

# Ecotourism-Based Management Model of Nantu Wildlife Reserve

Marini Susanti Hamidun<sup>1</sup>, Dewi Wahyuni K. Baderan<sup>2</sup>, Meilinda Lestari Modjo<sup>3</sup>

<sup>1,2</sup>Department of Biology, Faculty of Mathematics and Natural Sciences, Gorontalo State University

<sup>3</sup>Department of Tourism, Faculty of Literature and Cultural Studies, Gorontalo State University

**Abstract:** *Determination of an area as a conservation area often creates problems and conflicts between stakeholders and local communities. Ecotourism is a sustainable development concept that can bridge the interest of the government in conservation with the benefit of the local community in economic development. The purpose of this research was to develop a management model of Nantu Wildlife Reserve with ecotourism approach. Data collected using observations, interviews, literature studies, Focus Group Discussion (FGD), and then analysed descriptively. Result showed that: 1) Nantu Wildlife Reserve had a diversity of endemic flora and fauna and unique ecosystems which were potential as tourist objects and attractions; and 2) The ecotourism-based management model of Nantu Wildlife Reserve was able to unite the ecological, economic, and socio-cultural interests; it managed by local, national, regional and international interests with a networking system that involved local communities, relevant stakeholders, multi-skilled individuals, and local wisdom development to accommodate the interests of the community in regard to the principle of conservation, education and recreation, economics, community participation, and control.*

**Keywords:** Ecotourism, Conservation, Nantu, Wildlife Reserve

## 1. Introduction

An area determined as a conservation area is aimed to be able to provide: 1) protection of the balance of life-supporting ecosystem; 2) preservation of biodiversity and germplasm sources; and 3) sustainable use. However, in reality, the existence of conservation areas is often regarded as a source of conflict between various parties. Ecologically, almost all conservation areas show degradation in their biological natural resources and ecosystems. This degradation tends to increase, either caused by illegal activities such as illegal logging, illicit gold mining, encroachment, and wildlife hunting, or the urgency of non-forestry sector development, such as plantation, mining, industry, and settlement. Socio-economically, the conservation area management system has not been able to optimally promote the income or welfare of the community around the preservation area [1][2] [3][4].

Nantu Wildlife Reserve is a conservation area that administratively located in three regencies: Gorontalo, Boalemo, and North Gorontalo Regency. It established as a wildlife reserve in 1999 with an area of 31,215 Ha, which then expanded in 2010 to 51,507.33 Ha. The area expansion was adjusted according to the rearrangement of Gorontalo Province spatial plan and had stated in the space plan of Gorontalo, Boalemo, and North Gorontalo Regency. The inclusion of Nantu SM in the area program is significant because it is a form of local government support for the conservation of biological resources [5].

Nantu Wildlife Reserve area is part of Wallacea biogeography area which rich in biodiversity, and a mixed zone of Asian and Australian fauna. Tall tree dominates Nantu Wildlife Reserve vegetation stands with a very dense crown. There are various huge trees scattered in different places. The largest tree, the banyan tree (*Ficus* sp), is found to have a diameter of 400 cm. Another large tree widely

found is Nantu (*Palaquium obovatum* Engl.) hence the name of the area, Nantu Forest. There are 17 endemic plant species protected under the Government Regulation (PP) No. 7 of 1999 on the Preservation of Plant and Animal Species out of 204 plant species discovered. Those species also listed in CITES Appendix II, a category for a species that is not necessarily threatened with extinction but has the possibility of being so if its trade is not strictly regulated [6].

Nantu Wildlife Reserve area has 32 species of mammals with five of which protected and endemic species: babirusa (*Babirusa babirusa*), anoa (*Bubalus depressicornis*), tarsier (*Tarsius spectrum*), Sulawesi dwarf cuscus (*Strigocuscus celebensis*), and Heck's macaque (*Macaca hecki*). Aside from that, there are 49 species of birds with 24 species of which are protected species [7] [8].

