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Study of design criteria for the Ayung River estuary area as an urban riverfront park in Denpasar City, Bali

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Abstract
Public green open space management currently tends to be in strategic areas in Denpasar City, such as the Sanur coastal area, city center, and city roads. This centralization will, in time, create a feeling of saturation and require a new atmosphere and unequal development. One of the efforts is to explore the potential of vacant land in coastal areas that have yet to be touched by development, one of which is the estuary of the Ayung River. The community currently uses the edge of the estuary of the Ayung River for recreational activities. The first step is to have a design that supports this function, especially since this area has ecological benefits for the city. The research objectives can accommodate the community's needs, managers, regional potential, and sustainable landscape design approaches. The analysis technique used is descriptive analysis technique using walkability analysis and triangulation approaches. The results of the study integrate the theory of sustainable coastal area landscape design by producing design criteria, namely: Socio-cultural function design criteria with the principle approach of environmental community involvement, Economic function design criteria with the application of the economic tenets involving Small and Medium Enterprises (SMEs), Environmental function criteria with the principles of waste management, linkage criteria with an energy efficiency function approach, and aesthetic function design criteria with a safe and comfortable material principle approach.

Keywords:
Costal Tourism;
Design Criteria;
Landscape Design;
Urban Riverfront;
Walkability Analysis;

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INTRODUCTION

Sustainable city attention to the existence of Green Open Spaces/GOS Fields [1]. The presence of GOS, which is decreasing daily due to the development of settlements, and centers of economic activity, including offices, and government centers, has implications for cities' social and ecological functions. Population growth, urbanization, technological development, industrialization, and consumption that is not environmentally friendly are factors for natural damage [2]. Global change, population growth, economic development, and climate change are challenges for cities in the 21st century [3]. In addition, in the era of globalization and environmental uncertainty, landscapes are often considered less important than other issues [4]. I look at the principle of benefits, the existence of public GOS provides spaces for the community to improve the quality of life, such as sports and recreation. In addition, GOS enhances the quality of life for urban communities because it breaks down the heat island effect [5]. Urban development is guided by developing a sustainable urban environment [6].

Denpasar City, as one of the cities in Indonesia, consistently builds a sustainable city with attention to the availability of GOS that can provide social, ecological, and economic benefits to the community and the image of the town. The

current management of public GOS tends to be in strategic areas in Denpasar City, such as the Sanur coastal area, city center, city roads, and so on. This centralization will, in time, create a feeling of saturation and require a new atmosphere and unequal development. There needs to be a balance in planning urban GOS spread evenly in urban areas by looking at the needs of the community and the population [7]. One of the efforts is to explore the potential of vacant land in coastal areas that have yet to be touched by development, one of which is the estuary area. Attention to development is only limited to repairing irrigation canals which has yet to be followed by attention to GOS in the surrounding area.

Lack of attention can cause slum areas not taken care of, and even land conversion by the community can occur. This can have an impact on the facial image of the site. The river border area has an important role in maintaining the sustainability of the urban area. The part of the river border is so important that it is expected to be able to provide sustainability for the Denpasar City area.

The area on the Ayung River estuary is located in Denpasar City, precisely in Kesiman Kertalangu Village. The community currently uses the site on the estuary of the Ayung River for recreational activities, sports and health therapy activities, religious ceremonial activities, and arts and cultural activities. This activity has yet to be matched by the completeness of adequate facilities. Through the Kesiman Kertalangu Village government, they are trying to provide makeshift facilities, which they feel still need to support the activities that are taking place. The efforts should be appreciated; however, the structuring efforts should be carried out with good planning. The edge of a river mouth or river border has the function of water catchment and water basin [8][9]. Urban river corridors can be potential wind paths that reduce urban temperatures [10]. The existence of a river will be a potential space for the sustainable development of a city [6]. Especially considering its function, the bank of the estuary of the Ayung River is part of the river's border, whose primary function is to support the Denpasar City area.

Dharmadiatmika and Krisnandika have explored the potential of the Ayung River estuary area by looking at the visual potential of the area, which produces the highest visual quality value in the area of the most tree stands along the river border and coastal scenery [11]. The existing potential is also a future consideration in managing this area.

