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Gunung Padang Megalithic Site Management Strategy: SWOT Analysis Approach for Sustainable Tourism Development

Tri Wahyu Handayani[1], Risma Viantara[2], Hilman Rismayadi[3].
[1]Program Studi Teknik Arsitektur, Fakultas Teknik Perencanaan dan Arstitektur, UNWIM, Bandung, Indonesia, triwahyu@unwim.ac.id
[2]Program Studi Teknik Arsitektur, Fakultas Teknik Perencanaan dan Arstitektur, UNWIM, Bandung, Indonesia, rismaviantara@unwim.ac.id
[3]Program Studi Teknik Arsitektur, Fakultas Teknik Perencanaan dan Arstitektur, UNWIM, Bandung, Indonesia, hilman@unwim.ac.id

Corresponding Author: hilman@unwim.ac.id[3]

Abstract: This study focuses on the development and preservation of the Megalithic Site of Gunung Padang in Cianjur, West Java, which is one of the largest megalithic sites in Southeast Asia. The purpose of this research is to identify the potential and challenges in managing this site as a sustainable cultural tourism destination. The research methods used include a SWOT (Strength, Weakness, Opportunity, Threat) analysis to evaluate aspects of topography, accessibility, and environmental sustainability. The findings show that proper management and the development of educational tourism facilities are crucial to maintaining the site's preservation and enhancing visitor experiences. The study also recommends improving accessibility and implementing sustainable waste management as part of conservation efforts. Thus, this research provides significant contributions to the preservation of cultural heritage and the development of sustainable tourism in West Java.

Keywords: Mount Padang, Conservation, Tourism, Megalithic Site, Preservation.

INTRODUCTION

Tourism is one of the keys to economic growth in West Java, with a focus on increasing competitiveness and community welfare. In the 2019-2023 RPJMD, tourism is used as an economic locomotive with a target of 6% GRDP growth in 2024. The main programs include destination development, marketing, industrial competitiveness, and strengthening human resources and tourism image. One of the leading destinations is the Gunung Padang Megalithic Site in Cianjur, which has been inaugurated as a National Cultural Heritage and is a concern of the central, provincial, and regional governments. The Gunung Padang site is the largest megalithic site in Southeast Asia, with a unique cultural attraction related to the number five, such as five terraces and five mountains around it. However, the

management of tourism activities at this site is still limited, so some visitors act carelessly, which can damage the site. Managing and developing tourism activities that provide positive experiences for visitors is very important to maintain and increase the value of this cultural heritage for future generations..

Figure 1. Mount Padang Cianjur
Source: Adam Ferguson, 2023

METHOD

The research methodology used includes preliminary preparation and survey, including desk study, field data inventory, and creation of planning ideas. Implementation involves field surveys to collect physical and infrastructure data, as well as identification of development object boundaries.

This methodology is a combination of qualitative analysis (such as data interpretation, FGD, and suitability analysis) and quantitative approaches (such as field surveys, soil investigations, and laboratory tests) to produce a comprehensive and measurable plan.

Figure 2. Research location

RESULTS AND DISCUSSION

Gunung Padang is the largest megalithic site in Southeast Asia. The location of the Gunung Padang Site in Karya Mukti Village, Campaka District, Cianjur Regency is 30 km from Cianjur City and 90 km from Jakarta. The preservation of the Gunung Padang Site began with an inventory of historical objects or artifacts located at the location.

The location is in the Gunung Padang Site Area, Cianjur Regency, West Java. With an area of ± 11 Ha and hilly land contour.

SWOT Analysis

1. Strength

1.1 Topography

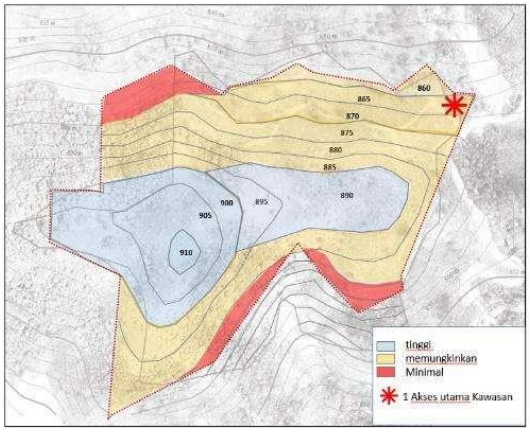

Figure 3. Topographic Measurement Results

In terms of topography, Planning Areas with very dynamic topography have the potential to increase land values because such conditions can provide a different spatial experience in the development area.