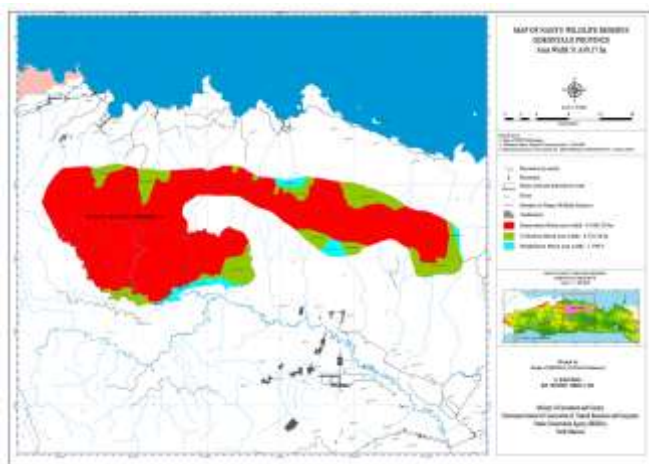
Nantu Wildlife Reserve is an ideal place for endemic wildlife, especially babirusa of Sulawesi, due to its sulphur salts contained hot springs functioning as a salt lick. Tropical rainforest of Nantu still has the original ecosystem and is one of the few old-growth forests of Sulawesi. It is also one of the best five rainforests in Southeast Asia with high flora and fauna biodiversity.

Determination of Nantu as wildlife reserve aims to: 1) protect the balance of life-supporting ecosystem; 2) conserve the biological diversity and germplasm sources; and 3) achieve a sustainable use. However, its management, like other conservation areas, is not free from problems. Its existence often regarded as a source of conflict. Establishing Nantu Forest as a wildlife reserve considered as blocking people's access to natural resources in the area, while they still have a high dependence on the natural resources. This situation leads to the impression that Nantu Wildlife Reserve does not provide economic benefits to the surrounding community, resulting in a dichotomy between conservation and the

economy. The management of Nantu Wildlife Reserve should not only be focused on conserving unique protected flora and fauna species, but also on the socio-economic needs of surrounding communities, both directly and indirectly, to assist in improving the community welfare, building conservation awareness, and encouraging community involvement in securing Nantu Wildlife Reserve. The management should also be able to develop conservation programs that can link with community economic activities, or otherwise promote community economic activities that can connect with conservation programs. Which is a community empowerment concept that can open alternatives for economic improvement for communities around conservation areas while contributing to conservation and raising awareness and support for protecting the area that has high biological, ecological, and historical values [9][10][11].

## 2. Method

This research conducted in Nantu Wildlife Reserve, which administratively located in Gorontalo Regency, Boalemo Regency, and North Gorontalo Regency.



**Figure 1:** Map of Nantu Wildlife Reserve

Primary and secondary data collection. Primary data collected were the potential of flora and fauna, landscapes, the socio-cultural life of communities, and management plans of Nantu SM. Primary data obtained from field observations, interviews with community leaders, experts, and relevant and competent stakeholders, and from focus group discussion (FGD). Secondary data obtained from previous research results, related government agency and non-governmental organisations reports, and online information. The data collected was then analysed descriptively.

## 3. Result and Discussion

### 3.1. Potential Tourist Attraction

The tourist attraction is an important part of developing an eco-tourism concept. It is described as everything unique, convenient, and has a value in the form of natural diversity, culture, or human-made creation attracting tourist visits. This factor is significant to motivate the visitors to come.

The view of Nantu Wildlife Reserve can be seen all the way along the river cruise to the area of Nantu Wildlife Reserve. Various objects can be seen such as mountains, hills, trees, forest, fields, nature panorama, flocks of birds fly above the river and are on the riverbank and other animals such as monitor lizards and monkeys. The scenery can observe along the tracking line. Several waterfalls can found in this area. The waterfall of Adudu River is  $\pm 10$  m high. The journey from Adudu guard post is about 20 minutes by foot along the shallow, clear and calm Adudu River. Throughout the trip to the location of the waterfall, the typical scenery of lowland tropical rainforest can see, such as large-diameter trees that grow tall with a dense crown. This beautiful view completed by several plants endemic to Sulawesi. Some animal's endemic to Sulawesi such as Sulawesi crested macaque, hornbill and some other bird species can meet. Another waterfall in Pangahu Village can be reached on foot through the village's houses, gardens and rice fields and followed by entering the Nantu Wildlife Reserve. A viewpoint can be reached by climbing upwards ( $\pm 1$  hour long) where the landscape of Pangahu Village and houses of Polahi, which is the isolated tribe of Gorontalo, can be seen.

