means that water must be used in a timely manner, the appropriate quantity and quality right (Yuliana, 2015).

In order to produce a solid rod, it is necessary that the roots can grow freely to support the growth of the stem above the ground. For those reasons, the roots in the growth also requires soil conditions, oxygen, water, temperature, nutrients and growing space optimally. Roots also require fotosintat results produced by the leaves (and stalks also if the stem has a chlorophyll) and distributed by the stem to the roots, so in this case the roots and stems dependent (occurring symbiotic mutualism). If the condition of plant growth under optimum state, there is a positive relationship between the number of stems per plant, number of stems that produce (panicle), and the number of grains per plant, so production with irrigation systems intermittent This increase means that concerns land productivity per unit area will decrease not occurs (Results Interview with Extension BPTP Bali Province, May 2015).

Puddling on the system of paddy cultivation is the result of unintentional from the cultivation of land in the state flooded. In the paddy soil, siltation is an important way of processing the soil and the ground processing system specific to rice cultivation. Because of the absence of air, then the reduction process occurs immediately ground into mud. Some of the advantages obtained as a result of siltation is relatively easier weed prevention, increase water holding capacity, and improve solubility bases (Sanchez, 1976). However, in addition to some advantages there are also some disadvantages including lowering the rate of percolation, lower redox potential values and damage the soil structure

so that crop production would be down (De Datta, 1981). From the statement of De Datta (1981) can be understood when the conventional irrigation continue to be maintained in paddy rice cultivation, the production plant will be lower when compared with the application of irrigation interrupted (intermittent irrigation).
Furthermore, based on interviews with a field extension of BPTP Bali Province is expressed as follows.

"... The growth of rice plants grown with intermittent irrigation systems, at the beginning of growth seems small, thin, so the plants look a bit in the field (rare), for a month or more after transplantation (weeding plants). After the first month and a second month, the plants begin to grow the stem, so that by the third month of rice fields seem to "explode" with a very rapid stem growth coupled with the growth of plants also "explode". In order to understand this, it is necessary to know phyllochrons concept, a concept that was applied to the grass family, including grain crops such as rice, wheat and barley. Phyllochrons not an object, but the period of time between the emergence of the Phytomer (a set of stems, leaves, and roots that emerge from the base of the plant) and subsequent germination. Phyllochrons size, is determined primarily by the temperature, and is influenced by other factors such as day length, humidity, soil quality, in contact with water, light, and nutrient availability .... "(Interview, June 2015).

In respect to this research team Faculty of Agricultural Technology, Gadjah Mada University (UGM), along with hundreds of farmers in four districts in Yogyakarta (DIY), developing cultivation techniques agricultural able to offer water-saving, seed and fertilizer to rice cultivation model of System of Rice Intensification. This method of rice cultivation, rice cultivation is breaking new ground by changing the management of plants, soil, and water (Anonymous, 2009).
Renewable watering Application (irrigation system is disconnected / intermittent irrigation) both in Wangaya Betan and Gunungsari Subak, implicated to increase farmers' income, increase the income of farmers in both Subak is actualized especially in the strengthening of the capital. Strengthening capital to support agriculture in the implementation of the second water control system aimed at investing in the ownership of a cow or buffalo. Cattle and buffalo is also an investment vehicle which can be traded at any time. An increase in income earned by farmers in both Subak, next in actualised in the purchase of cattle, also actualized in the form of savings, so that the pattern of life experienced by previous "close the hole dug hole" is no longer experienced today and the future. There is also an increase in revenue with menggu

lirkankan invested in the form of establishing new businesses such as making shop as a place of business. Farmers turned out very wisely utilize the resulting additional revenues now, without spending for things that are consumerism. However, it is possible, some farmers also have actualize an increase in revenue in the form of purchases of goods such as motorcycles, repair means a place of prayer (corrected), and also improvement of residence (home) which is believed to be beneficial to improve their welfare. Increased prosperity for farmers in both Subak not only be actualized in the form of objects, but also in other forms of welfare such as improved health and increased opportunities to send their children to pursue higher education.