1.2 View

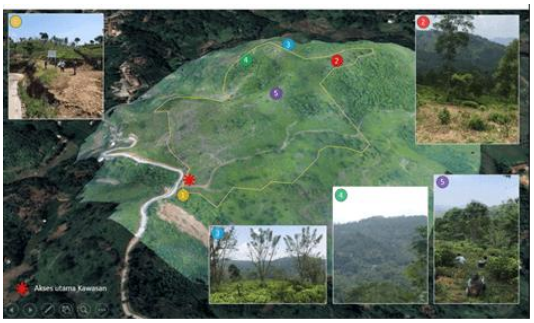

Figure 4. View Analysis

The location of the planning area has a view towards the Gunung Padang Site which is the main icon / selling point of the planning area. In addition, there are many interesting view spots in the planning area. In addition, this area has a view towards the mountains, tea plantations and the city of Cianjur.

1.3 Access

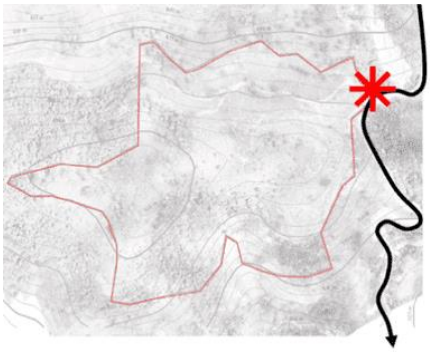

Figure 5. Area Accessibility Analysis

The main road access to the development area is the same access as the access to the Gunung Padang site. This road access already has adequate quality so that this area is much easier to access, especially when the planning area has been built.

2. Weakness
2.1 Technical

Topography The planning area is dominated by hills and valleys that are quite steep. The height of the lowest and highest points of the area reaches 50 meters. With topography like this, the planning area requires significant grading or cut & fill to be safe for use.

2.2 Topography

An area of 11.7 ha, most of which is hilly and has minimal sloping areas, is a challenge in itself in determining the most feasible locations for construction.

2.3 Access

For an area this large, at least 2 accesses are required, one of which is for alternative access for evacuation routes (safety). There is existing access to the plantation area around the planning area.

2.4 Existing Water Bodies

The Planning Area does not have any existing water bodies that could be utilized to add an attractive feature to the landscape design of the area.

3. Opportunity
3.1 Close to Gunung Padang Site

The existence of the Gunung Padang site area is the main potential of the planning area which functions as a supporting facility for the area **.**

3.2 Train station activation plan

The existence of several train stations around the planning area is a great potential for the planning area which can increase accessibility to the planning site both from within and outside the city of Cianjur.

3.3 Included in Two Provincial Tourism Destinations (DPP)

Tourism destinations bogor - cianjur - sukabumi and tourism destinations pangandaran - tasikmalaya - garut - cianjur. With this planning area is one of the priorities for the government to be developed as a tourist destination area.

4. Threat

4.1 Far from City Center

The location is quite far from the city center of Cianjur, requiring a travel distance of around 20 km.

4.2 Tourism Support Facilities

There are no facilities in the form of supporting tourism infrastructure in the surrounding areas.

4.3 Public Transportation

Alternative means of public transportation to and from the planning area are relatively minimal, so that accessibility to and from the area is not yet optimal.

Cultural Tourism Area Development Approach

In managing cultural tourism areas, it is necessary to consider the type of system that applies in the area. The systems in tourism areas are classified into two, namely:

1. Open Area System

The 3 A elements (Amenities, Accessibility, Attractions) that are utilized are not only located in the core, but also outside the core.

2. Closed Area System

Element 3 A (Amenities, Accessibility, Attractions) is utilized only within the area, all needs are provided by the manager within the area.

The consultant concluded that the Gunung Padang Tourism Area accommodates several functions/facilities.

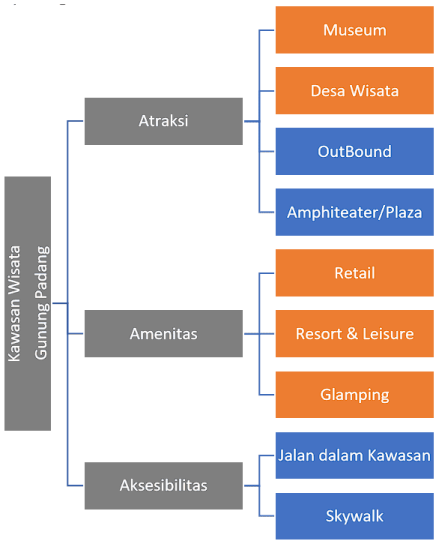

Figure 6. Grouping of Gudung Padang Tourism Areas

Development Concept

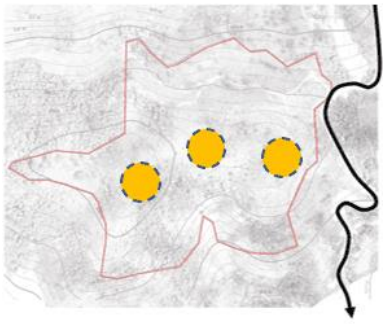

Figure 7. Step 1

In developing the area, planners include several core functions of the area which are realized into 3 zones, namely the reception and information zone, relaxation zone, and education zone. The information zone is realized with the presence of a *tourist information center* (TIC) facility. The relaxation zone is realized with the presence of retail facilities, rest areas, amphitheaters and flower fields and other supporting facilities. The education zone is realized with the presence of a museum, observation tower and binoculars and camping facilities.

