

The Potential of Sawarna Beach as an Educational-Ecotourism Area and Its Utilisation in Biology Education: A Systematic Review

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Abstract

Tourism is very important for the economy because of its natural beauty and cultural diversity, so this sector must be developed. Tourism is one of the most profitable branches of the economy and has great potential to become a growing asset that can increase national income. One example is Sawarna Beach, located in Sawarna Village, Bayah District, Lebak Regency, Banten Province, which has excellent potential for development, especially in terms of eco-tourism. This study aims to delve deeper into information related to the potential of Sawarna Beach from various aspects regarding how Sawarna Beach can become an Edu-Eco-Tourism location and its utilisation in biology education. This study employs a qualitative approach using a systematic review to synthesise (summarise) the results of qualitative descriptive research. The findings of this literature review indicate that Sawarna Beach possesses diverse tourism potential and is suitable for development as an Edu-Ecotourism site prioritising ecotourism principles, particularly in educating and empowering local communities. The natural potential of Sawarna Beach can be developed through biology learning themes such as Biodiversity, Ecosystem Interactions and Their Roles, and Environmental Change and Conservation. Educational products that can be developed from the natural potential include books, locally-based teaching modules, worksheets, observation guides, posters, and others.

Keywords: Tourism, Sawarna Beach, Ecotourism, Biology Learning

INTRODUCTION

Tourism is one of the strategic sectors that is closely related to national and regional development. Not only does it play a role in boosting economic growth, but this sector also drives the development of other fields, such as the creative industry, trade, agriculture, and plantations (Ardiansyah & Iskandar, 2022). Furthermore, tourism also has a significant social impact by providing direct benefits to local communities, both economically, culturally, and socially. Tourism can transform local communities through increased participation, changes in mindset, and the strengthening of local identity and values (Savira et al., 2023).

One form of tourism that is now increasingly developing is ecotourism, which is a nature-based form of tourism that emphasises education, environmental awareness, and sustainable management (Tuasikal, 2020). The purpose of ecotourism is not only to provide an enjoyable tourist experience but also to enhance tourists' understanding of the local environment and culture, as well as to directly contribute to the well-being of local communities (Hanum et al., 2021). In the context of sustainability, ecotourism requires a strong educational approach to create long-term environmental awareness. Therefore, the concept of edu-ecotourism has emerged, which is a form of tourism that specifically combines educational elements, nature conservation, and community empowerment (Setyawati et al., 2023).

One location with high potential for development as an edu-ecotourism destination is Sawarna Beach, located in Sawarna Village, Bayah Sub-district, Lebak District, Banten Province. This area is widely known to both local and international tourists for its beauty and diverse tourist attractions (Tresna & Riani, 2022). Sawarna Village itself is a developing tourist village, with tourist attractions including natural tourism (such as Ciantir Beach, Pulo Manuk, Legon Pari, Tanjung Layar, and Sikabayan), cave tourism (Langir Cave, Lalay Cave, Sikadir Cave, and Camaul Cave), and pilgrimage tourism (Saketeng Pilgrimage and Tumenggung Pilgrimage). Furthermore, the potential of this village can be enhanced through an ecosystem-based eco-tourism approach, which includes nature-based tourism, environmental education, ecological conservation, tourist satisfaction, and contributions to community welfare (Silvitiani et al., 2018)

As a coastal area with diverse ecosystems, Sawarna Beach is not only suitable for development as a tourist destination but also holds significant value as a medium for biological education. This aligns with the essence of biology, which studies living organisms and their interactions with the environment. The biodiversity and ecological phenomena found in this area make it a highly relevant natural laboratory for experiential learning activities. Based on this background, this study aims to examine the potential of Sawarna Beach from various aspects as an eco-tourism location, as well as to evaluate its suitability for use in contextual and environmentally oriented biology learning.

