Land Use Change Along Lebih Coastal Line, Entailing Its Designation as A Zone for Tourist Development

G A M Suartika, I A S O Ledysianty and K E Saputra
Universitas Udayana, Bali, Indonesia
E-mail: ayusuartika@unud.ac.id

Abstract. The coastal area is a physically productive area, but is easily degraded which may be due to the lack of planning or even natural factors. The coastal area in Gianyar has experienced a drastic physical development, especially after it is declared as Lebih Tourist Zone or Lebih Tourist Zone (LTZ) and the construction of the arterial road between Tohpati and Kusamba. The study documented in this paper discusses: (i) the form in which the coastal area in Gianyar are utilized post the recognition as the LTZ; (ii) the factors that influence the changes in land utilization in this region; and (iii) how does this condition affect the sustainability of the LTZ. Fundamentally, this study applies the conception of sustainable development and the descriptive qualitative research method. The data were collected through field surveys and in-depth interviews with the land owners, land users, and the authority. The research results showed that the LTZ has experienced a significant change, both physically and non-physically. The factors that influence this change in function is the physical condition of the land, economy, institutional factors, and accessibility. This change has implications for the environment, economy and social culture. This study concludes to develop the sustainability of the LTZ some fundamental actions must be made, namely: evaluate the usage of land, establish clear and restricting zoning law to anticipate any land use violation; consistency in the layout plan; the active participation in the control of land use by the government, the people and private sectors; providing incentives and disincentives in utilizing the space.

Keywords: change, land use, sustainability of Lebih Tourist Zone (LTZ)

1. Introduction

The Gianyar Coastal Area which located in the southern part of Gianyar Regency has aesthetic attraction as a natural tourism and it is supported by socio-cultural potential, and therefore, this area was designated as Lebih Tourist Zone (LTZ) in accordance with The Decree by the Governor of Bali (SK) Number 528, Year 1993. Related to this decree, the Governor of Bali has also enacted SK No. 16/2002 concerning Rencana Detail Tata Ruang (RDTR) [1] or The Detailed Layout Plan for the areas Along the Tohpati-Kusamba Artery Road which has the same delineation located in the Regency as the LTZ. This endeavor contributes to the development of the region and the increase of interactions with other centers of activity.

After being established as LTZ, physical development along the coast of Gianyar keep on growing and developing which then affect the economic activities, socio-cultural elements of the community as well as the ecological functions of the environment in the coastal areas of Gianyar. The rise of the development encourages people who initially rely on the agriculture, plantation, forestry, livestock or
fisheries sectors to shift to the tourism sector and consequently, agricultural land transform into non-agricultural land such as settlements, trade, and tourism support services.

Despite contributing to positive economic development and the welfare of the surrounding community, the tourism sector also gives a negative impact if it is not anticipated. This is related to socio-cultural issues that are expected to be the priority, especially those related to the implementation of religious activities. There are many temples in this area and beach is considered as a holy place where *Melasti* (cleansing ceremony) and *Nganyut* (part of cremation ceremony) conducted. In addition, all activities in fulfilling irresponsible tourism needs also have a negative impact on the environment, including violations of coastal boundaries, river pollution and other activities that occur on the coast that disrupt coastal protection functions resulting in increased potential for environmental damage [2].

The area along the Gianyar coast has three strategic functions that need to be preserved and developed. First, the ecological functions, coastal areas are beneficial in the preservation of fisheries (edible fish, ornamental fish, and other aquatic plankton) and beach abrasion control. Second, the economic functions, the coast is a place for developing natural and spiritual tourism. Whereas from the socio-cultural function, the coastal area is considered a sacred area and serves as a place for holding various religious ceremonies for Hindus. Given the importance of the functions and roles of the Gianyar coastal region for development and the socio-cultural activities of the Gianyar community, this area should be used in a way that maintain a balance in fulfilling these three functions.

2. Methods

This study uses qualitative methods with descriptive analysis techniques in assessing changes in land use along the Gianyar coast after the establishment of Lebih Tourist Zone (LTZ). The research area lies along the southern coast of the Gianyar Regency area. The coastal area in Gianyar Regency has beaches that stretch from *Dusun Siyut (Tulikup Village)* to *Gumicik Beach (Ketewel Village)*.

