

## Site Analysis of Kolam Evu for Sustainable Tourism Development

Apolinaris Remetwa, Darmansjah Tjahja Prakasa, Suko Istijanto

Universitas 17 Agustus 1945 Surabaya, Indonesia

### ABSTRACT

Kolam Evu is a natural tourism area located on Kei Kecil Island with distinctive characteristics, including natural spring water, high water clarity, and strong local cultural values. This study aims to analyze site conditions as a basis for sustainable tourism development. The research employs a qualitative descriptive method through field observation, literature review, and spatial analysis (Creswell & Creswell, 2018). The findings indicate that Kolam Evu has strong potential to be developed using a contextual architectural approach while maintaining environmental sustainability (UNWTO, 2021). Development strategies include zoning, circulation planning, and the use of local materials. This study contributes as a reference for sustainable tourism planning (UNWTO, 2021).

**Keywords:** *Site Analysis, Sustainable Tourism, Contextual Architecture*

#### **Corresponding author**

**Name:** *apolinaris Remetwa*

**Email:** *aprisremetwa@gmail.com*

## INTRODUCTION

Nature- and culture-based tourism has become an essential sector in regional development because it enhances economic growth while preserving local identity and cultural heritage (UNWTO, 2021). Sustainable tourism emphasizes the balance between environmental conservation, social well-being, and economic benefits.

Kolam Evu, located on Kei Kecil Island, has significant potential as a natural tourism destination due to its clear spring water, preserved vegetation, and strong cultural values embedded in local community life. These characteristics make the site not only a recreational area but also a socio-cultural space that supports daily community interaction (Kemenparekraf, 2021).

However, current conditions indicate several challenges, including limited facilities, inadequate accessibility, and the absence of integrated spatial planning. If not properly managed, these issues may lead to environmental degradation and decreased tourism quality (BPS, 2023).

Therefore, this study aims to analyze the site conditions of Kolam Evu and formulate a sustainable tourism development concept based on contextual architecture.

This research provides a planning reference that integrates environmental, social, and cultural aspects into a unified framework (UNWTO, 2021).

## **METHOD**

This study uses a qualitative descriptive approach to understand site conditions in depth. This method allows researchers to explore environmental, spatial, and social characteristics comprehensively (Creswell & Creswell, 2018).

The research was conducted at Kolam Evu, Kei Kecil Island. Data collection methods include field observation, documentation, and literature study. Field observations were conducted to identify physical elements such as topography, vegetation, and water sources.

Documentation in the form of photographs was used to capture visual characteristics of the site, while literature studies were conducted to understand sustainable tourism principles and environmental design strategies (UNWTO, 2021).

The data analysis process consists of three stages: analysis of existing conditions, identification of potentials and constraints, and formulation of development concepts. This structured approach ensures that the results are based on actual site conditions and current planning principles (Kemendagri, 2021).

## **FINDING AND DISCUSSION**

### **RESEARCH RESULT**



**Figure 1: .Evu Pool Bathing Open Space, Image Source: Author's Processing from relevant field data, 2026**

### **RESULT (Existing Condition Analysis)**

The analysis shows that Kolam Evu has a dominant natural characteristic in the form of a spring with high water clarity, indicating a well-preserved ecosystem. This condition is a major attraction for sustainable nature-based tourism (UNWTO, 2021). The high level of water clarity suggests that the natural filtration system and surrounding environmental conditions are still functioning effectively. Such conditions are rarely found in heavily developed tourism areas, making Kolam Evu a valuable ecological asset that must be protected. In addition, the presence of clean and stable water sources contributes to the