1.2 Implications Of Renewable Irrigation System Application to The Environment

The application of a conventional irrigation system in rice cultivation that has been applied for hundreds of years, it has implications for the fulfillment of the abundant irrigation water. Fulfillment of irrigation water for the conventional irrigation system requires the availability of irrigation water without restriction and without barriers, which must be continuous availability at all times. It is not a problem if only the presence of irrigation water does not have the limitations of both quality and quantity. But the reality today as it has been discussed in the first year of research, there is competition irrigation water use in various sectors. So this calls for a re-arrangement of the various forms of utilization of the water itself, so as not to damage the environment (natural resources) that exist or at least reduce the negative environmental implications. So one of the ways that the system applied in agriculture to anticipate the limitations of irrigation water is to apply new technologies in irrigation systems by implementing irrigation systems interrupted (intermittent irrigation).

Based on the phenomenon in the field, then the implementation of irrigation systems interrupted (intermittent irrigation) both in Wangaya Betan and Gunungsari Subak evidently has implications for improving the condition of the land, paddy ecosystem improvement, and the environment in general. Related to the improvement of soil conditions, repair ecosystems fields, and also the environment, then one informant that Mr. Nyoman Nadri (63 years old) one of the farmers at Wangaya Betan Subak, Mengesta Village, Penebel, Tabanan Bali, states very excited as follows,

"... I am as pekaseh (leader Subak) Wangaya Betan Subak was very pleased with the new technologies in the field of irrigation for rice crops. If the first applying conventional irrigation with continuously flooded rice fields during

its growth, it is very wasteful with water use. So that in recent years there is a trend in the downstream rice fields do not get the distribution of irrigation water because the longer presence increasingly terbats irrigation water, so farmers are not biased and planted fields. As a result of wetland in limbo for one growing season. Due to the lack of water distribution due to retention of water in rice fields upstream, there are few rice fields causing delayed planting season so that rice production decreased .... "(Interview, May 2015).

The same thing also delivered by the father by Jro Mangku Prajapati (70 years old), one of the farmers on Gunungsari Subak, Jatiluwih Village, Penebel, Tabanan, Bali, stated as follows.

"... I think the implementation of irrigation systems interrupted (intermittent irrigation) is a very important breakthrough in rice paddy farming. Now almost all the rice fields to get distribution of irrigation water in rotation so that no rice fields were not planted. With so improvements wetland conditions, also occurs at the same improvement rice paddy ecosystem and environmental improvement. Irrigation systems interrupted (intermittent irrigation) are to be implemented throughout Subak in Bali, because it has a good effect on the wetland at once on the environment .... "(Interview, May 2015).

From the expression of two speakers above, researchers feel impressed watching the excitement overflowing expressed either by the father or by Mr. Nyoman Nadri and Mr. Jro Mangku Prajapati. Mr Nyoman Nadri are farmers who have very long engaged in agriculture, and have been very understanding and understanding what is actually happening on the rice field ecosystem. The improvement in rice ecosystems are currently making her so excited and happy. Mr. Nengah Nadri also very proud of the farmers are younger than him, who dared to take on new breakthroughs for the improvement of agricultural systems as a whole in Wangaya Betan Subak as well as in its neighboring Subak ie Gunungsari Subak.

The existence of the events pengenangan and drying alternately interrupted as a result of applying irrigation (intermittent irrigation) on rice cultivation, then the process of reduction and oxidation reactions in the soil to be balanced. There is a balance in the oxidation reduction processes in the soil, causing also the adequacy of the availability of oxygen in soil, it will bring a favorable implications for the life of micro and macro organisms land, especially paddy fields. The improvement in the lives of the macro and micro-organisms in the wetland both Subak, Wangaya Betan and Gunungsari Subak, an indication little by

that the conditions of the land in good condition, both in terms of physical, chemical, and biological soil. According Soepardi (1983: 12) the soil is said fertile if three factors are physical, chemical, and biological properties of soil are in balance, when one of the above three factors are in imbalance, the factors will be the limiting factor for plant growth and development.