The beauty potential of the area is also a concern for the community to do recreation in this area. An idea for a functional area design is needed to improve the function of the Ayung River estuary area by looking at the main function, community needs, and existing potential. The design of a functional area considers the community's needs, the existing site's aesthetic value, the area manager's input, and the approach to the sustainable landscape design concept. River design is an act of managing human relations with water bodies [12]. Applying the concept of sustainable landscape design in the management of GOS is necessary to support management efficiency and effectiveness [13]. In addition to providing ecological benefits, the urban river landscape design offers a place for community recreation [14].

The novelty of this study is that it uses an area design approach by combining a combination of analyses used, namely the walkability analysis and triangulation analysis techniques which are expected to obtain a design that can accommodate the needs of the community, managers, area potential and a sustainable landscape design approach.

METHOD

The research uses a naturalistic paradigm: observing and collecting data in a natural setting without manipulating the subject under study or how it is [15]. The research was carried out by processing data descriptively from observations made during the field. Data collection techniques were carried out in purposive sampling and accidental sampling. Selection of village apparatus respondents who are considered to have an understanding of the location and its problems, such as the Village Head, Environmental Head, head of young people in *Banjar Tangtu*, and the community who frequently visit the location. The number of respondents interviewed was 30 people. Characteristic respondents had an age range of 17 – 60 years old, had known areas as well, and had visited the site more than five times.

Location

The Ayung River Estuary area, or ARE, is located east of Denpasar City, directly adjacent to the Indian Ocean. This area is one coastline with the coastal tourist areas of Denpasar City, such as Sanur Beach, Sindhu Beach, Sunrise Beach, etc. ARE is located adjacent to the boundary between Denpasar City and Gianyar Regency, so its location is in the eastern suburbs of the city center. ARE location is approximately 7 km from the center of Denpasar City. Geographically, ARE is

located at 080 39'11.28" - 080 39' 16.43" South Latitude and 1150 16'13.40" - 1150 16'14.12" East Longitude. This area has a 6 - 0 m height above sea level and a beach length of 359.44 m with an area of 5.19 Ha. ARE also has a river width of 45-50 meters, with land slopes varying from 0-2% [11].

ARE land ownership is managed by the Provincial Government of Bali and Banjar Tangtu, Kesiman Kertalangu Village. The ARE location has the following location boundaries: to the north, it borders the Banjar Tangtu rice field area; to the east, it borders Banjar Biaung, to the south, it borders the Indian Ocean, and to the west, it connects the Padanggalak area.

Material

Data collection techniques in research are observation techniques. The researcher collected data by walking along the access in the research area and then taking photos with a single directional view and a linear side view. Researchers went into the field by recording existing images and user activity. The second tool is an interview sheet used to collect data related to user perceptions and preferences based on specific parameters to assess the physical condition of the research site. The parameters used with the physical condition approach are comfortable, conspicuous, convivial, connectivity, convenience, and safety [16]. Research also uses literature studies in journals related to research objects in the form of similar research, research conducted at site locations, and references regarding sustainable urban landscape design.

The analysis technique used is a descriptive analysis using the walkability analysis approach by analyzing users' physical conditions and activities in the field. Then proceed with the triangulation analysis technique. This technique is used to obtain design criteria based on an analysis of field conditions, a literature review approach, and user perceptions and preferences. To maintain the sustainability of the landscape, designers consider multidimensional designs [4]. The triangulation method used is data processing from library research data sources, observation results, and interview results with walkability analysis techniques, as shown in Figure 1. The analysis framework compares three sources: field observation data with literature review data, analysis field observation data with result interview data, and literature review data and result interview data. Triangulation method used for answered problem research with sustainable architecture approach. The research sustainable flow design can be seen in the following diagram, as presented in Figure 2.

