

Development Strategy of Lau Debuk-Debuk Nature Park Based on Local Wisdom and Community Participation Using the Analytical Hierarchy Process (AHP) Method

Rezki Indah Siregar¹, Rahmawaty^{1,2}, Alief Athorick^{1,3}

¹Department of Natural Resources and Environment Management, School of Graduate Studies, Universitas Sumatera Utara, Indonesia

²Faculty of Forestry, Universitas Sumatera Utara, Campus USU 2 Bekala, Pancur Batu, Deli Serdang, Sumatera Utara, Indonesia

³Department of Biology, Faculty of Mathematics and Natural Science, Universitas Sumatera Utara, Indonesia
e-mail: rahmawaty@usu.ac.id

Received: September 18, 2023	Revision: December 27, 2023	Accepted: December 28, 2023
---------------------------------	--------------------------------	--------------------------------

Abstract

The designation of the Lau Debuk Debuk forest area as a nature reserve was based on the Decree of Radja Deli dated September 30, 1934. The area underwent a change in function from a nature reserve to a tourist park, according to the Minister of Agriculture's Decree Number: 320/Kpts/Um/5/1980 dated May 9, 1980, regarding the Change of the Status of the Nature Reserve covering approximately ± 7 hectares located in the Simalungun-Tanah Karo TK II Region, North Sumatra TK I Region as a Forest Tourism. In this area, there are hot springs containing sulfur. Lau Debuk-debuk Nature Park (TWA), located in the Berastagi District of Karo Regency, is one of the conservation areas managed by the North Sumatra Natural Resources Conservation Center. The research aimed to analyze local wisdom in the management of Lau Debuk-debuk Nature Park ecotourism. The study was conducted from February to May 2023 in the Lau Debuk-debuk Nature Park located in the Berastagi District of Karo Regency. It employed a qualitative approach involving local residents in the development process of strategies and the assessment of Lau Debuk-debuk Nature Park's ecotourism development based on local wisdom. The results indicate that the priority for the development of the Lau Debuk Debuk Conservation Area is the aspect of local wisdom, which is crucial for the development of a religious tourist area because it is the main reason tourists visit the natural tourist area, Lau Debuk-debuk Nature Park.

Keyword : Local Wisdom, Ecotourism, AHP Method

INTRODUCTION

The designation of the Lau Debuk Debuk forest area as a nature reserve was based on the Decision Letter of Radja Deli dated September 30, 1934. However, the area underwent a change in function from a nature reserve to a tourist park, as per the Minister of Agriculture's Decision Letter No. 320/Kpts/Um/5/1980 dated May 9, 1980. This change affected approximately 7 hectares of land located in Region TK II Simalungun-Tanah Karo, Region TK I North Sumatra, designated as a Forest Tourism

Area, specifically a Tourist Park. In terms of management activities, the conservation area, which includes the Conservation of Natural Resources Agency, has encountered various issues and challenges (Brahmanto et al., 2017).

One form of utilizing the concept of conservation in conservation forest areas that is currently evolving is ecotourism activities. One of the conservation areas managed by the Conservation of Natural Resources Agency of North Sumatra is the

Lau Debuk-Debuk Natural Tourist Park (TWA), located in the Berastagi District of Karo Regency. Lau Debuk-Debuk is a forested area situated at an elevation of approximately 1300 meters above sea level, featuring a tropical highland rainforest ecosystem. Initially, this area held the status of a Nature Reserve, as per the Decision Letter of Raja Deli dated December 30, 1924. However, its status was later changed to a natural tourist park, designated by the Minister of Agriculture through Decision Letter No. 320/Kpts/Um/5/1980 dated May 9, 1980, covering an area of approximately 7 hectares (Gabur & Sukana, 2020).

One of the conservation areas managed by the Conservation of Natural Resources Agency of North Sumatra is the Lau Debuk-Debuk Natural Tourist Park (TWA). It is located in the Berastagi District of Karo Regency. Lau Debuk-Debuk is a forested area situated at an elevation of approximately 1300 meters above sea level, characterized by a highland tropical rainforest ecosystem. Initially, this area had the status of a Nature Reserve, as per the Decision Letter of Raja Deli dated December 30, 1924. However, its status was later changed to a natural tourist park, designated by the Minister of Agriculture through Decision Letter No. 320/Kpts/Um/5/1980 dated May 9, 1980, covering an area of approximately 7 hectares (Dewi Astuti & Yuliawati, 2018).