METHOD

This research uses a qualitative approach in a systematic review to synthesize (summarize) descriptive qualitative research findings. This method is a technique for integrating data to obtain new theories and concepts or a deeper and more comprehensive level of understanding (Perry & Hammond, 2002). Qualitative systematic review includes the following steps: 1) Formulating the research question, namely, How is the potential of Sawarna Beach from various aspects (social, cultural, economic, and environmental), and How is the feasibility of Sawarna Beach as an Edu-ecotourism location? 2) Conducting a systematic literature search that can be obtained from the Google Scholar database with the index years 2019-2024. A literature search using the keywords “Sawarna Beach,” 3) Screening and selecting appropriate articles, 4) Analyzing and synthesizing findings, 5) Maintaining quality control, and 6) Compiling the final report.

RESULTS AND DISCUSSION

Nine works of literature that have discussed the potential of Sawarna Beach are known for their results of high-quality literature research and data extraction. Each literature, of course, discusses different topics according to the purpose of the research, namely the tourism potential of Sawarna Beach, biodiversity in Sawarna Beach, and the utilization of tourism potential in biology learning.

Overview of the Potential of Sawarna Beach as an Edu-Ecotourism Location

In the systematic literature review results, researchers analyzed 9 (nine) studies used in this study to find information about the potential of Sawarna Beach as an Edu-Ecotourism Location and its use for learning biology. The systematic review process followed the PRISMA guidelines. From an initial 48 records identified, 43 remained after removing duplicates. After title and abstract screening, 20 articles were reviewed in full text, resulting in 9 studies included in the synthesis. The process is illustrated in the following PRISMA diagram.

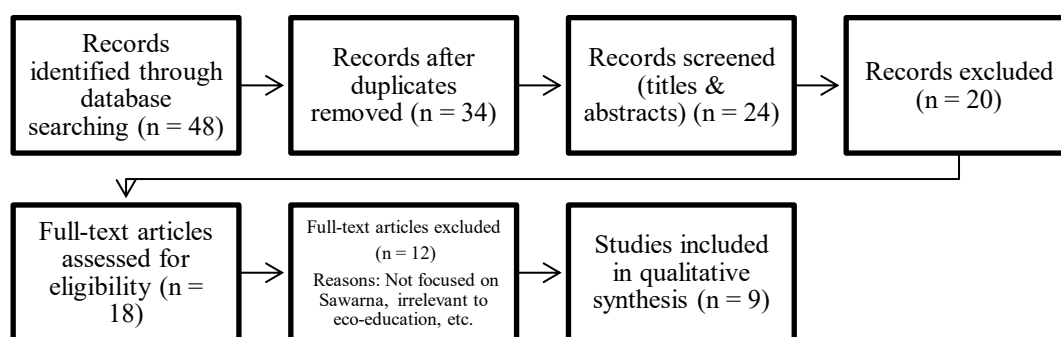


Figure 1. PRISM Diagram

Table 1. The Results of the Review

No.	Title	Author	Place Research	Summary of Article Content
1.	Identifikasi Morfologi Ulva Intestinalis Acanthophora Spicifera di Kawasan Pantai Tanjung Layar, Sawarna, Bayah, Kabupaten Lebak, Banten	Ramdan, M. R., & Nuraeni, E	Sawarna, Bayah, Lebak, Banten	The morphology of <i>Ulva intestinalis</i> consists of a thallus resembling small flat sheets, green, containing chloroplasts, had branches, and a holdfast in the form of fibers. Meanwhile, the morphological characteristics of <i>Acanthophora spicifera</i> consist of short thalli, brownish-green, branched, thorn-like, and cylindrical, and fiber-shaped holdfast.
2.	Keanekaragaman Jenis Burung di Kawasan Wisata Pantai Sawarna	Kurnia, I., Fajari, M. F., Qohhar, J. A., Rahmawati, N.,	Sawarna, Bayah, Lebak, Banten	There were 32 bird species from eight orders and 18 families. Nine species are protected by law, and one is included in Appendix II of

