

## The assessment of sustainability concept in Nusa Tourism Village, Aceh Besar, Indonesia

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**Abstrak:** Konsep Desa Wisata Berkelanjutan semakin sering digaungkan di Indonesia. Oleh karena itu, sebagai salah satu desa wisata di Aceh, Desa (Gampong) Nusa perlu diarahkan menuju konsep tersebut. Desa tersebut terkenal dengan pengelolaan limbah yang telah memberikan dampak positif terhadap warganya. Namun, belum diketahui apakah konsep berkelanjutan lainnya juga telah diterapkan. Oleh karena itu, studi ini bertujuan untuk mengidentifikasi konsep berkelanjutan apa saja yang telah dan belum diterapkan pada objek penelitian. Penelitian ini merupakan penelitian studi kasus dengan teknik analisis deskriptif. Metode pengumpulan data yang digunakan adalah observasi dan wawancara. Hasil penelitian menunjukkan bahwa Gampong Nusa telah menerapkan 10 konsep berkelanjutan pada tingkat permukiman meliputi konsep ekologi perkotaan, strategi energi, manajemen sumber daya air, manajemen limbah, material, strategi ekonomi, pelestarian budaya, manajemen operasional, komunitas dan komunitas lingkungan. Namun, temuan penelitian juga mengindikasikan bahwa penggunaan sepeda sebagai alat transportasi alternatif, pemanfaatan air hujan sebagai sumber air alternatif dan dukungan pemberian modal perlu ditingkatkan. Studi ini menyimpulkan bahwa Gampong Nusa menerapkan *Community Based Tourism* (CBT) karena adanya partisipasi komunitas dalam menerapkan konsep berkelanjutan, khususnya dalam pengelolaan sampah, strategi ekonomi, pengelolaan air, dan komunitas lingkungan.

**Kata Kunci:** Aceh Besar, asesmen konsep berkelanjutan, *community-based tourism*, Desa Nusa, pariwisata rural

**Abstract:** The concept of Sustainable Tourism Villages has been increasingly echoed in Indonesia. Therefore, as one of the tourist villages in Aceh, Nusa Village needs to be directed towards it. One sustainable applied concept is waste management. However, it is not known whether other sustainable concepts have been applied in the village. For that reason, this study aims to identify what sustainability concept has and has not been implemented in the research object. This study is conducted using a case study method with a descriptive analysis technique. The data collection methods used are observation and interviews. The results indicate that the Nusa Village has implemented 10 sustainable concepts at the village level namely ecology, energy strategies, water resource management, waste management, materials, economic strategies, cultural preservation, operational management, community, and environmental community. However, the study also suggests that the use of bicycles as an alternative transportation mode, the use of rainwater as an alternative water source, and incentives support need to be improved. This study concludes that Nusa Village has implemented Community Based Tourism (CBT) because of the community participation in implementing sustainable concepts, particularly in waste management, economic strategies, water management, and environmental community.

**Keywords:** Aceh Besar, sustainability concept assessment, community-based tourism, Nusa Village, rural tourism

## INTRODUCTION

The development has impacts on various sectors, such as economic, social, and environmental. Although it covers both sides, the benefits and the disadvantages, the primary concern is the adverse effect. There has been ecosystem destruction and global warming in the environmental sector; social conflict, identity crises, and cultural crises in the social and cultural sector; and poverty and unemployment in the economic sector (Ardiani, 2015). On the other hand, the development is needed to support and facilitate the human life. To mitigate the drawbacks of development in various sectors, the concept of sustainable development becomes a choice to ensure the continuity of human life for the current and future generations.

The concept of sustainable development is transformed into sustainable building, sustainable neighborhoods, and sustainable cities in the context of architecture and built environment. It can be achieved when the pillars (economic, social, and environmental) are in the equilibrium setting. The sustainable concept is a comprehensive concept that can be applied at various scales, one of which is at the village level. Previous studies highlight the sustainable practice in village scale including climate village program plus (Wiati et al., 2022), sustainable tourism development at the tourism village (Sitepu et al., 2021), ecovillage (Singh et al., 2019), or rural tourism entrepreneurship (Utami et al., 2023).

