

## Conservation of Subak to Promote Sustainable Development and Improve the Welfare of Bali's Farmers

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### Abstract

*This article describes efforts to preserve Subak in the Indonesian province of Bali. Subak is a traditional farmer-owned institution with many functions, including promoting food security, sustainable agriculture, and farmer welfare. The existence of Subak is threatened by the significant conversion of rice fields to non-agricultural sectors (settlements, infrastructure, and tourism support facilities). This qualitative study was conducted in six Subak across the island of Bali. Observations, in-depth interviews, and FGDs were employed to collect primary data. The findings of this study indicate that the conversion of rice fields in all of Subak was caused by external demand (from capital owners and the government) and internal needs (farming families needing land for housing). Land use change has varied drastically over the previous 30 years, depending on the commitment of farmers and stakeholders at the village level. Subak Tungklub Dalem reached an agreement with three parties (village's official, traditional village, and Subak) to prevent rice field conversion, ensuring that rice fields in Kekeran Village, Badung are generally safe. The recommendations are to strengthen Subak regulations in anticipation of high rice field conversion, raise farmer understanding of the necessity of preserving sustainable rice fields, and build an institutional economy that controls business units integrating agriculture and tourism (agrotourism).*

**Keywords:** Sustainable Agriculture, Subak Preservation, institutional transformation, and Agrotourism.

### Introduction

Subak is a traditional institution related to rice cultivation in rice fields (Sedana et al., 2021; Brooks et al., 2018; Sutawan, 2001). This institution is vital in supporting the lives of people in Bali. Subak is critical in ensuring food security (Budiasa, 2010; Sutawan, 2001). The Subak community uses Subak to maintain and develop culture and nature/environmental conservation. In the current situation, Subak is also expected to play a role as an economic institution to support an increase in farmers' income and the welfare of their families (Lanya et al., 2018). This multifunction shows that the existence of Subak should be strengthened so that the food supply in Bali is sustained and people's creativity in numerous fields is preserved.

In the midst of modernization and economic forces, efforts to preserve the survival of Subak encounter numerous unfavorable challenges. Subak's position is being weakened

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by the emergence of a hedonistic lifestyle, and robust cash flows through market processes in Bali as an international tourist destination. A huge number of rice field conversions has weakened the importance of Subak in numerous aspects of the farming community's daily life. According to Bengue and Neef (2018), the government's adoption of economic liberalization in the tourism industry's development generates conflicts in utilizing natural and cultural resources. Subak's position tends to be marginalized in the constellation of unequal competition.

Strategic efforts are needed to maintain the sustainability of Subak to prevent the decline in farmers' bargaining position. Priority should be given to the Subak preservation program to sustain the Subak's ability to carry out its varied functions. Efforts to preserve the existence of Subak can be conducted in an integrated and complete manner concerning the management of Subak organizations and the behavior of farmers. It should be understood that Subak, as an institution, has a Tri Hita Karana (THK) philosophy. In this case, farmers obey to carry out agricultural activities in harmony in the aspects of Parahyangan, Pawongan, and Palemahan. This article focuses on the preservation of Subak within the context of organizational management in order to prevent the uncontrolled conversion of rice fields in the Province of Bali.

Subak, as a social institution, requires strong and appropriate regulations to maintain its existence internally and externally. Awig-awig and Pararem become regulations that strengthen the solidity of farmers in Subak. In contrast, regulations issued by the government at the district, provincial and central levels are expected to provide space for Subak to carry out its function as a support for food security and other functions. External regulations needed by Subak are related to policies governing restrictions on the conversion of rice fields. Pekaseh leadership in Subak is expected to be able to fight for the land farmed by farmers so that it does not change its purpose and cause farmers to lose their jobs.

### **Conceptual Basis of Subak Preservation**

In the context of maintaining the sustainability of organizations/institutions or other entities, there are three terms used: preservation, conservation, and restoration (Christiani, 2020; Fatmawati, 2019; Makmur et al., 2021). Fatmawati (2019) describes that preservation includes conservation and restoration activities. Preservation is examined in two aspects, namely static and dynamic. The static aspect emphasizes the purpose of preservation, preserving everything by maintaining it as it was in its original state and condition (unchanged). In contrast, preservation from the dynamic aspect examines preservation activities as protection from destruction/damage. For example, the preservation of the Traditional House of Sade Lombok Village (Bale Tani), the architectural material for the traditional house of the Sasak Tribe, is highly recognized for its authenticity and integrity (Fatmawati, 2019; Widiyanti, 2017).