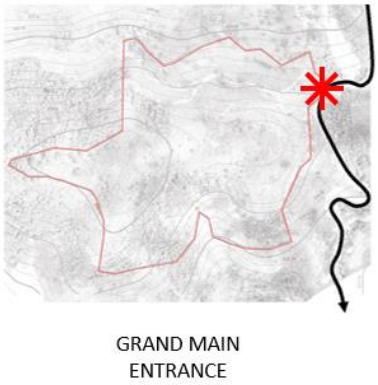

Figure 8. Step 2

entrance location is selected based on proximity to the road and suitability to the topography as well as ease of circulation and access.

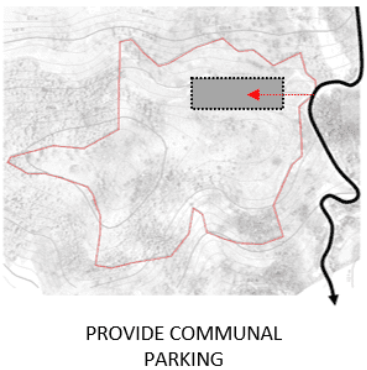

Figure 9. Step 3

Providing parking locations is important because this area must be able to accommodate the excess of tourists visiting the Gunung Padang site.

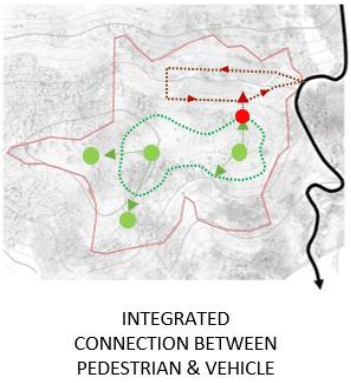

Figure 10. Step 4

The next step is to integrate the various existing functions with pedestrian paths that are attractively designed and able to provide an experience for visitors to this area.