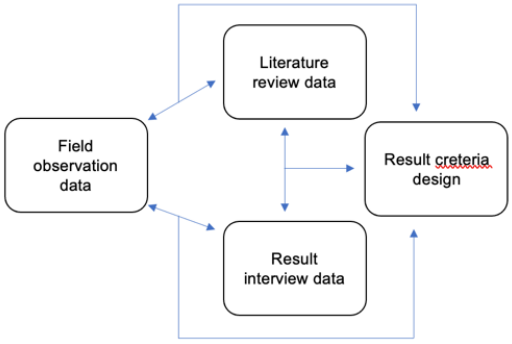

Figure 1. Flowchart Triangulation method

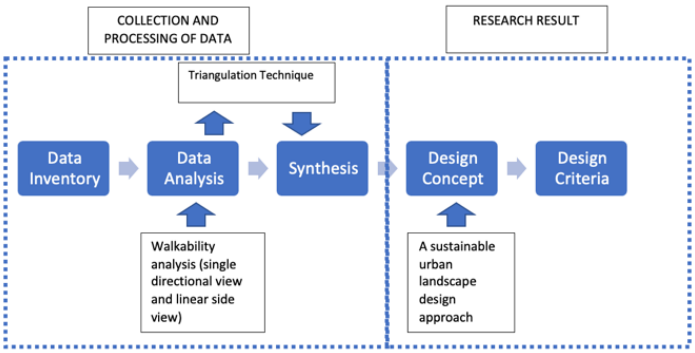

Figure 2. Research Flowchart

RESULTS AND DISCUSSION

Landscape Segment Division

This study divides segments based on the landscape's character and community activities at the site location. Segment division is to do for facilitate the research process. The division of the research segment is as follows:

1. The first segment is located west of the site, which is the primary access to the area. This segment includes the entrance area, the banks of the Ayung River, with stands of shade trees, banana plantation areas, and parking areas. The activities found at this location are fishing, sitting while enjoying the view of the river, and trading food and drinks.
2. The second segment is the area to the north of the first segment. The site includes part of the Ayung River, directly connected to the sea. There is also a stretch of empty land and graves. Activities encountered include sitting while enjoying the sunset, jogging when the river water and the beach recede, people bathing on the beach, and sometimes art and cultural activities in the area of vacant land.
3. The third segment is the northernmost area of the region. This segment is a black sand beach area with a wide beach border. There are several stalls selling various food and beverage needs and parking. There is access to and from the site. There were several community activities such as bathing in the river, sand therapy, fishing, jogging, enjoying the scenery, and on certain days people were found doing the *melukat* ceremony.

The division of segments in this study can be seen clearly in Figure 3.

Walkability Analysis of Social, Economic, Cultural, Ecological and Aesthetic Aspects

Analysis of Social, Economic, Cultural, Ecological, and Aesthetic Aspects of Segment One

The analysis presented is done by observing the point of the research location. The distribution of observation points can be seen in Figure 4. In segment one, user conditions/activities in this area are enjoying views of the river by sitting and relaxing on the riverbank, fishing activities, taking selfies, shopping for food at food stalls, there are temples, and several people often worship at that place. All activities carried out by visitors are not facilitated with good facilities, such as inadequate parking facilities, food stalls with makeshift buildings, inadequate seating facilities, no lighting, and no facilities that support activities. Recreation there.

Analysis of the single-directional view of the social aspect is obtained: The beautiful natural conditions of the river can be developed as a place of recreation. There are two accesses: the access directly adjacent to the river bank and the access to the farming road that connects the graves. Activities often encountered are exercising, fishing, sitting back while enjoying the view of the river, shopping activities, and praying. The site's potential has yet to be explored to support recreational activities in green open spaces.

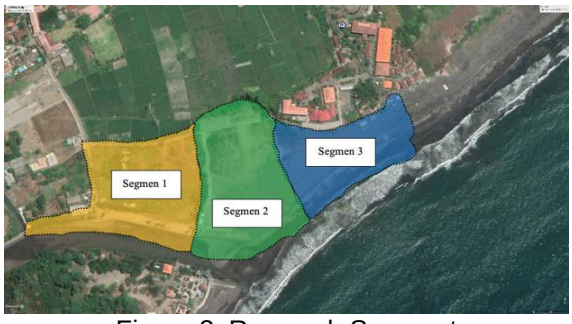

Figure 3. Research Segment

Figure 4. Segment One

There needs to be an image of the area to support activities in segment one. Results of the analysis: The potential of the area is used to support community activities around the site, such as developing outdoor children's education, sports facilities, seating facilities, arrangement of trade stalls, arrangement of area entrances as area characteristics, and enhancing the beauty of the area through landscaping. The riverside area is used as a pavilion and selfie spot.