Within this natural tourist park, there are hot springs that contain sulfur. This is influenced by its location at the foot of Mount Sibayak. TWA Lau Debuk-Debuk is considered sacred by some of the local communities.

On certain days, the Karo community, who follow the animistic belief system, conducts a ceremony called "erpangir" (ritual bathing with flower water). Followers of this belief are commonly known as "Kelak

Pamena," which is a local wisdom practiced in the Lau Debuk-Debuk Natural Tourist Park. The Lau Debuk-Debuk Natural Tourist Park (TWA) holds unique tourism potential, particularly in the realm of religious tourism. However, this tourism asset has not been fully maximized. This tourist attraction has the capability to boost the local economy and contribute to the well-being of the community through active participation in environmental conservation and the preservation of local wisdom within the Lau Debuk-Debuk TWA area (Peraturan Gubernur Sumatera Utara No. 38 Tahun 2016 Tentang Pembentukan Dinas-Dinas Daerah Provinsi Sumatera Utara., 2016). One of the standout attractions within the Lau Debuk-Debuk TWA is the sulfur hot spring tourism. This hot spring attraction is highly promising for development, as there are many other untapped potentials within it that can support the growth of the natural tourist park and attract visitors from outside the region. To harness the potential for ecotourism development, it is necessary to conduct an analysis of the development potential. The analytical methods employed include ODTWA (Object and Attraction of Natural Tourism), AHP (Analytical Hierarchy Process), SWOT analysis (Strengths, Weaknesses, Opportunities, Threats), and an exploration of the existing potentials within the Lau Debuk-Debuk TWA area as added value for ecotourism, ultimately attracting tourists to visit (Rudiyanto & Hutagalung, 2021).

Regarding this matter, the researcher is interested in conducting a study at the Lau Debuk-Debuk Natural Tourist Park (TWA) to develop ecotourism based on local wisdom and community participation. This type of tourism is one of the religious attractions aimed at enhancing the appeal for tourists to visit.

RESEARCH METHODOLOGY

The research is conducted at the Lau Debuk-Debuk Natural Tourist Park (TWA), located in the Berastagi District of Karo Regency. This park is one of the conservation areas managed by the Conservation of

Natural Resources Agency of North Sumatra. The research is conducted from March to July 2023. The location map of the research can be found in Figure 1.