Pitana and Setiawan (2013) emphasize that the preservation of Subak is an urgent need because Subak faces threats internally and externally, as well as new challenges related to social, economic, environmental, and development policies. The two researchers explained that the ability of Subak to adapt to various strategic environmental changes is crucial in optimizing the role of Subak in sustainable agricultural development. In 2012, Subak was declared a World Heritage Site (WHS) because of the institution's high social capital and proper and consistent implementation of local wisdom values (THK). The WHS criterion exerts pressure on the Balinese to maintain Subak and contribute to the continued advancement of the agricultural system. The development of agrotourism on WBD sites is a practical measure to preserve the existence of Subak and provide economic benefits to farmers (Pitana & Bachelor, 2020; Herawati, 2015). In addition, Pitana (2016) underlined that the participation of the younger generation in Subak is a significant component in the growth of agrotourism in Subak. For this reason, the

younger generation is encouraged so that they are aware that agrotourism has numerous advantages, such as protecting natural resources and local technology and providing an alternative source of revenue for the local community.

As an institution governed by socio-agrarian-religious farmers, Subak has five functions. Sutawan (2008) outlines Subak's five duties as follows: (1) locating and distributing irrigation water; (2) managing and mobilizing resources controlled by Subak, including human resources, asset, and money, as well as workforce so that Subak can carry out its functions; (3) building and managing irrigation network facilities; (4) addressing and preventing social conflicts due to dissatisfaction with the distribution of irrigation water and the utilization of other resources; and (5) preparing and carrying out religious ceremonies related to Subak's duties to ensure smooth rice cultivation in the area.

Subak, like other agricultural groups in Indonesia, encounters significant obstacles. Yuniati et al. (2017) discovered that the poor performance of agricultural institutions (such as Subak) is due to the institutions' failure to self-regulate. This vulnerability may hinder their ability to safeguard and fight for farmers' aspirations. Farmers with limited institutional knowledge or insight will be unable to optimize their resources if this weakness cannot be overcome. It is because farmers have limited access to finance, information, and the development of business networks.

Due to the limitations of the farmers, Khairunnisa et al. (2019) suggest three aspects for improving the performance of Subak and other agricultural institutions: strengthening the institutional structure, strengthening the capacity of members, and increasing the capacity of farmer institutions to perform their functions. Weak organizational management, leadership styles that tend to be less dialogic, conflicts of interest, limited human resource capacity, low infrastructure and innovation, and networks frequently impede the efficacy of improving agricultural institutions.

According to Muttaqien (2008), regulatory and institutional reforms are the key to the rapid development of Indonesia's Islamic economy. Changes to regulations have a favorable effect on institutional reform. In this situation, the institution can fulfill its duties per the expectations of various stakeholders. For instance, thanks to adequate legislation, Islamic banks in Indonesia can thrive and gain public confidence. It is also expected that regulatory and institutional reforms will play a significant role in preserving Subak.

According to Sutawan (1989), Subak institutions have five characteristics, namely the presence of Prejuru (management staff), the presence of Krama (members), namely farmers managing rice fields, the presence of Palemahan, namely rice fields, the presence of irrigation water, the presence of Parahyangan aspects in the form of temples (holy places) and religious rituals, the presence of Awig-awig, and Subak have full autonomy. If one of the seven components of the Subak institution is not functioning efficiently, the Subak dynamics would suffer. Attention to the institutional aspect is crucial in conserving Subak.

## Research Methodology

This qualitative descriptive study was conducted through a case study in six Subak at the province of Bali. Subak was located near regional development centers with special functions, such as public facility development areas (terminals, main causeways, or by-passes) or tourism activity development centers so that the pressure on the conversion of rice fields was very high. The Subak were Sungsang Subak, Tangkub Dalem Subak, Padang Legi Subak, Dlod Banjarangkan Subak, Kuwum Cangah Subak, and Gembong Subak. The data used were primary data from Subak institutions, farmers' opinions, and the Subak Kelian (leader) opinion on land conversion. Secondary data included regulations affecting Subak preservation initiatives and other supporting studies.

Interviews, Focus Group Discussions (FGD), and field observations were used to collect primary data. Secondary data was obtained by studying secondary sources such as regulatory documents, scientific articles, and books. The data were processed, analyzed, and presented qualitatively and descriptively.

## **Research Findings**

Based on field data, Subak has supporting components that can strengthen its existence to survive amidst rapid social changes in local and global contexts. An area is identified as a Subak if the area consists of: a stretch of rice fields with a certain area, irrigation water that flows into the fields, the presence of temple used for religious rituals, and the presence of farmers as farming managers as well as members of the Subak. Farmers play an important role in Subak's dynamics because their creativity and hard work enable Subak to adapt to the social and natural environment changing. This condition was identified in all observed Subak. It is proven that Subak members (farmers) have been running rice cultivation for generations by applying the THK philosophy. This philosophy is able to maintain rice fields and the availability of irrigation water. Farmers' success in preserving Subak has a vital function in supporting food security in the province of Bali. Subak preservation is very dependent on the ability of farmers to build harmonization of linkages and attachments between components in Subak. If one of these components fails to operate, Subak's existence is threatened. For instance, if the irrigation water supply is limited, rice fields will no longer be able to be sown with rice, and farmers will stop working in the fields. Subak will have only a temple, but agricultural activities that produce food for the people will not be able to function efficiently.