Analysis of a single directional view of the economic aspect is obtained: Cement one, shown in the figure, is currently used for vehicle parking areas however, there is no clear boundary between parking functions and other spatial functions in other areas. There needs to be a clear regional identity as a feature/differentiator of this area from its surroundings. There are trade stalls, but they need to be better organized. There is no structuring of economic functions to support activities on site. Results of the analysis: Arranging the area by providing trade stalls, parking facilities, arranging reception areas, management areas, public toilets, children's play areas, children's education areas, outdoor gym areas, and making designs as area identifiers. The design approach with the characteristics of the existing local culture.

Single-directional view analysis of environmental aspects: The environment is not maintained, and there are shady plants, but some in certain areas have died. No attractive landscape arrangement provides a sense of comfort for the user. As a buffer area, it is necessary to plant plants that can hold the soil from erosion and break wind movement. Results of the analysis: Planning a vegetation arrangement that functions for the area to prevent abrasion and break wind movement. Arranging the landscape to make the space more comfortable, beautiful, and attractive, designing landscapes that attract animals to the site. It is implementing an environmentally friendly design, reducing water runoff. The results of this analysis are strengthened by statements [17] urban riverfront design. The criteria for a comfortable riverfront urban design can support social and economic activities and create ecological functions on the site.

Analysis of Social, Economic, Cultural, Ecological, and Aesthetic Aspects of Segment Two

Segment analysis two can be seen in Figure 5. The explanation is described as follows: In segment two, the conditions/activities of users in this area are enjoying the beach and river views, fishing, resting while shopping at trade stalls, jogging, selfies, and cultural arts activities carried out on vacant land. Segment two has several supporting facilities for these activities, including gazebos, jogging tracks, and trade stalls. Analysis of the single directional view of the social aspect is obtained: Segment two is the area's core segment. Because in this segment, community activities are carried out in groups. The current condition could be more facilities to support user activities.

There needs to be a proper and uniform arrangement of stalls to give a consistent impression. The east wind is harsh, so it needs vegetation as a windbreaker. This segment has the most beautiful beach view angle at sunrise. There is a gazebo that users can use to enjoy the view. The beautification potential of existing rivers as an area attraction. Results of the analysis: There is a need for an attractive riverbank arrangement design to increase the aesthetic value and function of the site. Provide appropriate facilities to facilitate arts and cultural activities in the field area. There needs to be a stand of vegetation as a windbreaker.

Figure 5. Segment two

A single-directional view analysis of the economic aspect is obtained: Segment two has the potential to be developed as a core area of the region that facilitates arts and cultural activities. There needs to be an arrangement of the area to promote community activities. Provision of semi-permanent kiosk facilities, supporting vegetation, comfortable field designs, pedestrian and vehicle access to support activities within the site. Beautify the riverbanks so that they become attractive spots. Develop recreational areas on the riverbanks that are connected to the Ayung River. Results of the analysis: The arrangement of segment two includes additional functions, arrangement of facilities, and activities to support arts and cultural, economic, and environmental activities.

Single-directional view analysis of environmental aspects: Environmental conditions are not maintained, and no landscape arrangement can provide a sense of comfort on the site. Arrangement of the environment along the river border can beautify the river and provide an ecological function on the site. In the coastal area, it is necessary to have a landscape arrangement that functions as a windbreaker. Result: Planning a vegetation arrangement that provides functions for the site, mainly to prevent abrasion and wind breaking. Arrange the landscape so that the area becomes more beautiful and attractive. This statement aligns with the research [18], stating that vegetation in a sustainable landscape design has criteria for using local plants that adapt well and have attractive colours.

Analysis of Social, Economic, Cultural, Ecological, and Aesthetics of Segment Three

Three segment analyses can be seen in Figure 6. In the three segments, user conditions/activities in this area are enjoying beach views, fishing, resting while shopping at trade stalls, jogging, selfies, Hindu religious activities, and sand therapy. Segment three has several activity support facilities, including gazebos, jogging tracks, and trade stalls. In segment three, there is supporting access to and from ARE from the north of the area.

A single-directional view analysis of the social aspect was obtained: segment three found many community activities in ceremonial *melukat*/ cleansing using the beach. The black sand that generates heat makes people use the facility for health therapy. There is a gathering point for local fishermen with makeshift facilities. Results of the analysis: There is a need for additional facilities and improvements to existing facilities to improve the site's beauty and function. Developing a circulation plan, green planning, and regional spatial planning is necessary.