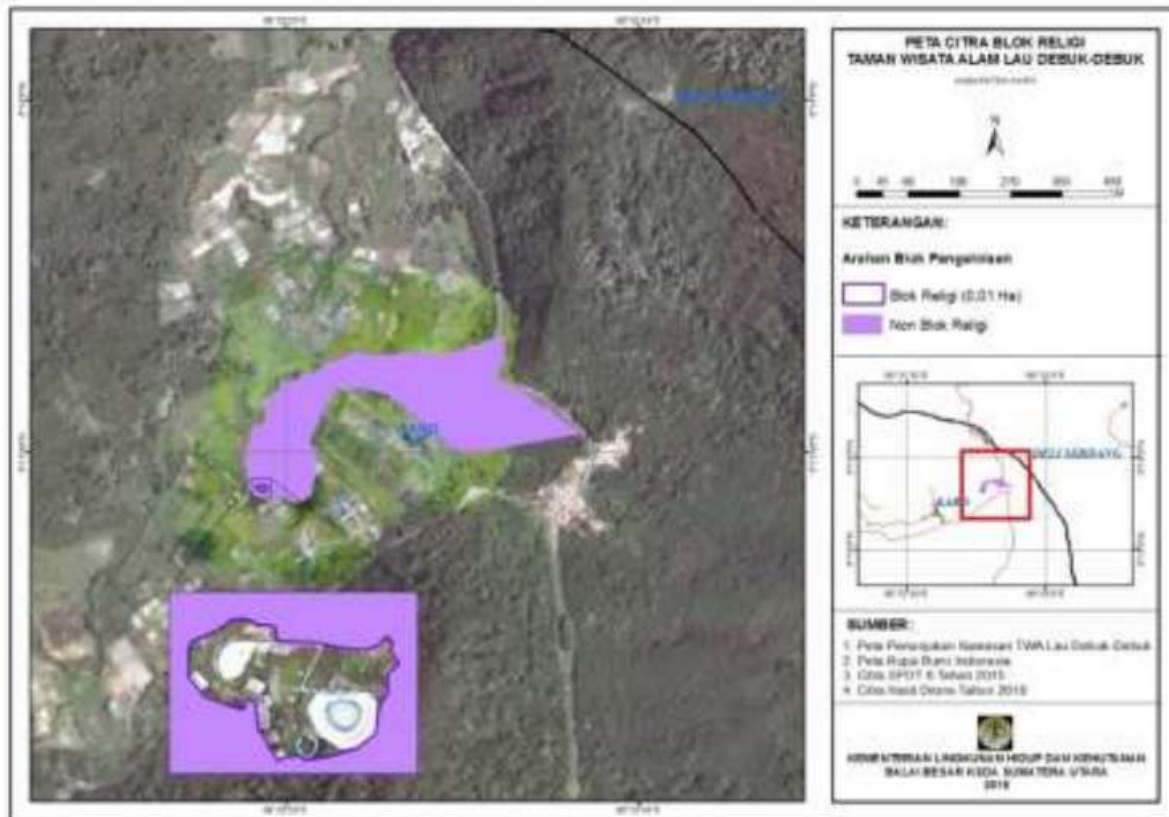


Figure 1. Map of the Religious Block Image of TWA Lau Debuk Debuk

The tools used in this research include writing materials, a laptop, a camera, and a recording device. The objects of this research are local wisdom and community participation in the development of ecotourism at the Lau Debuk-Debuk Natural Tourist Park (TWA) (Rudiyanto & Hutagalung, 2022).

This research employs the Focus Group Discussion (FGD) method and is processed using Expert Choice software. The informants selected for this research include the Head of Section for Region I of the Conservation of Natural Resources

Agency of North Sumatra, the Head of the Lau Debuk-Debuk TWA Resort, the Head of Doulu Village, and Village Officials. Informants chosen for this research were purposively selected, meaning they were selected based on the researcher's judgment that they possess adequate knowledge or experience regarding the research topic. The selection of informants was based on their perceived depth of information related to the research problem, their acceptance by various groups for policy-

making decisions, and their knowledge about the issues being studied (Sumantri, 2019).

The use of the Analytical Hierarchy Process (AHP) management method is carried out through the following steps: arranging the hierarchy in the AHP structure diagram, creating paired comparison

matrices among criteria, determining priority weights, measuring logical consistency by testing consistency indices, creating paired comparison matrices and priority weights, establishing global priorities, recording calculation results in the boxes for each criterion and alternative, and making decisions. The research hierarchy diagram is presented in Figure 2 as follows:

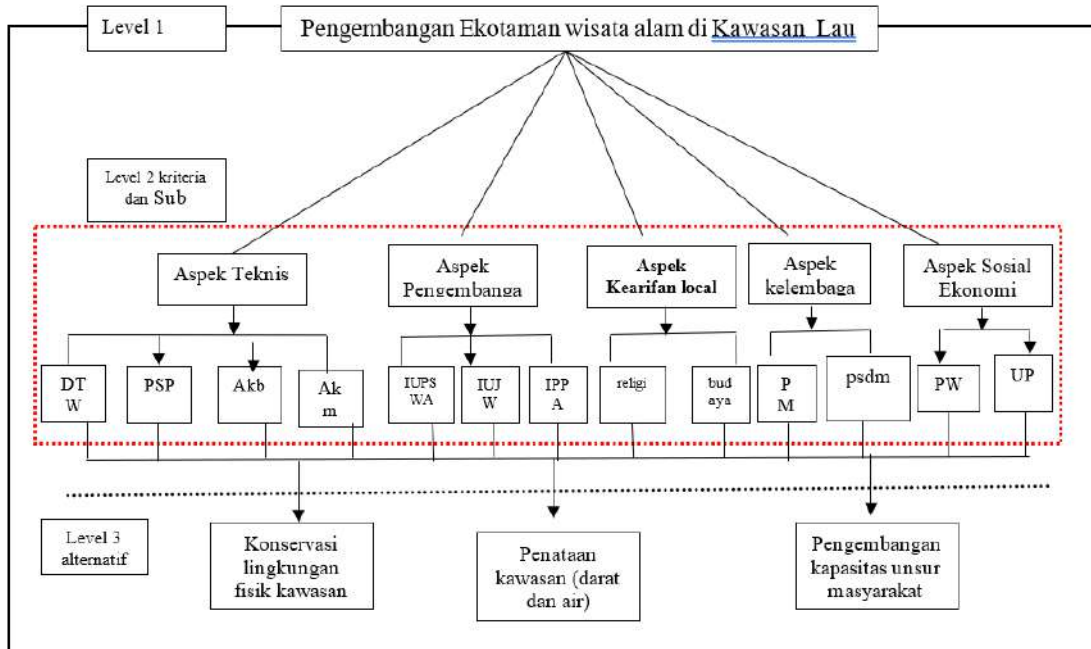


Figure 2. Research Hierarchy Structure Diagram

RESULTS AND DISCUSSION

Analysis of the Priority Level for the Development of Lau Debuk-Debuk TWA.

The AHP method is a method used to assist in making a decision. In this method, expert respondents are used to fill out questionnaires and conduct interviews to address the problems at hand. The assessment by expert respondents involves selecting criteria and alternatives based on a predetermined rating scale (Aminah, 2018).

To obtain priority weights in the development of Lau Debuk-Debuk TWA, a Focus Group Discussion (FGD) has been conducted with the resource persons

consisting of the managers of the Lau Debuk-Debuk TWA who have been working for more than 5 years, the Head of Doulu Village, Conservation Cadres, and Farmer Groups. Based on the data processing using the Analytical Hierarchy Process (AHP) with the assistance of the Expert Choice software application, the results can be seen in Table 1.

The results of the data processing using the Analytical Hierarchy Process (AHP) with the assistance of the Expert Choice software application are presented in Table 1.

Table 1. Weights in the criteria structure of Lau Debuk-Debuk TWA

No	Criteria	Criterion Values	Ranking
1	Local Wisdom Aspect	0,592	1
2	Technical Aspect	0,199	2
3	Development Aspect	0,99	3
4	Economic Aspect	0,66	5
5	Institutional Aspect	0,40	4

Source: Research Results, 2023

Based on the table above, it can be seen that the weight structure criteria in the development of Lau Debuk-Debuk TWA prioritize the following aspects in the following order: local Wisdom Aspect with a criterion value of 0.592, technical Aspect with a criterion value of 0.199, development Aspect with a criterion value of 0.099, Economic Aspect with a criterion value of 0.066 and Institutional Aspect with a criterion value of 0.040. The Local Wisdom Aspect is the top priority, and it is considered crucial for the development of a religious tourism area. This aspect is fundamental as it serves as the primary reason why tourists visit natural tourist areas such as Lau Debuk-Debuk TWA.

According to (Wiradiputra & Brahmanto, 2016), local wisdom can be understood as human efforts to apply

cognition to perform tasks and think about specific objects or events that occur in a particular place. This aligns with the explanation provided by TWN, which describes local wisdom as a tradition or customary practice carried out by a group of people residing in a specific area. It can be considered a law within a particular diverse community.

Based on this, the Lau Debuk-Debuk TWA area has uniqueness and unique potential, such as religious tourism, namely the Erpangir ceremony. The Lau Debuk-Debuk TWA area is one of the prime tourist destinations, especially for some members of the Karo ethnic group who have beliefs in performing rituals on specific days (according to Karo days) at the small ponds in the Lau Debuk-Debuk TWA area.



Figure 4. Erpangir Ceremony



Figure 5. Hot Spring Well

At certain times, the community conducts worship and stays within the area, followed by soaking in the hot spring pools. From interviews and supported by data, it has been found that the Lau Debuk-Debuk TWA area has experienced a decline, especially in terms of the number of visitors. This is due to the lack of renovation of various facilities and infrastructure, resulting in a decreased inclination for repeat visits. Additionally, some facilities such as traditional Javanese houses (Joglo), pools, toilets, and several pavilions (pandopo) are in a state of disrepair. Therefore, it is crucial to carry out repairs and rearrangements of facilities. Improvements are needed, and there is a need to add dedicated bathrooms for tourists

who come for health therapy and full-body soaking purposes, necessitating more private bathing facilities. In Lau Debuk-Debuk TWA, there is a natural hot spring well believed by some communities to possess supernatural powers and is used for rituals .

The lack of community participation is due to the perception that the tourism site does not offer promising economic opportunities. Community participation plays a crucial role in the development of ecotourism, as outlined in Government Regulation No. 33 of 2009, which emphasizes the importance of community participation as one of the principles in ecotourism development.

