Guidance for Designing the Master Plan for Mangrove Forest Conservation Areas by Implementing the Ecotourism Concept

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Abstract. JOINT BUSINESS GROUP Segara Guna Batu Lumbang is one of the groups fostered by the Denpasar City Fisheries and Food Security Service, which was given a recommendation to conserve Mangrove Forest covering an area of 963,253.34 m² at the Istuari Dam Dam Dam Sluice, Pemogan, Denpasar. This Mangrove Forest Conservation is planned to become a new Tourism Destination Area, but in its development there are many physical and non-physical needs that have not been planned properly, both from an architectural, social and economic perspective. This Community Service aims to compile a master plan that can make the Mangrove Forest Conservation Area a limited tourist destination, in order to increase the local JOINT BUSINESS GROUP's income. The method for implementing Community Service activities consists of four stages, the first is the preparatory stage where the administrative process; making survey documents; and tools and materials are prepared, the second is the data collection stage where primary and secondary data are collected to better understand and know the physical and non-physical conditions of the environment, the third is the data compilation and data analysis stage, and the last is the design stage where the ecotourism master plan is prepared. The results of the activity were in the form of directions for the preparation and design of a mangrove forest conservation area master plan, where based on the results of the FGD with partners, the concept of ecotourism as a development principle is very appropriate to be used as a reference for preparing the master plan design for JOINT BUSINESS GROUP Segara Guna Batu Lumbang.

Keywords: Denpasar; mangrove forest conservation area; ecotourism master plan.

Introduction

JOINT BUSINESS GROUP (Joint Business Group) Segara Guna Batu Lumbang is located in Pemogan Village, Banjar Gelogor Carik Neighborhood, Denpasar, By Pass Ngurah Rai Road, the edge of the DAM estuary mangrove forest. According to the JOINT BUSINESS GROUP Profile (2019), this fishermen group consisting of 47 people was first formed on August 20, 2005. The Segara Guna Batu Lumbang Fishermen Group has priority activities in the form of fishing (INKAPI/Intensification of Fishing). Having an area of ± 1000 m2, the Segara Guna Fishermen Group Batu Lumbang has a northern boundary: Tukad Badung/Environment Br. Gelogor Carik

Pemogan Village, East boundary: Pedungan Village, South boundary: Benoa Harbor, and West boundary: Kuta Badung Traditional Village. JOINT BUSINESS GROUP Segara Guna Batu Lumbang is one of the fostered groups from the Denpasar City Fisheries and Food Security Service, which was given a recommendation to conserve Mangrove Forest on the shore of the DAM estuary mangrove forest.

The location of JOINT BUSINESS GROUP Segara Guna Batu Lumbang which is strategic and close to Mangrove Forests, holds potential resources that can be developed as new Tourism Destination Areas. According to Damanik, et al (2022) Tourism Destination Areas as a product of the tourism industry have three important components, including tourists, tourist attractions, facilities at recreational destination locations, and affordability to recreational destination areas. The aspect of tourist attractions has of course been accommodated by the mangrove forest conservation area of JOINT BUSINESS GROUP Segara Guna Batu Lumbang, namely by utilizing the natural atmosphere of mangrove forests and swamps with all their unique flora and fauna. In addition to natural potential, cultural and social potential is also a mainstay of JOINT BUSINESS GROUP Segara Guna Batu Lumbang, where the culture of fishing in the traditional way (using*boat*, fishing rod*round*, *basic rawe, scatter*) and social traditions of fishing communities that work together on the basis of kinship can be the main attraction for visitors who come. By utilizing natural, cultural and social potential, the Segara Guna Batu Lumbang JOINT BUSINESS GROUP mangrove forest conservation area according to Yunana and Suweja (2021) is expected to become one of the popular tourist destinations in Denpasar City which provides economic benefits to members and the surrounding community.