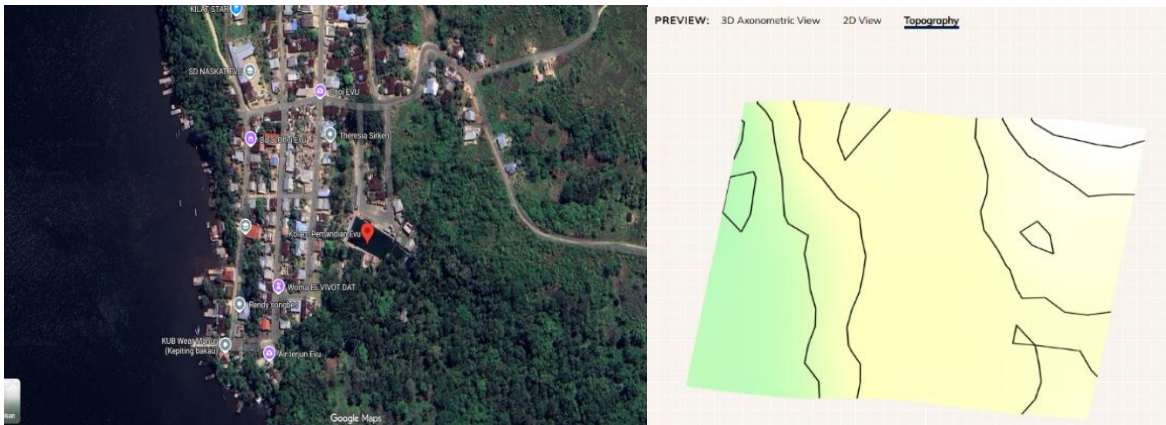
sustainability of both ecological systems and tourism activities, ensuring long-term usability of the site.



**Figure 2: .Evu Bathing Pool**

Image Source: Evu Bathing Pool, The Story Behind the Formation of Evu Pool - DAILY VOYAGERS - Tales, 2026

Furthermore, the presence of a natural spring with high water quality also reflects the integrity of the surrounding watershed system, which plays a crucial role in maintaining hydrological balance within the area. This condition indicates that land use changes around the site are still relatively minimal, allowing natural processes such as infiltration, groundwater recharge, and surface runoff regulation to function properly. However, without proper management, increased tourism activities may pose risks such as water contamination, waste accumulation, and disruption of the natural flow system. Therefore, it is essential to implement preventive strategies, including controlled visitor access, designated activity zones, and environmentally friendly infrastructure to protect the water quality (UNEP, 2020).



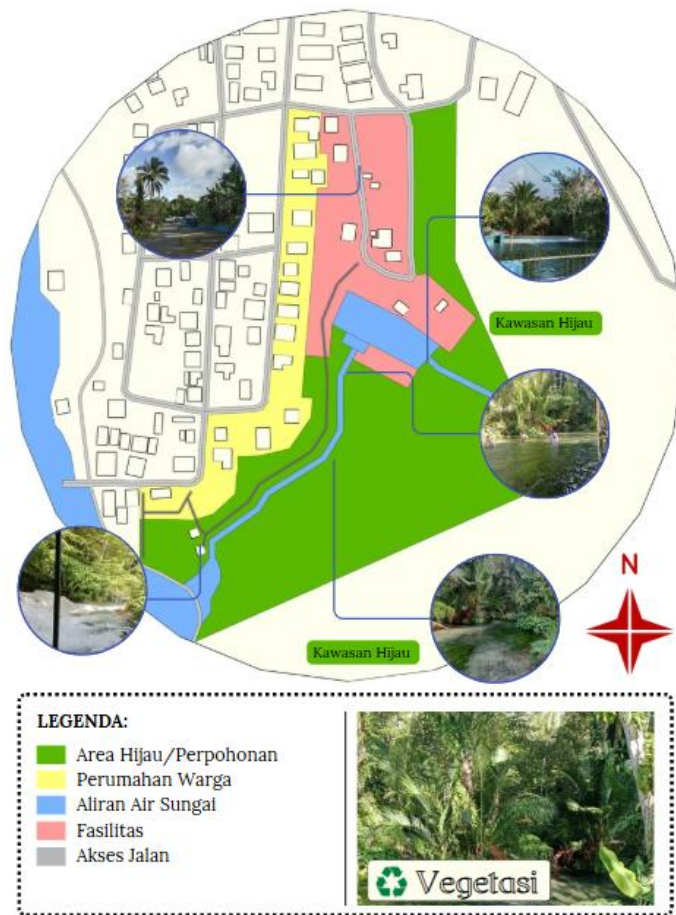
**Figure 3: . Site Area and Topography of Ohoi Evu**

Image Source: Author's processing from Cadmapper relevant, 2026

In addition, the ecological value of the spring can be further enhanced through sustainable design interventions that prioritize conservation while accommodating tourism needs. For instance, the development of viewing platforms, pathways, and resting areas should be carefully designed to minimize direct contact with sensitive zones. Educational elements, such as interpretive signage about the natural water system, can also be introduced to raise visitor awareness regarding environmental preservation. By integrating conservation efforts with tourism experiences, Kolam Evu can serve not only as a recreational destination but also as an educational landscape that promotes environmental responsibility and long-term sustainability (UNWTO, 2021).

