

# Green economy in tourism village development for sustainable development goals: A case study in Bireuen, Indonesia

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## ABSTRACT

Bireuen Regency, located approximately 223 km from Banda Aceh City in Aceh Province, Indonesia, is renowned for its natural beauty and culinary delights. The region's abundant natural resources hold significant potential for developing tourism villages to drive local economic growth and foster sustainable livelihoods. Tourism villages are vital for economic development, offering opportunities to enhance community welfare while promoting environmental sustainability. This aligns closely with the principles of ecotourism, which emphasize environmental awareness and social responsibility. This study explores integrating green economy principles into developing tourism villages to achieve sustainable development goals. Using a descriptive qualitative research method, the study focuses on a coastal tourism village in Bireuen Regency that attracts numerous local and regional visitors. The findings highlight several green economy applications in tourism village development, including natural resource management, waste management, resource conservation, carbon emission reduction, enhancement of tourist experiences, adoption of innovation and technology, economic impact, and adherence to certification and standards.

## KEYWORDS

Green economy; village; tourism; SDGs

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## 1. Introduction

Bireuen Regency is one of the regencies located in Aceh Province, approximately 223 km from the center of Banda Aceh. This regency became an autonomous region on October 12, 1999, due to the division of North Aceh Regency. Known as the "Kota Juang," Bireuen holds historical significance for Indonesia, having served as the second capital of the Republic of Indonesia on June 18, 1948, during the Dutch Military

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Aggression II (1947–1948). Additionally, the region is renowned for its natural beauty and culinary delights (Bireuen.go.id, 2023).

Bireuen offers diverse natural attractions, including waterfalls, beaches, and rivers. Notable sites include Ceuraceu Waterfall in Pandrah, Peuneulet Baroh Beach in Simpang Mamplam, Kuala Raja Beach in Kuala, Krueng Juli and Ujong Blang Beaches, Batee Iliék Springs, Jangka Beach, Samalanga Waterfall, Krueng Simpo, Calok Samalanga Beach, Mamplam, Ulee Kareng, Rumoh Teungku Chik in Awe Geutah, Ie Rhop Waterfall, Pyramid Waterfall, Cot Panglima, Laot Lapang Beach, and Reuleng Manyang Beach (tempatwisataseru.com, 2023). Beyond its natural beauty, Bireuen also offers a culinary allure with specialties such as Sate Matang, Mie Kocok Geurugok, Rujak Manis, Bakso Gatok Kutablang, Bu Sie Itek, and Nagasari (Bireuen.go.id, 2023).

Given its abundant natural potential, these tourist areas present opportunities to become tourist villages, driving rural economic growth and creating sustainable livelihoods (Wirawan, 2018). Tourist villages play a strategic role in increasing village income and serve as a means for local economic development, a vital component of the tourism industry (Fang, 2020). Developing tourist villages requires not only government involvement but also community participation. Such development must adhere to three principles: alignment with local culture, enhancement of environmental quality, and community empowerment (Yunita & Sekarningrum, 2020).

Awareness and responsibility for environmental preservation and community welfare can be implemented across various fields, including tourism, commonly known as ecotourism. Ecotourism emphasizes community-based tourism management (Purnomo, 2020). Furthermore, ecotourism integrates conservation and tourism, offering social and economic benefits to local communities (Herman & Supriadi, 2017). Thus, ecotourism development is an appropriate approach for tourist villages.

On the other hand, tourism, a significant source of national revenue, also contributes to global carbon emissions. Therefore, there is a pressing need to adopt environmentally friendly, green tourism practices. Green tourism refers to tourism activities that provide eco-friendly services through practical and tangible environmental management techniques. This concept supports sustainable development and mitigates environmental degradation.

Based on this background, this study aims to analyze the implementation of a green economy in developing tourist villages to achieve sustainable development goals in Bireuen Regency.

## **2. Literature review**

### **2.1. Green economy**

Global changes pose significant threats and challenges to the sustainability of national economic development, characterized by the rapid process of globalization. This phenomenon implies that changes in one sector of the world can quickly affect others. Economically, the current market system is expanding into a single global market. No country can isolate itself from external influences, but this change presents opportunities for national economic development if managed effectively. Strengthening national economic resilience becomes crucial in addressing globalization's positive and negative impacts. A nation demonstrates economic resilience when it can withstand uncertainties caused by globalization and improve its citizens' welfare through sustainable development. Hence, the concept of a green economy has emerged.

The UNEP defines the Green Economy (GE) concept as an economy that enhances human well-being and social equity while significantly reducing environmental risks and ecological scarcities (UNEP, 2011). According to the UNEP Green Economy Initiative (2011) and the International Chamber of Commerce (2012), a green economy promotes human welfare and social equity by minimizing environmental risks and ecological scarcity, emphasizing low-carbon, resource-efficient, and socially inclusive practices. This economic system synergizes economic growth and environmental responsibility, supporting social development progress.