Natural, cultural and social potential as a tourist attraction certainly requires good facilities and accessibility to support the area to become a DTW. These two aspects cannot be accommodated by JOINT BUSINESS GROUP Segara Guna Batu Lumbang. Based on the investigation by the COMMUNITY PARTNERSHIP PROGRAM TEAM in the field, there were several obstacles faced by partners, the first obstacle was that JOINT BUSINESS GROUP Segara Guna Batu Lumbang had not optimally utilized the site which is a mangrove forest area with all the uniqueness and wealth of biological natural resources it has, currently the mangrove forest area is only used as a mangrove nursery, fishing activities, and limited tourism that has not been well planned. The second obstacle is that there are still many tourist facilities that cannot be accommodated in the area, such as buildings for culinary areas, parking lots, proper boat and canoe docks, mangroves.*board walk, signage* and regional landmarks as photo spots, freshwater fish aquariums as locations*display* maritime diversity, monitoring towers, and worship facilities and religious activities. The third obstacle is that the circulation path within the site has not been well organized and planned, and the circulation path connectivity has not been properly accommodated.

Another obstacle facing the world of Indonesian tourism is the downturn due to the Covid-19 pandemic. Damanik, et al (2022) revealed that adaptation to new habits was also carried out in the world of the tourism industry by implementing health procedures such as*Clean, Higienis, Save Environment* and the obligation to comply with health protocols. According to Ashoer et.al, (2021) the government's appeal not to crowds at tourist sites was intensified as an effort to prevent the emergence of new sources of virus transmission from clusters of tourist objects. Tourism behavior has changed, where visitors prefer open tourist sites that blend with nature and with the application of good health

procedures. Tourism industry actors in this case are required to change the direction of their tourism development, from mass tourism with high opportunities for visitors to flock to quality tourism that is more sustainable (Prasandya, 2022).

Based on the constraints or problems faced by JOINT BUSINESS GROUP Segara Guna Batu Lumbang's partners and the constraints of the world of tourism due to the Covid-19 pandemic in general, the Community Service team was moved to formulate directions for designing a master plan for the mangrove forest conservation area JOINT BUSINESS GROUP Segara Guna Batu Lumbang, to solve various obstacles faced by partners and world tourism to create new limited and sustainable forms of tourist destinations. In line with the tourism program made by the government and the physical and non-physical conditions of the mangrove forest, the master plan for the mangrove forest conservation area of the JOINT BUSINESS GROUP Segara Guna Batu Lumbang will be based on ecotourism, because in ecotourism the number of visitors is strictly limited or regulated according to the carrying capacity of the environment and social culture of the community.

In addition, according to Prasandya (2022) ecotourism development can provide financial benefits and empowerment for local communities by creating tourism products that prioritize local values. Due to the absence of human resources in engineering and management, especially Architecture, Civil Engineering and Business Management at JOINT BUSINESS GROUP, the partners, namely JOINT BUSINESS GROUP (Joint Business Group) Segara Guna Batu Lumbang, through the JOINT BUSINESS GROUP Treasurer, contacted the proposing party (Warmadewa University) to help in the form of community service.

Methods

A qualitative descriptive method is used by describing in writing the results of a field survey regarding the physical and non-physical conditions of the area. Primary data collection through observation and secondary data collection from related literature and agency data is used to obtain data on potentials, constraints, and planning directions for the JOINT BUSINESS GROUP Segara Guna Batu Lumbang Mangrove Forest Conservation Area. Camera, GPS,*drone*, and a laser meter were used as primary data collection instruments. The four stages of activity to produce the formulation of the master plan design directions can be seen in Chart 1 below.



Figure 1 Stages of Masterplan Formulation Activities

The primary and secondary data that have been successfully collected are then analyzed to determine the physical and non-physical conditions of the area as well as directions for the development of the area based on the problems and needs of partners. The results of the analysis will be followed up with an intensive discussion through*Focus Group Discussion* (FGD) with partners until the stages of the design process have been passed to realizing the direction of the regional master plan design in the form of pictures/graphics and writing. The role and participation of partners, in this case all members of the Segara Guna Batu Lumbang JOINT BUSINESS GROUP, are vital in providing input, criticism, and directions for the realization of a master plan design that is in accordance with the needs and expectations of all*stakeholder* related. The following is a documentation of the activities of the stages of data collection and FGD which were carried out after all primary and secondary data were successfully compiled and analyzed.