Moving on from the statement Soepardi above three factors, either physical, chemical, and biological properties of soil must be in balance, the factors that may affect the existence of other factors. When one of the factors are in imbalance, for example, the levels of nutrients (chemical factor) existence is too extreme in the ground (can be high or low at all), then this will lead to biological factors of land, both macro and micro-organisms soil (well eels, frogs , snakes, worms, bacteria and other organisms) will be stunted. Whereas the microbial life in the soil would affect soil physical factors such as the formation of the pores of the soil, soil friability, it solum soil, and others. In the end, all of which will have implications on soil fertility, and further has implications also for rice ecosystems.

In connection with this issue, the results of interviews with the father of one informant Nengah Suarsana, SH (aged 52 years), one of the farmers in Subak Wangaya seoran Betan stated as follows.

"... Compared with before the implementation of irrigation systems is lost is the ecosystem of paddy has to be good, so now could easily diliat there kakul, belauk, eel, worm, or a snake ...." (Interview, June 2015).

Based on the expression conveyed by Mr. Nengah Suarsana, SH has been well recognized paddy ecosystem changes as the implications of the application of irrigation interrupted (intermittent irrigation). Ecosystem rice fields which had previously been in a state of lack of balance has now led for the better in a sustainable manner. Along with that, the expected realization of soil fertility balanced both in terms of physical, chemical, and biology, so that all of this has implications for the overall improvement of rice ecosystem and the environment in general.

A frightening specter for the world community over the past decade about the damage to the environment, is also a matter of concern by farmers in Wangaya Betan and Gunungsari Subak concerned with environmental sustainability. Specter haunting the world community and farmers about environmental damage, caused by many things one application of irrigation technology that is not appropriate and environmentally unfriendly implications kill the earth and the farmers themselves. This can not be passed and

little, recommendations for scientific research needs to be exhumed and examined again in order to get the best solution to protect the environment itself, without diminishing the importance of the traditional wisdom of farmers are familiar and friendly to nature. Nature itself be a wise teacher, so that human beings should have to feel at one with nature, not otherwise kill nature. The recommendations have now been rolled in the second Subak Subak Subak Wangaya Betan and Gunungsari, characterized by the application of irrigation interrupted (intermittent irrigation). Application of irrigation interrupted (intermittent irrigation) itself has implications for many domains of life in the study site (as described above), and it also has implications for environmental improvement. The implications of this is very important due to multiflayer efect, from the application of irrigation interrupted (intermittent irrigation) are rolling well in Subak Wangaya Betan and in Subak Gunungsari.

Application of irrigation interrupted (intermittent irrigation) are rolling well in Subak Wangaya Betan and in Subak Gunungsari, not only has implications for the improvement of the quality of the paddy field, but also affects the overall improvement of the rice field ecosystem. Of good quality rice field, all sectors of life in the rice field ecosystem raised. Rice fields as a source of food make it a continuous cycle of all time, both of paddy want any of the organisms produced, which in turn has implications for the improvement of quality and the environment as a whole in the second well in Wangaya Betan and Gunungsari Subak.

1.3 Implications of Renewable Irrigation System Application Against Social Environment

As already outlined in the previous year's research that the phenomenon is now happening in the field of competition will be the utilization of water. The existence of various external forces caused Subak organizations increasingly weak in maintaining the autonomy of the force over the years, including in managing irrigation water. So it is not a rare case of a shortage of irrigation water in some ecosystems Subak in Bali, which ultimately besides causing internal conflict Subak, also led to low productivity of land.

Water is often a source of conflict in society in the last decade, because of the competition of utilization of water use. Use of water use with different interests such as household, tourism industry (Figure 3.1 and 3.2), agriculture and livestock, causing a struggle for water is increasing. The need for the benefit of domestic (household), tourism, livestock are increasing from day to day, in line with the increase of population, The rise of tourism (Figure 3.3), and the supporting factors of tourism such as farm all of which require water in the

capacity / number of great causes water needs for agriculture (rice cultivation) increasingly limited. So this affect the amount of water that is acceptable in the agricultural sector is diminishing. On the other hand the existence of water resources are also diminishing due to the destruction of forests in the upstream, causing water consumption increased competition.