Design Concept

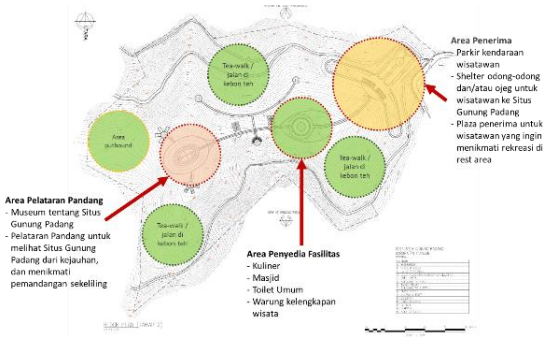

Figure 11. Masterplan Design Concept

1. Space Program

1.1 Analysis of Actors & Activities

a. Visitor Group

Figure 12. Visitor Activity Analysis

b. Tourism Awareness Community Groups

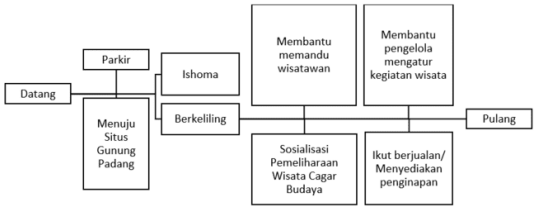

Figure 13. Analysis of Tourism Aware Community Group Activities

c. Management Group

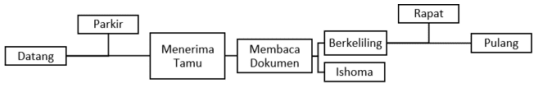

Figure 14. Analysis of Leadership Activities

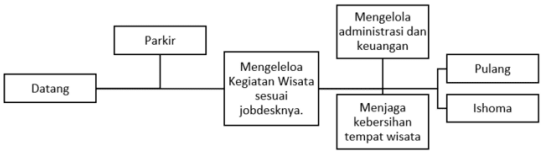

Figure 15. Employee Activity Analysis

Figure 16. Analysis of Caretaker Activities

Figure 17. Analysis of Security Guard Activities

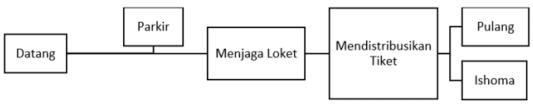

Figure 18. Analysis of Counter Guard Activities

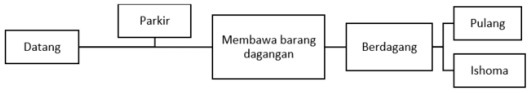

Figure 19. Analysis of Trader Activities

1.2 Space Requirements Analysis

Table 1. Space Requirements Analysis

Fasilitas	Aktivitas	Kebutuhan Ruang	Sifat
Pusat Informasi / Tourist Information Center (TIC)	- Menanyakan Informasi mengenai fasilitas Wisata - Beristirahat - Ishoma - Mengelola Kegiatan Rest Area Pasir Domas - Berfoto	- Resepsionis - Kios - Tempat makan - Musholla - Toilet - Kantor Pengelola - Taman Tematik	Publik & Private
Museum	- Mengunjungi Pameran - Menikmati Pemandangan Gunung Padang & Gede - Berfoto - Mengelola kegiatan	- Ruang Pameran Umum - Ruang Pameran Khusus - Pelataran Pandang - Kantor Pengelola - Toilet - Pantry - Musholla	Publik & Private
Atraksi	- Atraksi Budaya	- Amphitheater	Publik
Penerima	- Parkir Kendaraan - Membeli Tiket Masuk - Menggunakan	- Bangunan Ticketing - Buggy Car - Plaza Penerima - Tempat Parkir	Publik
Tahap II			
Tempat Menginap	Menyewa Penginapan Berkemah	Cottage Glamping	Private
Food & Beverages	Memesan makanan Beristirahat	Retail	Publik
Atraksi	Tea Walk Outbound	Skywalk Area Outbound	Publik

1.3 Spatial Relationship Analysis

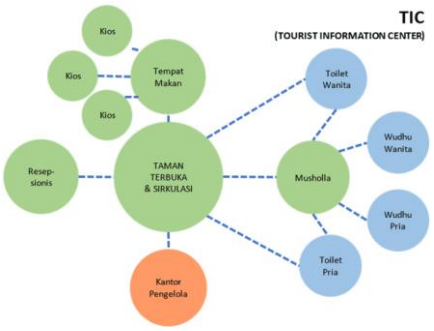

Figure 20. Hub. TIC Room

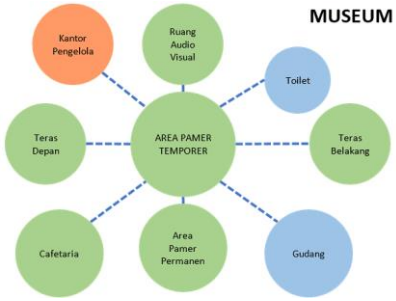

Figure 21. Hub. TIC Room

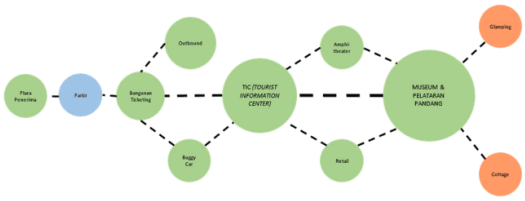

Figure 22. Macro Space Hub of Pasir Domas Rest Area

2. 3 Layer Tourism Concept

Table 2. 3-Layer Tourism Concept

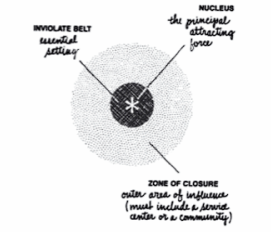

Figure 5-3. *Tripartite attraction concept. In attraction development, the planning and development of three spatial zones should be considered—the nucleus, the inviolate belt, and the zone of closure (which includes one or more communities).*

Gambar 7.1 Konsep Wisata 3 Lapis

Tripartite Attraction Concept
Claire Gunn, 1977
1. *Nucleus*/Zona Inti
adalah zona dimana daya tarik wisata itu berada. Menjadi pusat utama dari sebuah daya tarik wisata.
2. *Inviolate Belt*/Zona Penyangga
adalah zona yang menghubungkan zona inti dan public zone 'bridging'. Berguna untuk menjaga citra dari daya tarik wisata itu sendiri, dan juga kenyamanan wisatawan. Dapat difungsikan juga untuk menciptakan pengenalan dari zona inti kepada wisatawan.
3. *Zone of Closure*/Zona Fasilitas
adalah zona dimana fasilitas-fasilitas pendukung wisata berada. Seperti toko souvenir, restoran, TIC, dan lain sebagainya.

Gambar 7.2 Konsep Wisata 3 Lapis Kawasan Wisata Situs Gunung Padang

Rest Area Gunung Padang di Pasir Domas
Zona Inti diperuntukan untuk wisatawan yang memiliki ketertarikan dan apresiasi tinggi terhadap Situs Megalitik Gunung Padang (menginginkan pengalaman otentik, mau membayar lebih mahal, mau menghormati batasan-batasan yang diterapkan untuk melestarikan situs)
Zona Penyangga – Rest Area Pasir Domas untuk wisatawan umum yang ingin tahu Gunung Padang tapi cukup melihat dari jauh. Lebih menginginkan rekreasi umum yang beragam bersama teman dan keluarga.
Zona Fasilitas

3. Contour Response

3.1 Elevation Decrease

Masterplan Design Many use High DPT. This will result in the budget structure being inefficient.

