

**IMPLEMENTATION OF ARCHITECTURAL ECOLOGICAL CONCEPTS IN CULTURAL RESORT  
DESIGN IN COASTAL AREA  
A CASE STUDY OF KUBU BEACH, PANGKALANBUN, KOTAWARINGIN DISTRICT,  
WEST KALIMANTAN**

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**Abstract**

The issue of global warming and its impact on the environment requires urgent consideration from the profession of architecture. One of the ideas for using the notion of ecology as an application and reaction to the issue of environmental harm is to create tourism destination amenities in the form of resorts in coastal areas. The issue that planners face is how to keep the resort building's architecture in keeping with the site's culture. The implementation of the concept of architectural ecology was employed in the design of the resort building on Kubu beach, based on the existing challenges. The implementation is carried out by attempting to keep the place cultivated as a green space. The Resort on Kubu Beach, which is one of Kotawaringin Regency's green space areas (GSA), incorporates the notion of architectural ecology into its design, both in terms of outdoor space and residential buildings and facilities. One of the design solutions is to make use of the natural environment while still providing the modern amenities required by today's society.

**Keywords:** site culture resort, architecture ecology

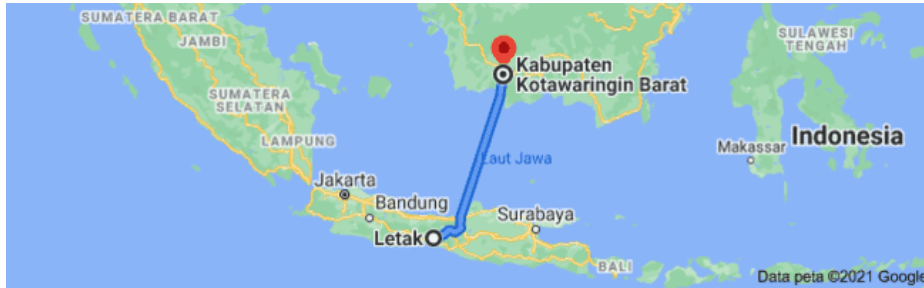
**INTRODUCTION**

Global warming as the impact of the greenhouse effect has affected on the reduction of green land significantly which makes the earth's ozone layer thinner. This endangers the earth and humans. In addition, now it is time to reduce the impact by re-greening or reforestation. However, with the rapid human development, the use of land is getting wider. Therefore, to meet human needs without increasing global warming, a solution is required so that both are fulfilled. One of the solutions is a design approach with the concept of architectural ecology as mentioned by Frick and Suskiyatno.

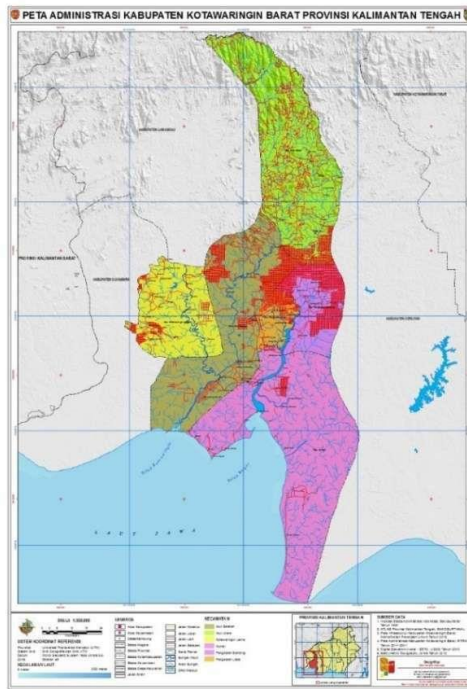
The concept of ecology can be applied in various designs. Pendit and Lawson highlight the design for tourist facilities in the form of resorts in coastal areas. The concept of architectural ecology according to Yeang cited in Titisari et al (2012), the ecological approach in architecture defined by Ecological design is bioclimatic design, design with the climate of the locality, and low energy design. Thus, there is an integration between local ecological conditions, micro and macro climates, site conditions, building programs or areas, concepts and systems that are responsive to climate as well as low energy use. The Integration can be carried out at three levels as follows:

1. Physical integration and local ecological physical characteristics (soil, topography, groundwater, vegetation, climate, etc.)
2. Integration of systems with natural processes (how to use water, treatment and liquid waste disposal, exhaust systems from buildings, heat release from buildings, etc.)
3. Integration of resource use which includes the use of sustainable natural resources.