Figure 2 Data collection and FGD activities

After all the directions for designing the master plan were produced, then a handover process was carried out from the team to JOINT BUSINESS GROUP Segara Guna Batu Lumbang which became the service partner. The final stage is the evaluation and preparation of reports as a form of accountability for Community partnership program activities.

Results and Discussion

Based on the results of data analysis, the Segara Guna Batu Lumbang Mangrove Forest Conservation Area Master Plan that is designed must be able to solve the obstacles faced by partners and tourism challenges after the Covid-19 Pandemic. The master plan that is designed architecturally must be able to accommodate the ongoing activities, the interests of social spaces, while taking into account the condition and environment of the Mangrove Forest so that it remains sustainable and natural. For this reason, based on the results of literature and literature studies, the concept of ecotourism is very appropriate to be used as a reference in the design and development of the area. The Ecotourism Master Plan for Mangrove Forest Conservation Areas for the Segara Guna Batu Lumbang Joint Business Group will make the Segara Guna Batu Lumbang JOINT BUSINESS GROUP area a form of a new tourist destination in Denpasar that is limited and sustainable both in terms of environment, economy, social and culture.

Ecotourism Concept as a Reference for Master Plan Design

Ecotourism according to Fennel (1999) is an activity of tourist trips to natural areas that are carried out with the aim of conserving the environment and preserving the life and welfare of the local population. According to the Ministry of Culture and Tourism as wellWorld Wide Fund for Nature-Indonesia (2009), mentions several key aspects in ecotourism, including (1) The number of visitors is limited or regulated to suit the carrying capacity of the environment and socio-culture of the community, (2) Eco-friendly tourism patterns, (3) Culture-friendly tourism patterns and local customs , (4) Directly helping the local community's economy, (5) The initial capital required for infrastructure is not large.

Judging from these key aspects, the characteristics of ecotourism are very different from mass/conventional tourism. The development of ecotourism is considered very appropriate because mass tourism is seen as having a negative impact, namely causing environmental degradation and

degradation of social, cultural, including economic values due to its development approach which only emphasizes economic factors without considering local environmental, social and cultural aspects (Akis, 2011). Prasandya's research (2022), has succeeded in formulating six criteria for ecotourism development, including environmental criteria, level of community participation, education, economy, socio-culture, and institutional. These six criteria will be used as the basis for the master plan design.

Environmental Criteria

Mangrove forests apart from being the main ecosystem supporting life that is important in coastal and marine areas, also have an ecological function as a provider of nutrients for aquatic biota, resisting abrasion; raging typhoons; and tsunamis, absorbing waste, and preventing seawater intrusion (Asyiawati and Akliyah, 2014). Mangrove ecosystems are also breeding grounds for various aquatic animals, such as fish, shrimp, crabs and mollusks (Karimah, 2017). Several types of vegetation that are often found in the conservation area of the Segara Guna Batu Lumbang mangrove forest such as mangroves (Rhizophora conjugata), white mangrove (Rhizophora apiculata), prapat (Soneratia Alba), orange (Acanthus ilicifolius), dan taruntum (Lumnitzera racemosa). Some types of fish that are found in conservation areas include milkfish, snapper, crab, julung-julung, and shrimp. Some of the many types of birds that are found among them are bondol's eagle, cuckoo, sea hawk, rice field owl, crow, heron, tekukur, and starling. The design of the ecotourism master plan besides being able to take advantage of these various potentials to make the Segara Guna Batu Lumbang JOINT BUSINESS GROUP area one of the new tourist destinations in Denpasar must also be able to maintain the sustainability and preservation of its various environmental potentials.



Figure 3 Environmental Potential of Mangrove Areas

Society participation

Local community in this case Group Segara Guna Batu Lumbang fishermen play an active role in every activity of the group, especially those concerning the preservation of the mangrove environment. Mangrove cleaning actions are carried out routinely every month, efforts to nurse mangrove plants continue to be intensified, as well as efforts to improve the quality of the area by managing the JOINT BUSINESS GROUP Segara Guna Batu Lumbang area continue to be carried out in stages. The local community is also directly involved in the management of transportation facilities in the form ofcanoe andboat which can be used by visitors to travel around the mangrove waters. The special social tradition of the fishing community and mutual cooperation based on family becomes its own attraction for visitors who come. Group Segara Guna Batu Lumbang fishermen as a local community of course also play an active role in providing directions and suggestions regarding the design of the ecotourism master plan, so that the resulting ecotourism master plan is in accordance

with the needs of the fishermen group and the entire community of mangrove forest conservation areas.