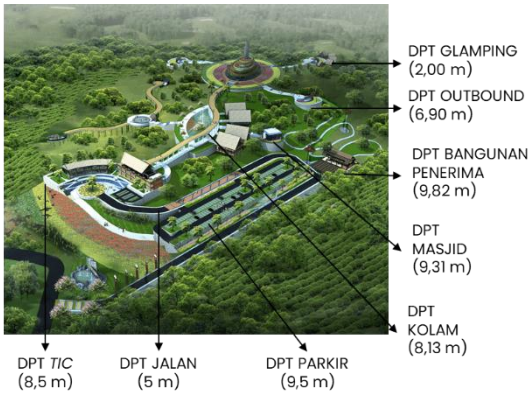

Figure 23. Land Filling and DPT Placement Concept

Figure 24. DPT Design with Concrete Material (top): Example of Concrete DPT (bottom)

Responding to the sloping land conditions, the Building & Infrastructure are adjusted again in elevation so that there are not too many DPT. The Cut & Fill volume of the land is attempted to have a balanced size.

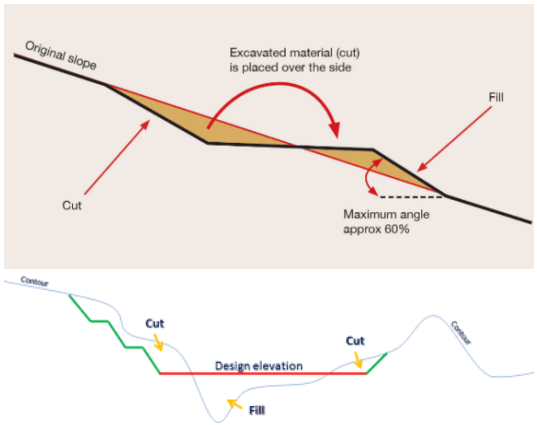

Figure 25. Proposed Cut and Fill Concept

Figure 26. Proposed DPT Design

After elevation reduction and Cut and Fill, some buildings still require retaining walls. To create a more natural impression the DPT was changed to grass.

3.2 Building Mass Placement

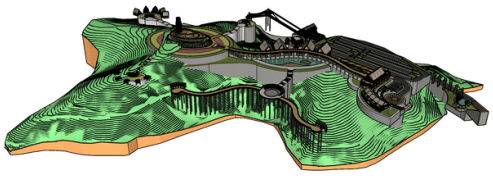

Figure 27. MasterPlan Design of Building Mass Placement Before Measurement

The initial Masteplan design refers to the development scenario and does not respond to contours because there are no topographic measurement results.

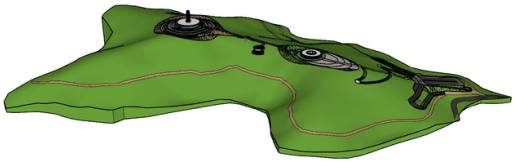

Figure 28. MasterPlan Design of Building Mass Placement After Measurement

After the topographic measurement is done, the main consideration in designing is the contour result. Therefore, the design is adjusted back to the existing contour.

Infrastructure Planning for Gunung Padang Tourism Area

1. Access within the Area

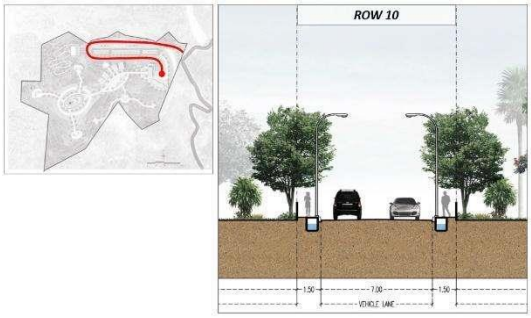

Figure 29. Road cuts in the area

Access within the area can be passed by vehicles until the drop off area of the recipient, then the vehicles are directed to the parking area. Road access is designed with a ROW of 10 meters with 2 vehicle lanes of 3.5 m each plus 2 pedestrian lanes on each side of the lane with a width of 1.5 m.

2. Parking

The need for parking space is based on the ratio of the number of *saleable areas* to the number of vehicles, where every 50 m2 must provide 1 car park, the saleable area is +- 21,667 m2 , so the area must provide a minimum of 200-230 units (total parking area 0.68 ha).