A single-directional view analysis of the economic aspect is obtained. There is no development of the area's potential, so it can impact the local community's economy by visiting people who want recreation, exercise, perform ceremonies, etc. Results of the analysis: In this area, develop the area's potential by providing facilities to support religious ceremony activities, beach recreation, structuring trade stalls, structuring jogging tracks, structuring catchment areas, and developing semi-permanent kiosk areas to support arts and culture. Improving the quality of the environment by arranging the landscape so visitors feel comfortable. This aligns with the [18] criterion statement of sustainable landscape design, one of which is to provide comfort (security, privacy, harmony with nature, attractiveness, and high element quality).

Single-directional view analysis of environmental aspects: Environmental conditions could be better maintained and organized. This segment also has a rainwater and beach water storage area. There are no vegetation stands that can support comfort levels that affect temperature.

Figure 6. Segment Three

It facilitates every activity of the surrounding community within the site, such as education, health support, and as a buffer zone.

This area often receives garbage shipments, causing the beach border to become dirty. There is no vegetation stand that functions as a buffer. Results of the analysis: Planning a vegetation arrangement that functions for the area to prevent abrasion and wind breaking. Arrange the landscape so that the area becomes more beautiful and attractive. We are designing landscapes that can attract animals to come to the site. Implementing a design by utilizing the valley as a water storage area to reduce the water runoff that occurs.

Analysis of the site's beauty uses the study results from the research Field [11] with the distribution of landscape photos in segments one, two, and three, which can be seen in Figure 7. The distribution of these photos produces a value for the quality of the beauty of the landscape in three categories, namely low, medium, and high, with the results shown in Table 1. If it is related to the research location segment, segment one has the highest beauty, segment two is classified as medium, and segment three has low beauty. Influencing factors are vegetation stands, cleanliness, and arrangement of facilities.

Figure 7. Spatial Photo Beauty Value of the Landscape Ayung River Estuary [11]

Table 1. Beauty Value of the Landscape Ayung River Estuary [11]

Value Category Landscape Beauty		
Class	**Deviation**	**Photo**
Low	0 – 26.27	3,4,9,10,11, and 12
Middle	26.28 – 52.55	6,7,8,13, and 14
Hight	52.56 – 78.81	1,2, and 5

Based on these results, the design approach considers the vegetation components and the arrangement of facilities that support activities on the site.

Component Analysis Comfortable, Convenient, Convivial, Conspicuous, and Connected (5C)

Based on the results of interviews and analysis of the authors obtained:

1. Comfortable: a convenience approach from area development to provide facilities for community recreational activities; There needs to be attention from the manager of this area, the potential is huge if it is managed properly; it is necessary to have separate pedestrian and vehicle circulations, the arrangement of pedestrian and vehicle areas, and greening; There needs to be a design for the development of this area so that it can provide facilities for community recreational activities.
2. Suitable: Utilizing existing land for pedestrian and vehicle access designs with existing design standards and still being able to carry out activities by accessing existing roads, which are inconvenient and less attractive, requires arrangement.
3. Convivial: there needs to be an arrangement that all components of society can use regarding age and gender. Efforts can be made from accessibility to facility utilization. Provide special space for people with special needs.
4. Conspicuous: There needs to be a clear spatial division of the area; visitors hope there will be efforts to improve/design the site to become a new destination in Denpasar City.
5. Connected: Knowing and increasing the clarity of access connections from and to the area; it is necessary to have an arrangement that can secure the southern access and the northern access to the area; providing access to activities that have taken place on the site such as access for fishermen, community access for ceremonial activities, and access for recreation and sports.

Concept of Design Based on Study Aspects

The design concept approach looks at site capacity, community needs, and environmental sustainability. Design landscape elements that provide benefits must create human connectedness with the landscape/environment [6]. The design of public GOS provides a user-friendly design goal, which means that users feel safe and comfortable [19]. Design spaces in urban design in green open space areas with vegetation will make users carry out activities longer than indoors [20]. The design of the river bank must pay attention to the river's character so that the environment's ecological function and carrying capacity can be maintained [12].

In addition, the design uses the attributes of local wisdom and culture [21]. The criteria for a comfortable riverfront urban design can support social and economic activities and create ecological functions on the site [17].