The surrounding vegetation consists of large trees that provide natural shading and contribute to environmental balance, including microclimate regulation and ecological stability (UNEP, 2020). These vegetation elements play a crucial role in reducing temperature, maintaining soil moisture, and supporting biodiversity within the area. Furthermore, dense vegetation enhances the aesthetic quality of the landscape, creating a comfortable and attractive environment for visitors. The preservation of this vegetation is essential, as it acts as a natural buffer that protects the site from environmental degradation caused by human activities.

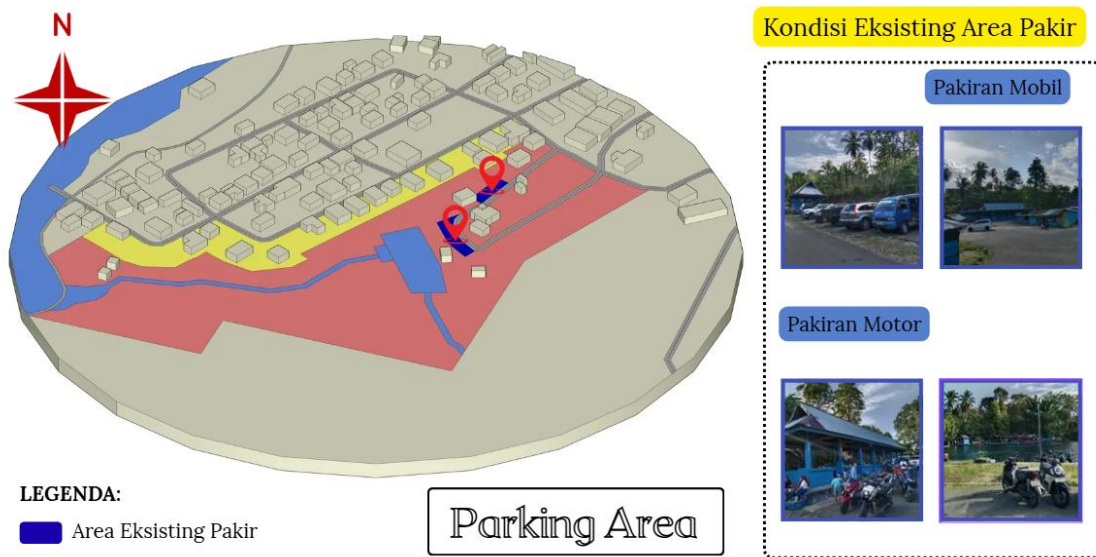
In addition, vegetation also functions as a protective layer against erosion and surface runoff, especially in areas with high humidity and water presence. The root systems help stabilize the soil structure, preventing land degradation and maintaining the physical integrity of the site. Therefore, preserving existing vegetation is not only important for ecological reasons but also for ensuring long-term environmental stability (UNEP, 2020).



**Figure 4: .Vegetation Analysis of the Evu Pond Area**

Image Source: Author's compilation from Relevant Analysis, 2026

Moreover, vegetation plays a significant role in shaping the spatial experience and environmental comfort within the site. Large trees and dense plant coverage contribute to shading, reduce solar radiation, and improve air quality by filtering pollutants and producing oxygen. These conditions create a more pleasant microclimate, which directly enhances visitor comfort and encourages longer stays. From a design perspective, vegetation can also be integrated as a natural element in spatial planning, serving as visual guides, boundaries, and transitional spaces between different activity zones. However, without proper management, excessive human interaction such as trampling, illegal cutting, or land clearing may threaten the sustainability of this vegetation system. Therefore, strategic conservation efforts combined with controlled development are necessary to maintain both ecological functions and the overall quality of the tourism environment (UNWTO, 2021).