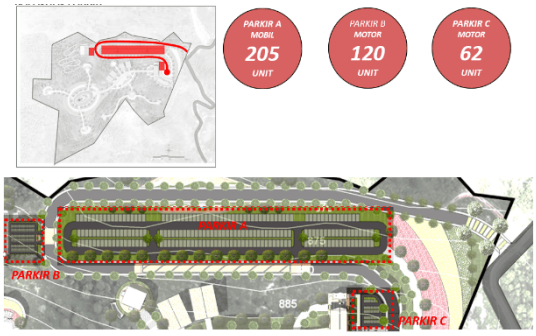

Figure 30. Parking Space

Shuttle transport as a mode of transportation from and to the Gunung Padang site from the planning area has a major role in facilitating accessibility as well as being a means of controlling/mass tourism control, which also functions as a rest area and tourism information center for the Gunung Padang site .

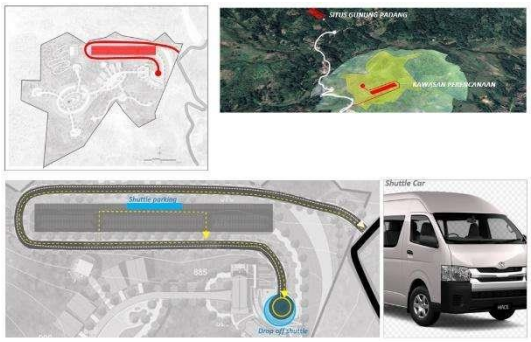

Figure 31. Shuttle Bus Transportation System

3. Water Needs

Clean water needs are calculated based on the planning criteria of the Directorate General of Human Settlements, Department of Public Works, 1996, the non-domestic water needs of the tourism sector are 0.1 - 0.3 l/sec/ha. The planning of clean water provision for the Gunung Padang Tourism Area uses the criteria of 0.3 l/sec/ha. The area of the building of the tourism area is 0.5 Ha, taking into account a leakage of 20% so that the clean water needs are obtained at 0.4 l/sec.

In the Gunung Padang Tourism area, 12 toilet units are planned, 1 unit consists of 2 women's toilets and 2 men's bathrooms. Placed inside and outside the building, the number of each toilet can be seen in the following table:

Table 3. Number and Distribution of Toilets

Nama Bangunan	Jumlah
TIC	1
Lobby	1
Museum	2
Area Komersial	4
Mushola	1
Glamping	2
Area Parkir	1
Total	12

To meet the water needs of 4 l/sec, a Reservoir volume is required as a water reservoir of 7 m3 which is placed at the highest elevation of the Tourism area, namely 910 m so that

it can flow water to each unit by gravity. The location of the Reservoir and the clean water distribution scheme can be seen in the following picture.

Figure 32. Location of the Gunung Padang Tourism Area Reservoir

4. Wastewater Management

The calculation of the volume of wastewater in the Tourism Area is obtained from the clean water requirement, which is 0.27 l/sec *grown water* and 0.1 l/sec *blackwater* .

Wastewater treatment in the tourist area is planned to use an anaerobic-aerobic biofilter process, which combines the decomposition of organic matter through anaerobic and aerobic processes. In the anaerobic stage, organic pollutants are converted into carbon dioxide and methane gases without additional energy, but ammonia and hydrogen sulfide (H2S) remain. To achieve the quality of treated water that meets quality standards, the wastewater is then processed through an aerobic biofilter, which oxidizes ammonia to nitrate and converts H2S to sulfate, producing high-quality treated water with low energy consumption.

Anaerobic biofilter reactor consists of two chambers, where microorganisms decompose organic matter. Wastewater from this reactor is then channeled to an aerobic biofilter reactor that uses honeycomb plastic media and aeration to increase the efficiency of organic matter decomposition and the nitrification process. This biofilter is placed behind the toilet or several adjacent units for processing optimization.

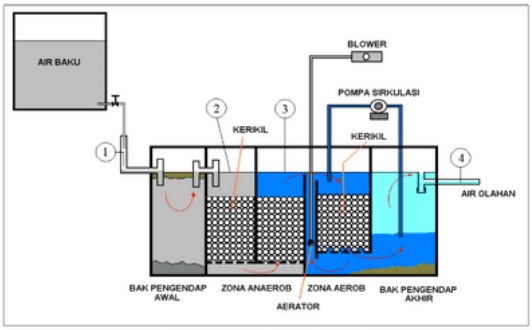

Figure 33. Wastewater Treatment Process with Anaerobic-Aerobic Biofilter Process

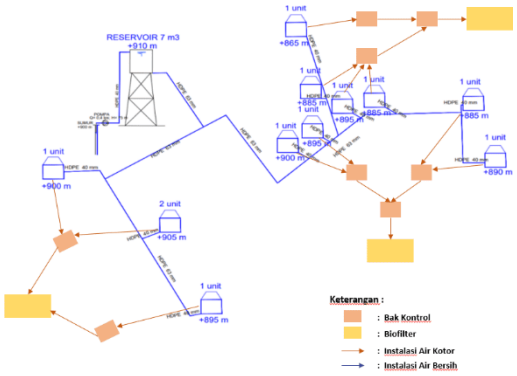

Figure 34. Clean Water and Dirty Water Installation Diagram

5. Waste Management with Zero Waste Concept

The waste generated from tourism activities with the assumption of 1.4 liters/person/day, then with the number of visitors of 250 people every day, the waste generated from the Gunung Padang tourist area is **350 l/day.**