Nantu Wildlife Reserve also has a unique salt lick in the form of sulphur salts contained hot spring. The salt lick has mineral deposits such as sulphate sulphur ( $\text{SO}_4\text{S}$ ), iron ( $\text{Fe}$ ), sodium ( $\text{Na}$ ), manganese ( $\text{Mn}$ ), and calcium ( $\text{Ca}$ ). The mineral is essential for animals because it helps the metabolism process of the animals (Clayton, 1996). This hot spring surrounded by various types of primary forest plants which are the ideal habitat for endemic and rare mammals such as babirusa, anoa, and black macaque and also several bird species for bathing, playing, eating, or drinking. The area can easily reach, as it only takes 10 minutes on foot from Adudu guard post. The attractive display of natural scenery of endemic and rare animals is eating, drinking, mating and playing and the existence of salt lick can be the main attraction of ecotourism activities in Nantu Wildlife Reserve. These potential tourist attractions of Nantu allow Nantu Wildlife Reserve management unit to design and develop ecotourism activities inside or outside of the Nantu Wildlife Reserve. Such as agrotourism, photo hunting, hiking and camping, jungle trekking, educational tour, bird watching, wildlife observation, panoramic tour, river tour, boating and rafting, waterfall bathing, and cultural tourism.

### 3.2. Ecotourism-based Management Model of Nantu Wildlife Reserve

Development of Nantu Wildlife Reserve should be able to include conservation programs that can link with community economic activities, or otherwise develop community economic activities that can connect with conservation programs. Which is a community empowerment concept that can open alternatives for economic improvement for communities around conservation areas while contributing to conservation and raising awareness and support for protecting the area that has high biological, ecological, and historical values? The ecotourism-based management model of Nantu Wildlife Reserve illustrated in the scheme below:

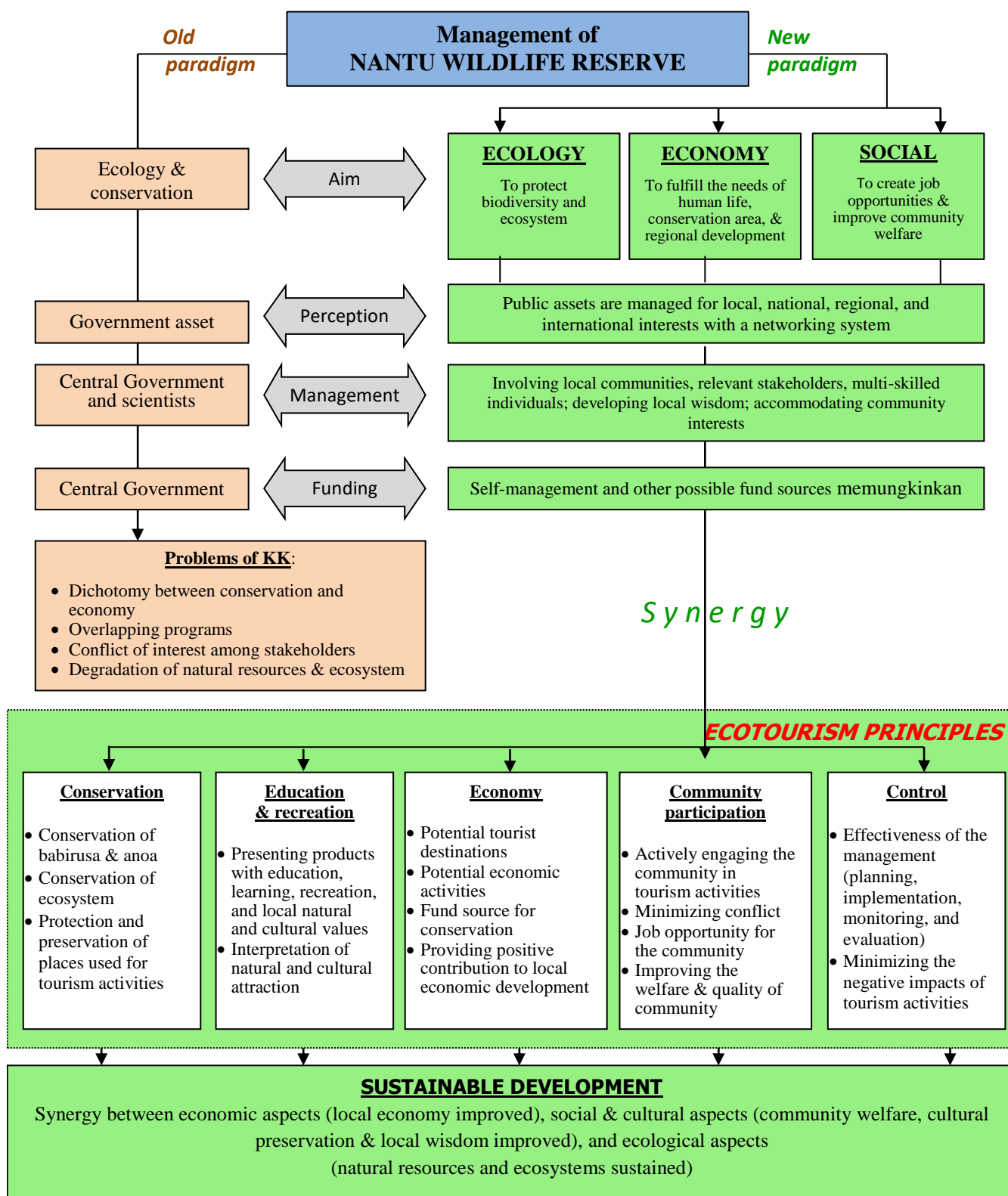


Figure 2: Ecotourism-based management model of Nantu Wildlife Reserve

An operational form of the sustainable development concept, which is an activity that can bridge the interest of the government in conservation with the benefit of the local community in economic development, is ecotourism. Ecotourism is a fusion of preservation and tourism where the revenues from tourism returned to the area for the protection and maintenance of biodiversity and socio-economic improvements of the surrounding communities. In practice, ecotourism activities should consider the carrying capacity of

the environment, actively engage the local community and its cultures, promote environmental education, and provide economic benefits to the management of the conservation and the surrounding community [12][13][14]. Implementation of ecotourism approach in the master plan of Nantu Wildlife Reserve can generate revenues to manage and protect endemic species and their habitat. Ecotourism also involves the local community in its master plan which enables them to benefit from the conservation area. Meanwhile, it also

provides a means to increase the awareness of the importance of knowledge and environmental conservation.

Ecotourism-based management of Wildlife Reserve based on how to preserve and protect the natural resources of the area so that it can be utilised for the present and also future generations. Sustainable use of natural resources and environment supports the formation of civil society and sensitive to the cultural and social values of indigenous people and local communities. This concept is responsive to shifting values, interests, and preferences in the market and also contribute to local and national economic development. The ecotourism concept is implemented based on the following principles: conservation, education and recreation, economy, community participation, and control [15]. The implementation of each principle of ecotourism in Nantu Wildlife Reserve described as follow.:

#### 1) Conservation

The aim of conservation is as a protection for ecological systems as a life buffer system, preservation of biodiversity, and sustainable use. Nantu Wildlife Reserve is a natural area dedicated to the conservation of babirusa and anoa. This area is the only habitat of babirusa and anoa which previously believed spread across Sulawesi by several researchers. Babirusa and anoa are priority species. They are rare, endemic and endangered.

#### 2) Education and Recreation

Ecotourism is an activity that presents market-worthy products that are educational and recreational based on the values of natural and cultural characteristics of the local community. Nantu Wildlife Reserve has a rich biodiversity along with its highly diverse ecosystem, and its people with their life tradition and cultural diversity that can use as a source of knowledge for visitors.