But the fact that water alone should not be monopolized by the agricultural sector. Pembagaian water should be equitable, all must be the distribution of water, water is required by all sectors of life, without water life would unfold. Amid limited water then the only way that must be taken is to implement water use regulation in order to effectively and efficiently to obtain optimal results.

Figure 1. Location Panorama Research Offers Natural Beauty, Being the World Tourism Destination (Documentation Photo of Euis Dewi Yuliana, May 2014).

Figure 2. Other side Research Location With Beautiful Natural Scenery (Documentation Photo of Euis Dewi Yuliana, May 2014).

When the competitive conditions of water use is not addressed, inevitable social conflicts in society will soon explode. The current conflict as a fire in the hull, in certain limits can still be overcome, but the longer if the condition is not addressed then the chances of social conflict would be enormous. According to Coser (in Purba, 2005), the conflict was preventing a freezing of a social system by urging the pressure of innovation and creativity. Conflicts between or within the group are always manifested in social life. Based on the theory that the changes proposed by Lewis A. Coser, Ralf Dahrendorf and Talcott Parson (in Poerwanto 2008), conflicts and internal contradictions in a social system, in the process of adjustment in an environment is a dynamic force. The theory of the three experts is more on. focused on how humans face the world through systems of social relationships, conflicts and contradictions as well as basic consensus, which in turn created an integration.

Figure 3. Stretching on Area Tourism Research, One of the Causes of Water Usage at the Field Competition (Documentation Photo of Euis Dewi Yuliana, May 2014).

Coser (in Susan, 2009), distinguishes two basic types of conflict, that conflict and nonrealistis realistic. Realistic conflict has a concrete source or material, such as the seizure of economic resources, territory or natural resources. If they are in conflict has gained the seizure source, and when it can be obtained

without a fight, then the conflict will end soon. Nonrealistis conflict motivated by irrational and tend to be ideological, such as religious conflicts, ethnic conflicts and so on. Between the first and second conflict, a conflict that nonrealistis tend to be difficult to find a resolution of the conflict and consensus and peace will not be achieved easily.

The phenomenon of water use in the public competition that occur at this time is mainly caused by the conflict realistically (the source of the conflict is material), which is characterized by the existence of competition or struggle for water utilization in various sectors. If it does not happen seizure of understanding sources of the (water), then the conflict will continue, consequently leading to conflict nonrealistis, driven by the desire irrational and tend to be ideological, which conditioned the development of the strengthening of the identity to pull out the sentiment of the group. It is difficult to find the cause of conflict resolution and consensus, and peace will not be achieved easily. Aspirations of an increasingly rigid will make the conflict more difficult meditation.

Competition conflicts so that water use in the community are not more complex, it is necessary to look for a solution from the various studies, one in the field of agriculture, in terms of water use and efficient irrigation sfektif namely by applying irrigation interrupted (intermittent irrigation). In respect of this case, both Subak in District Penebel of Tabanan that Wangaya Betan Subak, Mengesta Village and Gunungsari Subak in the village of Jatiluwih has implemented irrigation renewable in irrigation systems by implementing irrigation effectively and efficiently called irrigation interrupted (intermittent irrigation) , With this irrigation system happened efficient use of irrigation water is increasingly limited in rice cultivation, without lowering the productivity of the land and even increase rice production per unit area. But how percent savings in irrigation water, in the application of this disconnected irrigation system, has yet to be examined.