Figure 4 The Participation of Fishermen Groups as an Effort to Preserve Mangrove Areas

Source: facebook.com, 2022

Education

Efforts made by fishermen groups to increase visitors' understanding of the mangrove environment such as the accommodation of mangrove nurseries and freshwater aquariums. The mangrove nursery is used by visitors to understand more deeply the procedures for nursery and planting (cultivation) of mangrove trees. While freshwater aquariums are used to provide information to visitors regarding the types of fish found around the mangrove area. However, it can be regretted that these two facilities in terms of arrangement andsetting the location still needs to be improved to make the mangrove area a new tourist destination in Denpasar. The designed ecotourism master plan must be able to properly accommodate these two facilities.



Figure 5 Educational Facilities in Mangrove Areas

Source: facebook.com, 2022

Economy

The Segara Guna Batu Lumbang mangrove forest conservation area provides many financial benefits for local fishermen groups. Fishermen have succeeded in utilizing the pidada (Sonneratia caseolaris) and lindur (Bruguiera gymnorrizha) mangroves to be processed into food and beverage products such as mangrove jam, ladrang, keciput, and syrup. Various processed mangrove fruit products will be marketed to increase income/income fishermen's family. The design of the ecotourism master plan must accommodate space that can be used as a place for manufacturing and marketing mangrove tourism products. Apart from being able to improve the quality of the area, the

ecotourism master plan must also be able to provide financial benefits to the surrounding community through the provision of the tourist attractions offered.

Socio-cultural

Social and cultural potential is the mainstay of JOINT BUSINESS GROUP Segara Guna Batu Lumbang, where the tradition of fishing is done in traditional ways (useboat, fishing rodround, basic rawe, scatter) is still being carried out today. The tradition of fishing in the traditional way is carried out based on work groups for the sake of equal distribution of income, and can be a special attraction for visitors who come. Some of the catches are marketed to JOINT BUSINESS GROUP's partners in the form of fresh fish, and some are used as raw materials for the processing of pindang, crackers, shredded meat and meatballs as a joint venture with JOINT BUSINESS GROUP. In designing an ecotourism master plan, it must pay attention to the social and cultural aspects that have been carried out by JOINT BUSINESS GROUP members and accommodate each of these socio-cultural activities so that they can become tourist attractions that attract visitors to come to the mangrove forest conservation area.

Institutional

JOINT BUSINESS GROUP Segara Guna Batu Lumbang is a non-formal fishing organization based on the principles of kinship and mutual cooperation. Having a clear organizational structure and being fostered by the Head of the Denpasar City Livestock, Fisheries and Maritime Services Office, JOINT BUSINESS GROUP currently has good cooperation with the private sector and government agencies. Such as POKMASWAS (Community Monitoring Group) in coastal areas, HNSI (All Indonesian Fishermen's Association), and government officials. JOINT BUSINESS GROUP also has good work programs in the short, medium and long term. The design of the ecotourism master plan must be able to adjust to the work program that has been determined by the fishing group and the private sector as well as government officials that have been agreed upon by the JOINT BUSINESS GROUP.

Directions for Ecotourism Master Plan Design for Mangrove Forest Conservation Areas

Comprehensive arrangement of the Mangrove Forest Conservation Area through the design of an ecotourism master plan, by placing all buildings that can represent the functions, activities and needs of allstakeholder needed to strengthen the Mangrove Forest which will be managed by JOINT BUSINESS GROUP (Joint Business Group) Segara Guna Batu Lumbang, as a limited Tourism Destination Area that carries the concept of ecotourism. The vision adopted is the JOINT BUSINESS GROUP Segara Guna Batu Lumbang Mangrove Forest Conservation Area as a New Tourism Destination for Denpasar City with an Ecotourism Insight. The mission or strategy undertaken to create a mangrove forest conservation area according to the vision adopted is to plan and arrange the Segara Guna Batu Lumbang JOINT BUSINESS GROUP area to become a sustainable tourist destination both in terms of the environment; economy; social; as well as culture, and complete the functions/facilities that can strengthen the area as a tourist destination. The functions/facilities that will be accommodated in the Segara Guna Batu Lumbang JOINT BUSINESS GROUP area can be seen in Table 1.

