Community-based ecotourism planning in the intensive-used zone of Taman Nasional Bali Barat, Gilimanuk, Jembrana

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Abstract. Taman Nasional Bali Barat (TNBB) is conservation area for many species including a protected bird species of Curik Bali (Leucopsar Rothchildi) and the ecosystems of the park is vulnerable so that it requires to be protected. To develop the region, especially a conservation area, we need a balance ecosystem management while providing benefits to the local community. The objectives of this study were inventorying a physical, social, economic and cultural resources of the park and at the same time planning the area by considering a balance between environmental protection and providing benefits for the community. Our focus area was on the national park management unit I (SPTN I) of intensive-used zone (iz). This research was conducted with the survey method through several stages. Firstly, inventory by conducting observation, interview and literature study. The second stage was analysis-synthesis phase by implementing SWOT analysis and spatial analysis. The last one was planning stage by selecting program and priorities and implementing it into spatial zoning. Based on our analysis, there were four buffer villages found in the area (Blimbingsari, Ekasari, Gilimanuk, Melaya) with five types of forest ecosystems (tropical rain forest, mangrove, monsoon, savannah and coastal forest). We develop the area into two area namely main area and supporting area with proportion of 31% main area and 66% supporting area. In main area, it characterized as community independently managing an ecotourism enterprise. In contrary in supporting area, it characterized as community depend on ecotourism enterprises while they might work in private or regional or cooperative companies.

Keywords: community-based planning, conservation area, ecotourism, landscape planning, Taman Nasional Bali Barat (TNBB)

1. Introduction
Taman Nasional Bali Barat (TNBB) is a national park located in western part of Bali islands which administratively located in two regency of Bali Province namely Buleleng Regency and Jembrana Regency. This area consists of two types of ecosystem i.e. terrestrial ecosystem (land basis) and aquatic ecosystems (water basis). The park is also a place or a hotspot for biodiversity in Bali for both plants and animals especially initial and essential place of Curik Bali bird species (Leucopsar rothchildi) so that ecosystems of these critically endanger species need to be protected.[1]

Spatially, the park is divided into seven management zones i.e. core zone, protection zone (land and marine), intensive-used zone, religious, cultural and historical zone, special zone, and traditional zone.[2] Furthermore, the intensive-used zone was covered about 5,761.15 hectare or around 29.81% of the total area. According to government, this area is allowed to be developed with accordance to region's potential and resources and Gilimanuk is one region which is part of this area.
Currently, the Gilimanuk is well-known as a busy port in western Bali. There are many ferries crossing from Bali to Java backwards. Meanwhile, the area also eminent for local and international tourist communities as one that has beautiful scenery as well as recreation site. The scenery come from the beauty of the area’s vegetation which is part of savannah forest. It was also look interesting formation of mangrove along the shoreline adding heterogeneity to landscape beauty. However, the existence of the zone without good regional planning can lead to threats to the sustainability of the area in the future, such as waste, soil erosion and vegetation damage [3] as it happened in other national parks. The existence of the place which close to conservation area and community settlements is a motivating factor for planning the region by empowering the community with tourism potential. Therefore, this study aims to invent its biophysical and social resources and to plan intensive-used zone as ecotourism in line with regulation and existing activities so that the existence of the area not only has a role for the balance of the surrounding ecosystem but also it gives benefits the community so the area will remain to sustain.

2. Method

The research was carried out from March to September 2019. The observation site was located at intensive-used zone of TNBB, Management Unit I (SPTN I) of Jembrana, Bali, Indonesia (Fig. 1).

![Figure 1 Observation Site on Intensive-used Zone at TNBB](image)

This research was conducted by survey method through several stages, namely inventory, analysis-synthesis and planning stage. On the first stage, we collecting data by conducting direct observations as well as by interviewing staff of the park and local community in terms of area utilization activities. While, a site survey was conducted to determine the characteristics of the area such as environmental conditions, tourism activities and facilities. Furthermore, we also conducting literature study i.e. documents review obtained from the park office as well as reviewing on regulations and legislation related to the park management.

In the next stage, we then analyzing and formulating strategy using SWOT. Data were described and categorized based on four aspects of the SWOT (Strengths-Weaknesses-
Opportunities-Threats) and the four components were grouped into internal aspect (strengths and weaknesses) and external aspect (opportunities and threats) based on observation and secondary data collected,[1][4] The best strategies produced were formulated based on exploring opportunities and strengths, neutralizing threats and correcting weaknesses.[4] This process was resulting a concept in the form of strategies and programs obtained from SWOT analysis. Further, the strategies formulation was applied to the region with spatial analysis using GIS (delineating boundary, clipping and overlaying).

The last stage was planning stage. In this step, we determined the area base on concept which was decided as formulated strategies created previously. The zoning area was proposed in accordance with the existing potential and the selected program plans that are prepared.