The shrinking area of Subak raises concerns for Pekaseh/Kelian Subak at the research location because they admit that it is difficult for them to manage resources so that Subak can fulfill their role. The six Subak leaders whose opinions were explored regarding the impact of the conversion of rice fields stated that the reduction in rice fields is very difficult for farmers because their responsibilities in implementing THK are getting heavier. As expressed by Pekaseh Subak, Sungsang Tabanan I Wayan Kantor and Kelian Subak Padang, Legi I Ketut Sugata, the transfer of functions resulted in fewer Krama being invited to take responsibility for maintaining physical facilities (repairing and cleaning irrigation canals, temples, and Subak halls). In addition, it is increasingly more work for Subak members to prepare and carry out religious ceremonies because reduced rice fields mean a decrease in the number of farmers who have an obligation to carry out THK.

“There are several rice fields whose owners have changed, and we do not know the new owner because the land is not cultivated, so we have difficulty finding people to ask for help or to work together. The land owner has never involved Krama or Subak administrators when selling their land” (I Wayan Kantor, interview, 24 October 2022).

This condition indicates the weak bargaining position of Subak administrators and farmers in the face of positive law from other policymakers, both at the village, district, provincial and national levels. According to I Ketut Sugata, Pekaseh of Subak Padang, Legi, and Masceti, Blahbatuh Gianyar District, Subak's assets in the form of temples which are places of religious rituals from 20 Subaks are claimed to belong to certain traditional villages, causing Subak to incur losses in the form of loss of income from outside agricultural activities such as leasing parking areas and tourism activities in the Subak museum. The decreased number of farmers undertaking numerous responsibilities and the loss of Subak's funding source from non-farming activities could lead to the demise of Subak institutions.

This concern is justified because there is a tendency for more rice fields to change function over time in all research locations. However, the rate of land conversion in each

Subak varies based on the leadership and policies in place. Table 1 depicts the decline of rice fields in each research location.

Table 1. Estimated Shrinkage of Rice Field Areas in each Subak research location

No	Subak name	Rice Field In 1990s (Ha)	Rice Field in 2022 (Ha)	The rice fields converted in 30 years Ha
1	Subak Sungsang	262	242.5	19.5
2	Subak Tungkub Dalem	254	252	2
3	Subak Padang Legi	59	26	33
4	Subak Dlod Banjarangkan	240	235.9	4.1
5	Subak Kuwum Cangah	54	51.6	2.4
6	Subak Kubu Gembong	30	18	12
Number of rice fields converted in research locations				899 73 826

Source: Processed from 2022 primary data

Based on Table 1, there has been a change in land use in all of the Subak research locations, which reached 73 hectares in 30 years. The transfer of functions is due to push and pull factors. The push factors are: (1) the housing needs of the farming families who own the fields; (2) the need for funds that are quite large for living expenses such as school fee, religious ceremonies cost, or funds for the departure of children to work abroad; (3) land productivity has decreased due to problems in the irrigation water because irrigation canals have been narrowed and even closed by landowners whose rice fields have been converted. In many cases, buyers of rice fields for settlements maximize the land, including a narrow area previously a tertiary irrigation canal (several centimeters wide) that is also pegged and filled in. It prevents water from flowing to the downstream region. This condition forces other farmers to sell or convert their land; (4) there is a system of inheritance and conflict within the farmer's family where the solution is to divide the land so that the cultivated area of the rice fields becomes narrow. The narrow arable area results in unprofitable management of rice farming, so farmers intend to convert their land.

Meanwhile, the exceptionally high need for land for non-agricultural usage is a pull factor for the conversion of rice fields. Each Subak faces unique challenges related to the pull factor over the function.

1. Subak Sungsang experienced the conversion of rice fields, reaching 19.5 hectares. Because Subak Sungsang is located in a coastal area close to Tanah Lot, Kediri Tabanan, the need for land for main businesses/facilities causes high land prices. It is suspected that many rice fields in the southern part of Tabanan Regency have changed hands and been controlled by land brokers. Many farmers who were once landowners became sharecroppers due to this predicament. This condition was recognized by research informants in Subak Sungsang, who stated that it was difficult to prevent changes in the ownership of rice fields because of the large number of land brokers operating in Subak. One of the informants emphasized that the farmers stopped cultivating the land because several people claimed to be the owners or confidants of the landowners who asked for their share of the rice fields. The sharecroppers were confused, so they stopped managing their farming business because they wanted to avoid conflict with other parties due to the crops they managed.

2. Subak Tungkub Dalem in Kekeran Village, Mengwi, Badung Regency, underwent a land conversion of 2 hectares. This Subak has the challenge of maintaining its rice field area due to construction of an inter-island terminal in Mengwi Village. This condition can trigger an increase in demand for land for settlements and businesses. Farmers and local community leaders succeeded in adapting regulations so that land conversion by involving people from outside the residents of Kekeran Village could be avoided. This condition causes minimal land conversion.