Implemented in tourism village, sustainable concept offers benefit significantly. Not only benefit for the environmental sustainability, socio-cultural empowerment, and economic development through various way, it also promotes a holistic and inclusive development through active community participation (Amerta et al., 2018). One of the villages (known as “Gampong” in Acehnese) in Aceh Besar that has been indicated for implementing the Sustainable Village Concept is Gampong Nusa. Gampong Nusa is not only known for its tourist village but also the active involvement of the community in waste management. The role of the community in waste management activities is very good and in line with the 3R program outlined in Law No. 18 of 2008, which includes 1) reducing, avoiding the use of items that can generate waste to reduce waste volume, 2) reuse, reusing used items that are still usable, and 3) recycle, processing waste into reusable products (Hanum et al., 2018). This study also shows that 77.30% of citizens strongly agree with community participation in the 3R program. Furthermore, waste management activities carried out by the Gampong Nusa community have been able to reduce the volume of waste and also support the local economy because the community sells recycled products to tourists (Mahlil et al., 2021). The residents have successfully established a home industry with 120 female members. This initiative was established through the Nusa Creation Community (NCC) and Waste Bank programs. The program focuses on producing handicrafts from recycled materials by female members. The primary goal of this waste management program is environmental conservation.

The achievements of the sustainable village are not solely attained through the implementation of a single concept. Essentially, the implementation of several concepts is required to create holistic results. While studies in sustainable village practice have emerged, the principle of sustainable village as the implementation basis is limited. However, a sustainable neighborhood theory from Ardiani (2015) offers comprehensive (including cultural consideration) and interconnected sustainability pillars in village scale. Those are ecology, energy strategies, water resource management, waste

management, materials, economic strategies, cultural preservation, operational management, community, and environmental community (Ardiani, 2015).

Currently, waste management is one implementation of sustainable concept in Gampong Nusa. Nevertheless, the implementation of other sustainable village concepts is not yet known. Therefore, the authors are interested in conducting research titled "The Assessment of Sustainable Concepts in Nusa Tourism Villages, Aceh Besar, Indonesia." Gampong Nusa was selected as a case study because it is potential to become a sustainable tourism village. Considering the background, the research problem is "What sustainable village concepts that have been and have not been implemented in research object?" This research aims to assess the sustainable concepts present in the research object and identify the sustainable concepts that are still lacking. The result can be used to optimize the Sustainable Tourism Village concept in Gampong Nusa which lead to the improvement in environmental conservation, socio-economic sector and the society's prosperity. Beyond, the assessment will be valuable for the sustainable village practice and contribute to the achievement of Sustainable Development Goals (SDGs) nationally.

## RESEARCH METHODS

Gampong Nusa is located in Lhoknga Subdistrict, Aceh Besar Regency, 10 kilometers from Banda Aceh capital city center. The research location is a rural area situated along the Banda Aceh-Calang highway, between  $5^{\circ}2' - 5^{\circ}8' \text{ N}$  latitude and  $95^{\circ}80' - 95^{\circ}88' \text{ E}$  longitude. Geographically, it is part of *Kueh* settlement area, covering approximately 350 hectares. The villages consist of four hamlets, namely Deah, Monblang, Mon Aroen, and Cot Lamcrung, with total of 306 households and 1.144 populations.

The research method used in this study is qualitative with a case study approach. It was conducted in May 2021. Figure 1 shows the research location while Figure 2 demonstrates the research flow.