3. Overview of LTZ

LTZ with the area of ±4.577 Hectare consists of 9 (nine) villages in the administrative area of Sukawati Sub-district (*Candra Asri/Batubulan, Ketewel, Sukawati*), Blahbatuh Sub-district (*Saba, Pering, Keramas, Medahan*) and Gianyar Sub-district (*Lebih and Tulikup*). The delineation boundaries of the LTZ are as follow, bordering north by the administrative area of *Dusun Sasih* (except tempekan *Candra Asri*), *Batubulan Village, Batubulan Kangin Village, Guwang Village, Celuk Village, Batuan Village, Kemenuh Village, Blahbatuh Village, Belega Village, Abianbase Village, Serongga Village, Banjar Pande, Tulikup Village, bordering east with the *Klungkung* Regency, bordering south by the *Badung* Strait and to the west bordering the Denpasar City area. For more details, an Overview of LTZis described in Figure 1.
4. Geographical Conditions of the Research Area

The study area has a sloppy topography (lowland and coastal plains) with good land suitability for agricultural and non-agricultural activities. Lebih Tourist Zone (LTZ) mostly consist of beach/coastal areas, and thus based on oceanography, the environment is affected by tides. Beaches along LTZ are lowland coastal areas with a coastline of 14.95 km (RDTR, 2013) that stretch from west to east which are located along the LTZ. In this area, there are no Sad Kahyangan temple, but there are 10 Kahyangan Jagat temple and 3 of them are Dang Kahyangan Temple namely Erjeruk Temple, Masceti Temple and Tengkulak Temple.

5. Transportation Network Conditions

Lebih Tourist Zone (LTZ) are crossed by two national roads, namely Tohpati-Sidan Street and Tohpati-Kusamba/Ida Bagus Mantra Street and it also split by a Provincial Road namely Ketewel-Sukawati Street. The national road located in the research area is part of Tohpati Kusamba (Jl. IB. Mantra) Street with a road length of 15,899 km from Tohpati to Siyut Beach.

6. The Utilization of Lebih Tourist Zone Area

The form of land use that has occurred in Lebih Tourist Zone (LTZ) among others:

a. Settlement Activities

Because of its natural potential, LTZ is targeted by the developers/investors as a place to build settlements and villas, especially for foreigners/outsiders. The area which is in a great demand is mainly situated along the coast, and the land around the view of rice fields and river banks. The physical and
The panoramic attraction has the potential to be an alternative location for developing new settlements and tourism/recreational settlements.

b. Wetland/Rice Field Farming Activities

Agricultural activities, especially food crops dominate land use in LTZ (reaching 55.32% of the total area). The widest use of agricultural land/rice fields can be found in Pering Village, Sukawati Village, Saba Village, and Keramas Village, while the smallest land use for rice fields can be found in Lebih Village. Meanwhile, the highest conversion of agricultural land into settlements occurred in Pering Village and Ketewel Village. While the threat of conversion to tourism accommodation occurs mainly in the villages of Ketewel, Sukawati, Saba, Keramas, Medahan, Lebih, and Tulikup. Rice fields designated as green lines are found in Saba and Pering villages. The average rice field area are situated in the southern part of the residential area that stretches from west to east. The existence of the Tohpati-Kusamba Primary Arterial Road, which crosses this LTZ area, almost entirely cuts off areas that were previously used as rice fields.

c. Dryland/ Moor Farming Activities

Dryland/ moor farming activities in the study area are situated along watershed or river banks and certain places which do not have irrigation networks, with gradient slopes of between 0 and 450 and generally planted with plantation crops. The plantations in question are plants that are cultivated on the ground such as; coconuts, fruit plants, tobacco and senggo wood plants which are limitedly developed. Dryland or tegalan are generally managed in a traditional manner instead of in an intensive way. The areas which dominated by dryland/ tegalan agricultural activities are Saba Village, Sukawati Village and Ketewel Village.

d. Fisheries Activities

This activity covers fishing as done in Br. Gumicik-Ketewel Village, Br. Saba-Saba Village and Br. Lebih Beten Kelod-Lebih Village. This activity has survived, along with the existence of a dining business that sells a menu of processed seafood. While the activity of shrimp farming takes place along the coast of Gumicik Beach, Purnama Beach, and Siyut Beach, has ceased.