Ecotourism adds value to the community and visitors in the form of knowledge and experience. The natural, social, and cultural diversities can accommodate the development of visitors' interest (sense of interest). Everything that exists in nature can directly observe (feelings of reality), investigated (feelings of inquiry), and discovered (feelings of discovery). Therefore, education is an inherent part in ecotourism. [16] states that one of the main elements of ecotourism is the experience of merging with nature and local communities, and enjoying their routines. Visitors will gain awareness and knowledge of the natural environment and cultural aspects, which will transform their paradigm and change them to a person who respects the environment and local culture. With the interaction between visitors and objects, ecotourism activities have succeeded in delivering educational messages that lead to positive changes in attitude and views on the environment. The visitors are then aware of the philosophy of their journey, the primary purpose of their trip is not the objects, but what to find, learn, and understand to appreciate later.

#### 3) Economy

Ecotourism is an activity of utilising an area as a tourist attraction that provides economic incentives for the community, various job opportunities, and Original Local

Government Revenue. The trend of world tourism development shows that tourism has become the largest industry in the world. Significant growth indicates that tourism can be a solution for developing countries to change their present state faster. Tourism promoted as a sector that can not only grown in places that have resources for secondary industries but can also develop from the gorgeous and beautiful of natural resources and local culture. The development of the tourism industry is not only related to the travel business in general but also on the frequency of visits in the conservation area. In addition to economic incentives, tourism activities also open up new job opportunities in tourist destinations.

Forms of services in Nantu Wildlife Reserve which become sources of income are:

- Attractions such as sites with biodiversity and productive ecosystems, especially sites where babirusa, the area mascot, can be seen
- Accommodation services such as homestay or family house owned and managed by community with eco-friendly concepts, especially in the Saritani Village, Pangahu Village, Pangea Village, Tangga Village, and Mohiyolo Village
- Transportation services, both land transportation and river transportation
- Local guide services (interpreter) that is familiar with the biodiversity and ecosystems of Nantu Wildlife Reserve, the cultural origins and traditions and the implied meanings
- Culinary business, mainly traditional dishes
- Traditional art performances
- Handicraft company that produces unique souvenirs

#### 4) Community Participation

Ecotourism involves communities in decision-making, area management, including the socio-cultural conditions of local communities that may trigger conflict, such as land use (for farms, plantations, agriculture, settlements, and locations of non-timber forest harvesting). The city will eventually take part when nature or their culture provides direct or indirect benefits for them. Benefits continuously, life or culture must be managed and maintained. It is the mutual relationship among tourist attractions, the management of profits gained from ecotourism, and community participation. Community engagement is essential for ecotourism success and will provide immediate benefits, both ecological and economic, for the community.

As ecotourism practitioners, the community around Nantu Wildlife Reserve must have the required skills. Quality improvement of the community as the human resources can make by counselling, training, informal education (courses), expert assistance, and comparative study of places that have successfully organised ecotourism activities. The type of training provided is customised to the kind of ecotourism products to developed while planning for ecotourism product development at Nantu Wildlife Reserve is adjusted to biodiversity potential, physical condition and landscape, market potential, and availability of supporting resources. Community members involved in ecotourism activities



organised into several groups, each will receive different training according to their work field.

The groups consist of:

- Ecotourism management board comprises democratically elected representatives of community to take charge of ecotourism
- Ecotourism operators and administrators trained in small business management, financial administration system, English, ecotourism marketing, community empowerment and comparative study.
- Tour guide and interpreter, are formed not only as a guide but also as an excellent and insightful interpreter. Their purpose is to make visitors of Nantu Wildlife Reserve acquire additional knowledge and experiences as a part of the process to understand, acknowledge and appreciate the substantive values of the tourist sites and in turn, to protect and preserve the area. The interpreter should be a person who is very aware and understand the existence of every object in the area. Thus the best person to do this is the member of surrounding community.
- Artisans are those who can create handicrafts and fine art.
- Cook, are those who have the talent and skill in serving healthy and hygienic food and beverages
- Rentier, are those who provide residential accommodation (homestay) for visitors
- Performers are dancers, singers, or poets who play a role to entertain guests.
- Transporters, either by land or by river transports.