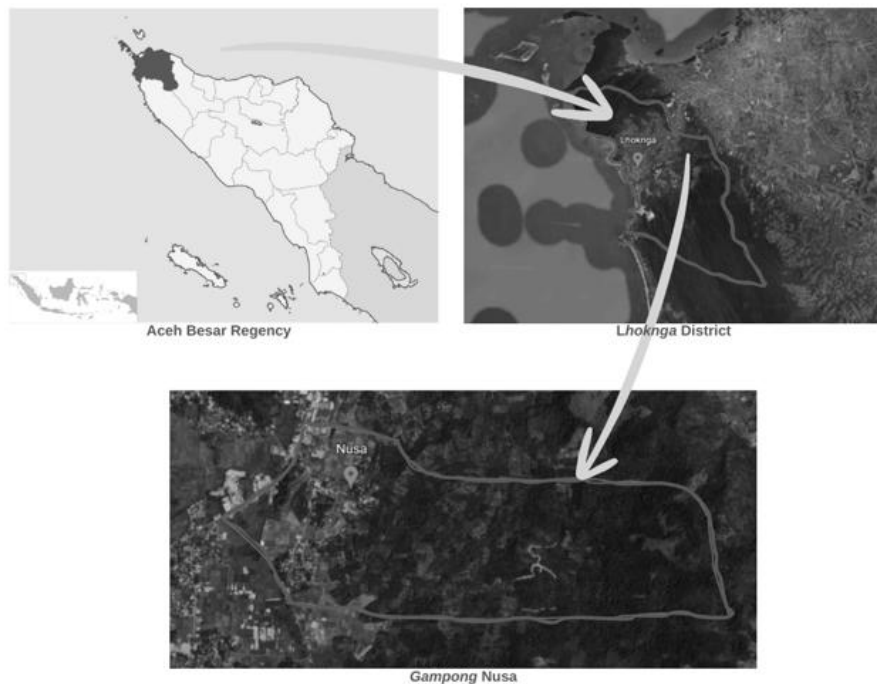


Figure 1. Research location

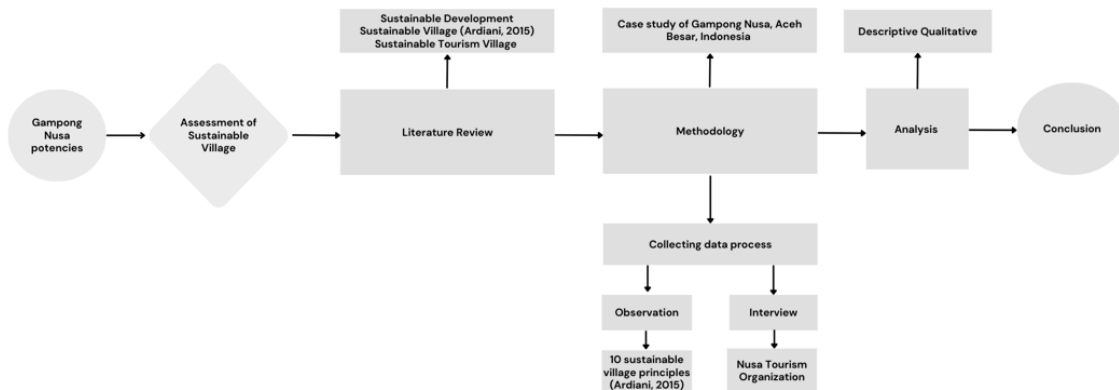


Figure 2. Research flow

Data collection methods include observation and interviews. In this study, observation was conducted on the sustainable concepts, both physical and non-physical, developed by Ardiani (2015). It is chosen as Ardiani's framework is the most comprehension one, ranging from environmental pillar to economic and socio-culture pillars. The principles consist of urban ecology, energy strategy, water management, waste management, material, economy strategy, cultural conservation, management, community, and environmental community (Ardiani, 2015).