**Figure 5: . Parking Area Analysis**

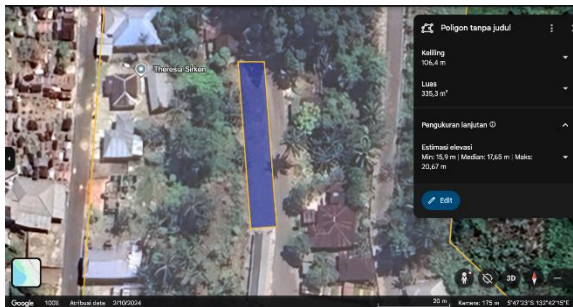
Image Source: Processed by the author from Relevant Analysis, 2026

In addition, Kolam Evu functions as a social space where local communities conduct daily activities such as bathing, gathering, and interacting. This reflects strong socio-cultural values that must be preserved in tourism development (Kemenparekraf, 2021). The interaction between the community and the natural environment demonstrates a harmonious relationship that has been maintained over time. This socio-cultural dimension adds intangible value to the site, making it not only a physical destination but also a living cultural landscape. Therefore, any development strategy must respect and integrate these local practices to avoid disrupting community dynamics.

Figure 6-7

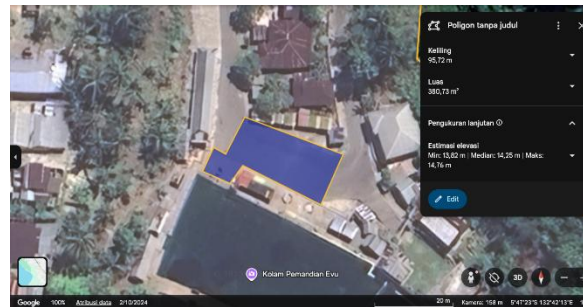
1. Vegetation functions as a natural erosion control system by stabilizing soil through root structures, reducing the risk of land degradation, especially in areas with high water intensity (UNEP, 2020).
2. It plays an important role in regulating microclimate conditions, such as lowering ambient temperature, increasing humidity, and providing natural shading for visitor comfort (UNWTO, 2021).
3. Dense vegetation supports biodiversity by providing habitat for various flora and fauna, contributing to ecological balance within the Kolam Evu area (UNEP, 2020).
4. Vegetation enhances visual quality and landscape aesthetics, creating a more attractive and immersive natural tourism experience for visitors (Kemenparekraf, 2021).
5. It acts as a natural buffer zone that minimizes the impact of human activities, such as noise, pollution, and uncontrolled movement within sensitive areas (UNWTO, 2021).

6. From a spatial design perspective, vegetation can be utilized as a natural element for zoning, guiding circulation paths, and forming transitions between different functional areas.
7. However, unmanaged tourism activities may lead to vegetation damage, such as trampling, illegal cutting, and land clearing, which can disrupt ecological stability (UNEP, 2020).
8. Therefore, conservation strategies such as controlled access, protective zoning, and environmental awareness are essential to maintain vegetation sustainability in the long term (UNWTO, 2021).



**Figure 6: . Pakiran Area 1**

Source of Image: Processed by the author  
from Relevant Analysis, 2026



**Figure 7: . Pakiran 2 Area**

Source of Image: Processed by the author  
from Relevant Analysis, 2026

From an accessibility perspective, the site still faces limitations in infrastructure and circulation systems, which may reduce visitor comfort and safety. Proper spatial planning is therefore essential for sustainable tourism development (UNWTO, 2021). The absence of clear pathways, signage, and organized entry points can lead to inefficient movement patterns and potential environmental damage due to uncontrolled access. Improving accessibility should not only focus on convenience but also consider environmental sensitivity by minimizing land alteration and preserving natural features.

Accessibility improvements should therefore prioritize both functionality and environmental preservation. Simple interventions such as clearly defined pathways, directional signage, and designated entry points can enhance visitor movement while reducing ecological disturbance. By integrating these elements with the natural landscape, accessibility can be improved without compromising the environmental integrity of Kolam Evu (UNWTO, 2021).