Cowan and Ryn put forward the principles of ecological design as: solution grows from place, ecological accounting informs design, design with nature, everyone is a designer, make nature visible. Kubu Beach becomes one of the selected research objects considering that Kubu beach is one of the tourist destinations within the scope of the Green Spatial Area, but the land condition is not considered as many ecological problems. Researchers need to describe the Location of West Waringin Regency, Kalimantan (figure 1 and 2) and the condition of Kubu coastal area (figures 3,4 and 5).



**Figure 1: Location of Kotawaringin Barat Regency, Kalimantan on the map**  
Source: Google map.com, 2021



**Figure 2: Location map of Kota Waringin Barat Regency, Kalimantan, and Administrative Map**  
Source: <https://www.google.com/>; <https://aminjaya.desa.id/NEWS/detail/-List-nama-kecamatan-kelurahandesa--kodepos-di-kota-district-kotawaringin-barat-kalimantan-tengah>



**Figure 3: Location of Kubu Pantai Beach, Source: Google Maps, 2021**



**Figure 4: One of the views from the coast of Kubu**  
 Source: Google Maps, 2021



**Figure 5: Kubu Beach Tourism Objects**  
 Source: <https://www.google.com>, 2021

In addition, the development of tourist destinations on Kubu coastal area also becomes one of the development priorities by the local government until 2030 (West Waringin Tourism Office, <https://www.radarsampit.com/berita/dispar-optimis-wisata-kobar-segera-bangkit.html/2>, downloaded December 14, 2021). From the results of initial observations, it shows that several tourist destinations become favorite choices by tourists: Kubu Beach, Teluk Bogam Beach, and Tanjung Puting National Park. The data shows that these three tourist destinations have a significant increase in the number of tourists from year to year.

**Table 1.3 Table of Kubu beach visitors**

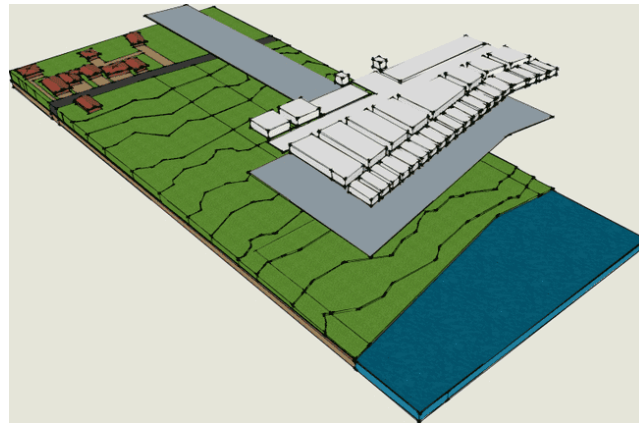
Year	Visitor
2006	29, 769
2007	31, 495
2008	28, 224
2009	53, 362
2010	53, 430
2011	57, 506
2012	51, 657
2013	48, 366
2014	57, 031

**Source: West Kalimantan Tourism Office, 2020**

Kubu Beach is located in Kotawaringin Barat Regency, Central Kalimantan, Indonesia. There are various kinds of tourist destinations available in Kotawaringin Barat. However, a selection was made to choose a tourist destination with the most visitors. In addition, related to the issue of local governments about developing marine tourism destinations, it is one of the considerations for developing Kubu beach as one of the main destinations in West Waringin.

Another consideration in planning the completeness of tourism on Kubu Beach is the distance to Kubu Beach from the city of West Waringin which can be taken within 2 hours. Therefore, tourists who need some rest and stay longer need a place to stay. With the completeness of tourist facilities on Kubu beach, it is hoped that there will be an increasing number of tourists. Accordingly, it will contribute Locally Generated Revenue (LGR) to Waringin City.

The condition of Kubu beach which is located around the green area requires attention and thought to apply design concepts and strategies so there is no damage on the environment. The application of the concept of Architectural Ecology is an alternative that can be used for this purpose. In addition, the condition of Kubu Beach is that there is no vacant land. The available vacant land is green land (figure 6).