Table 1. Instrument for observation

No	Principles	Implementation
1	Urban ecology	Optimizing green open space
2	Energy strategy	Reducing the use of fossil fuel vehicles Using bicycles as transportation Using LPG (liquefied petroleum gas) in the kitchen
3	Water management	The utilization of natural resources in power plants Reduce The utilization of rainwater in the household The utilization of rainwater in the neighborhood
4	Waste management	Reducing the household waste Waste sorting
5	Material	Optimizing the local material potencies in constructing the residential environment
6	Economy strategy	Optimizing workshops for economically disadvantaged communities Job opportunities The village officials support providing capital for the community to start a business
7	Cultural conservation	Gathering space
8	Management	The village management support
9	Community	Optimizing citizen participation in creating a healthy and ideal neighborhood area
10	Environmental community	Optimizing the space and park for gathering activity

Source: Adapted from Ardiani (2015)

Along with observation, the authors also interviewed two representatives of the Nusa Tourism Organization (Lembaga Pariwisata Nusa). The choice of respondents was based on purposive sampling as this organization has advocated the village inhabitants in terms of tourism village. This research employed a semi-structured interview, where the interview started with the issues covered in the interview guide which asked the availability of sustainable village implementation. The research not only adheres to the

interview guide but also develop questions beyond it to achieve the goals related to the topic being investigated.

The data analysis technique used in this research is descriptive analysis. It is conducted to present the processed observation and interview data in an organized manner, allowing the researcher to comprehend the researched object. The existing condition is compared to the ideal implementation stated by Ardiani (2015). The gathered information is organized to facilitate a conclusion. The results are presented in the form of narrative text. Considering the resources limitation, this study focuses on qualitative approach rather than quantitative measurement.

## RESULTS AND DISCUSSION

### 1. The implementation of sustainable neighborhood principles in Gampong Nusa

Based on the data collection process through observation and interviews, information was obtained according to the ten principles of the sustainable concept on the village scale. The observation result is shown in Table 2.

Table 2. The observation results

No	Principles	Implementation	Availability
1	Urban ecology	Optimizing green open space	Available
2	Energy strategy	Reducing the use of fossil fuel vehicles	Available
		Using bicycles as transportation	Not Available
		Using LPG (liquefied petroleum gas) in the kitchen	Available
		The utilization of natural resources in power plants	Not Available
3	Water management	Reduce	Available
		The utilization of rainwater in the household	Not Available
		The utilization of rainwater in the neighborhood	Not Available
4	Waste management	Reducing the household waste	Available
		Waste sorting	Available
5	Material	Optimizing the local material potencies in constructing the residential environment	Available
6	Economy strategy	Optimizing workshops for economically disadvantaged communities	Available
		Job opportunities	Available
		The village officials support providing capital for the community to start a business	Not Available
7	Cultural conservation	Gathering space	Available
8	Management	The village management support	Available
9	Community	Optimizing citizen participation in creating a healthy and ideal neighborhood area	Available
10	Environmental community	Optimizing the space and park for gathering activity	Available

In terms of urban ecology, some efforts that are found in providing green spaces include (a) utilizing vacant land as agricultural areas for the local community to earn a living as farmers, (b) providing green open spaces such as parks for gathering, (c) protecting existing plants without causing harm. Based on the results of field observations, the local community has utilized vacant land as agricultural areas. The types of crops planted by the local community are those that cannot be easily damaged by monkeys, as the village has a significant monkey pest problem. Field observations also indicate that crops like vegetables, corn, and other monkey-edible plants are grown by residents in their yards to protect them from monkey pests. Moreover, the community in this village has already utilized the riverbanks as a riverside park by constructing a

beautiful wooden bridge equipped with comfortable seating. This park is used by the community for gatherings, maintaining the social bonds within the community. As this village is a tourist village, the community also uses this park as a camping area or for other outdoor events. Not only by maximizing green open spaces, but the villagers also show concern for the environment by protecting existing plants. The results of the interviews conducted state that the community demonstrates care for plants by organizing the annual Nusa Festival, one of its activities being a communal tree planting event where trees are distributed to the community.



Figure 3. Riverside park as a productive community space in Gampong Nusa

Regarding the reduction of fossil fuel usage in transportation, the community still prefers using motorcycles over bicycles. The use of bicycles as a mode of transportation is only adopted by some of the younger generation, children in the village, or tourists. Meanwhile, fossil fuel is no longer used as the primary fuel in daily activities. The community prefers using Liquefied Petroleum Gas (LPG) as a cooking fuel because it is available and affordable. Furthermore, the implementation of renewable energy utilization is not yet visible in this village. However, based on the interviews, it was stated that the village has the potential to create wind power generators. A study on this power generator has already been conducted.