#### 5) Control

The effectiveness of management is the fundamental of the principle of scrutiny, which defined in planning, implementation, monitoring, and evaluation. The principle of scrutiny minimises adverse impacts of the tourism activities that utilise natural resources and the conservation area by referring to the prevailing regulations and laws.

## 4. Conclusion

Nantu Wildlife Reserve had the potential to become a tourist attraction due to its diversity of endemic flora and fauna and its unique ecosystems. The ecotourism-based management model of Nantu Wildlife Reserve was able to unite the ecological, economic, and socio-cultural interests. It managed for local, national, regional and international interests with a networking system that involved local communities, relevant stakeholders, multi-skilled individuals. Ecotourism also developed the local wisdom to accommodate the interests of the community regarding the principle of conservation, education and recreation, economics, community participation, and control.

## References

- [1] G. Andrade and J. Rhodes, "Protected areas and local communities: An inevitable partnership toward successful conservation strategies?," *Ecol. Soc.*, vol. 17, no. 4, 2012.
- [2] J. S. Ayivor, C. Gordon, and Y. Ntiemoa-Baidu, "Protected area management and livelihood conflicts in

- Ghana: a case study of Digya National Park," *Parks*, vol. 19, no. 1, pp. 37–50, 2013.
- [3] A. Habib, "Human-wildlife conflict-causes, consequences and mitigation measures with special reference to Kashmir," *J. Zool. Stud.*, vol. 2, no. 1, pp. 26–30, 2016.
- [4] C. Bragagnolo, K. Ng, H. Calado, and M. A. P. P. Esteves, "Understanding and mapping local conflicts related to protected areas in small islands," *Isl. Stud. J.*, vol. 11, no. 1, pp. 57–90, 2016.
- [5] Balai Konservasi Sumberdaya Alam Sulawesi Utara, "Penataan Blok Suaka Marasatwa Nantu." Provinsi Gorontalo, 2014.
- [6] M. S. Hamidun, "Zonasi Taman Nasional dengan Pendekatan Ekowisata," *Disertasi. Inst. Pertan. Bogor. Bogor*, 2012.
- [7] I. Dunggio, "Zonasi Pengembangan Wisata di SM Nantu Propinsi Gorontalo." Tesis. Institut Pertanian Bogor. Bogor, 2005.
- [8] M. Hamidun and D. W. Baderan, "Potensi Satwa Liar Untuk Pengembangan Ekowisata di Kawasan Suaka Margasatwa Nantu Provinsi Gorontalo," in *Seminar Nasional Perhimpunan Biologi Indonesia XIII*, 2012, pp. 88–96.
- [9] M. Z. Haque, M. I. H. Reza, M. Alam, Z. U. Ahmed, and M. Islam, "Discovery of a potential site for community-based sustainable ecotourism in the Sundarbans reserve forests, Bangladesh," 2016.
- [10] S. Tiwari, S. Nepali, J. Paudel, and S. Upadhaya, "Ecotourism in Protected Areas of Nepal: An Application of Individual Travel Cost Method," *Res. J. Agric. For. Sci.*, vol. 5, no. 1, pp. 1–7, 2017.
- [11] W. Hill, J. Byrne, and F. de Vasconcellos Pegas, "The ecotourism-extraction nexus and its implications for the long-term sustainability of protected areas: what is being sustained and who decides?," *J. Polit. Ecol.*, vol. 23, no. 1, pp. 308–327, 2016.
- [12] H. Ceballos-Lascurain, *Tourism, ecotourism, and protected areas: The state of nature-based tourism around the world and guidelines for its development*. Iucn, 1996.
- [13] S. Sekartjajrarini and N. K. Legoh, "Rencana Strategis Ekowisata Nasional," *Kementerian. Kebudayaan dan Pariwisata. Jakarta*, 2004.
- [14] L. De Witt and P. Van der Merwe, "Key environmental management factors in protected areas an eco-tourist perspective," 2015.
- [15] S. Sekartjajrarini, "Kriteria dan indikator ekowisata Indonesia," *IdeA, Bogor*, 2009.
- [16] B. Sander, "The Importance of Education in Ecotourism Ventures," 2010.