1. Aspects of socio-cultural studies: involving communities within the local community in planning the use of spaces within the area for social, cultural, and artistic functions.
2. Aspects of economic studies: channelling community-scale production results in the household in the surrounding environment. Schedule community activities that foster innovation and productivity so that they have to sell points in the community.
3. Environmental aspects: urban ecology approach with energy strategy, waste management, environmentally friendly materials, and water management, utilization of existing, local and functional food crops.
4. 4Linkage Aspect: the connectedness of the surrounding environment to planning within the area regarding ease of access for the whole community. Creating sustainable accessibility between pedestrians and existing transportation access [19]
5. Visual Aspect: Visual connectedness means using natural visual potentials around the area as natural objects offered to visitors. As well as the management of harmful visual objects to be improved again. Efforts to improve the site's beauty by arranging areas with low visual quality. As for the flow of each aspect used, the approach includes the principles of sustainable architecture, which aligns with applying the nine principles of sustainable architecture [22]. This aligns with previous studies where the design approach uses sustainable architecture. The design concept can be seen in Figure 8.

Design Criteria

The riparian landscape's arrangement considers the landscape's character to create a sustainable landscape design. This aligns with research, which states that landscapes commensurate with rivers should be developed as GOS according to river characteristics that meet user needs and maintain their sustainability [23]. Spatial design must focus on the functions of social spaces [24]. The user Field physically likes the social function space field Field[20]. It creates human-to-human relationships [25] Designs that support social activities are comfortable spaces, quite spacious, trade stalls, family-friendly rooms, child-friendly, providing security. The design can integrate nature into the architectural design [26]. Physically equipped with public and accessible toilet facilities and well-maintained facilities.