**Figure 8: .Visitor Activities at Evu Pool**

Source of Image: Author's rendition from Relevant Analysis, 2026



**Figure 9: .Wear Mas II**

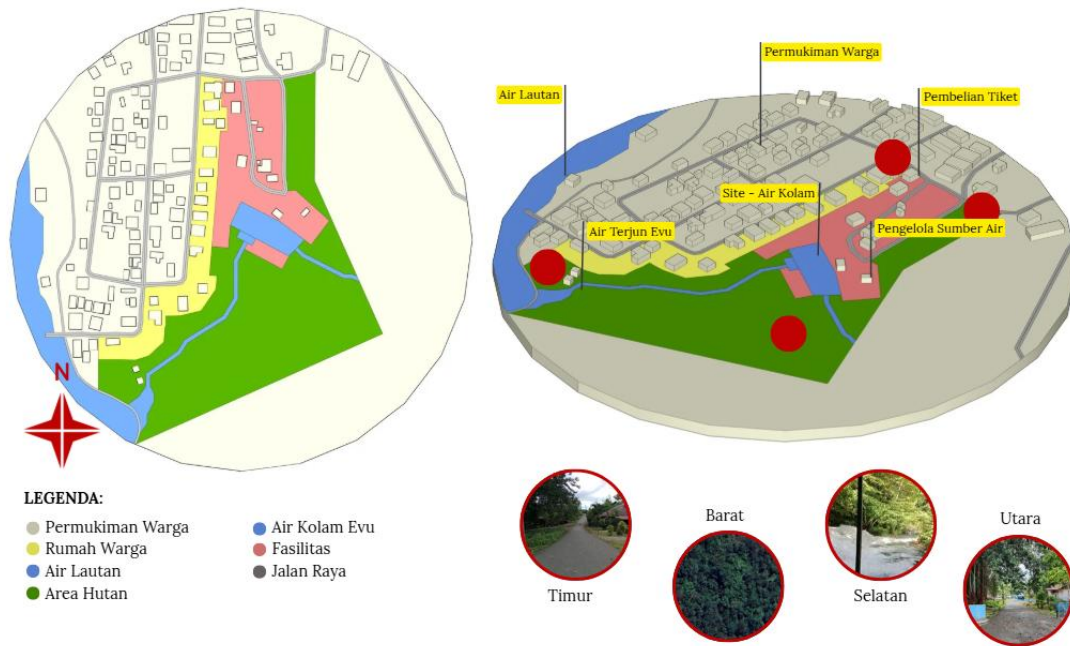
Source Image: Author's elaboration from Relevant Analysis, 2026



**Figure 10: .Open Space Pool**

Source of Image: Processed by the author from Relevant Analysis, 2026

Existing facilities remain minimal and unorganized, indicating the need for development that supports tourism while maintaining environmental sustainability (BPS, 2023). The lack of adequate facilities such as seating areas, sanitation, and designated activity spaces may limit the overall visitor experience. However, this condition also presents an opportunity to develop facilities in a controlled and sustainable manner, ensuring that future interventions are well-integrated with the natural environment and do not compromise ecological balance.



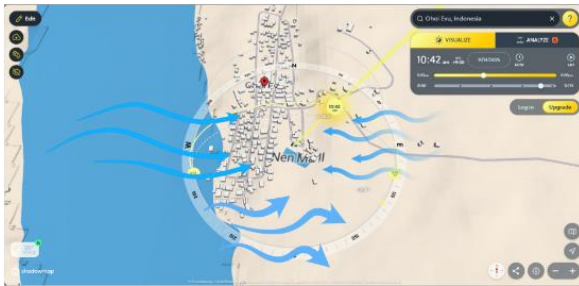
**Figure 11: .Region View Analysis**

Source of Image: Author's elaboration from relevant analysis, 2026



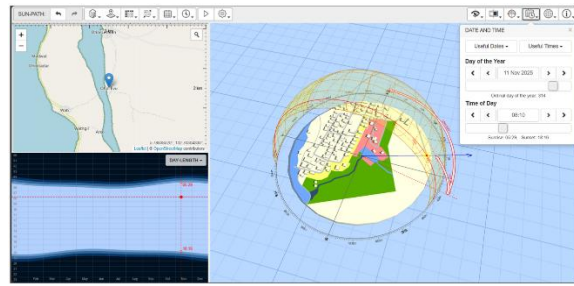
**Figure 12: .Spatial Layout Contour of Ohoi Evu**

Source of Image: Processed by the author from Topoexport relevant, 2026



**Figure 13: .Shadowmap (Ohai Evu, Indonesia, November 14, 2025 at 10:42 WIT)**

Image Source: Author's processing from relevant analysis, 2026



**Figure 14: .Sun Path According to Andrew Marsh**

Image Source: Author's rendering from relevant analysis, 2026

## DISCUSSION (Development Analysis)

The findings confirm that Kolam Evu has strong potential to be developed as a sustainable tourism destination. This aligns with global sustainable tourism principles emphasizing environmental conservation, community participation, and economic sustainability (UNWTO, 2021).