3. Subak Padang Legi in Gianyar Regency and Subak Dlod Banjarangkan is on the Ida Bagus Mantra bypass road crossing from the Tohpati Area (Denpasar City) to the Kusamba Village area (Klungkung Regency). Both Subak have the same pull factors. Based on the Bali Provincial Regulation No. 16 of 2009, Lebih Beach is one of the tourist areas in the Province of Bali. This rule causes a high demand for land to provide tourism facilities. Many tourist accommodations, such as hotels, villas, and inns, were built in this area. It has caused land conversion in Subak Padang Legi to reach 33 hectares in the last 30 years. After the Ida Bagus Mantra bypass's opening, tourism activities flourished in Klungkung Regency. As a result, many rice fields in the downstream area of Subak Delod Banjarangkan were converted (totaling 4.1 ha) for the construction of tourism accommodations and other businesses, both those that support tourism needs and those unrelated to the tourism sector.

4. Subak Kuwum Canggih, located around the DTW Taman Ujung Karangasem or in the Karangasem sub-district area, has two vital factors that attract the conversion of land functions. First, the rice fields are on the path to Taman Ujung DTW, so many capital owners, including those from Tumbu Village (Subak is included in the Tumbu Village area) and outside, are looking at various business opportunities. They submitted proposals to transform the rice fields into commercial spaces. Tumbu Village, near the city of Amlapura, is also called a buffer zone so that it opens up space for development as a residential area. Several informants explained that Tumbu Village residents had received information that Tumbu Village was a residential area, but this was not stated in the Karangasem Regency Regional Regulation No. 17 of 2020 concerning Regional Spatial Plans. Over the past 30 years, land conversion has reached 2.4 hectares.

5. Subak Kubu Gembong is located in the Kalibukbuk Tourism Area, Buleleng Regency. The pull factor for converting rice fields in Subak is for constructing tourism support facilities and other business activities. The conversion of relatively large rice fields (more than 5 acres) is carried out by capital owners who come from outside the Subak members while farming families tend to convert rice fields on a small scale (under 5 acres). Land conversion by farming families is generally carried out to construct houses or small-scale business. In the last 30 years, the conversion of rice fields in Subak Kubu Gembong has reached 12 hectares.

The next finding is from the institutional aspect. All Subak have a relatively well-established organizational structure. Each Subak has a management structure, farmers, water sources, and a holy place (temple). However, of the six Subaks, one Subak does not have a written Awig-awig, namely the Subak Dlod Banjarangkan, Klungkung Regency. Nevertheless, Subak Dlod Banjarangkan is still managed regularly following local wisdom, and farmers follow all aspects regulated by Subak management. For example, Subak Dlod Banjarangkan regulates the rotation of irrigation water with a block system, namely Block A and Block B. If the first planting season water is distributed to Block A, Block A will have the turn to plant rice, then Block B will plant crops. In the following planting season, irrigation water will be distributed in Block B to plant rice and group A to plant crops. This kind of cycle has been going on for a long time due to a limitation of irrigation water supplies. This reduced agricultural water supply is due to the fact that the dam's water supply is shared with neighboring Subak in Gianyar Regency. Previously, this dam's irrigation water served just Subak Dlod Banjarangkan.

Leadership determines the effectiveness of an organization or group in order for it to fulfill its functions. In optimizing the Subak function, the role of the Subak leader is also crucial. In this study, in each Subak, it is known that Kelian and Pekaseh lead Subak in maintaining the institution's sustainability. There are slight differences in the meaning of Kelian and Pekaseh in several research locations. The two terms carry the same meaning at the four research locations in Gianyar Regency, Badung Regency, Tabanan Regency, and Buleleng Regency. However, in East Bali, namely in Subak Dlod Banjarangkan and Subak Kuwum Cangah, the term Pekaseh is used for Tempek/Munduk leaders or a narrower area than Subak. Consequently, the Kelian Subak of the two Subaks has a number of Pekaseh. In other words, Kelian Subak is the supreme leader of Subak, and Pekaseh is the representative of Kelian Subak in narrower areas.

In general, the leadership in all Subak is democratically elected. Kelian Subak was chosen based on deliberation for consensus. Farmers appoint someone to sit in the Subak management based on trust and the belief that the chosen leader can fight for the aspirations of farmers. Several Kelian Subak figures have led their Subaks for over one period (five years). Even Pekaseh Subak Sungsang, I Wayan Kantor, agreed to be Pekaseh for three periods. Pekaseh Subak Padang Legi, I Wayan Sugata, became the leader of two Subaks, Subak Padang Legi and Subak Masceti. Another Kelian Subak managed to occupy the position of Kelian Subak because of his excellent performance as Kelian Tempek.