The urban design framework is prepared as a scenario for structuring and planning tourist areas to facilitate formulating regional master plans. The city design framework also includes scenarios for tourist trips for visitors and tourist experiences that visitors will get in the mangrove forest conservation area. The Urban Design Framework for Mangrove Forest Conservation Areas is as follows. The Segara Guna Batu Lumbang mangrove forest conservation area with an area of 963,253.34 m² will be divided into five structuring spots. The first spot (radius 400m) is the visitor reception area. The second spot (200m radius) is the canoe tour short route, the third spot (300m radius) is the boat tour attraction route, the fourth spot (300m radius) is the boat tour detour, and the fifth spot (100m radius) is the boat tour return route.

At the first spot the green arrangement along the main road will be arranged, along with the visitor parking area.Landmark The area accommodated at this spot is a wharf which is uniquely and attractively designed.Anchor the area as well as the function of driving pedestrians in the form of culinary areas and pedestrian decks. The conservation function accommodated is in the form of a fish aquarium and a mangrove nursery. At spot two,anchor the area is in the form of natural views of mangrove forests with attractions in the form of photo spots and monitoring towers. At spot three,anchor area in the form of a guest house with points of attraction in the form of tours/water sports and a monitoring tower. While the conservation function that will be accommodated is in the form of fish cages. At point four,anchor the area is in the form of a mangrove tunnel and a turning area and a point of attraction in the form of a photo spot. At the five anchor spots the area is in the form of a mangrove tunnel and the attraction point is in the form of a monitoring tower. For more details, the urban design framework can be seen in Figure 1.

Tabel 1. JOINT BUSINESS GROUP Segara Guna Facilities Batu Lumbang Towards New Tourism Destinations

No	Criteria	Facility
1	Environment	*Landmark* Area Parking Spot Photo Dock *Signage* *Deck* Pedestrian Public Restrooms
2	Society participation	Water Travel Trails (Canoe and*Boat*)
3	Education	Conservation Zone (mangrove nurseries and fish cages) Aquarium Bird cage
4	Economy	Tourism Products Trade Area Culinary Area Water Sports Facilities *Guest House*
5	Socio-cultural	Arrangement of Worship and Religious Facilities
6	Institutional	Watchtower *Bale Bengong*