A contextual architectural approach is considered appropriate because it ensures that design interventions respond to local environmental conditions and cultural identity (Kemenparekraf, 2021).

One key strategy is implementing a zoning system that divides the area into conservation zones, activity zones, and supporting zones. This helps control land use and prevent environmental degradation (UNEP, 2020).



**Figure 15: .Overall Tourism Condition of Evu Pool**

Source of Image: Author's processing from relevant analysis, 2026

Circulation planning is also essential to create efficient and environmentally friendly movement patterns. Circulation paths should follow natural contours to minimize ecological disruption (UNWTO, 2021).



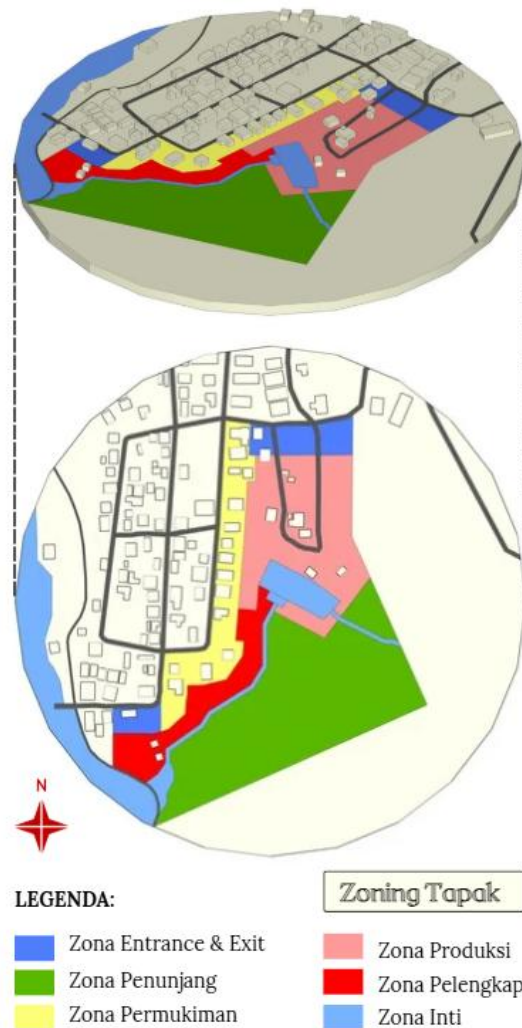
**Figure 16: .Contour Shape on the Footprint of Evu Pond**  
Image Source: Author's processing from relevant analysis, 2026

The use of local materials is important to reduce environmental impact and strengthen local identity, which is a key principle in sustainable design (Kemenparekraf, 2021).

Community involvement plays a crucial role in maintaining sustainability, as local residents have direct connections to both the environment and cultural values of the site (UNDP, 2020).

However, this study has limitations, particularly the lack of quantitative data and technical measurements. Future research should include environmental impact assessments and detailed design evaluations (UNEP, 2020).

## CONCLUSION



**Figure 17: .Evu pond area zoning**

Source image: Author's processing from relevant analysis, 2026

Kolam Evu has strong potential as a sustainable tourism destination due to its natural and cultural characteristics. Site analysis shows that development must be carefully planned to maintain environmental balance and preserve local identity (UNWTO, 2021). In this context, the integration between ecological preservation and tourism activities becomes a key factor in ensuring long-term sustainability. The natural spring system, vegetation coverage, and existing landscape structure must be maintained as primary elements that shape the identity of the area, rather than being altered for short-term development goals. Moreover, uncontrolled tourism growth may lead to environmental degradation, such as water pollution and loss of vegetation, which can reduce the quality and attractiveness of the destination (UNEP, 2020).