## Discussion

Subak preservation is essentially maintaining a balance of the three aspects of Subak following the THK philosophy: Parahyangan, Pawongan, and Palemahan. Globalization and modernization have resulted in changes to several farmer activities in these three aspects. Changes in the farmer's approach to managing rice production shifted from subsistence (saving rice for family needs is more important, and the rest is then sold) to commercial (all rice production is sold and buying rice for family needs), causing some activities in Parahyangan to be conducted infrequently. Because of the cutting method (selling rice directly on the rice fields without harvesting), the *Mantenin* rice ceremonial activities in the barns are rarely or never performed.

Building farmer solidity in supporting the Subak work program or complying with Subak rules (*Awig-awig* and *Pararem*) requires enormous effort. Farmers historically established Subak with a sense of shared fate and responsibility or oneness. Subak became a solution when farmers faced crucial problems that could not be resolved individually. Sarjana (2005), for example, stated that Subak Giri Merta Yoga in Mengani Village, Bangli, was developed as a result of farmers' embarrassment (internal motivation) owing to problems in using agricultural techniques due to drought. According to presidential instructions in the early 1990s, Mengani Village was categorized as an underdeveloped village. It caused embarrassment to the local community leaders, so they gathered to discuss strategies for improving the situation of their village. The discussion results decided that the villagers agreed to find a water source and build an irrigation canal. In 1992, the agreement began to be worked out in which three small rivers in the West Kintamani area were selected as water sources. Farmers volunteered to build 7.2 km long tunnels and about 8.5 km of open irrigation canals (canals/Telabah).

Within the community, these relationships have begun to weaken. Subak members frequently act in ways that undermine a feeling of community and solidarity, such as selling or converting rice fields without notifying the Subak management. Even though, according to positive legal norms in Indonesia, this action is justified, ethics as members of the community who from the beginning adhered to the local wisdom "*segilik-seguluk sebayantaka*," which can be interpreted as farmers as members of Subak will always

collectively overcome various problems encountered, should be maintained for Subak sustainability.

The values of the social wisdom of the Balinese people are social capital for strengthening the preservation of Subak. It was proven by Kusuma et al. (2018), who analyzed the role of social capital in three aspects: trust, norms, and networks. Trust in Subak is described by the following attributes: (a) farmers' trust in other farmers; (b) members' trust in Subak officials; (c) farmers' trust in government programs; (d) farmers' belief in religious rituals; and (e) farmers' trust in cooperatives. The results of this study illustrate that the actions of farmers who convert the rice fields or sell fields without prior notification to administrators and other Subak members indicate that prompt action is required to restore trust between Subak members to strengthen Subak preservation.

From the Palemahan aspect, the preservation of Subak also faces serious challenges. This study found that land use change cannot be avoided and can only be minimized. Efforts to minimize this conversion were found in Subak Tungkub Dalem, Kekeran Village, Badung Regency. Pekaseh Subak Tungkub Dalem, I Gusti Nyoman Sudiarsa, described that even though the Subak location was very close to the inter-island terminal in Mengwi District City, the conversion of rice fields involving residents outside Kekeran Village did not occur. The agreement on three village community institutions, Desa Dinas Kekeran, Desa Adat Kekeran, and Pekaseh Subak Tungkub Dalem, in early 1998 became a stronghold for overcoming the massive conversion of rice fields. In the agreement, the local village head did not issue permits for entrepreneurs and the community to convert rice fields to residential areas or other business facilities on a large scale. The Kekeran Traditional Village party stipulates a very high "penanjung batu"/dowry/initial fee for new customary village members who come from outside Kekeran Village and provisions to follow all Sima Dresta (customs) and the same obligations as local Krama adat. Subak also stipulates a similar policy so that these requirements can limit the intention of people outside Kekeran Village to buy rice fields and use them for purposes other than food production. However, people outside Kekeran Village are still very likely to purchase rice fields because certain burdensome customary laws only apply if the landowner constructs a building in the rice fields. In other words, as long as the rice fields are managed for rice and other crops farming, the farmer (landowner) is not obliged to fulfill these complex and high-cost requirements.

The approach taken by village institutional administrators in Kekeran Village can be used as a model for Subak preservation by raising the collective understanding that if rice field conversion is not managed, Subak's existence as a buffer for community food security will not work properly. Conditions in the field show that the conversion of rice fields is motivated not only by economic concerns but also by the encouragement/motivation of genuine development participation. For example, farmers do not sell their land due to urgent needs but have to give up their rice fields to build public facilities such as terminals, shrines (temples), and roads. The conversion of rice fields to residential and tourism accommodation has caused the recent massive conversion. There are also productive rice fields that are freed by the government. According to the Indonesian Forum for the Environment (Walhi) for the Bali area, about 480 hectares of productive rice fields have been leveled and compacted due to the construction of the Gilimanuk-Mengwi toll road in Bali Province, which construction was begun in 2022. The area of these rice fields is spread across three regencies in Bali, namely Jembrana Regency. Rice fields function as toll roads covering an area of 253.52 Ha, Tabanan Regency covers an area of 212.89 Ha, and Badung Regency covers an area of 14.13 Ha ([www.bali.bisnis.com](http://www.bali.bisnis.com)).