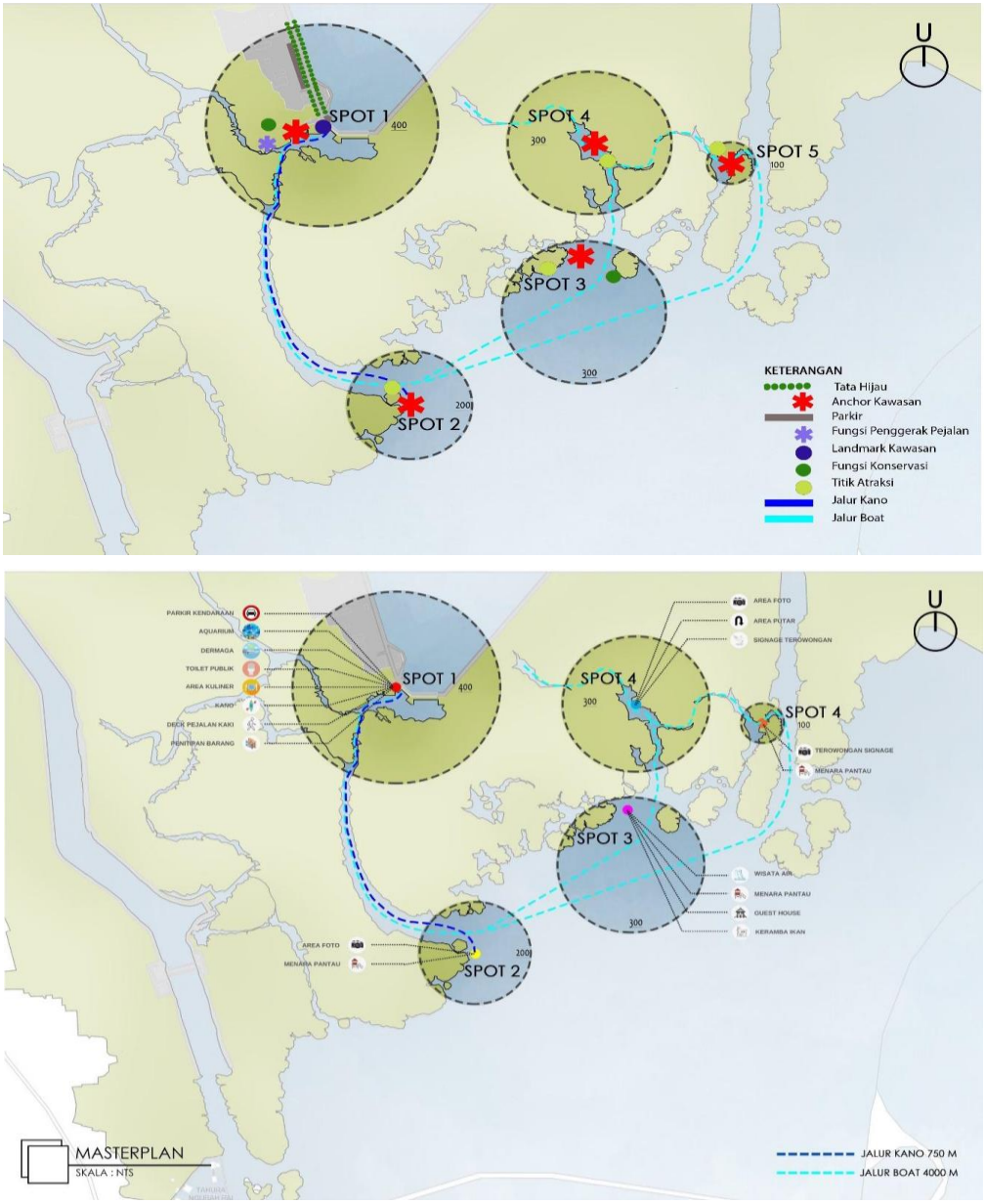


Figure 6 Masterplan Concept For Manggrove Forest

Based on the city design framework, the directives for the mangrove forest conservation area master plan were made to make the Segara Guna Batu Lumbang mangrove forest conservation area a new ecotourism-based tourist destination for the City of Denpasar. Development and arrangement of functions that can strengthenimage the area as a new tourist destination can be seen in Figure 6.

Conclusion

Based on the area problems that have been analyzed previously and the desires and needs of the JOINT BUSINESS GROUP Segara Guna Batu Lumbang fishermen group, the mangrove forest conservation area master plan being developed will be based on ecotourism. The ecotourism master plan for the mangrove forest conservation area as well as meeting the tourism challenges after the Covid-19 Pandemic while still paying attention to the condition and environment of the mangrove forests so that they remain sustainable and natural. Six ecotourism development criteria covering environmental, community participation, educational, economic, socio-cultural, and institutional criteria will be used as the basis for the master plan design.

The various functions or facilities that will be accommodated by the area are adjusted to the problems of the area, the needs and desires of fishermen groups, and ecotourism criteria. There are several facilities planned to be accommodated in the area including:landmark area, parking spot, photo spot, wharf, signage, deck pedestrian crossing, public toilets, water tourism routes (canoes andboat), conservation areas in the form of mangrove nurseries and fish cages, fish aquariums, bird cages, tourist product trading areas, culinary areas, sports facilities,guest house, arrangement of worship and religious facilities, monitoring towers andbale dumbfounded.

All of these facilities are supported by all the physical and non-physical potentials of the area which will make the mangrove forest conservation area a new tourist destination for the City of Denpasar based on ecotourism in accordance with the vision of the JOINT BUSINESS GROUP Segara Guna Batu Lumbang Mangrove Forest Conservation Area which was previously formulated.

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