e. Mining Activities

Mining activities on a small scale, namely the collection/ extraction of decorative stones that are widely available at Masceti Beach (Medahan Village), Lebih Beach (Lebih Village) and Siyut Beach (Tulikup Village). This activity does not use land permanently but it only uses the area on the beach for shelter and as a place to put decorative stones that have been collected. Nevertheless, this activity certainly has other impacts on the environment, besides creating the impression of slums in the area/region, this activity also brings a negative impact on the environment. In addition, this activity triggers beach abrasion, and therefore it is prohibited (for example in Masceti, Keramas Village), however, some people still carrying out such activity due to economic needs.

f. Trade and Service Activities

Trade and service activities tend to develop along the Tohpati Kusamba Primary Arterial Road and along the coast. In addition, in the corridor of the Cucukan-Lebih Village, tourism support facilities have also developed, as a result of the construction of Safari Park Attractions.

g. Tourism Activities

Tourism activities are mostly in the form of beach tourism which stretches from west to east, namely: Candrasrni Beach in Batubulan Village, Ketewel Beach, Gumicik Beach, Manyar Beach and Pabean Beach in Ketewel Village, Rangkan Beach and Purnama Beach in the Sukawati Village administration area, Saba Beach in the administrative area of Saba Village, Keramas Beach in Keramas Village, Masceti Beach and Cucukan Beach in Medahan Village, Lebih Beach in Lebih Villages, Siyut Beach, Gumicik Beach, Saba, Selukat and Masceti (Keramas Village), Lebih and Siyut Beach in Tulikup Village.
7. Distribution of Tourist Attractions

The distribution of tourist attraction in the 2018 research area is described in Figure 2.

![Figure 2. Detailed Layout of the Lebih Coastal Zone](image)

Source: Spatial Plan for Gianyar Regency, Detailed Spatial Plan for Lebih Tourist Zone, 2013

8. The Form of Land Use along the Gianyar Coast after designated as LTZ

The development of Lebih Tourist Zone (LTZ) began to be identified since 1993. In the period of 1993-2018, LTZ experienced significant changes, both physically (the amount of development/land conversion), and non-physical (changes in the level of the economic, social and cultural life of the community)[3]. Several phases of land-use transformation are illustrated below.

a. The Land Use in the Period of 1988-1993 (before being designated as a tourism area)

The use of LTZ land in the period of 1988-1993 was generally dominated by open land/no building, namely agriculture/rice fields, dry land, and the existing buildings were semi-permanent. There is no significant land conversion in this period. The area also does not have an arterial road infrastructure network and is only linked by several local roads that connect the rural area to the city. The map of LTZ land use in the research area in 1993 based on agency data, observations, and interviews are outlined in Figure 3.
The percentage of change in land use in the region can be seen in Table 1.

Table 1 The Changes in Land Use in the Research Area (1988-1993)

| No | Land use     | 1988 Area (ha) | 1988 Percentage (%) | 1993 Area (ha) | 1993 Percentage (%) | Change Area (ha) | Change Percentage (%) |
|----|--------------|----------------|----------------------|----------------|----------------------|------------------|-----------------------|
| 1  | Paddy Field  | 598,313        | 85.45                | 598,313        | 85.45                | -                | -                     |
| 2  | Dry Land/ moor | 36,635        | 5.23                 | 42,806         | 6.11                 | (6,170)          | (0.88)                |
| 3  | Others       | 65,237         | 9.32                 | 59,066         | 8.44                 | 6,170            | 0.88                  |
|    | Total Area of Open Land | 700,185 | 100.00            | 700,185        | 100.00              | -                | -                     |

Source: Data processed by [5]

b. The Land Use in the Period of 1993-2002 (after being designated as a tourism area)

In order to maximize the potential of the region as a tourist destination, in 1993 the Bali Provincial Government established a tourism area in the research area through SK of Governor of Bali Number 528 of 1993 concerning 21 Tourist Regions in Bali. The development of tourism in this region began to grow and develop, as community activities changed as a result of tourism. This is marked by massive construction of villas/tourist accommodation, especially in the zone designated as a tourist attraction (beach), among others that occur in the Village of Saba, Medahan, and Pering. Changes in land use that occur in this period are presented in Table 2.
Table 2. The Changes in Land Use in the Research Area (1988-1993)