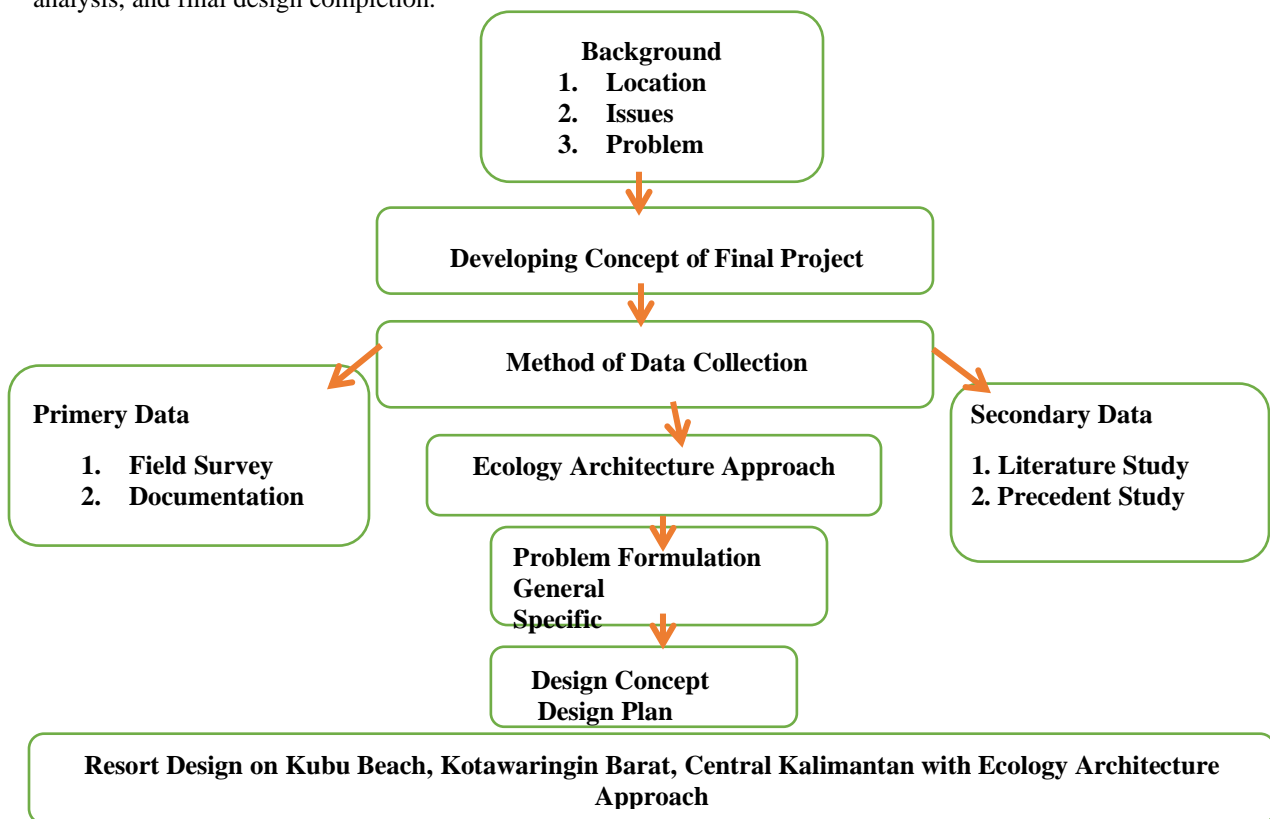


**Figure 6: zoning of land use in the coastal area of Kubu Kotawaringin Barat**

How the concept of architectural ecology can be used to complete the design of the resort on Kubu beach by the culture of the beach and the culture of its green open space. It is to produce a design concept with the results of a resort building design by the culture of Kubu beach and the culture of the Green Open Space Area.

**METHOD**

The method in this research is a design method with the implementation of the concept of architectural ecology in the design of resort buildings. The basic concept of architectural ecology is a major factor in the design. This concept will be used in every step taken, starting from primary data collection on-site and site selection that meets ecological criteria, secondary data collection and case study selection, site analysis, spatial program analysis, structural and utility analysis, and final design completion.