No.	Title	Author	Place Research	Summary of Article Content
	Kecamatan Bayah Kabupaten Lebak Provinsi Banten	Affandi, M. R., & Aeni, A. Z. K.		CITES. The birds included seabirds such as the white daralaut (<i>Gygis alba</i>); shorebirds such as the small-collared creek (<i>Charadrius dubius</i>); waterbirds such as the grand canal (<i>Ardea alba</i>); and terrestrial birds such as the crested many (<i>Ploceus many</i>) and the gelling ekek (<i>Cissa thalassina</i>). Variations in bird groups are due to variations in habitat that differ.
3.	Potensi Rammang Rammang Maros sebagai Sumber Belajar Melalui Ecotourism	Hayati, R. S.	Maros, Sulawesi Selatan	The products of this development research are ecotourism guidebooks for tourism managers and ecotourism guidebooks for teachers and students. The potential of Rammang-Rammang Maros as a source of biology learning can be material on ecosystems with subtopics on biological components, energy flow and biogeochemical cycles, and the utilization of ecosystem components for life. Karst and mangrove ecosystems are the focus of the potential development of Rammang-Rammang Maros as a source of biology learning through ecotourism.
4.	Potensi Keunggulan Lokal Kabupaten Majalengka dan Pemanfaatannya pada Pembelajaran Biologi	Aripin, I., & Yulianti, D.	Majalengka	The products of this development research are ecotourism guidebooks for tourism managers and ecotourism guidebooks for teachers and students. The potential of Rammang-Rammang Maros as a source of biology learning can be material on ecosystems with subtopics on biological components, energy flow and biogeochemical cycles, and the utilization of ecosystem components for life. Karst and mangrove ecosystems are the focus of the potential development of Rammang-Rammang Maros as

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				a source of biology learning through ecotourism.
5.	Pengelolaan Sektor Pariwisata Melalui Pendekatan Partisipasi Stakeholders di Kawasan Wisata Desa Sawarna Kabupaten Lebak Provinsi Banten	Suharyana, Y., & Hermawan, A. A.	Sawarna, Bayah, Lebak, Banten	The local resources of Sawarna Village are very useful but have not been widely utilized to encourage local community participation in development, especially in tourism management.
6.	Perkembangan Desa Wisata Sawarna Tahun 2002–2020	Rustama, A. & Ribawati, E.	Sawarna, Bayah, Lebak, Banten	Sawarna Tourism Village has various potentials, including natural tourism (marine tourism and caves), cultural tourism (cultural arts, arts and crafts, pilgrimage attractions, Sawarna bubu tours, and Sawarna harvest), and artificial tourism (Sawarna best festival, Sawarna beach festival). Sawarna Tourism Village was initiated by Erwin Komarasukma in 1990; in 1999, Sawarna's potential was increasingly explored, and in 2002, Sawarna was used as a tourist development village. In 2014, the village head decided to inaugurate Sawarna Tourism Village (Dwiwarna). In addition, the social impact of Sawarna Tourism Village is the population structure, livelihood transformation, value system transformation, and family modernization. However, the cultural impact comes from changes in the community around the tourist attraction due to tourism development and development.
7.	Penanaman Pohon Mangrove sebagai Mitigasi Bencana Abrasi di Pantai Cihasem, Desa	Bethary, R. T., Saputra, A., Nurhafidah, W., Ramadhani, M., Juwita, I.,	Pantai Cihasem, Desa Sawarna, Kabupaten Lebak.	To prevent abrasion around Sawarna Village, disaster mitigation efforts involve educating the community about what can be done to reduce the impact of damage. One way of