| No | Land use             | Area (ha) 1993 | Percent (%) 1993 | Area (ha) 2002 | Percent (%) 2002 | Change Area (ha) | Change Percent (%) |
|----|----------------------|----------------|------------------|----------------|------------------|------------------|--------------------|
| 1  | Paddy Field          | 482,103        | 68.85            | 476,375        | 68.04            | (5,728)          | (0.82)             |
| 2  | Dry Land/ moor       | 61,704         | 8.81             | 62,202         | 8.88             | 0.498            | 0.07               |
| 3  | Settlement           | 51,087         | 7.30             | 53,216         | 7.60             | 2,129            | 0.30               |
| 4  | Commerce and Service | 7,450          | 1.06             | 7,525          | 1.07             | 0.075            | 0.01               |
| 5  | Other                | 97,841         | 13.97            | 100,867        | 14.41            | 3,026            | 0.43               |
|    | **Area of Open Land**| **641,648**    | **91.64**        | **639,444**    | **91.33**        | (2,204)          | (0.31)             |
|    | **Area of Built Land**| **58,537**    | **8.36**         | **60,741**     | **8.67**         | **2,204**        | **0.31**           |
|    | **Total**            | **700,185**    | **100.00**       | **700,185**    | **100.00**       | **0.000**        | **0.00**           |

Source: Data processed by Badan Pusat Statistik (Bali), 2015

In the 1993-2002 period, the conversion of agricultural land into non-agricultural land began to occur, including settlements, trade and services, although such conversion is only at a relatively minimal percentage. The conversion mainly occurs in Kusamba Tohpati arterial road. Based on agency data, observations and interviews conducted, the development of land use in LTZ in 2002 was presented in Figure 4.

c. The Land Use in the Period of 2002-2012 (after the enactment of SK of Gianyar Regency No. 227/2002 concerning Detailed Spatial Plan (RDTR) of Lebih Tourist Zone)

In this period, the Government of Bali Province carried out the construction of the Tohpati-Kusamba Primary Arterial Road based on SK of Governor No. 16/2002 [1], regarding the RDTR of the area along the Kusamba Arteri Tohpati Road which has the same delineation area in Gianyar Regency as the LTZ. In this period, the Government of Bali Province carried out the construction of the Tohpati-Kusamba...
Primary Arterial Road based on SK of Governor No. 16/2002, regarding the RDTR of the area along the Kusamba - Tohpati Arterial Road which delineates the planning area in the Gianyar Regency area as the delineation of MPA. The observations show that the development of tourist accommodation grows rapidly which spread along the Tohpati Kusamba Arterial Road and in rice fields along Lebih Beach. This happened dominantly in the Coastal Village such as Medahan, Saba, Keramas and Lebih. The types of tourist accommodation built are private villas, hotels, and guesthouse. The changes in land use are presented in more detail in Table 3. Meanwhile, the developments of land use in LTZ at the end of 2012 can be seen further in Figure 5.

Table 3. The Changes in Land Use in the Research Area in 2002-2012

| No | Land use          | 2002 Area (ha) | 2002 Percentage (%) | 2012 Area (ha) | 2012 Percentage (%) | Change Area (ha) | Change Percentage (%) |
|----|-------------------|----------------|----------------------|---------------|----------------------|------------------|-----------------------|
| 1  | Paddy Field       | 476,375        | 68.04                | 428,508       | 61.20                | (47,867)         | (6.84)                |
| 2  | Dry Land/ moor    | 62,202         | 8.88                 | 82,801        | 11.83                | 20,599           | 2.94                  |
| 3  | Settlement        | 53,216         | 7.60                 | 78,588        | 11.22                | 25,372           | 3.62                  |
| 4  | Commerce and Service | 7,525     | 1.07                 | 22,013        | 3.14                 | 14,488           | 2.07                  |
| 5  | Other             | 100,867        | 14.41                | 88,275        | 12.61                | (12,592)         | (1.80)                |
|    | **Area of Open Land** | 639,444   | **91.33**            | **599,584**   | **85.63**            | **39,860**       | **5.69**              |
|    | **Area of Built Land** | 60,741    | **8.67**             | 100,601       | **14.37**            | **39,860**       | **5.69**              |
|    | **Total**         | 700,185       | **100.00**           | 700,185       | **100.00**           | 0.00             | 0.00                  |

Source: Data processed by Badan Pusat Statistik (Bali), 2015 [3]

- Built area kept growing inline with changes in land use took place across the LTZ.
- The completion of Jalan Arteri Tohpati-Kusamba in 2008 has resulted in the development of new growth points. This circumstance has triggered the development of new settlement and commercial area that diminished land used for rice growing activities.
- The tendency of land use change grew annually and reached its peak in this period.
- Land use for commercial activities happened rapidly along the jalan arteri Tohpati Kusamba and along the LTZ's coast.