Related to water management, the villagers often use river water during the rainy season for bathing, washing, and other needs to reduce water consumption and save on water costs. However, during the dry season, river water cannot be used because it becomes salty due to the rising of sea levels. As for the utilization of rainwater for household purposes, the community only collects rainwater using buckets or other containers, which are then used for watering plants. The utilization of rainwater is frequently applied by one of the hamlets, namely Cot Lamcrung, as they have a garden and utilize the yard to grow various types of vegetables such as corn and others. However, the use of rainwater in the broader area has not yet been implemented by the community.

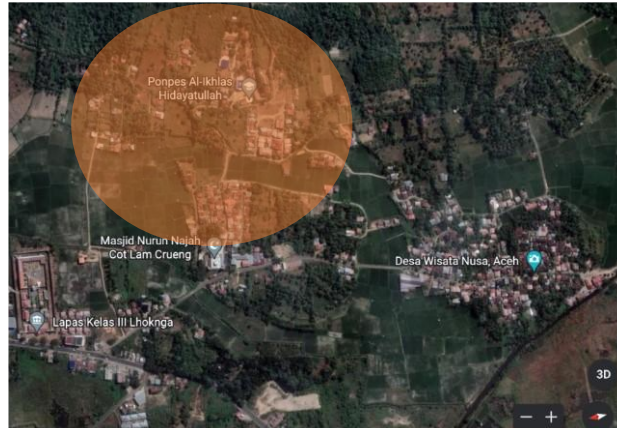


Figure 4. Location of Cot Lamcrung hamlets which optimizing rainwater harvesting system

Furthermore, the community has been transforming plastic waste into handicrafts and selling them to tourists as part of waste management. The aim of recycling plastic waste is to reduce non-biodegradable plastic waste, making the environment cleaner and well-maintained. Additionally, this initiative aims to boost the local economy through the proceeds from selling these creations. Concerning household waste reduction, as observed in the field, there is a noticeable awareness among the community about reducing the use of plastic. There is no visible plastic waste in the environment. They have also repurposed plastic waste into creative works. As for organic waste such as food leftovers and dry leaves in the yard, they are turned into compost by burying them in the soil, utilized for agricultural land. Household liquid waste, such as wastewater from bathing, washing, and sanitation, is directed to the community-based sanitation system (SANIMAS) provided by the Ministry of Public Works and Public Housing (PUPR). This approach helps maintain the cleanliness of the river. The community also has been making efforts to separate organic and inorganic waste. They have also established a Waste Bank, where children can sort and save waste by type, and later sell it. The proceeds from the sales are used to pay for various activities. Additionally, the PUPR has implemented SANIMAS in the village to improve the existing sanitation system, keeping the community free from diseases, preventing air pollution and foul odors, and avoiding direct discharge of fecal waste into the river.



Figure 5. The community-based sanitation system (SANIMAS) provided by the Ministry of Public Works and Public Housing (PUPR)



In terms of material, it is noted that some of the buildings in this village still utilize local materials, particularly wood. The structures in the area, such as houses, meeting halls, Quranic study halls, and various other buildings, continue to incorporate wood as a primary construction material. Additionally, according to the interviews, there are plans for the construction of a culinary establishment using bamboo as the primary material.



Figure 6. Building, utilizing wood as local material, serves as a homestay in Gampong Nusa

Regarding the implementation of workshops for economically disadvantaged communities, the observations reveal that the village has organized specific training sessions to produce handicrafts. These workshops are held every Wednesday in the village. The activities often take place in the meeting hall, serving not only to train people in creating crafts but also to provide a space for the community to gather and discuss new ideas related to the development of sustainable concepts in the village. As a tourist village, job opportunities in the tourism sector are available. The Nusa Tourism Organization (Lembaga Pariwisata Nusa) provides employment opportunities for the community by utilizing their homes as homestays for visiting tourists. Another business venture adopted by the community is offering bicycles as a means of transportation for tourists who wish to explore the village, as well as selling handicrafts to tourists.