Slowing the conversion rate of rice fields is required to improve Subak's ability as a traditional institution that plays a crucial part in the development of Bali today. The institution founded by these farmers is expected to improve the Balinese people's internal unity and serve as a cultural display in national and international interactions. Internally,



Subak is an institution that can support food security, considering its main role as an organization that helps and protects farmers in managing farming in rice fields. Meanwhile, in supporting tourism development, Subak needs to transform to play a role in international interaction in introducing Balinese culture to domestic and foreign tourists. Both the role of supporting food security and diversification of tourist attractions (DTW) must be developed sustainably.

Based on the interviews with the Manager of Jatiluwih DTW, I Nengah Sutirta Yasa, S.E., who manages Subak-based tourism activities at the WBD site, there are several aspects of farmer activities in managing rice farming that can be packaged as agrotourism packages. Sutirta Yasa emphasized that there are various tourism potentials in Subak, namely: (a) farmer activities in managing the rice fields (ngendagin/hoeing, nenggala/makal, ngelampit, nampadin, nandur, ngebisin/mejukut, fertilizing, ngulahin kedis, and harvesting); (b) post-harvest activities (bringing the harvested rice from the rice fields to the house to be stored in the barns and ceremonies/mantenin ceremonies and pounding rice/nebuk); and (c) agricultural rituals (Magpag Toya Ceremony, Ngendag Tanah Carik Ceremony, Ngurit Ceremony, Ngerasakin Ceremony, Pangawiwit/Nuwasen Ceremony, Ngekambuhin Ceremony, Pemungkah Ceremony, Panyepian Ceremony, Nyegara Gunung Pangerestitian Ceremony, Ngaba Asem Ceremony, Ngusaba/Mesaba Ceremony, Ngadegang Bhatara Sri/Bhatara Nini Ceremony, Ngayarin Ceremony, Manyi, and the Mantenin Ceremony as well as the Ngaturang Sarin Tahun Ceremony).

“These agricultural activities are not altered for the sake of tourism, allowing farmers to continue their work without feeling disturbed. Depending on the phases of rice production in the fields, tourists can study, observe, or participate directly in farmer operations” (I Nengah Sutirta Yasa, interview, 7 October 2022).

This statement is consistent with Pitana and Sarjana's (2020) study, which states that agriculture-based tourism activities are rewards for farmers' perseverance in managing farming businesses so that the plants grow and produce well. If farmers are satisfied with the farming (rice fields or gardens) they manage, visiting tourists will be as well. Aside from the commodities grown, agrotourism can provide intriguing and distinctive tourist experiences, such as a rural ambiance with cool air and attractive scenery. Other travel packages include a stay in a rural region and breakfast and lunch in an agricultural setting such as rice fields or gardens. The attractiveness of agrotourism is particularly popular with tourists, as indicated by the increasing number of tourist visits to Jatiluwih, as seen in Table 2.

Table 2. Visits of tourists to DTW Jatiluwih from 2014-2022

No	Year	Visits		Number or visitors (person)
		Foreign	Domestic	
1	2014	147,574	17,470	165,144
2	2015	142,937	21,429	164,366
3	2016	185,268	24,241	213,509
4	2017	211,288	39,505	250,973
5	2018	227,804	49,380	277,189
6	2019	246,736	67,707	314,443
7	2020	38,817	54,926	93,743
8	2021	1,704	51,100	52,804

9	2022	111,363	55,240	106,306
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Source: DTW Jatiluwih (2022)

It demonstrates that Subak, a traditional Balinese institution whose members are farmers, forms the basis for implementing sustainable development. In the strengthening issue of the integration of the agricultural and tourism sectors in supporting the welfare of farmers, Subak is expected to support sustainable development in both sectors. This condition results from Bali's status as Indonesia's most popular international tourist destination, with cultural tourism as its primary tourism brand. In the context of the development and preservation of Balinese culture, Subak has a vital role as a support for Balinese culture because, according to experts, Balinese culture developed from the civilization of an agrarian society. In other words, Subak is expected to play a key role in bridging the gap between tourism growth and agricultural nature conservation. Subak is required by the tourism industry as a cultural institution capable of delivering a wider variety of tourism products to increase Bali's competitiveness as a tourist destination. Tourists always have high motivation to visit this Thousand Temple Island. On the other side, Subak members (farmers) have high hopes that Subak would be able to become an organization that channels aspirations and struggles so that farmers receive equal rights as members of a community that supports Bali. Farmers do not want to be spectators in the story of the huge income of Bali's tourism industry, which uses Subak assets as tourism products. In other words, farmers expect Subak to participate in distributing the tourism "cake" among farmers.

The opportunity to increase the income of Subak members in the Province of Bali after the COVID-19 pandemic is widely open. Tourist visits have gradually increased since the Bali entrance's opening, as shown in Table 3.

Table 3. Number of International and Domestic Passengers at Ngurah Rai Airport in 2021 and 2022

No	Month	Domestic		International	
		2021	2022	2021	2022
1	January	83,659	280,653	66	11
2	February	78,207	194,399	82	1,985
3	March	134,544	284,133	188	18,657
4	April	149,765	245,047	60	66,739
5	May	140,351	376,970	70	127,538
6	June	230,260	383,075	0	194,531
7	July	32,311	387,602	0	268,065
8	August	42,623	356,706	0	290,580
9	September	120,333	329,111	0	309,376
10	October	237,068	352,425	2	327,573
11	November	279,247	225,782	3	219,941
12	December	354,455		2	
Total		1,882,823	3,715,903	473	1,824,996

Source: BI Kaper Bali, 2022

The large growth between 2021 and 2022 shown in Table 3 demonstrates that visitor interest in visiting Bali is extremely high. Domestic tourism has grown by 50.67 %. The

higher number of tourist visits to Bali means that tourists need various types of tourist attractions and activities to feel satisfied while enjoying their trip to Bali. It indicates that agrotourism development has a significant possibility to diversify Bali's tourism products. A comparison of domestic tourist arrivals at Ngurah Rai Airport and domestic visitors visiting the Jatiluwih DTW shows that Subak-based agrotourism in Jatiluwih Village reached 2.8% in 2022. Meanwhile, due to the pandemic situation in which numerous countries of origin of foreign tourists have not opened their border gates or allowed their nationals to travel overseas, comparisons of international tourist arrivals at Ngurah Rai Airport and Jatiluwih DTW cannot be carried out. Nevertheless, the data still provides evidence that Jatiluwih DTW, which utilizes Subak as the main attraction, has a unique position in the minds of tourists because three out of every hundred tourists who visit Bali visit Jatiluwih.

The existence of Subak Jatiluwih as a DTW can be used as a model for an approach to preservation using an institutional economic approach. Institutional economics emphasizes that economic activities (transactions) can run well if there are institutions that work effectively. Institutional economics in Subak refers to the agreement of Subak members to build Subak into a new, more dynamic organization capable of running businesses in the agricultural and tourism sectors. Sarjana (2011) proposes that Subak can be transformed into a community enterprise because Subak has human resources (farmers and their families), natural and cultural wealth (rice fields, rice, and horticultural crops, daily activities, and customs), as well as networking. It means that Subak can collaborate with other stakeholders at the village level to launch non-agricultural businesses, such as agrotourism. Based on the findings of the focus groups and the panel of experts, a method for transforming Subak institutions into economic institutions that manage businesses that integrate the agricultural and tourism sectors, namely the development of Subak-based agrotourism, is formulated. Figure 1 depicts the chart or mechanism of institutional economic transition in Subak.

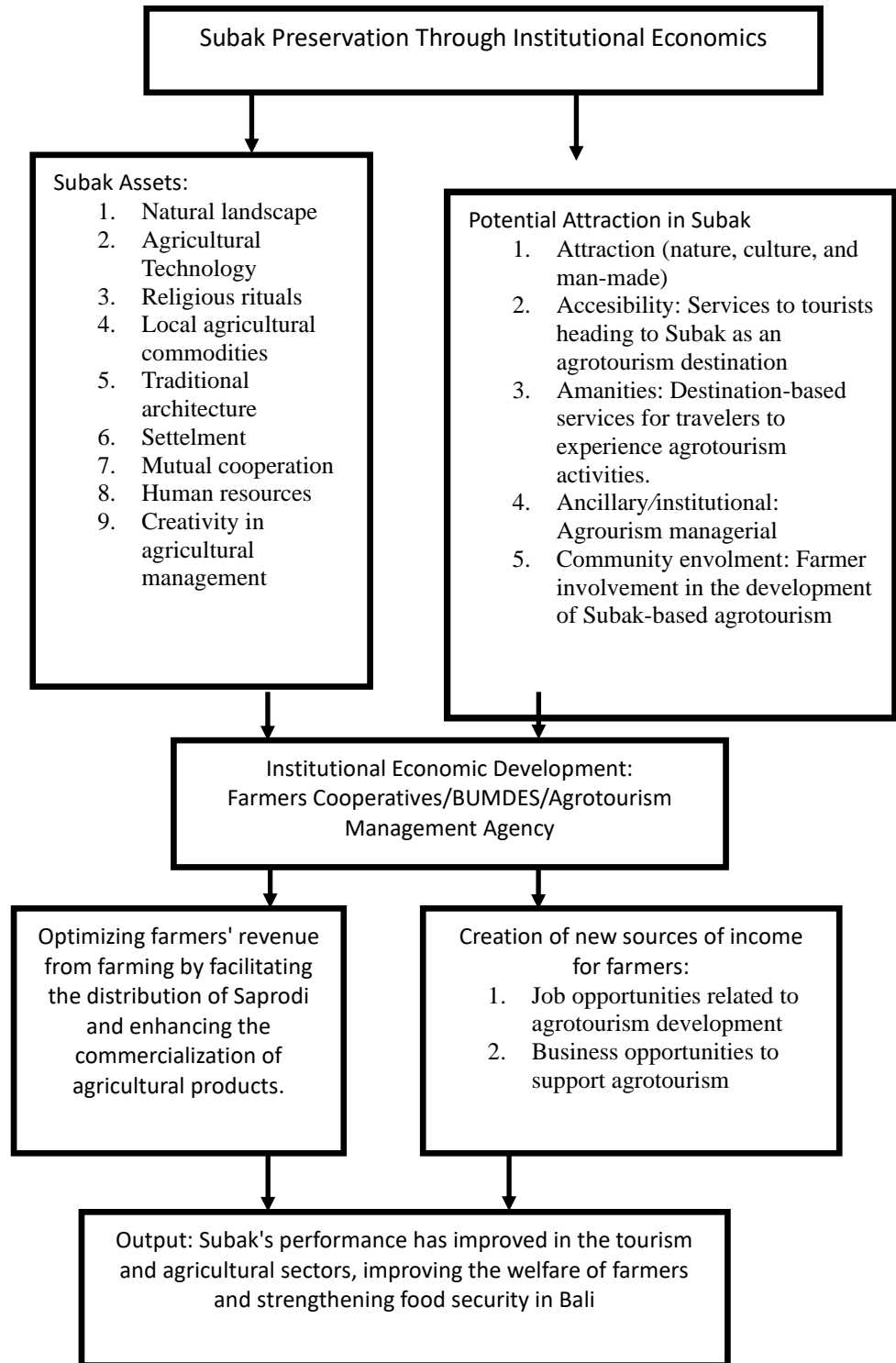


Figure 1. Institutional Economic Development Mechanism in Subak

Figure 1 shows that agricultural and tourism activities can be integrated within Subak. Such integration is highly dependent on the performance of economic institutions in Subak. Due to its reputation as a social system that is not business-oriented, Subak is known as slow to adjust to changes in the agricultural and tourism sectors. Weak modern management in Subak is caused by Subak's focus on efforts to adopt agricultural innovations, implement local wisdom values, and build togetherness and solidity among Subak members. There must be an adaptation to the most recent social phenomenon, in

which the burden of living is becoming heavier on the community, particularly farmers. Farmers are increasingly unable to make ends meet by farming in rice fields alone.

Subak should make a breakthrough by transforming itself into an economic institution. In other words, Subak management is expected to have a stronger business vision in order for Subak to have economic (business) institutions such as cooperatives, individual businesses, and financial services organizations. If the Subak cannot manage the business independently, the Subak management might collaborate (partnership) with other stakeholders at the village level. The formation of these economic institutions is intended so that the tourism potential in Subak can be managed appropriately so that farmers get additional income from outside their farming business.

The FGD indicated that Subak administrators at the research sites were highly motivated to manage their assets for Subak-based agrotourism. Subak Sungsang, Subak Tungkub Dalem, Subak Padang Legi, Subak Kuwum Cangah, and Subak Kubu Gembong have tremendous potential to be developed as agrotourism attractions. All Subak have the potential for attractiveness and accessibility, but amenities, institutions, and farmer involvement must be improved. Kelian Subak stated that his party was waiting to realize the work program of regional leaders (village heads related to the Subak concerned) to create tour packages in Subak. It was found in Subak Kubu Gembong, and Subak Sungsang. Pekaseh Subak Kubu Gembong, I Nyoman Sulendra, emphasized that the local village head had been planning to develop agrotourism in the Subak area since 2020. However, the idea was not realized due to the COVID-19 pandemic. Pekaseh Subak Sungsang, I Wayan Kantor, also explained that his party had collaborated with private universities in Denpasar to take potential inventory that could be packaged as tour packages. However, the study's results by academics have not yet been disseminated to the village (Subak Sungsang). This circumstance demonstrates that the development of Subak-based agrotourism is not merely intended to suit the interests of tourists for a variety of tourism activities but also serves the needs of farmers in carrying out Subak preservation.

## Conclusion

Based on the results and discussion, the following can be concluded:

1. Subak conservation is an urgent need because of the increasing conversion of rice fields due to external factors (demand from investors and the government) and internal (the need for land for residential farming families/population growth).
2. Strengthening regulations and increasing farmers' awareness of the importance of rice fields in maintaining food security, sustainable agriculture, and supporting farmers' welfare need to be strengthened. Subak Tungkub Dalem's proactive strategy of entering into an agreement with three institutions (village's official, traditional village, and Subak) is a practical and real measure for preventing the massive conversion of rice fields.
3. Strengthening the institutional economy in Subak or transforming Subak into a business-oriented institution should be implemented to create job opportunities and business opportunities outside of farming activities so that farmers get new sources of income. The development of Subak-based agrotourism is one of the business activities that Subak can manage independently or in collaboration with other stakeholders at the village level.

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