Table 2. Weights in the criteria structure of the Local Wisdom aspect

No	Sub criteria	Sub-criteria values	Ranking
1	Religion	0,592	1
2	Culture	0,199	2

Source: Research Results, 2023

The term "kearifan lokal" can be understood by breaking it down into two words: "kearifan" (wisdom) and "lokal" (local). "Lokal" means local or indigenous, and "wisdom" is synonymous with knowledge or sagacity. In other words,

"kearifan lokal" can be understood as the local ideas, values, perspectives, and knowledge that are wise, virtuous, and held in high regard by the members of a community (Nadlir, 2014).

Based on Table 2, we can see that the

weight in the criteria structure of the local wisdom aspect is as follows religious with a score of 0.592 dan cultural, which serves as a supporting element in the development strategy of Lau Debuk-Debuk TWA ecotourism, with a sub-criteria value of 0.199.

In the development of ecotourism, collaboration with the local community can enhance the well-being of the community and increase their involvement in preserving the area's sustainability. According to (Rudiyanto & Hutagalung, 2022), the

collaborative approach is based on the belief that community support is crucial for the sustainability of conservation efforts by facilitating the reconciliation of interests between the management and the community through the allocation of authority and responsibilities among stakeholders. In the context of natural tourism development, it is essential to uplift the welfare of the local community (Nasution, 2015). Therefore, cooperation with the local community is highly necessary for monitoring and enforcing the agreed-upon regulations.

Table 3. Weights in the criteria structure of the Technical aspect

No	Criteria	Criterion Values	Ranking
1	Tourist Attraction	0,462	1
2	Accommodation	0,231	2
3	Accessibility	0,154	3
4	Facilities and Infrastructure Equipment	0,154	4

Source: Research Results, 2023

Based on Table 3, the criteria structure of the technical aspect in the ecotourism development strategy for Lau Debuk-Debuk TWA is as follows tourist Attraction (Daya Tarik Wisata) with a score of 0.462, accommodation (Akomodasi), which serves as a supporting element in the ecotourism development strategy for Lau Debuk-Debuk TWA, with a sub-criteria value of 0.231, accessibility (Aksesibilitas), where a high

level of accessibility facilitates the community's access to utilize natural tourist attractions and increases the likelihood of visits to Lau Debuk-Debuk TWA, with a sub-criteria value of 0.154 and facilities and Infrastructure Equipment (Perlengkapan Sarana dan Prasarana), which is a supporting element in the ecotourism development strategy for Lau Debuk-Debuk TWA, with a sub-criteria value of 0.154.

Table 4. Weights in the criteria structure of the Development aspect

No	Criteria	Criterion Values	Ranking
1	Natural Tourism Business Permit	0,571	1
2	Natural Tourism Facility Business Permit	0,286	2
3	Natural Tourism Service Business Permit	0,143	3

Source: Research Results, 2023

Based on Table 4, the criteria structure of the development aspect in the ecotourism development strategy for Lau Debuk-Debuk TWA is as follows, Natural Tourism Business Permit (Izin Pengusahaan Pariwisata Alam) with a score of 0.571,

Natural Tourism Facility Business Permit (Izin Usaha Sarana Pariwisata Alam), which serves as a supporting element in the ecotourism development strategy for Lau Debuk-Debuk TWA, with a sub-criteria value of 0.286 and Natural Tourism Service

Business Permit (Izin Usaha Jasa Wisata Alam), which is a supporting element in the ecotourism development strategy for Lau

Debuk-Debuk TWA, with a sub-criteria value of 0.143.

Table 5. Weights in the criteria structure of the Institutional aspect

No	Criteria	Criterion Values	Ranking
1	Society participation	0,667	1
2	HR Development	0,333	2

Source: Research Results, 2023

Based on Table 5, the criteria structure of the Institutional aspect in the ecotourism development strategy for Lau Debuk-Debuk TWA is as follows Community Participation (Partisipasi Masyarakat) with a score of 0.667. This indicates that community participation is crucial in the development of ecotourism in Lau Debuk-Debuk TWA and

human resource development serves as a supporting element in the ecotourism development strategy for Lau Debuk-Debuk TWA, with a sub-criteria value of 0.333. This involves enhancing the skills and knowledge of the management team through various training programs in collaboration with relevant stakeholders.