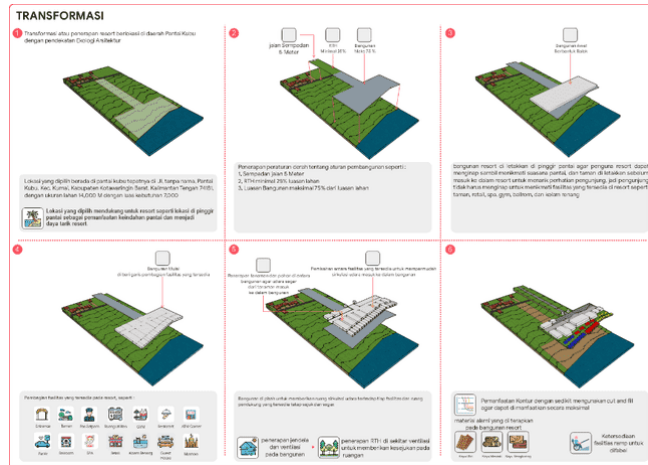


**Figure7: Framework of Design Method**

## FINDINGS AND DISCUSSION

The lodging amenities offered at Kubu beach, according to the researchers, range from modest hotel to 3-star hotel buildings. According to Coltmant, the planned accommodation is in the shape of a resort, which is in keeping with the area's sustainability and the environment. The resort's architecture will take into account the cultural conditions of Kubu Beach and the cultural region, which is a green open space, as proposed by Febrianto (2019).

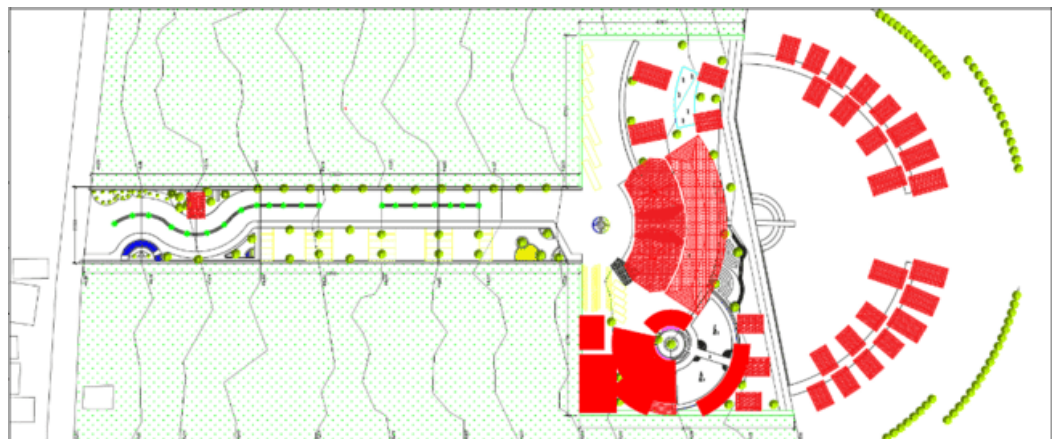
### Concept of shape transformation



**Figure 8: Concept of volumetric study in area**  
 Source: Researchers analysis

The accessible sites are on the beach due to the nature of the site culture located in Kubu coastal area and the green open space area. As a result, gaining access to the achievement necessitates the acquisition of land. This concept preserves the site culture stability in the green open space.

#### 1. Situation Illustration

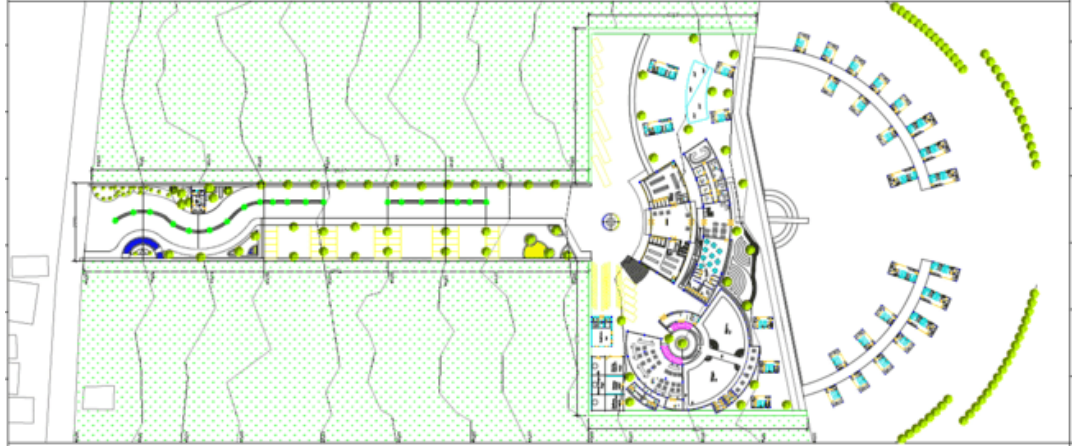


**Figure 8: Image of the resort situation on the Kubu beach area site**  
 Source: researchers analysis

The accessibility part is processed from the available sites while retaining the culture of the green open space region. 50 percent of the site is on land/seaside, and 50 percent is in coastal waters. The resort's residential structures are distributed, rather than in a single huge mass, to preserve the cultural circumstances of the