Figure 5. Land Use in the Research Area in 2002-2012
Source: Site observation
**d. The Land Use in the Period of 2012-2018 (after the enactment of Governor Law No. 16/2012 concerning RTRW Gianyar Regency until now)**

Table 4. Changes in Land Use in the Research Area (2012-2018)

| No | Land use          | Area (ha) 2012 | Percenta (%) 2012 | Area (ha) 2018 | Percenta (%) 2018 | Change Area (ha) | Percenta (%) Change |
|----|-------------------|----------------|-------------------|----------------|-------------------|------------------|---------------------|
| 1  | Paddy Field       | 428,508        | 61.20             | 318,660        | 45.51             | (109,848)        | (15.69)             |
| 2  | Dry Land/moor     | 82,801         | 11.83             | 158,560        | 22.65             | 75,759           | 10.82               |
| 3  | Settlement        | 78,588         | 11.22             | 79,411         | 11.34             | 0.824            | 0.12                |
| 4  | Commerce and Service | 22,013     | 3.14              | 54,830         | 7.83              | 32,817           | 4.69                |
| 5  | Other             | 88,275         | 12.61             | 88,724         | 12.67             | 0.448            | 0.06                |

**Area of Open Land**: 599,584 (85.63%) to 565,943 (80.83%) (33,641) (4.80%)

**Area of Built Land**: 100,601 (14.37%) to 134,242 (19.17%) (33,641) (4.80%)

Total: 700,185 (100.00%) to 700,185 (100.00%) (0.00) (0.00)

Source: Data processed by Badan Pusat Statistik (Bali), 2015 [3]

Governor Law Number 16 of 2002 concerning the Detailed Spatial Plan (RDTR) for the land along the Tohpati-Kusamba Arterial Road, stipulates that almost all of the southern part of the Tohpati-Kusamba Primary Arterial Road is a Green Open Space. This area has a 0% Building Base Coefficient, 200 meters thick from the road. However, this provision does not apply to the construction of public infrastructure supporting the security of road functions. In a further development, Gianyar Regency DPRD Decree Number 12 of 2010 stipulated that the ban on buildings on along the lane of the road in the Gianyar Regency area, especially on coastal access roads had triggered physical developments in the research area.

Figure 6. The Map of Land Use in the Research Area 2018
Source: Processed satellite image, 2018
In the current period, development progress has increased along with the growth of economic activity along the Tohpati-Kusamba Arterial Road, and thus land use in the region will continue to experience changes due to the ease of accessibility and developers' interest in investing their capital. The ease of accessibility also encourages the proliferation of tourist accommodation developments that are scattered in almost all research areas. The locations that are excellent for this purpose are villages of Medahan, Saba, Keramas and Lebih. The land conversion creates a pressure on the environment within the research area and therefore, it must be controlled in the future and we have to find solutions to minimize problems related to environmental sustainability. Table 4 presents changes in land use in the research area in 2018.

Data shows that more than 50% of the area is productive wetland found in almost all villages in the research area, including in Sukawati and Medahan Villages. Meanwhile, 50% of agricultural lands found in Saba and Lebih Villages are dryland/moor. Furthermore, land use for settlements reached a level (10-20)% which spread in Ketewel, Saba, Medahan and Keramas Villages. This function is predicted to grow further in the future. Trade and service activities reached 10% - 15%, which occurred in Keramas, Lebih, Medahan and Ketewel villages. The map of land use in KPA can be seen in Figure 6.

9. Factors Affecting Changes in Land Use along the Gianyar Coast after being designated as LTZ

The changes in land use that occur in the research area cannot be separated from various factors that influence the development of this region. These factors include land physical conditions, economy, institutions and accessibility. This formula is based on the results of field observations, information obtained through interviews with people who exploit land in the research area.

a. Land Physical Conditions Factor

Physically, the existence of the coast is very important for people's lives, especially related to social and cultural activities. In addition, a beach is also a place for recreation, sightseeing, swimming, fishing, and so on. A large number of community activities in some parts of the coast provides an opportunity for the surrounding community to carry out various businesses including marine fisheries, fishponds, fishing, and so on. These activities are the result of the creativity of the community in utilizing the geographical and physical potential offered by nature to become a source of livelihood. This condition has encouraged the use of coastal land for seafood restaurants. The beachside food stalls which were originally built as a base began to be organized and managed by the community and the Desa Adat or customary village. This condition has given rise to a new identity for the Lebih region as a seafood culinary destination.