No.	Title	Author	Place Research	Summary of Article Content
	Sawarna, Kabupaten Lebak.	Maldini, M., ... & Iqom, S.		disaster mitigation to overcome abrasion is to plant mangroves on Sawarna Beach, Cihaseum Hamlet, and Sawarna Village. Mangrove ecosystems have a greater ability to prevent abrasion than weathered coastal buildings.
8.	Community-based Ecotourism in Sawarna Tourism Village	Sihombing, S. O., & Suwu, S. E.	Desa Sawarna, Bayah, Lebak, Banten	Sawarna Beach has various facilities that make visitors' experience more enjoyable and comfortable. Besides being fun and comfortable, Sawarna Beach is also very suitable if applied as ecotourism at Sawarna Beach. Therefore, the importance of developing ecotourism in Sawarna Tourism Village is based on community empowerment to improve the community's economy.
9.	Creating Sustainable Natural Tourism Destination	Ismail, Y	Desa Sawarna, Bayah, Lebak, Banten	9 Creating a sustainable natural tourism destination: Ismail, Y Sawarna Village, Bayah, Lebak, Banten. With its diverse coastal landscape, Sawarna has the potential to become a tourist destination. As long as the environmental impact seen from the physical characteristics of the waters is still not polluted, sustainable tourism can be carried out. Tourism development can improve community welfare through increased income. Social, economic, and environmental considerations are needed to make this area a tourist destination.

Based on the results of a systematic literature review, the researchers analysed nine relevant literature sources that discussed in depth the potential of Sawarna Beach as an eco-tourism destination. These literature sources highlighted various important dimensions, ranging from economic, social, cultural, to environmental aspects. The findings from this analysis indicate that Sawarna Beach has characteristics that are highly conducive to being developed as an Edu-Eco-Tourism destination, given its abundance of natural and social resources. This

beach not only offers breathtaking natural beauty but also harbours educational values that can be leveraged for direct environment-based learning activities. Ismail (2021) also states that with its diverse coastal landscape, Sawarna has the potential to become a tourist destination. As long as the environmental impact from the physical characteristics of the water remains unpolluted, sustainable tourism can be carried out. However, the development of Sawarna Village into an ecotourism destination must be based on community empowerment to improve the local economy (Sihombing & Suwu, 2023). The natural potential of Sawarna Village can serve as an educational resource for the community.

Ecotourism itself is a form of tourism with a specific focus, prioritising environmental conservation, educating tourists about environmental and social issues, and empowering and improving the well-being of local communities. In practice, ecotourism not only provides a tourist experience but also expands visitors' knowledge and awareness of the importance of nature conservation and local wisdom. As the paradigm of modern tourists shifts towards prioritising educational and sustainable aspects in their travel activities, interest in ecotourism destinations is increasing. This is reinforced by the view that tourism is not only for entertainment but also as a means to learn about ethnology, the environment, and local culture (Murianto & Masyhudi, 2021).

Regulations supporting the development of ecotourism in Indonesia are outlined in the Ministry of Home Affairs Regulation No. 33 of 2009. The regulation states that ecotourism is a form of utilising unique natural and cultural resources, which, if developed with the right strategy, can become a leading sector in the region. However, to date, this potential has not been optimally utilised in many areas. Therefore, a comprehensive and integrated development strategy is needed, covering planning, management, control, institutional strengthening, and community empowerment. All these processes must be carried out while maintaining a balance between social, economic, and ecological aspects. The active participation of all stakeholders is crucial to ensure that ecotourism can operate sustainably and make a real contribution to improving the welfare of local communities.

The existence of ecotourism is closely related to the concept of edu-ecotourism, which is an approach that integrates nature-based tourism activities with educational elements. This concept can be an innovative strategy in instilling awareness of the importance of environmental conservation from an early age. Edu-ecotourism not only provides recreational experiences for visitors but also offers contextual learning, where participants can directly engage with biodiversity, ecosystem functions, and real-world environmental issues on-site. Thus, tourism activities that are typically recreational can be developed into an effective

educational medium to foster concern, responsibility, and concrete actions in safeguarding environmental sustainability. Sutisno & Afendi (2018) emphasise that the eco-tourism approach has great potential to teach ecological values through direct experience, making it easier for participants—especially children and teenagers who are in the early stages of environmental awareness development—to accept and understand. The presence of eco-tourism-based tourism will undoubtedly benefit both tourists and local communities. Tourists will receive education about the tourism, and the local community will be economically empowered. However, the existence of eco-tourism requires support from the government and local community for its sustainability. The development of eco-tourism will have a positive impact on the integrity of the original ecosystem of Sawarna Beach, with a focus on environmental aspects.