Related to the above, Veco (2007) stated that the paddy crop cultivation techniques with intermittent irrigation water management, integrated with the development of rice cultivation model of System of Rice Intensification, was able to save the use of irrigation water. Given the growing day supply of water for rice farmers continues to decrease, then the application of renewable irrigation system with irrigation systems interrupted (intermittent irrigation) on paddy rice cultivation

If the irrigation system is interrupted (intermittent irrigation) can be applied in the cultivation of rice crops in the Subak system throughout Bali, the conflict in competition for water utilization can be avoided. Conflict occurs as a result

of the utilization of the same interests of the natural resources are increasingly limited. On the other side of the conflict can also occur as a result of inadequate understanding of farmers in the utilization of water resources wisely. Hereditary from hundreds of years ago, farmers have made use of irrigation water is less efficient, especially in rice cultivation systems with stagnant system, which is actually less useful for rice plants. If this continues then the water use conflicts, inevitably, should not have to happen. It is very fitting to the implementation of irrigation systems interrupted (intermittent irrigation) is applied in rice cultivation, to avoid a wider conflict in the utilization of irrigation water, so that the social environment in the community can be conducive. Thus the excess is not to say that the implementation of irrigation systems interrupted (intermittent irrigation), could have implications on the well-organized social conditions in the community, especially in the environment of farmers.

4. Conclusions and Recommendations

4.1 Conclusions

The conclusions of this study are as follows.

1. Application of renewable irrigation system (irrigation system is disconnected / intermittent irrigation) in the second Subak in Bali, ie Gunung Sari Subak at Jatiluwih village and Wangaya Betan Subak at Mengesta village, have significant implications for the increase in rice production. Rice production in this case the wet grain increased almost doubled from 4-5 tonnes per hectare to 7-8 tons per hectare, by implementing a renewable irrigation system. On the other hand if any of irrigation water in paddy fields priced with value for money, then there has been a decrease in production costs due to the efficient use of irrigation water. Also there has been a saving for manpower and time, because the flooding is only done 2-3 times only during rice production (depending on the variety planted), so that it can be said that the implementation of the irrigation system is renewable (irrigation system is disconnected / intermittent irrigation) turns cost-effective production, if labor and time farmers in the value of money.
2. The application of irrigation systems interrupted (intermittent irrigation) both in Subak Wangaya Betan and in Subak Gunungsari evidently has implications for improving the condition of the land, paddy ecosystem improvement, and the environment in general. The existence of the events pengenan

gan and drying alternately interrupted as a result of applying irrigation (intermittent irrigation) on rice cultivation, causing the process of oxidation and reduction reactions in the soil to be balanced. There is a balance in the oxidation reduction processes in the soil, causing also the adequacy of the availability of oxygen in soil, it will bring a favorable implications for the life of micro and macro organisms land, especially paddy fields. The improvement in the lives of the macro and micro-organisms in the wetland both Subak Subak Wangaya Betan and in Subak Gunungsari, an indication that the conditions of the land in good condition, both in terms of physical, chemical, and biological soil.

Application of irrigation systems interrupted (intermittent irrigation) both of them was able to suppress the conflict in competition for water utilization, so that the social environment in the community can be conducive. Thus the excess is not to say that the implementation of irrigation systems interrupted (intermittent irrigation) This has implications for well-organized social environment in society, particularly in the neighborhood farmers.

4.2 Suggestions

There are some suggestions that can be presented in this paper is as follows.

1. Given water supplies are increasingly limited, the application of renewable irrigation system with irrigation systems interrupted (intermittent irrigation) on paddy rice cultivation is appropriate, in addition to saving the cost of production also has implications for increasing rice production (wet rice) almost doubled (4-5 tons to 7-8 tons per hectare).
2. It should be applied irrigation systems interrupted (intermittent irrigation) on paddy rice cultivation so that the environmental conditions, especially wetland and paddy ecosystem for the better.
3. It should be applied irrigation systems interrupted (intermittent irrigation) on paddy cultivation that competition conflicts water use can be reduced.
4. Need to do more research on how percent savings in water usage by implementing irrigation systems interrupted (intermittent irrigation), because until now there has been no data on it.
5. The irrigation system is interrupted (intermittent irrigation) are to be implemented in other Subak in Bali, in addition to the second water control system where research is done.

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