3. Results and Discussions

3.1 Biophysical Characteristics of the Area

In general, the intensive-used zone was distributed in a long and circular form from north to south boundary which covers land and water areas. The focus area of this research was located in management unit 1 region (SPTN Wilayah 1). It consists of four buffer villages namely Gilimanuk, Melaya, Ekasari and Blimbingsari which belong to Melaya District, Jembrana Regency (Fig. 2).

![Figure 2. Spatial Distribution of Intensive-used Zone (IZ) in Melaya District, Jembrana Regency](image)

Based on spatial analysis, we found that the largest intensive-used zone was located in Gilimanuk village which cover about 3.91 km². Then, it followed by Ekasari village (1.7 km²) in the easternmost part. The small portion of the zone belong to Melaya village area which cover about 0.84 km² and Blimbingsari village about 0.02 km². It can be inferred from the statistical data [5] that the total administrative area of each village from the largest to the smallest respectively is Melaya village (60.74 km²), followed by Gilimanuk village (56.01 km²) and Ekasari village (15.26 km²). The smallest area was Blimbingsari village which covered an area about 4.43 km². Although Melaya was administratively covered the largest among four villages, but the total of intensive-used zone was only 0.84 km² or about 1.4% of the total area. In general, Blimbingsari village was the smallest among others administratively and functionally to serve as intensive-used zone.
Ecologically, the whole area was divided into land and water areas with terrestrial ecosystems ranging from tropical rain forests or evergreen forests, monsoon forests and savannahs. Further, the aquatic ecosystem expanding from mangrove forests, coastal forests, coral reef ecosystems, sea grass ecosystems, shallow marine ecosystems and deep sea ecosystems (Fig. 3). In addition, there are also types of ecosystems that are affected by climate, which are called zonal types and ecosystem types that are influenced by habitat or habitat climax or called azonal type.[6]

![Ecosystem Diversity in TNBB](Photo credit: TNBB)

Besides, the park also has a type of ecosystem which is mono type or homogeneous namely the formation of the small Sapodilla plant (*Manilkara kauki*). This plant often found around Prapat Agung, part of Gilimanuk. In addition to having ecological value for the park area, the small sapodilla plant also has a high economic value.

In animal diversity, the TNBB has four classes of wildlife found i.e. mammals (18 species), reptiles (18 species), amphibian (12 species), aves (205 species), butterflies (82 species) and fish (120 species)[2] Concurrently, there was an endemic species of bird which was rare and protected in TNBB namely Curik Bali (*Leucopsar rothschildi*). This bird species status was classified as critically endanger (CR) species because the population was decreasing and only found about 1-49 adult individuals [7] and its adaptability in the nature quite difficult even though it has been released.[6]

3.2 Social and Cultural Characteristics of Communities in Buffer Village Areas

TNBB as a whole were consist of six buffer villages, both traditional [8] or official village, at the same time four of which were belong to Jembrana Regency (Melaya Village, Gilimanuk Village, Ekasari Village and Blimbingsari Village) and two others belong to Buleleng Regency (Pejarakan Village and Sumberklampok Village) administratively. All four villages buffer area recorded as part of District of Melaya.

Based on statistical data of the district[5], Melaya village has the largest population with number of 10,520 inhabitants and then followed by Gilimanuk village with a total number of inhabitants about 8,352. Furthermore, the next largest populated area was in the village of Ekasari with a total inhabitatants about 4,025 and the last with the least population is the Blimbingsari village with 796 inhabitants. Similarly, the educational background of the
community characterized as low educated group because only 1.79% and 1.49% were graduated from higher education or university (undergraduate and postgraduate level). The rest of the population were graduated from elementary school or SD (38.8%), junior high school or SMP (17.86%) and senior high school or SMA (20.39%). Referring to data from the park [6], the livelihoods of the people in the buffer villages were mostly dominated by farmers or ranchers (33.7%) which were followed by self-employed (traders) as much as 9.88% and as other worker about 7.41%. Other type of livelihoods accomplished by local such as fishermen, civil servants or military or police and private employees, but they were in a smaller proportion.

The typical community in buffer village were characterized as heterogeneous in terms of ethnicity, religion, language, customs, culture, and socio-economy. Based on villager ethnicity from the population, Gilimanuk village consists the largest ethnics group to reach 13 namely Javanese, Balinese, Sundanese, Bugisnese/Makassarnese, Betawinese, Melayunese, Batakinese, Sasaknese, Ambonese, Papuanese, Sumbanese and Floresnese. In general, it mostly dominated by Balinese, Javanese and Sundanese ethnic. All of them were joined in several social and cultural organization.[6]

Furthermore, in harvesting forest resources, the community conducted some activity for example collecting firewood from broken or dead stems and branches, utilizing water springs in the forest to irrigate agricultural land and fish ponds and also harvesting seaweeds. While other onshore activities undertaken were utilizing conservation areas for ecotourism activities such as bird watching, tracking and also aquatic tourism such as diving, snorkeling (Fig. 4). Currently, there were around 8-13 ecotourism fostered groups among the buffer village. For the use of cultural and rituals activities, they also utilizing TNBB area for conducting prayers and cremation ceremonies for Balinese Hindus (Ngaben).