The potential of Sawarna Beach as an eco-tourism location is highly relevant to the biology curriculum at the senior high school level, particularly in Grade 10 Phase E. In this phase, students are encouraged to understand topics such as Biodiversity, Components and Interactions of Ecosystems, and Environmental Change and Conservation. Learning outcomes in this phase focus on students' ability to identify and create solutions to various environmental issues based on an understanding of local, national, and global issues. In addition, students are required to master various scientific skills, ranging from observation, questioning, planning investigations, analysing data, to presenting results. Therefore, areas such as Sawarna Beach are ideal as natural laboratories that can support contextual learning, strengthen 21st-century skills, and shape an environmentally conscious character in the younger generation (Irnaningtyas & Sagita, 2022).

In addition, the potential of Sawarna Beach as an eco-tourism location is highly relevant for integration into biology education through the application of the Outdoor Learning method. This teaching method encourages students to engage directly with the natural environment as a source of learning, so that the learning process is not limited to the classroom but extends to open spaces rich in real-world experiences. Outdoor Learning is considered effective in increasing student engagement because they can observe biological objects and phenomena directly in their natural habitats (Yanti et al., 2022). Moreover, this approach has been proven to deepen students' understanding of biological concepts through active interaction with nature (Ariesandy, 2021), foster a sense of care and responsibility toward the environment (Suleman et al., 2022), and positively impact significant improvements in student learning outcomes (Julianti & Somantri, 2017).

Table 2. The Potential of Sawarna Beach as an Educational-Ecotourism Area

Topic	Outcome Learning	Product	Method
Biodiversity of Shorebirds	Identification and observation of birds in their natural habitat	Bird classification poster	Outdoor Learning, Inquiry
Mangrove Ecosystem	Mangrove zoning observations, vegetation types & adaptation	LKS Coastal Ecosystem	Problem-Based Learning
Abrasion Mitigation	Mangrove planting simulation & abrasion measurement	Abrasion investigation report	Project-Based Learning

By leveraging the biodiversity and ecosystem conditions of Sawarna Beach, teachers can design various experience-based learning models such as Project-Based Learning, Problem-Based Learning, or Inquiry Learning tailored to the local context. Through these activities, students not only gain knowledge but also develop scientific skills, critical thinking, collaboration, and ecological values. The implementation of Outdoor Learning at Sawarna Beach not only supports biology learning objectives but also strengthens students' character and environmental awareness in facing future ecological challenges. Learning products that can be developed from the natural potential of Sawarna Beach include books, locally-based teaching modules, worksheets, observation guides, posters, and others.

CONCLUSION

Tourism is a field related to national and regional development because it can boost economic growth and encourage growth in other fields, such as industry, trade, agriculture, and plantations. Tourism is important to the economy because of its natural beauty and cultural diversity, so this sector must continue to grow. Sawarna Beach is a well-known coastal tourist resort among both foreign and local tourists, making it one of the distinctive features of Sawarna Beach with a continuously evolving tourist pattern. The results of this literature review indicate that Sawarna Beach has diverse tourism potential and is suitable for use as an Edu-Ecotourism location that prioritises ecotourism principles, particularly in education and community empowerment. Tourism potential can be applied in biology education, such as topics on biodiversity, ecosystem interactions, and their roles, as well as environmental changes and conservation for Grade 10 students.

REFERENCES

- Aripin, I., & Yulianti, D. (2018). Potensi Keunggulan Lokal Kabupaten Majalengka dan Pemanfaatannya Pada Pembelajaran Biologi. *BIO EDUCATIO: The Journal of Science and Biology Education*, 3(1), 43-52.

- Ardiansyah, I., & