The Existence of Subak inside the Northern Kuta Tourism Area, Bali

I N Sunarta¹, I M Adikampana¹, S Nugroho¹

¹Tourism Destination Department, Tourism Faculty, Udayana University, Jl. Dr. R. Goris 7, Denpasar, Bali, Indonesia

Abstract. Subak recognized as traditional Balinese agricultural institution based on local water management. The existence of subak determines the sustainability of tourism development in Bali. However, there are concerns that the development of the tourism would have an impact on the subak particularly located in the tourism area. The objective of this article is to understand the existence of subak in Northern Kuta Tourism Area. The spatial approach adopted to determine the spatial change that occurs from agriculture to tourism. Based on the spatial analysis with GIS application, interview, and observation can be addressed the spatial change caused by the penetration of accommodation development, tourism amenity, accessibility, and communal facility. Such circumstances occur due to the increasingly limited tourism space in the center of the tourism area or tourism business district (TBD) such as Kuta Beach and Legian. That spatial change indicates the tendency of socio-cultural shifting of the local community around Northern Kuta Tourism Area from agriculture to sub-urban characteristic, thus affecting the existence of subak as the last bastion of the sustainable cultural tourism development in Bali.

Keywords: Subak, tourism area, spatial change, sustainability

1. Introduction

Bali Province has 16 tourism areas that have been defined in the regional spatial plan in 2009 - 2029. One of the tourism areas that have very strong allures is Kuta. The Kuta Tourism Area is notable for its products based on coastal and the way of life of local community. Administratively the tourism area covers two districts, which is Kuta District on the Southern side and North Kuta District in the Northern part. The center of tourism areas or referred to the term of tourism business district (TBD) is located at Kuta Beach and Legian, that situated in the southern part of the area. Whilst the area around the center of tourism, which is predominantly located in the north, is a buffer for tourism with land use domination in the form of agriculture. As a buffer zone, the northern part of the area or hereinafter appoint to as the Northern Kuta Tourism Area cannot be separated from the impact of tourism development, particularly related to spatial changes of agricultural cultivation area into tourism industry. These changes have a significant impact on the existence of subak as a noble cultural heritage.

Subak as a Balinese water management based agricultural institution has uniqueness because it is not solely profane but also sacred (symbol of harmonization). The uniqueness of subak constitutes the main capital for cultural tourism development in Bali thus far. But ironically, when tourism has grown into the economic base of the Balinese people, the preservation of subak has become a huge challenge [1].
Such a phenomenon as well observed in the Northern Kuta Tourism Area. The development of tourism in this area tends to be a threat to the continuation of subak. Challenges to the sustainability of subak in the tourism area, have a high level of distress, considering the tourism area is an area that has urban character. Areas within urban character have high aggressiveness related to changes in the physical, social, cultural and economic circumstances of the subak landscape. Various changes those emerge due to the increasingly diverse interests of urban society. Based on the preliminary evidence available, the objective of this article is to address the existence of subaks in the Northern Kuta Tourism Area.

2. Literature Review

2.1. Subak is the world cultural heritage landscape

Subak is familiar as a typical Balinese irrigation system, because it is not only a technical implementation in the context of providing water for the soil and its plants, but also involves the social, cultural and spiritual aspects of Hinduism in the form of Tri Hita Karana philosophical manifestations [1]. Given that in practice Hindu-Balinese farmers obey the rules relating to Subak and Pura Subak (water temple). Subak has at least three main components, specifically: (1) components of the physical system, in the form of paddy fields; (2) irrigation system components, in the form of water management procedures; (3) the social system component, which is krama subak (a member of the subak) consisting of farmers and rice field owners [2].

It can be stated that subak is a traditional Balinese agricultural institution based on local wisdom in water governance. In this context, subak can be stated to fulfill the social and cultural dimensions of water resources. Relates to this dimension, in 2012 the United Nations Educational, Scientific and Cultural Organization (UNESCO) endorsed the subak as a World Cultural Heritage Landscape [1]. The recognition given is a high appreciation from the global community for the local wisdom of Balinese people based on agrarian culture. Local wisdom contained in subak is a uniqueness that can be developed for the preservation of subak itself through the development of tourism in Balinese culture.

2.2. Environmental impact of tourism

Tourism as a human activity in pursuit engaged upon during leisure time [3]. Certainly has a particular impact on the surrounding environment. The intended environment consists of natural and human features. These environmental components have been widely recognized as the main capital of tourism development [4]. There is interdependence between the environment and tourism, which is symbiosis-mutualism relation. [5] explains that tourism benefits from the quality of environmental services. Likewise, the environment will benefit from quality tourism. Alongside to the benefits, there are also problems in tourism development if not carefully planned.

According to [6], the negative impact of tourism on the environment arises because tourism as “a space consumer” requires a large land for the development of various elements of tourism. These negative impacts create conflicts between tourism and the environment. Conversely, the positive impact of tourism occurs when tourism is able to be a conservation agent and able to improve the quality of the environment. This positive impact can produce a synergy between the environment and tourism.

2.3. Northern Kuta Tourism Area as a suburban area

Administratively the Northern Kuta Tourism Area consists of six villages, that is Kerobokan Kelod, Kerobokan, Kerobokan Kaja, Tibubeneng, Canggu, and Dalung. The majority of Northern Kuta tourism areas constitute rural areas that get an abundance of tourism development from the TBD's. The whole of tourism product components built in the northern Kuta areas gives that area an urban character. With the result that appears in several zones showing the configuration of the city, but on the other side, there are still characteristics of the village. The existence of two regional characters in the Northern Kuta Tourism Area indicates that this area is a suburban or peripheral area. It is because, in the beginning, the suburban area was a rural area that transitioned into an urban area. The natures of suburban are the
mixing of rural and urban characters. Thus the Northern Kuta Tourism Area is an area that runs into suburbanization process.

Suburbanization is a very significant process in determining socio-cultural-spatial changes in urban areas, especially conurbation or metropolitan area. Suburbanization can occur due to the economic penetration from the center to the periphery. According to [7], suburbanization takes place due to changes in the regional economic structure. The transformation of the economic structure has led to changes in the composition of the population's occupation from the agricultural to industry including tourism. The industrial sector becomes very developed and encourages the population to substitute jobs or livelihoods. The industrial which located in urban areas attract rural population migrate to urban areas. Suburbanization is a continuation process of urbanization. Thus suburbanization takes place in the peripheral areas, as an outcome of urban development. As a result, peripheral areas that were initially rural transitioned to urban areas [8].

3. Methodology

The research approach is qualitatively and spatially. The qualitative approach to describe and explain the phenomena and relationships between phenomena systematically. While the spatial approach is applied to understand the tendency of spatial changes of agricultural area. There are three methods of data collection that is the interpretation of subak area spatial data, observation, and interviews with subak leader (pekaseh) and the representative of villages (kelian adat and kelian dinas).

The area of subak that has been calculated and projected for land degradation is spread in six villages in the North Kuta Tourism Area. After the spatial change in subak area was identified, afterward it was analysed descriptively qualitative to explain the cause of spatial transformation of agricultural area.

4. Result and Discussion

Tourism area is a place with the main function of tourism and relatively self-contained [9]. Under the specialization of the function, the tourism area is always supported by various types of amenities and accessibility to meet the needs of tourism product providers and the tourism market. [10] and [11] state that areas that have special functions and there are various supporting facilities and services are spaces with urban character. Kuta Tourism Area, located in Badung Regency, Bali has been reputable as a world-class tourism destination. The development of tourism products such as attractions, amenities, and accessibility spread to the outskirts of the tourism center or suburban areas. This occurs due to the increasingly limited land in the center of Kuta Tourism Area. Moreover, the penetration of the development of tourism products to the periphery as well caused by an incident of the Bali Bombing in 2002 and 2005. The bomb terror influences the development of tourism and makes tourism providers prefers the locations product component in suburban areas to obtain a comfort and safety.

Through present, the development of any type of accommodation especially homestays and villas, restaurants and souvenir shops, is quite massive in the Northern Kuta Tourism Area which is a suburban area. Not only that, this area is also the location of housing development, where most of the residents are tourism workers or indirectly related to tourism industry. Penetration of the development of tourism products and housing to the Northern Kuta Tourism Area lead the high conversion of agricultural cultivation land into a component of tourism products and communal or public facilities. The transformation the spatial function, exhibit the reduction of subak in the Northern Kuta Tourism Area.

In the Northern Kuta Tourism Area there are 19 subaks: Basangkasa, Kedampang, Petitenget, Sebuah, Muding, Tegal, Banjarsari, Bantan, Daksina, Dawas, Perancak, Semat, Canggu, Liplip, Umaalas, Umadesa, Bernasi, Gaji, and Saih, which figured in six villages: Kerobokan Kelod, Kerobokan, Kerobokan Kaja, Tibubeneng, Canggu, and Dalung. Based on the interpretation of data spatial of subak in the year 2012 and 2017 and confirmed by the observations and interviews with some pekaseh, kelian adat, and kelian dinas, ascertained that the whole subak in the North Kuta Tourism Area has degradation of the area an average of 34% over the past five years (Table 1. and Figure 1.).
## Table 1. Degradation of Subak Area

| Village            | Subak Area (Ha) | Change (Ha) |
|--------------------|-----------------|-------------|
|                    | 2017            | 2012        |           |
| Kerobokan Kelod    |                 |             |           |
| Basangkasa         | 72.63           | 101.74      | -29.11    |
| Kedampang          | 76.48           | 101.98      | -25.51    |
| Petitenget         | 38.71           | 76.45       | -37.74    |
| Kerobokan          |                 |             |           |
| Sebuah             | 98.31           | 148.69      | -50.38    |
| Kerobokan Kaja     |                 |             |           |
| Muding             | 38.52           | 78.94       | -40.42    |
| Tegal              | 66.57           | 76.42       | -9.84     |
| Tibubeneng         |                 |             |           |
| Banjarsari         | 31.42           | 60.34       | -28.92    |
| Bantian            | 47.61           | 57.93       | -10.32    |
| Daksina            | 45.85           | 58.95       | -13.10    |
| Dawas              | 22.13           | 26.52       | -4.39     |
| Perancak           | 35.38           | 72.66       | -37.28    |
| Semat              | 43.80           | 72.77       | -28.98    |
| Canggu             |                 |             |           |
| Canggu             | 74.64           | 152.99      | -78.35    |
| Liplip             | 25.57           | 29.22       | -3.65     |
| Umaalas            | 13.34           | 33.51       | -20.17    |
| Umadesa            | 77.49           | 82.55       | -5.06     |
| Dalung             |                 |             |           |
| Bernasi            | 71.74           | 88.45       | -16.72    |
| Gaji               | 28.27           | 48.86       | -20.59    |
| Saih               | 82.96           | 131.29      | -48.33    |
|                    | 991.40          | 1,500.26    | -508.86   |

### Figure 1. Change of Subak Area
In 2012 the total area of subaks in the Northern Kuta Tourism Area was 1,500.26 Ha. After five years, the Subak area decreased by 508.56 Ha or if divided equally every year, the reduction occurred around 102 Ha/year. The subak with the most changes in spatial function until 2017 were Petitenget (49%), Muding (51%), Banjarsari (48%), Perancak (51%), Semat (40%), Canggu (51%), Umaalas (60%), Gaji (42%), and Saih (37%). The spatial functions of subaks include Petitenget, Banjarsari, Perancak, Semat, Canggu, Umaalas, which tend to change to the development of tourism products. While subak Muding, Gaji, and Saih, the changes are inclined to housing development along with allocating the public facilities.

Subaks that have a trend in changing their spatial functions into tourism is mostly located in the villages of Kerobokan Kelod, Tibubeneng, and Canggu. The three villages are relatively close to Kuta and Legian as the center of the tourism area and also that three villages have beaches as essential tourism capital. Whereas subaks which tend to turn into housing is found in Kerobokan Kaja Village and Dalung Village. The preferences of the two villages as housing development locations are because the distance is quite far from the tourism center, so the land prices are relatively more affordable compared to other villages in the Northern Kuta Tourism Area. Even though quite far but the level of accessibility to the center of tourism and other land use is fairly high (Figure 2.).

![Figure 2. Subak’s Land Use Change](image)

Besides the decreasing quantity of space, the subak which has a spatial change shows scattered or dispersed formations. Dissociated forms have caused subak as an agricultural institution based on
traditional water management has many obstacles and limitations to the distribution of water. The development of tourism products and housing has resulted in many irrigation channels turn into drainage (sewage channels) and others technical irrigation infrastructure does not function properly (Figure 3. and Figure 4.). This condition could increase the acceleration of spatial changes of agricultural area in the future, thus affecting the existence of subak in the Northern Kuta Tourism Area.

Corresponding with the spatial changes pattern of subak in the North Kuta Tourism Area indicate that the closer subak to the tourism center and own the presence of tourism resources, the existing agricultural area tends to turn into tourism products. And vice versa the more away, the tendency is the agricultural area massively transform into housing with all the public facilities. Figure 5 represent the spatial division in the Northern Kuta Region that formed a concentric pattern, with in general land use is for tourism, housing, and a mixture of tourism and housing The concentric pattern follows to the suburbanization process from the center of tourism development to the periphery. In addition to the spatial change of subak, transformations in space also appear on a micro scale. The houses of the local people who are on the main corridor of the tourism movement into commercial facilities.

**Figure 3.** The irrigation channel changes to drainage  
**Figure 4.** The structure of water distribution does not function properly

1 Tourism center and beach  
2 Tourism  
3 Mixture tourism and housing  
4 Housing  
5 Suburbanization

**Figure 5.** Land Use Pattern
Not only spatial changes, the suburbanization process also affects the social and cultural of local communities. Observed socio-cultural changes in society include shifting livelihoods [11] from agriculture to service, lack of agricultural regeneration, adaptation to daily congestion, and the wave of immigrants. Various spatial and socio-cultural transformations in the Northern Kuta Tourism Area progressively to marginalize the subak. Eventually, if there is no synergized with tourism as a suburbanization force, accordingly that subak in the Northern Kuta Tourism Area are increasingly weakened and further disappeared.

5. Conclusion and Implications

This study aims to understand the existence of subak in the Northern Kuta Tourism Area, Bali. The land use in this area was for agriculture cultivation. In accordance with tradition, agriculture in Bali in general and included in this area is managed by subak institutions. Since UNESCO recognizes subak as a world cultural heritage landscape, the uniqueness of the Balinese agricultural management is increasingly being developed as a basis for tourism attractions, especially in rural areas. But it is different from the development of tourism in urban areas and even suburbs. The existence of subak in this area is progressively threatened due to the development of tourism and its supporting facilities. Likewise in the North Kuta Tourism Area as a suburban area, subak in this area more and more is shrinking very significant. Over the past five years, most of the spatial changes in agricultural have been used for the development of tourism products and housing. Such transformation takes place due to the suburbanization process specifically penetration of the tourism development in the center of tourism area i.e. Kuta and Legian to the buffer area or suburban. The suburbs are the locations of the growth of tourism products tend to be closer to the center of the tourism area. While more away from the center, the changes that appear are dominated by the housing development. The tendency of spatial changes in forms of the concentric pattern that follows the suburbanization process through the path of tourism movement as its medium. Besides, it was also found that the change of agriculture area into a location for tourism products and housing created the scattered spatial formation. The scattered pattern of agriculture area encourages the acceleration of transformation of agriculture to the service-culture. Finally concluded that the suburbanization with tourism as its driving force resulting in the weakening of the existence of subak and predicted to be lost in the future.

In order to strengthen the existence of subak in the suburban area, a strategy to synergize between agriculture and tourism is needed. The capable recommendations to build agricultural synergy with tourism include: maintaining the tradition and implementation of agricultural rituals in the Subak Temple as a form of ennoble of subaks; creating agrotourism products (agriculturally-based leisure attractions) to be able to develop agricultural value chains; involve subak leader (pekaseh) in the planning and development of tourism products and housing; limitation of visits by creating small-scale tourism development; and provide reward and punishment for spatial development.

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