In general, the meaning of ("Zero Waste Concept") is a concept in the process from production to the end of a production process that can avoid waste production, or minimize waste. One of the Zero Waste concepts is by implementing the 3-R principle (Reduce, Reuse, Recycle).

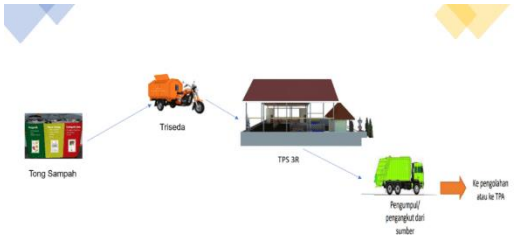

Figure 35. Operational Scheme of Waste in the Gunung Padang Tourism Area

Garbage collection from each container is collected using 2 Triseda (garbage motors) equipped with a box that is also sorted. Triseda takes the garbage to a waste processing facility with 3R facilities (TPS 3R), with a 3-day itinerary, to be processed.

6. Electricity Supply

The area's electrical infrastructure includes Power Sources, Substations, Panels and Cable Networks. This electrical system has various facilities according to the function of each system facility, system capacity and system service level. So this is a collaboration of various facility systems that require 'interconnection' that can guarantee the level of system service.

Table 4. Electrical Load Standards

No.	Demand Factor	Fungsi	Beban Listrik
1.	100 %	Toko/ Mall	55 - 2185 VA/m^2
2.	100 % - 80 %	Hotel/ Wisata	41,5 – 1110 VA/m^2
3.	80%	Perumahan	900 - 3500 VA/unit

With a sellable area of 21,667 m2 , based on the electricity requirement standards in tourist areas, an estimated electricity requirement for the area is assumed to be 728 kVA.

7. Function of Pasir Domas Rest Area

Figure 36. Concept of the Function of the Pasir Domas Rest Area

8. Material

8.1 Parking Area

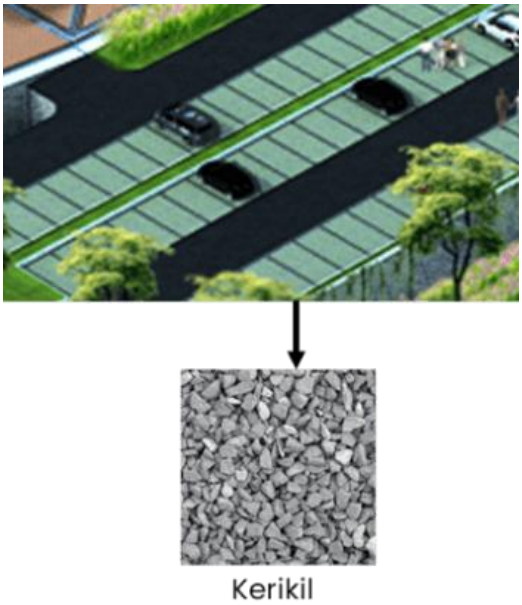

Figure 37. Parking Area Materials

The use of asphalt in the parking area is considered less effective because it cannot absorb water and the use of grass blocks is quite expensive in terms of cost. Therefore, the entire parking area is replaced with gravel.

8.1 Courtyard Area

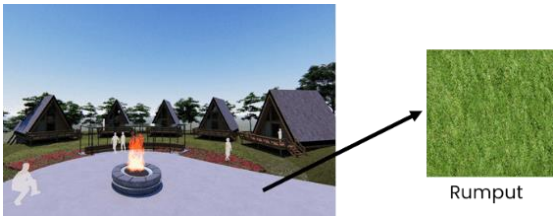

Figure 38. Yard Area Materials

After reviewing the masterplan, the courtyard area is recommended to use materials that easily absorb water, or not hard courtyards. For example grass or gravel.

RESULTS AND DISCUSSION

Conclusion

In the conclusion section of this research, the results are presented in the form of the Gunung Padang Site Design.