coastal waters, allowing the natural behavior of the seawater to continue. It is planted with mangrove forest plants on the outside of the created radius as a barrier to ocean currents and waves.

## 2. Site plan

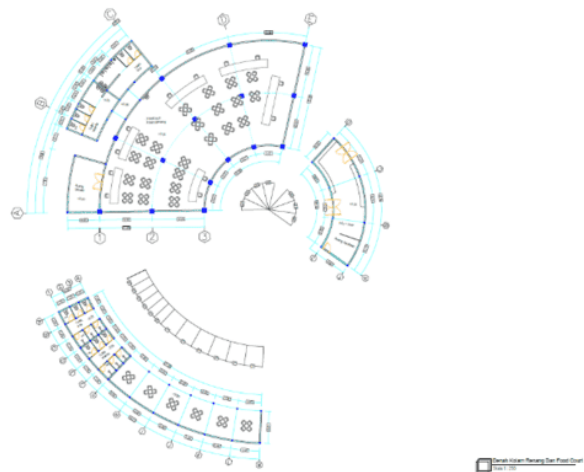


**Figure 9: Image of site plan**  
Source; researchers' analysis

The site plan is divided into circulation space zoning in the attainment section from the road to the site location while maintaining the cultural condition of the green open space area, the public zone, namely the group of receiving rooms and buildings, and the main supporting buildings consisting of the lobby, front office, restaurant, and café, and the public zone, namely the group of receiving rooms and buildings. The semi-private zone is in the southern part of the building intended for swimming pool and café enthusiasts, as well as the private part. The core of the building accommodates residential buildings, some of which are both on land/beach and in waters bordered by water hyacinth forests. These are arranged in a layout that is not continuous but made in stages so that wave culture and seawater are maintained (figure 9).

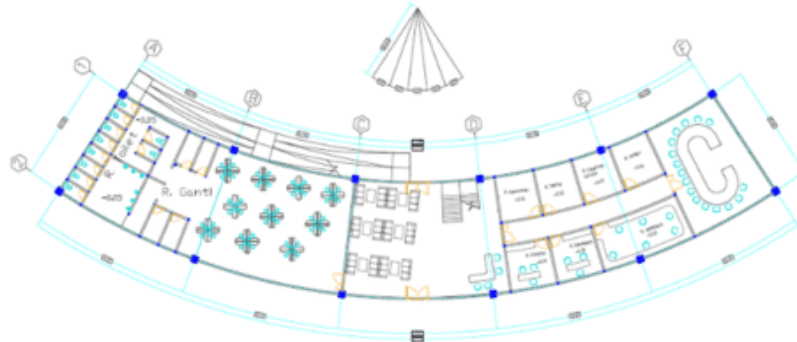
## 3. Building layout

Here is the image of building layout from several periods of the main and supporting buildings (figures 10, 11)



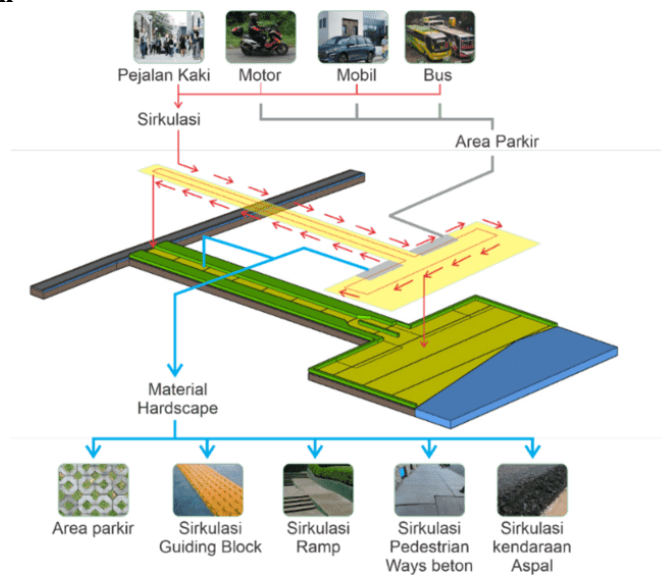
**Figure 10: Swimming pool and food court**  
Source: researchers' analysis

The space program is adjusted to the standards and space requirements of the resorts on the Kubu beach ( Neufert and Sunarto, 2020).