Naturally, LTZ does have a diverse natural appeal - panoramic sea with Nusa Penida view, sunrise, rice fields, tourist villages, safari parks, arts, surfing locations with big waves, rural atmosphere, agriculture and so on. This basic physical potential strongly supports the development of various tourism activities, such as coastal recreation, agro-tourism, nature tourism, water tourism, and sports. This potential supports the establishment of the region as a tourist destination. This determination is expected to be able to develop the southern region of Gianyar as the center of economic growth. However, this determination implies a shift in functions and utilization of regional spaces.

The data presented at the beginning has shown the amount of agricultural land and empty land which are converted into building/residential houses. Native and beautiful nature, with a calming beach atmosphere which situated in a place relatively close from Denpasar City, is a consideration for migrants and developers to develop housing in this region. On the other hand, the geographical conditions of the region which are prone to abrasion encourage landowners (especially farmers) to change the function of their land or sell their land. Field observations show that the high level of land sale and purchase in the region has triggered the high rate of land-use conversion.

b. Economic Factor

The area can be used by local residents to improve their welfare by opening a business or by leasing their land for commercial activities. The land conversion due to economic reason in this area occurs rapidly. Most of the conversions aim to develop businesses by considering economic benefits. Strategic
location, many visitors, ease of loading and unloading, easy access, economic prospects, and the establishment of tourism areas, have become the dominant considerations that have triggered the rapid development of LTZ [7].

Besides that, land prices also give a big influence. Before the construction of the Tohpati-Kusamba Primary Arterial Road, most of the land was owned by local residents and most of them were agriculture with relatively low prices (Rp. 15-20 million/100M²). After the construction of road infrastructure, the economic value of land has increased significantly (reaching Rp. (150-500) million/ 100M²). At the same time, farmers see agriculture as a non-competitive sector which cannot fulfill their basic needs. This condition has led to a rampant sale and purchase of land which in turn has triggered land conversion. This condition was harnessed by investors who came to open hotel/villa businesses. Land speculation is also a trigger in the emergence of this situation, due to the high demand for land by investors and/or developers. The land market is also enlivened by a large number of local people who become land brokers and make it a profession.

c. Institution Factor

The institutional factors in question are policies in spatial use, those issued by the government at the provincial level, the district level and the village level. The government plays a role in determining the direction of the development of a region through the rules set as guidelines and the basis for the growth and development of a region and the activities within it. However, there are some obstacles in the implementation. For example, there are some cases where space used not in accordance with the allotment/zoning. The green lane policy along the coast of Gianyar as stipulated in Bali Provincial Regulation No. 16 of 2009 concerning the Spatial Plan (RTRW) of the Province of Bali in 2009-2029 [4], considered to be detrimental to the existence of coastal areas which have been very potential in developing tourism in this region. The aspirations of the community to utilize the coastal area of Gianyar Regency are quite substantial. Consequently, in this period, there were many constructions which did not have permits, especially those located on the south side of the road.

Gianyar Regency DPRD Decree Number 12 of 2010 finally revised the provisions of this green line. This decree states that the prohibition on constructing buildings along the lane of the road in the Gianyar Regency area, especially on road access to the coast will be revoked. This decision triggered the physical development of the Gianyar Coastal area. Ideally, the use and development of this area must follow policies related to spatial planning and licensing requirements that follow the rules for utilizing space for the buildings constructed, such as the Building Base Coefficient rules, road borders, river borders, beach borders and efforts to control the use of space through the existence of green open spaces.

d. Accessibility Factor

Accessibility in an area/region is influenced by one of the developments in transportation technology [8]. Roads as one of the transportation infrastructures play an important role in the development of a region. The road network will provide various impacts or changes that will arise due to the accessibility of the road infrastructure, creating physical connectivity of the region to other regions. Likewise, the existence of the Tohpati-Kusamba Arterial Road that crosses the research area provides easy interaction between regions in this area. Tohpati-Kusamba Arterial Road was built in a period of 15 years (1993-2008), which covered three regency/city areas, namely Denpasar City, Gianyar Regency and Klungkung Regency with a road length of 26.2 km. This arterial road passes through the area designated as LTZ (Figure 7).