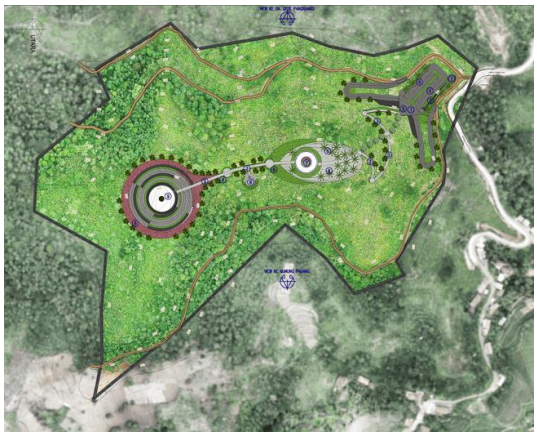

Figure 39. Proposed Design of Hold 1

STAGE 1
1. Receiving Plaza
2. Pedestrian Path
3. Pedestrian Track & Buggy Cas Electric
4. Parking Area
5. Ticketing Building
6. Thematic Park
7. TIC & Retail Building
8. Amphitheater
9. Museum & Tower

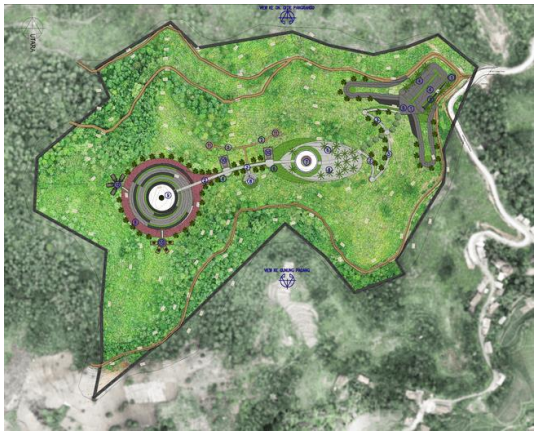

Figure 40. Proposed Design Hold 2

STAGE 2
1. Receiving Plaza
2. Pedestrian Path
3. Pedestrian Track & Buggy Cas Electric
4. Parking Area
5. Ticketing Building
6. Thematic Park
7. TIC & Retail Building
8. Amphitheater
9. Museum & Tower
10. Cafeteria
11. Viewing Post
12. Cottage
13. Glamping
14. Outbound Area

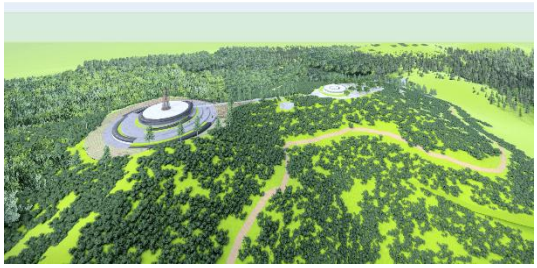

Figure 41. 3D Perspective View of the Area

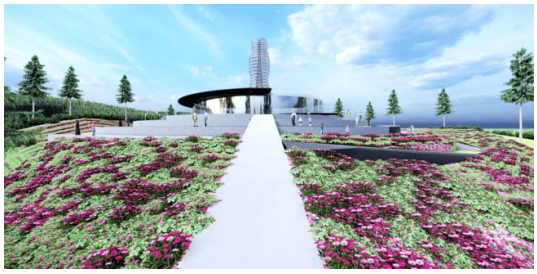

Figure 42. 3D View Museum

Figure 43. 3D Pedestrian, Sky Walk & Amphitheater

Figure 44. 3D View Glamping

Figure 45. 3D View Glamping

Figure 46. 3D View of the Area (Museum)

Suggestions/Recommendations

1. **Comparative Study** :
   Further research could conduct comparative studies with other megalithic sites in Indonesia or Southeast Asia to gain a deeper understanding of effective management and conservation strategies. This would provide insight into best practices that could be adopted at Gunung Padang.

2. **Long Term Research** :
   Given that cultural site management often takes a long time to see results, further research should be conducted over a longer period of time to monitor the impacts of conservation interventions and sustainable tourism development.

3. **Ecological and Social Studies** :
   In-depth research into the ecological and social impacts of tourism development around sites is needed to ensure that conservation efforts not only safeguard cultural heritage but also support environmental sustainability and the well-being of local communities.

4. **Technology Innovation** :
   Integrating advanced technologies into conservation and management, such as the use of drones for site monitoring and mobile applications for visitor experience, could be an interesting topic for further research.

5. **Local Community Involvement** :
   Research that focuses on local community empowerment strategies in tourism management and development on Mount Padang needs to be expanded, because community participation is the key to success in sustainable conservation efforts.

6. **Impact Measurement Methodology Development** :
   To quantitatively assess the impact of various management interventions, the development of more precise and detailed measurement methodologies is essential. This will help in evaluating the effectiveness of the programs that have been implemented.
7. **Interdisciplinary Research** :
   Combining various disciplines such as archaeology, tourism, environment, and cultural management in research will provide a more holistic approach in managing this megalithic site.

Through these suggestions, it is hoped that further research can address existing deficiencies and provide a more comprehensive contribution to the preservation and development of the Gunung Padang site.

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