The application of contextual architecture provides an effective approach to integrating development with existing site conditions. Through proper zoning, circulation planning, and environmental preservation, Kolam Evu can be developed sustainably without compromising its ecological and cultural values (Kemenparekraf, 2021). This approach emphasizes harmony between built and natural environments, where design interventions respond to local climate, materials, and cultural patterns. For instance, zoning strategies can separate conservation areas from tourism activity zones to minimize environmental pressure, while circulation systems can be designed to follow natural contours, reducing land disturbance and erosion risks (UNWTO, 2021).

Furthermore, the use of local materials and construction techniques not only reduces environmental impact but also strengthens the visual and cultural identity of the site. Community involvement is also essential in the development process, as local residents play a significant role in maintaining traditions and managing tourism activities sustainably (UNDP, 2020). By involving the community, the development process becomes more inclusive and ensures that economic benefits are distributed fairly.

In addition, sustainable tourism development at Kolam Evu should incorporate environmental management strategies such as waste control systems, water conservation, and visitor capacity regulation. These measures are necessary to prevent overexploitation and to maintain ecological balance over time (UNEP, 2020). Therefore, a comprehensive and integrated planning approach is required to ensure that Kolam Evu can evolve into a resilient and sustainable tourism destination while preserving its natural and cultural heritage.

## REFERENCES

- Badan Pusat Statistik (BPS). (2023). *Statistik pariwisata Indonesia 2023*. Jakarta: BPS.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: qualitative, quantitative, and mixed methods approaches* (5th ed.). Thousand Oaks, CA: Sage Publications.
- Dredge, D., & Jamal, T. (2015). Progress in tourism planning and policy: a post-structural perspective on knowledge production. *Tourism Management*, 51, 285–297. <https://doi.org/10.1016/j.tourman.2015.06.002>
- Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: a rapid assessment of COVID-19. *Journal of Sustainable Tourism*, 29(1), 1–20. <https://doi.org/10.1080/09669582.2020.1758708>
- Hall, C. M. (2019). Constructing sustainable tourism development: the 2030 agenda and the managerial ecology of sustainable tourism. *Journal of Sustainable Tourism*, 27(7), 1044–1060. <https://doi.org/10.1080/09669582.2018.1560456>
- Inskeep, E. (1991). *Tourism planning: an integrated and sustainable development approach*. New York: Van Nostrand Reinhold.
- Kementerian Pariwisata dan Ekonomi Kreatif (Kemenparekraf). (2021). *Pedoman pariwisata berkelanjutan*. Jakarta: Kemenparekraf.

- Lane, B. (2018). Will sustainable tourism research be sustainable in the future? an opinion piece. *Tourism Management Perspectives*, 25, 161–164. <https://doi.org/10.1016/j.tmp.2017.12.001>
- Lew, A. A., Hall, C. M., & Williams, A. M. (2015). *The Wiley Blackwell companion to tourism*. Oxford: Wiley Blackwell.
- Mihalic, T. (2020). Conceptualizing overtourism: a sustainability approach. *Annals of Tourism Research*, 84, 103025. <https://doi.org/10.1016/j.annals.2020.103025>
- Rahayu, S., & Prakoso, A. (2021). Sustainable tourism development strategy in Indonesia. *IOP Conference Series: Earth and Environmental Science*, 738(1). <https://doi.org/10.1088/1755-1315/738/1/012045>
- Setiawan, I., & Putra, I. N. D. (2020). The role of local culture in sustainable tourism development. *Journal of Tourism Studies*, 15(2), 45–55.
- Sharpley, R. (2020). Tourism, sustainable development and the theoretical divide: 20 years on. *Journal of Sustainable Tourism*, 28(11), 1932–1946. <https://doi.org/10.1080/09669582.2020.1779732>
- Timothy, D. J. (2018). *Cultural heritage and tourism: an introduction*. Bristol: Channel View Publications.
- United Nations Development Programme (UNDP). (2020). *Tourism and community development*. New York: UNDP.
- United Nations Environment Programme (UNEP). (2020). *Sustainable tourism and environment*. Nairobi: UNEP.
- United Nations World Tourism Organization (UNWTO). (2021). *Sustainable tourism development guidelines*. Madrid: UNWTO.
- Wijaya, I. K., & Nugroho, S. (2022). Site analysis approach in sustainable tourism planning. *Journal of Architecture and Environment*, 21(1), 12–20.