Table 6. Weights in the criteria structure of the Economic aspect

No.	Criteria	Criterion Values	Ranking
1	Promotion of Tourism	0,500	1
2	Productive Enterprises	0,500	2

Source: Research Results, 2023

Based on table 6, it can be seen that the economic aspect in the development strategy of TWA Lau Debuk Debuk ecotourism is ranked first with a score of 0.500. The second criterion is Productive

Business, which is a supporting element in the development strategy of TWA Lau Debuk Debuk ecotourism, with a sub-criteria value of 0.500.

Table 7. Weights in the Goal Structure

No	Sub Criteria	Sub-criteria values	Rating
1	Religion	0,750	1
2	Community Participation	0,667	2
3	Permit for natural tourism business	0,571	3
4	Tourism promotion	0,500	4
5	Productive businesses	0,500	5
6	Tourist attractions	0,462	6
7	Human resource development	0,333	7
8	Permit for natural tourism facility business	0,286	8
9	Culture	0,250	9
10	Accommodation	0,231	10
11	Accessibility	0,154	11
12	Infrastructure and facilities equipment	0,154	12
13	Permit for natural tourism service business	0,143	13

Source: Research Results, 2023

Based on table 7, it can be seen that in the structure of goals in the development of TWA Lau Debuk-debuk, the first priority is Religious with a score of 0.750. The second criterion is Community Participation, which is a supporting element in the strategy for the development of TWA Lau Debuk-debuk, with a sub-criteria score of 0.667. The third place is occupied by the Permit for Natural Tourism Business with a sub-criteria score of 0.571, followed by Tourism Promotion in fourth place with a sub-criteria score of 0.500. Fifth place is held by Productive Business Activities with a sub-criteria score of 0.500. The sixth criterion is Tourist Attraction with a score of 0.462, followed by Human Resource Development in seventh place with a sub-criteria score of 0.333. In eighth place, there is the Permit for Natural Tourism Facility Business with a sub-criteria score of 0.286. Ninth place goes to Culture with a sub-criteria score of 0.250, and tenth place is occupied by Accommodation with a sub-criteria score of 0.231. Accessibility is ranked eleventh with a sub-criteria score of 0.154, followed by Infrastructure and Facilities Equipment in twelfth place with the same sub-criteria score of 0.154. The

thirteenth and last position is occupied by the Permit for Natural Tourism Service Business with a sub-criteria score of 0.143. Based on the data collected in the field, accessibility to the TWA Lau Debuk-debuk ecotourism area is considered suitable for development. The good road conditions, along with the availability of becaks (cycle rickshaws) and ojek (motorcycle taxis), make it relatively easy for tourists to reach the ecotourism area. The uniqueness of TWA Lau Debuk-debuk in attracting tourists to visit is the Erpangir Kulau ceremony, which is held on the wari cikura lau or the thirteenth day of the month. According to the followers of this belief, it is a highly anticipated sacred day believed to bestow blessings, prosperity, and health upon its participants. Erpangir Kulau is not just a cultural ritual passed down through generations but also carries deep meaning in terms of preserving nature (Marsono, 2014). Specifically, the TWA Lau Debuk-debuk area, as a ritual site, must be conserved and kept pure. The number of tourist visits on the day of the Erpangir ceremony significantly affects the overall visitor count at TWA Lau Debuk-debuk.

Table 8. Weights in the alternative structure of TWA Lau Debuk-debuk

No	Alternative	Alternative values	Ranking
1	Conservation of the physical environment of the area	0,423	1
2	Capacity development of community elements	0,292	2
3	Area arrangement (land and water)	0,285	3

Source: Research Results, 2023

Based on Table 8, it can be seen that for the weight of the alternative structure of TWA Lau Debuk-debuk, the aspect of Environmental Conservation of the Area's Physical Environment occupies the top position with a value of 0.423, while in the second position is the aspect of Capacity Development of Community Elements with a value of 0.292. These two aspects certainly go hand in hand, as reflected in the previous

sub-criteria results. The rearrangement of ecotourism, the renewal of facilities that are no longer suitable, and the repair of various damaged facilities conceptually involves improving the ecotourism location by considering improvements to supporting infrastructure. The better arrangement of the area goes hand in hand with tourist interest and increases community participation in the management and development of the

area, such as reactivating productive activities of the local community around the ecotourism area, which directly benefits the development of ecotourism and the local economy. In the third position, there is the aspect of Area Arrangement (land and water) with a value of 0.285 (Yusuf, 2014).