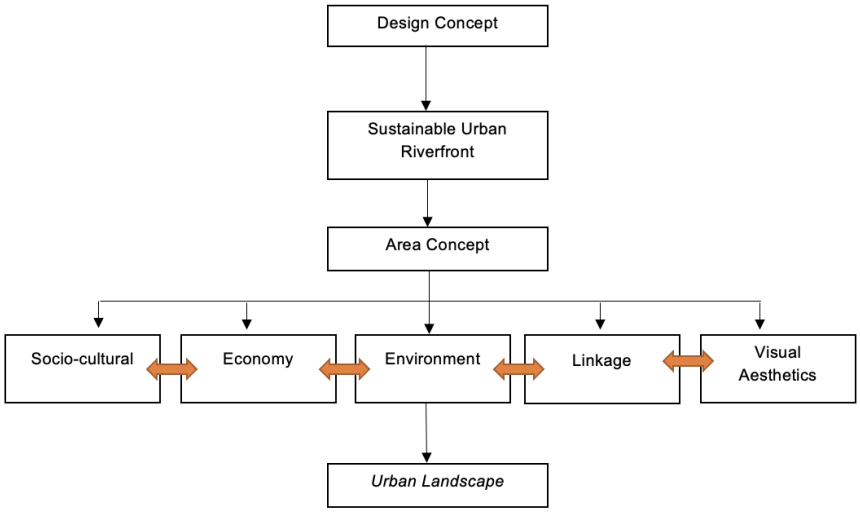

Figure 8. The Design Concept Flow

1. Socio-cultural function design criteria. The principle of involving the environmental community. Involve communities around the site both in area management and area utilization. The focus of preserving or creating culture is a form of activity facilitated within the area in the state of activities to preserve customs, arts, and culture.
   a. Provide space for visitors to socialize and recreational activities. Examples of gathering spaces, socialization, workshops, lectures, etc. are sourced from the community for the community.
   b. Landscaping provides more seating facilities with shady trees to create a microclimate on the site.
   c. The design is connected with comfortable access with sufficient width for the user.
   d. The design of the area can facilitate all community activities including children.
   e. Provide children's play space so they train physically and respond to the surrounding environment.
   f. The area development plan provides space for physical exercise apart from jogging tracks, including outdoor gym equipment.
   g. The development provides special educational activities such as spaces for discussions, stages, installations for work exhibitions, etc.
   h. Providing wifi facilities in several resting areas and educational areas.
   i. Providing a field area that is used for arts and cultural performances.
   j. Provide area management room facilities to provide information and services to visitors.
2. Criteria for the design of economic functions. Application of the principles of economic strategy by involving small and medium enterprises of the local community.
   a. Utilization of local materials such as bamboo, red brick, used wood, and sand that is around to provide cost efficiency.
   b. Providing facilities for trade stalls permanently in the area.
   c. The location of the trade stalls to sell the community's production results allocated is at several points to support activities in the area.
   d. Providing plantation areas aims to educate the public about agriculture in urban areas, besides, the results of these plantations can provide economic income for the community and area managers. Urban agriculture will work if managed with the community Field's active participation [27].
3. Environmental function design criteria: Application of urban ecological principles by maximizing the existence of green open spaces. Water management principles (water saving, sufficiency, replacement, reuse, and recycling). The relationship between humans and rivers/environment [28] Principles of waste management (solid, liquid, and gas waste) [29]. Implementation of this can be:
   a. Maintain existing plants that resist erosion and break beach winds/buffers into the area.
   b. b. Using local plants [30].
   c. Providing educational space for agricultural crops (food and horticulture) as academic and economic benefits for the community.
   d. Complete open spaces with vegetation stands, such as trees with spreading crowns for shade.
   e. Selection of sea pine/*Casuarina equisetifolia plants*. Because this type of plant can adapt to coastal areas and is an existing plant.
   f. Water management by utilizing the existing catchment area as a rain garden. At times of high rain intensity, this area is a place for water storage and can be reused [31]. At low tide, this area can be used for recreation.
   g. Provide grass fields to support relaxation activities, play, and social interaction.
   h. Provide trash bags by type. It provides temporary waste storage integrated with local village waste management.
   i. The riverbank's design must consider 100 years of flood discharge.
4. Linkage function design criteria. This criterion can implement the principle of energy efficiency in the form of:
   a. Providing bicycle transportation and its supports such as bicycle paths, bicycle rental, and storage that are integrated with the surrounding environment.
   b. Determination of the orientation of supporting facilities/buildings, considering the sun's direction, wind movement, mass form, and appearance.
   c. Utilization of solar panels/solar harvesters to support electricity efficiency.
   d. Access point designs are made to connect areas within the region. Provide special lanes for jogging by utilizing existing jogging routes. Provide dedicated vehicle lanes and emergency access.
   e. Designing an icon in the area, namely a bridge that connects the north and south sides of the Ayung River area.
   f. Providing platform facilities along the Ayung River border which can be an attraction in the area.

g. Provide regional signboards so that to become area markers. The placement is in the entrance area and the end of the Ayung River, which is the most exciting viewpoint.
h. Provide toilet facilities for visitors. The location of the toilet is integrated with communal spaces for easy reach by users.

5. Design criteria for aesthetic functions with an approach to implementing material principles using materials that provide user comfort and safety. The material in question is a sustainable architectural material that is durable, non-toxic, resilient, recycled, and biodegradable, materials that do not affect air emissions in manufacture, installation, and use, easy to repair/replace, sufficient availability, has high regeneration rate, and increased durability. Friendly materials/ ecological materials are tolerant to the environment and utilize local materials [32].
   a. Designing the entrance as a regional marker. The design is made with a local values approach.
   b. Maintain high visual value and increase low visual value by adding vegetation stands and arrangement of facilities, as well as improving the cleanliness of the area.
   c. Provide viewing tower facilities for visitors to see the site's natural scenery and bird species.
   d. Utilization of fabricated materials so that they are easy to install (time and labour efficiency).
   e. Designing a representative riverside area to become an attraction for the community aligns with the research results, presenting area identity to provide understanding to users [33, 34, 35].

The layout plan area can be seen in Figure 9 and the 3D perspective in Figure 10.

Figure 9. Layout Plan

Figure 10. Perspective Design

CONCLUSION

Development of the area concept on a macro basis with an emphasis on sociocultural, economic, and environmental functions, regional linkage, and aesthetics. The area's design is oriented towards providing supporting facilities for economic activities, educational/educational, health, socio-cultural, arts, and religious facilities. Regional design is the development of the initial function of the spaces on the site by looking at the area's biophysical conditions, the community's wishes, the direction of development from the manager, and the rules in place so that the design can accommodate all existing components. The general design criteria are in the form of the principle of involving the environmental community, the application of the principles of an economic strategy by involving small and medium enterprises of the local community, implementing the principles of energy efficiency, implementing the principles of materials using environmentally friendly materials, the principles of environmental sustainability, the principles of aesthetics and the principles of linkage.

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