**Figure 11: Office facilities and resort lobby**  
 Source: research design analysis

#### 4. Circulation Design



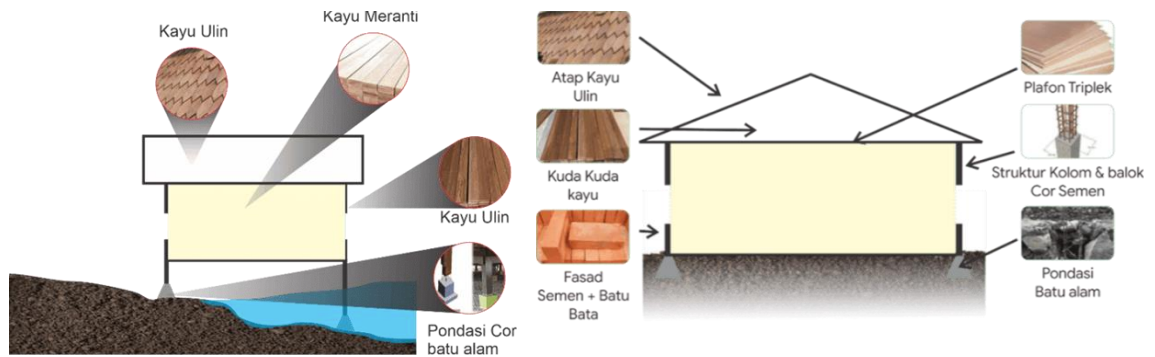
**Figure 12: Circulation plan on site**

Source: Researchers Analysis

Pedestrian circulation, two-wheeled vehicle circulation, four-wheeled vehicle circulation, and bus circulation are all parts of the overall circulation concept. Changes in the culture of the area will be influenced by circulation space that demands pavement. As a result, eco-friendly elements, namely hardscape materials, are used in this circulation design.

#### 5. Building Material

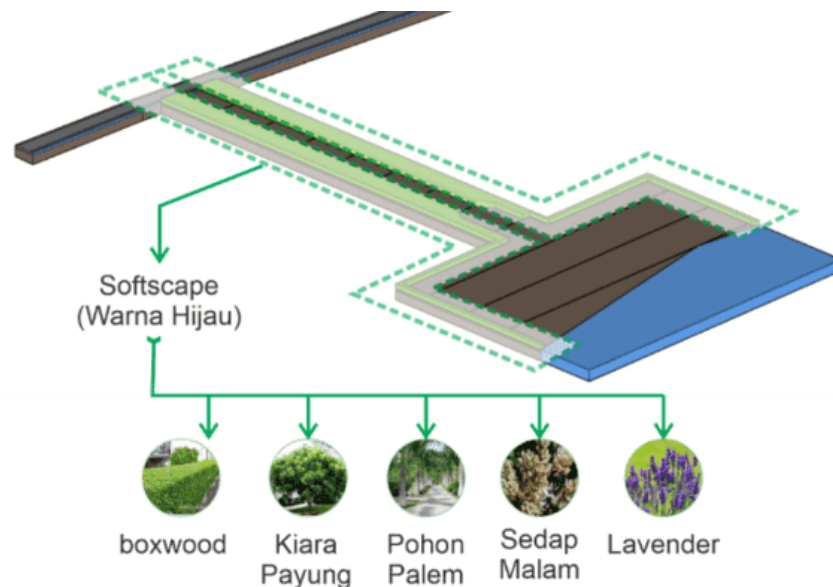
Wood is used extensively in the construction of the green area to ensure its long-term viability. Ulin wood is utilized in resort structures that are located near the water because of its endurance against seawater.