Building cooperation and collaboration with the community for ecosystem recovery through the formation of trained tour guides. Previously, the North Sumatra Natural Resources Conservation Agency (Balai Besar KSDA Sumatera Utara) already had several Conservation Cadres assigned to provide the best services for tourists (Rahmawaty, Najmatul K, 2015). However, there is a need for more active training and education to ensure optimal performance for the visiting tourists. This represents a community-based development strategy.

CONCLUSION

The priority for the development of the Conservation Area TWA Lau Debuk-Debuk is the aspect of local wisdom, which is a primary consideration. This aspect is crucial for the development of a religious tourism area, as it serves as the main reason tourists visit natural tourism areas such as TWA Lau Debuk-Debuk. The goal structure includes religious and environmental conservation aspects in the alternative structure.

REFERENCE LIST

Aminah, L. N. (2018). Analisis Kelembagaan Gapoktan Di Kesatuan Pengelolaan Hutan Ix Kota Agung Utara Kabupaten Tanggamus Provinsi Lampung. Universitas Lampung.

Brahmanto, E., Hermawan, H., & Hamzah, F. (2017). Strategi Pengembangan Kampung Batu Malakasari Sebagai Daya. *Jurnal Media Wisata*, 15(2), 588-600.

Dewi Astuti, S. N., & Yuliawati, Y. (2018). Faktor-Faktor Yang Berpengaruh Terhadap Keputusan Kunjungan Wisata Di Agrowisata Kabupaten Semarang. *Jurnal Agribisnis Terpadu*, 11(2), 241. <https://doi.org/10.33512/jat.v11i2.5099>

Gabur, M. F. A., & Sukana, M. (2020). Manajemen Pariwisata di Pulau Padar, Taman Nasional Komodo, Labuan Bajo. *Jurnal Destinasi Pariwisata*, 8(2), 336. <https://doi.org/10.24843/jdepar.2020.v08.i02.p23>

Marsono. (2014). Penggunaan Metode AHP Dalam Penelitian. In *Media*.

Nadlir. (2014). Urgensi Pembelajaran Berbasis Kearifan Lokal. *Jurnal Pendidikan Agama Islam*, 2(2), 300-330.

Nasution, Mhd. Rizky Azhari, Purwoko, Agus dan Hartini, K. S. (2015). Analisis Potensi dan Strategi Pengembangan Wisata Alam Air Terjun Silimalima di Kabupaten Tapanuli Selatan. *Jurnal Fakultas Kehutanan*, (1), 1-7. *Jurnal Fakultas Kehutanan*, 1(1), 1-7.

Peraturan Gubernur Sumatera Utara No. 38 Tahun 2016 Tentang Pembentukan Dinas-Dinas Daerah Provinsi Sumatera Utara., (2016).

Rahmawaty, Najmatul K, and A. R. (2015). Land use change assessment as an effort to mitigate climate change and Belawan watershed using-integrated-approach 2 nd international conference on tropical biology "ecological restoration in Southeast Asia: challenges, gains, and future directions." SEAMEO BIOTROP.

Rudiyanto, R., & Hutagalung, S. (2021). Pengelolaan Potensi Pariwisata Desa Watu Tiri Dengan Pendekatan Pariwisata Berbasis Masyarakat. *Khasanah Ilmu - Jurnal Pariwisata Dan*

-
- Budaya, 12(1), 1-6.
<https://doi.org/10.31294/khi.v12i1.8713>
- Rudiyanto, R., & Hutagalung, S. (2022). Analisis Potensi Wisata Alam Dengan Ado-Odtwa Studi Kasus: Desa Kempo. *Jurnal Kepariwisata*, 21(2), 130-143. <https://doi.org/10.52352/jpar.v21i2.821>
- Sumantri, D. (2019). Strategi pengembangan desa wisata di Kelurahan Jelekong, Kabupaten Bandung. *Jurnal Geografi Lingkungan Tropik*, 2(2). <https://doi.org/10.7454/jglitrop.v2i2.47>
- Wiradiputra, F. A., & Brahmanto, E. (2016). Analisis Persepsi Wisatawan Mengenai Penurunan Kualitas Daya Tarik Wisata Terhadap Minat Berkunjung. *Pariwisata*, III, No.2(2), 129-137 ISSN: 2355-6587.
- Yusuf, A. M. (2014). *Metode Penelitian Kuantitatif Kualitatif dan Penelitian Gabungan*. Prenadamedia Group.