Before the construction of the Tohpati-Kusamba Primary Arterial Road in the research area, the road network that available was the Denpasar-Sukawati-Blahbatuh-Gianyar-Klungkung-Padang Bai Arterial Road and local roads that connected villages and sub-distRICTS. The accessibility offered by the Tohpati-Kusamba Arterial Road and the establishment of LTZ eventually boost the development of tourism activities in the research area. Tourism distribution from the southern Bali region (Nusa Dua, Kuta, and Sanur) towards the eastern part of Bali, transportation predominantly utilizes the Tohpati-Kusamba Arterial Road rather than the Denpasar-Sukawati-Padang Bai arterial Road.
The new road network provides better access to the research areas, thereby encouraging the emergence of new activities that have an impact on the reduction of agricultural land/rice fields. Almost all types of existing activities related to rice fields and the moor around the area along the Tohpati-Kusamba Arterial Road has changed. This shows the role of accessibility as a trigger for land use around the surrounding area. The pattern of land use along the Tohpati-Kusamba Arterial Road follows the direction of the road, dominated by commercial activities such as trade, services, tourist accommodation, industry/warehousing and public services.

Trading/service activities began with the emergence of small shops managed by local residents. Some developers use the lands to build housing, land plots, shop houses, offices and various business places such as gas stations, cargo/warehouses, workshops, shops with specific merchandise specifications, building material/material business, cement industry and so on. Restaurant/food court and art shop businesses also grow rapidly. The construction of hotel/guesthouse and villas, both in the existing rice fields and on the beach edges, also spread in the research area.

10. The Impact of Changes in Land Use along the Gianyar Coast to the Sustainability of LTZ

The changes in land use that occur along the coast of Gianyar certainly have an impact, both positive and negative. The impact of these land-use changes on the sustainability of LTZ will be outlined based on three pillars of sustainable development, namely ecological, economic and socio-cultural.

a. Ecological

The ecological impact of the development of land use in LTZ shows negative implications. LTZ vulnerability to the dangers of beach abrasion with relatively large waves has resulted in changes in the coastline. This process is followed by a sedimentation process that has the potential to cause silting of the coastal area. If this condition is not addressed immediately, the beach abrasion will get worse and threaten the functions along the LTZ. This condition also disrupts the daily activities of the fishermen. In addition to these natural factors, human interventions that do not provide sufficient space for the balance of the dynamic process of the coast, and other activities that change the pattern of tides and waves have caused a decline in the coastline. These facts certainly threaten the existence of various infrastructure and buildings along the beach. In addition to the danger of beach abrasion, other impacts...
that need to be addressed are waste and the occurrence of sediment from the river and religious ceremonies.

Figure 8. Beach Abrasion in LTZ
Source: Observation, 2015

The development that violates coastal boundary provisions is also an important condition that exacerbates the impact of beach abrasion on LTZ sustainability (Figure 8). This circulation will also come into contact with the role of LTZ as a public space that can be utilized by the general public. As stated earlier, the coastal area is widely used as part of the cultural and religious processions of Hindus because some temples (and their sacred areas) are located along the coast. The mechanism of control and firmness in applying regulations on how the complexity of functions (including coastal ecological functions) is regulated (Figure 9).

Figure 9. Condition of Lebih Beach
Source: Observation, 2015

b. Economic Sustainability

The changes in land use at the LTZ contribute great support for the sustainability of the economic sector. The establishment of LTZ itself initially aims to improve regional economic growth and land utilization for tourism accommodation such as hotels, villas, and guest houses, trade, restaurants, and others with the view to gain economic benefits from the designation of the area as a tourist area (Figure 10). The rise of services or offers in the fields of trade and services, restaurants and hotels can be perceived by looking at the increasing number of people who are involved in or working in these fields. The interview results show that from 2011-2015, 50% of the respondents received new jobs; shift (from farmers/farm laborers); and increase employment in trade and services, restaurants and hotels (Table 5).
Table 5. Changes in Land Use in the Research Area (2012-2018)