Figure 7. Recycled products as a workshop product, benefits for both citizen income and environmental preservation



In preserving their culture, the community utilizes the meeting hall as a gathering place for discussions. Additionally, based on field observations, the community presents traditional dances as performances when tourists visit, provides traditional food, and maintains the elevated house structure in each residence, thereby preserving the traditional Acehnese house concept.

Another sustainable concept focuses on community groups aiming to sustain neighborhood livelihoods within their scope. With the existence of these community groups, they can also preserve the culture of their environment. Regarding community groups, according to field observations, the village has established community groups such as the Nusa Tourism Organization (Lembaga Pariwisata Nusa), aiming to engage residents in preserving the culture of the village's characteristics, making it an attractive destination for tourists. There is also the Nusa Creation Community (NCC), encourages the community to transform waste into handicrafts that can be sold. The village also has provided gathering places like parks, ensuring that social values within the community are maintained. Additionally, meeting halls are available for community members to gather and engage in beneficial activities, such as the crafting of waste into handmade items.

## **2. Community based tourism in Gampong Nusa**

The results show that Gampong Nusa has successfully implemented several principles of sustainable concepts. One of the most interesting aspects is the active participation of the community in implementing sustainable concepts, especially in waste management, economic strategies, water management, and community and environmental communities. In addition, other aspects have become part of the daily activities of the community and values that have been internalized in social structures, such as urban ecology, materials, and cultural preservation.

Based on that findings, Gampong Nusa has implemented community-based tourism (CBT), by optimizing local potential and local wisdom as key factors in developing a sustainable tourism village. CBT itself is a tourism approach that emphasizes sustainability in terms of the environment, social aspects, and culture (Arintoko et al., 2020; Marlina, 2019). In this context, CBT promotes awareness among tourists and offers experiences about daily activities (Arintoko et al., 2020; Priatmoko et al., 2021). This concept is an alternative form of tourism that aims to optimize local benefits, encourage capacity development, and empower communities to achieve development goals (Febriandhika & Kurniawan, 2019).

CBT has been successfully implemented in several villages in Indonesia, such as in Dermaji Village in Banyumas Regency, where community participation led to improvements in education, infrastructure, environmental awareness, and economic growth (Hariyadi et al., 2024). Similar to Dermaji Village in Banyumas Regency, CBT in Gampong Nusa is implemented through community involvement, empowerment of local wisdom, economic participation, environmental sustainability, and political empowerment. Gampong Nusa has successfully implemented several elements of these dimensions, such as the creation of job opportunities, improvement of quality of life, respect for local culture, environmental awareness, and active participation of the local population. However, the availability of capital for community development still requires attention. Learning from other best practices, some empowerment models for sustainable tourism village can be taken such as spatial planning approach, sectoral approach,

institutional and human resources approach, and information technology development approach (Purnomo et al., 2020).

It can be said, that the active role of government and community is crucial in the practice of sustainable tourism village (Arintoko et al., 2020; Maryani & Indrianty, 2024). The society commitment (Simanihuruk et al., 2024), the leader (both formal and informal) along with good governance and the interconnection of governance, welfare and participation (Simanihuruk et al., 2024) determines the success story of CBT (Priatmoko et al., 2021). Therefore, further efforts to accommodate key dimensions, implement empowerment model, and encourage the agents interconnected can be a step towards greater success in the implementation of CBT in Gampong Nusa.

## CONCLUSION

Gampong Nusa in Aceh exemplifies a sustainable tourism village through the effective implementation of Community-Based Tourism (CBT), rooted in local wisdom, community participation, and resource optimization. Ten sustainability principles have been applied, though areas like rainwater harvesting, eco-transportation, and community enterprise support require further improvement. This study highlights the cultural dimension as vital to sustainability in the Indonesian context and offers a model for village-scale sustainable development. Future research should expand to other villages and adopt more rigorous evaluation methods.

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