Initially developed to respond to the financial crisis, the GE concept has gained popularity regionally, nationally, and internationally (Bina & La Camera, 2011). It serves as an operational policy agenda to achieve measurable environmental-economic advancements (Schmalensee, 2012) and forms a pillar of sustainable development implementation, transitioning toward a low-carbon, green economy. Countries like the UK, France, China, and several African nations like Rwanda, Morocco, Ethiopia, Senegal, and South Africa have adopted this concept, focusing heavily on green growth (Bailey & Caprotti, 2014).

Natural resource depletion and environmental degradation have drawn global attention, including discussions at the 1991 Earth Summit in Rio de Janeiro (Kristanto, 2020). The green economy, supported by the green GDP indicator, offers hope for better sustainable development by integrating environmental aspects into economic activities. Indonesia's Law No. 32 of 2009 on Environmental Protection and Management designates green GDP as an economic instrument to prevent environmental damage, including funding for reforestation, reclamation, critical land restoration, water system improvements, conservation, corporate social responsibility (CSR), and environmental research and development (Kristanto, 2020).

The green economy concept is critical for guiding sustainable development policies, addressing core issues, and regulating economies to align with local and global ecological prerequisites and long-term dynamics (Anwar, 2022).

## 2.2. SDGs

Sustainable development encompasses three pillars: economic, environmental, and social. The SDGs program aims to enhance global welfare and preserve nature through 17 key objectives, including no poverty, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry innovation and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, life below water, life on land, peace, justice, and strong institutions, and partnerships for the goals (Idcludhost.com, 2019, in Murni et al. 2022).



**Figure 1.** SDGs indicators (UNWTO, 2015)

## 2.3. Green economy indicators in developing tourist villages for SDGs

Several indicators measure green economy implementation (Rahmat et al. 2024), including renewable energy use, energy efficiency, waste management, natural resource conservation, local economic empowerment, community involvement, environmental education, social impact, tourism product diversity, and a sustainable visitor index. These indicators form the core of this study's discussion.

For instance, Indonesia's renewable energy production reached 19.6% of total electricity generation in 2022, equivalent to 65 terawatt-hours (TWh), up from 18.16% in 2021 (Our World in Data, 2022). Waste management, regulated through Law No. 18 of 2008 and Presidential Regulation No. 97 of 2017, emphasizes reducing waste through the 3Rs (Reduce, Reuse, Recycle) and managing 70% of waste by 2025. Conservation efforts align with Law No. 5 of 1990, which aims to preserve natural resources, maintain biodiversity quality, and enhance their value for societal welfare and quality of life.



**Figure 2.** Proportion of Indonesia's electricity production from renewable energy (2019-2022). *Source:* ourworldindata

Sustainable economic development in villages is vital for national progress, as approximately 70% of Indonesia's population resides in rural areas, relying primarily on agriculture (Asnuryati, 2023). Strategies promoting community empowerment and local economic independence are crucial for addressing economic and social development disparities.

Fostering sustainable communities requires education to raise environmental awareness and encourage public involvement in decision-making. Providing knowledge and skills enables communities to contribute to positive environmental changes, aligning individual behavior with broader sustainability goals.

### 3. Methods

This study employs a qualitative research method with a descriptive approach to analyze the implementation of the green economy in developing tourist villages as an effort to achieve sustainable development. The data sources utilized include both primary and secondary data. Primary data were obtained through structured interviews with tourist village managers across 10 sub-districts in Bireuen Regency that manage tourism.

Three data collection techniques were employed in this study: structured interviews, observations, and focus group discussions (FGDs). Data analysis was conducted

descriptively using a qualitative method based on the Miles and Huberman approach, which involves data collection, data presentation, data reduction, concluding, and providing recommendations or suggestions.

## 4. Results and discussion

### 4.1. Results

Interview results structured to manager village tour show the existence of a green economy in the development of a village tour beach in Bireuen Regency (see Table 1).

**Table 1.** Results of interviews

Question	Answers
Natural Resource Management	- There is access to clean water around tourist attractions, which is managed comprehensively, and coaching is carried out regarding water management, which is monitored by the community.
Waste management	- Waste management is carried out by collecting, transporting, and final waste management at the final disposal site (TPA) through waste sorting, reduction, and recycling in the form of shell crafts, fish scales, and coconut leaves, which can be used to make handicrafts.
Conservation of Natural Resources	- Small things that can be done to protect the marine ecosystem include not littering and not catching fish with tiger nets. - Urge government to issue regulations to combat net fishing tiger and push practice management fishery sustainable. - Using technology-efficient energy and materials in a chemistry-friendly environment can help reduce the negative impact of diverse biological.
Local Community Participation	- The community is directly involved in developing object tourism, for example, by maintaining security, selling food and drinks, etc. - The community is indirectly involved in developing object tourism, for example, by joining guard security. - The community determines the development tourist's vision, mission, and goals. - Communities are involved in identifying source-protected, developed, and utilized power for developing and managing Power pull tours.
Carbon Emission Reduction	- The use of environmentally friendly transportation in tourism still needs to be increased, such as walking, cycling, and using electric bicycles; this is very important to reduce air pollution, is beneficial for health, helps reduce the negative impacts of climate change, and does not cause carbon emissions. - Currently, renewable energy technology is not used in tourist attraction facilities. However, it is inevitable that in 2025, there will be the use of renewable energy technology considering that one of the villages, namely Kuala Raja village, was selected as a Modern Fisherman's Village, namely a program from the Indonesian Ministry of Maritime Affairs and Fisheries.
Quality of Traveler Experience	local communities feel satisfied with environmental protection practices