**Figure 13: Building material plan**  
 Source: researchers analysis

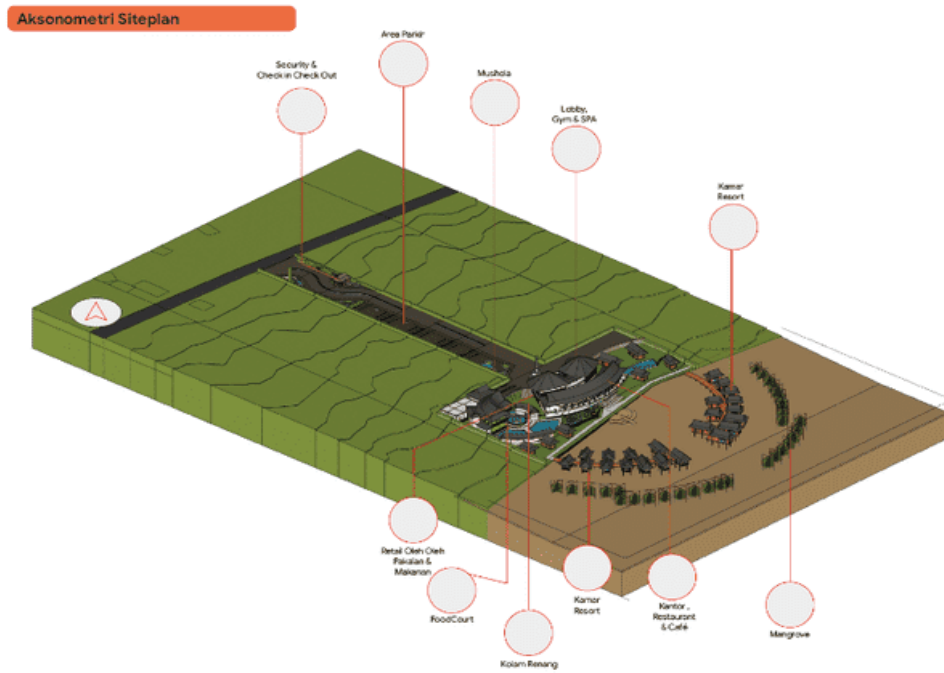
Several types of trees are used in landscape design to support the area with the goals of reducing heat, noise, and providing a relaxing effect, such as boxwood as a barrier to the site area and the land around. Kiara Payung is placed around the pedestrian area. Palm Trees are provided at the road divider from the entrance to the drop off aiming to give direction to visitors. Planting tuberose and lavender aims to give a relaxing effect on smell in the form of fragrant smells along with pedestrians and around resort inns. They are also planted on the side of the highway aiming to provide shade for several resting spots because the distance from the highway to the facility has a fairly long distance.

## 6. Landscape Design



**Figure 14: Landscaping plan**  
 Source: researchers analysis

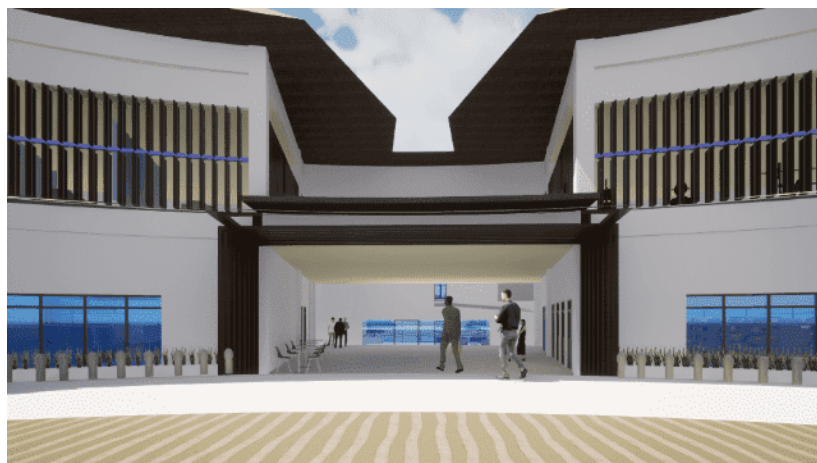




**Figure 15: Final Transformation and Application of Ecology at Resorts and facilities description**  
Source: Researchers Analysis Results

## 7. Architectural Sketches of the final result

### Interior Image



**Figure 16: Lobby Building**

Source: the results of the researchers' analysis

As part of the completion and implementation of the architectural ecological concept in the architecture of the resort on Kubu beach, the lobby has an open concept.