3.3 SWOT and Spatial Analysis
The results from SWOT analysis were formulated as many as 12 important strategies in managing of intensive-used zones. SWOT was implemented in zoning area as it has been applied to research conducted by researcher in developing tourist destinations at the level of the site [9] and accelerating development of a city.[10] The first strategy from SWOT analysis was a strategy composed by strengths and opportunities (SO) [4] where all strategies generally related to optimizing the role of human resources, optimizing the potential of owned landscape resources mainly in intensive-used zone, optimizing village unit-based community empowerment by zoning the space of each natural tourism activity inside the area, and expanding the park promotion network nationally and internationally. The second was the aspects from strength and threat (ST) which include strengthening the socio-economic
community through community empowerment in natural tourism management business activities, especially in public spaces, planning programs which were in line with central and local government programs, identifying early threats to conservation areas by collaborating with the community, government, educational institutions and implementing priority threat based management.

In addition, strategies also formulated to overcome weaknesses with opportunities (WO) by increasing revenue sources and maximizing management through cooperation with parties, enhancing and strengthening human resource capacity through training and personnel addition, area planning according to zones, implementing security cooperation patterns that are mutually beneficial between managers and communities around the park. The last one was strategy related to minimizing weaknesses and threats (WT) such as the establishing supervision and control in developing the intensive-used zone and also maximizing cooperation with local government officials in managing the park.

From twelve important strategies description in managing intensive-used zones of the park, there were several programs can be formulated i.e. internal program (IP) such as strategy to strengthen human resource capacity of the park such as comprehensive management planning to achieve sustainability of the area, formulating threat management strategy in collaboration with other parties and monitoring and evaluation on implementation of development of utilization zones. While external program (EP) consist of optimizing natural resources by zoning appropriate areas, village resource-based management planning, empowering buffer village communities especially community participation in public spaces and promotion and cooperation with stakeholder to increase fund resources.

### 3.4 Area Zoning Concept and Development

Based on analysis of strategies and programs outlined previously, it is necessary to develop programs related to zoning by formulating appropriate planning concepts. A Community-based ecotourism planning has an important role as a source of income for the surrounding community even though the amount is not too large.[11] This is also in accordance with the vision of the park itself where natural tourism and environmental services have a role for the welfare of the community around the area.[6][2]
There were two areas generated from spatial analysis i.e. the main area (Ma) and supporting area (Sa). The main area was selected based on the potential for greater community involvement in the intensive-used zone and vice versa.[12] The ratio between these areas was about 3:7 where the main area was covering about 31% area and the supporting area was covering about 69% area. The concept of this area was the main area as a typically operate as a business space while the supporting area typically operate as public space.

The supporting area were distributed in four village such as Gilimanuk, Ekasari, Blimbingsari, Melaya while the main area was distributed only in two villages like Gilimanuk and Melaya. Although the main area only covers a lower percentage than the supporting area, the area will have a significant impact if it is near or related to the protected area.[11] In forestry type, the supporting area consist six forest type i.e. savannah, mangrove, coastal forest, monsoon, tropical rain forest and plantation forest (HPT) while the main area consists of five forest type i.e. savannah, mangrove, coastal forest, monsoon forest and plantation forest (HPT). In the supporting area, the community able involved in an ecotourism business space as employees or workers from private/regional enterprise or cooperatives while in the main area they can directly been involved as an entrepreneur.

In terms of social community, although the number of inhabitants who lived inside the main areas having smaller number compared to them in supporting areas, but this large number may not necessarily provide greater benefits to the community as it acknowledge by researcher where the latest experience on ecotourism project explains that with a small number of communities able to produce (at most) cash benefits.[11] Further, it explained about other economic concern which related to determining difference between profits and revenues. Other researchers also revealed that a success in the conservation incentive model like local conservation impact determined by the incentive structure inherent in the model and the substitute or complementary model of other productive activities.[13] It means that it needs for labor arrangements as well as land allocation where recommendations are given to site-specific.

4. Conclusion
It can be concluded that the intensive-used zone (uz) of Taman Nasional Bali Barat in Management Unit I (SPTN Wilayah I) consists of four buffer villages, Gilimanuk has the largest of intensive-used zone area which occupied 3.91 km² or 6.9% of total area of village. There were five forest ecological types exist and socially the people from buffer village were characterized as low level on education while they were also described as multi-ethnical community.

The zoning formed into two zone i.e. main area (MA) and supporting area (SA) with the proportion 31% SA compared to 69% MA. The difference between them emphasized: the MA's was oriented to individuals with community empowerment concept while SA's oriented to private/regional/cooperative business entity with indirect community involvement (employees or laborers on ecotourism business).

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