**Table 2.** Results of interviews (*continued*)

Innovation and Technology	The technology today, namely IoT, can help monitor the environment in real-time by using connected environmental sensors. These sensors can measure various parameters such as air quality, temperature, humidity, and water pollution levels. This will be improved as much as possible because many are getting programs from the Indonesian Ministry of Marine Affairs and Fisheries.
Economic Impact	<ul style="list-style-type: none"> <li>- Direct jobs include being a lifeguard, an instructor fishing in the open area, and selling canteens.</li> <li>- Indirect jobs include fishermen, locals providing seafood, and artisans making beach-themed souvenirs.</li> </ul>
Certification and Standards	<p>Educational programs that are currently being implemented and are also frequently implemented include:</p> <ul style="list-style-type: none"> <li>- Environmental Management Training. The village gives This training to the surrounding community to educate them about environmental management and the prevention of environmental pollution.</li> <li>- Conservation Program Environment. This program can include planting trees or building gardens around tourist locations.</li> </ul>

#### 4.2. Discussion

Developing sustainable tourist villages can be an essential component of the green economy. This initiative has also gained the attention of the Bireuen Regency Government through the Bireuen Regent Regulation of 2029 regarding the Designation of Tourism Destination Areas in Bireuen Regency. The research findings indicate the implementation of a green economy in tourist village development, which is evaluated through various indicators.

Natural resource management has been carried out by providing access to clean water around tourist sites, which is comprehensively managed for visitors. This is crucial for ensuring sustainability and balancing economic benefits with environmental preservation, as tourist villages often rely on natural beauty, biodiversity, and local culture as their primary attractions. Thus, integrating local culture into providing clean water facilities is vital to attracting tourists.

Waste management plays a significant role in maintaining environmental cleanliness, public health, and ecological preservation. In Bireuen's tourist villages, waste is well-managed through collection, transportation, disposal to designated landfills, and recycling into crafts such as shell, fish scale, and palm leaf-based items. This effective waste management supports sustainable tourism and offers long-term benefits to the villages.

Natural resource conservation has been implemented by preserving marine ecosystems, advising visitors against littering, and discouraging harmful fishing practices such as using trawl nets. Additionally, environmentally friendly chemicals are

encouraged. Conservation of natural resources is a critical element of sustainable tourist village development.

Community participation is evident through direct and indirect involvement, such as maintaining security, selling food and beverages, and engaging in decision-making processes concerning tourist village development.

Reducing carbon emissions includes promoting environmentally friendly transportation methods like walking and cycling. Although these practices are not fully implemented, one village has been recognized as a modern fishing village by the Ministry of Maritime Affairs and Fisheries due to its use of renewable energy technology. Reducing carbon emissions ensures sustainability and environmental quality.

Local communities express satisfaction with environmental conservation practices, as these bring positive benefits to visitors. The ability to enjoy natural surroundings comfortably and peacefully ensures that tourism activities remain sustainable, contributing to the economic well-being of local communities and national economic growth.

Innovation and technology remain limited, but there is potential for improvement through village funding from programs initiated by the Ministry of Maritime Affairs and Fisheries.

Tourism activities generate economic benefits for local communities through trade, rentals, handicrafts, and other activities. Developing tourist villages significantly impacts local and national economies by creating job opportunities and boosting community incomes.

Private companies and the government have conducted training on environmental management and pollution prevention. However, no village has yet received certification. Certification is essential for maintaining service quality and sustainability, increasing the tourist appeal of these destinations for both domestic and international visitors.

The study concludes that these indicators reflect the implementation of a green economy in tourist village development. The participation of local communities and the alignment of green economy indicators support the global Sustainable Development Goals (SDGs). These initiatives contribute to reducing poverty, enhancing economic growth, and promoting decent work through food sales in tourist areas; preserving marine resources by promoting responsible fishing practices and avoiding ocean pollution; fostering partnerships between communities and the government in managing tourist environments; advancing industry, innovation, and infrastructure with environmentally friendly technology; and providing clean and affordable energy through access to clean water facilities available for visitors in tourist areas.

## 5. Conclusion

Based on the research findings, it can be concluded that tourist villages in Bireuen Regency have implemented the concept of a green economy in tourism development to achieve the SDGs. This is evident from various indicators of the green economy, such as natural resource management, waste management, natural resource conservation, carbon emission reduction, tourist experience quality, innovation and technology, economic impact, and certification and standards. The green economy activities carried out at tourist sites in Bireuen Regency have contributed to enhancing the performance of the SDGs.

## Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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