**Figure 17: Restaurant & Caffe Room (AC)**  
**Source: The results of the researchers' analysis**

The restaurant and café rooms are designed in two styles to promote comfort to users: some with clear walls because they employ artificial ventilation and others in open spaces with natural ventilation systems. This design employs a hybrid concept that combines the concepts of ecology with modern architecture.



**Figure 18: Interior Room of Restaurant & Caffe Non AC**  
**Source: The results of the researchers' analysis**



**Picture 19: Food Court on the 2nd Floor**  
**Source: The results of the researcher's analysis**



**Figure 20: Resort Room Type 1 room**  
**Source: The results of the researcher's analysis**

Priatman (2002) highlighted that the design of residential space/rooms at the resort uses an open building system. It is considered to provide maximum view facilities and environmental ecological comfort.



**Figure 21: Overview of the entrance**  
**Source: Researcher Analysis Results**

The site entry is designed using landscape design, which takes into account the notion of ecology by applying it to the selection of materials that will help to sustain the environment ecology. The runway is not paved in asphalt, but rather with grass block material, in order to keep the site drainage system in good working order. Rainwater will not inundate the building exterior.



**Figure 22: the atmosphere of the Dropoff section**  
Source: The results of the researchers analysis



**Figure 23: outdoor restaurant and cafe atmosphere**  
Source: The results of the researchers analysis



**Figure 24: Swimming Pool & Food Court**  
Source: Researchers analysis results

The construction of a swimming pool to a resort is in response to modern societal demands for resort amenities to be completed.



**Figure 25: Swimming Pool & Food Court 2**  
Source: Researchers Analysis Results



**Figure 26: Park area near the beach**  
Source: Researchers Analysis Results



**Source: Researchers analysis results**  
The design of green space maintains site culture.



**Figure 28: Bird's Eye Resort 2**  
Source: Researchers analysis results



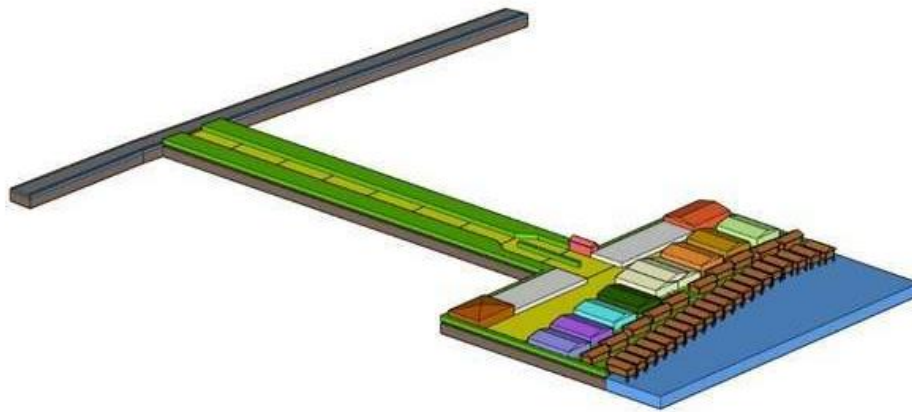
**Figure 29: Bird's Eye Resort 3**  
Source: Researchers Analysis Results



**Figure 30: Bird's Eye Resort from the sea**  
Source: Researchers Analysis Results

A portion of the building is situated in the sea, with the Mangrove Forest serving as an element of the ecological concept's execution and as a means of protecting the structure from beach waves.

## CONCLUSION



The concept of architectural ecology colors the results of the design, starting from the selection of locations and sites, which are also adjusted to the plans of the local government in Kotawaringin Barat Regency in improving tourist facilities on the Kubu beach. Structuring the site without damaging the character of the area is done by maintaining its ecological culture, structuring circulation, structuring the mass of the resort residential buildings, the selection of materials and the completion of the design details. The concept of designing a resort building on the coast of Kubu, Kotawaringin Barat Regency, can maintain the condition of the green space in the selected location. Thus, marine habitats and coastal habitats can be maintained and sustainable.

The design of this Kubu beach resort meets the criteria for the concept of architectural ecology on the following ecological design principles: Solution Grows from Place, Ecological Accounting Informs Design, Design with Nature, and Integration of physical and physical characteristics of the local ecology.

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