| General Work Field in the Year 2000 | Number Based on Work Field (People) |
|------------------------------------|-------------------------------------|
|                                    | 2010      | 2011      | 2012      | 2013      | 2014      | 2015      |
| Agriculture, Plantation, Forestry and Fisheries | 672.204   | 556.615   | 572.685   | 545.827   | 38.098    | 39.268    |
| Mining & Excavation                | 7.042     | 12.635    | 7.637     | 9.066     | 0         | 597       |
| Processing industry                | 303.589   | 290.132   | 311.225   | 320.555   | 58.866    | 48.879    |
| Electricity, Gas and Water         | 3.952     | 6.859     | 6.347     | 9.155     | 0         | 570       |
| Construction                       | 144.041   | 185.705   | 185.764   | 211.093   | 19.485    | 29.844    |
| Commerce, Restaurants and Hotels   | 571.274   | 596.527   | 625.302   | 628.585   | 76.346    | 100.304   |
| Transportation, Warehousing and Communication | 95.202   | 81.744    | 85.711    | 72.764    | 11.745    | 9.261     |
| Finance, Insurance & Building Rental Business | 58.832   | 83.281    | 83.876    | 93.368    | 7.727     | 7.461     |
| Community, Social and Individual Services | 321.222 | 391.376   | 390.161   | 383.484   | 53.520    | 47.595    |

Source: Badan Pusat Statistik (Bali) of Gianyar Regency

In analyzing the impact of land use conversion on the economic sector, it can be described through analysis of land status and value hierarchy, which is described as follow.

1. Based on land status, the research area is classified as an area with high potential to be converted because it has land suitability, both for agriculture and non-agriculture. This condition has the potential to increase the economic value of land, especially those directly adjacent to the road and coast.

2. The preserved land will affect the economic dynamics that are owned and viewed as assets in development planning and their utilization must be guided by the applicable spatial plan.

3. Land value hierarchy related to the use and exchange value. The value of use (use-value) of land in LTZ is driven by community needs, especially for settlements, trade, and services. While the exchange value is the value of a land investment based on the calculation of the profits that can be obtained from the land purchase value. This is what underlies the practice of land speculation at the research area.

c. Socio-Cultural Sustainability

Almost all of the beaches in LTZ are used as a place to held nganyut and melasti religious activities, especially for the Hindu community. The development of land use in LTZ will have an impact on the sustainability of these socio-cultural activities. The transfer of land which provides space for cultural activities will be an attraction that supports the development of LTZ as a tourism area. Otherwise, the land conversion will have a negative impact[7,9,10]. The development of LTZ aims to synergize aspects of local culture with land use so that negative impacts can be minimized. The potential negative impacts that are likely to occur are: disruption of the existence of Parahyangan and the sanctity of temples along the LTZ; the impact on Pawongan, namely the occurrence of a cultural shift that might lead to inter-cultural conflict which implies a harmonious relationship between community members; and the impact on Palemahan, where land ownership, especially which are located along the Arteri Tohpati Kusamba...
Road and along the coast has implications for the physical order of the area which certainly requires regulation and control regarding border violations (beaches, rice fields, tegalan, valley, cliffs, etc.).

11. Conclusion

The forms of land use along the Gianyar Coast after being designated as LTZ are dominated by the agriculture/rice field sector and dryland/moor. During this period, the development of the region tends to be static so there is no significant change in land use. In the period of 1993-2002, changes began to occur, where agricultural lands shift into settlements. The construction of the Kusamba Tohpati arterial road that occurred during this phase also encouraged the beginning of land use for trade and service functions. The enactment of SK of Gianyar Regent No. 227/2002 on the RDTR LTZ (2002-2013) and the completion of the Tohpati-Kusamba Arterial Road (1993-2008) have resulted in the emergence of new growth poles, especially for settlements and trade and services. This has an impact on the decline in land area for agriculture. The enactment of Governor Law No. 16/2012 concerning RTRW of Gianyar Regency which serves as a guideline for regional spatial planning law in Gianyar Regency increasingly supports the physical developments in the research area. This condition has reached its peak in 2018.

The factors that influence changes in land use along the Gianyar Coast after being designated as LTZ, among others: land physical factors; economic factors; institutional factors and government policies that establish land direction and use in LTZ through spatial planning regulations that become a reference for the community in utilizing land and providing stimulants for the region to continue the development; accessibility factors, namely the existence of the Tohpati-Kusamba Arterial Road that crosses the research area provides easy access between regions in the area.

The impact of change in land use along the Gianyar Coast on the sustainability of LTZ has been analyzed based on three pillars of development, namely: ecological sustainability (violation of coastal border lines, violation of temple sanctity radius and disruption to protected functions due to high beach abrasion rates); economic sustainability (tourism activities open employment opportunities in the field of trade and services, but the land value become increasingly expensive); socio-cultural sustainability (supports the development of the region as a tourism area, but has an impact on parahyangan (violation of temples/holy areas), pawongan (conflict/shift of cultural values), and pemahaman (violation of borders related to the existence of rice fields, moor, valley, cliffs and so on).

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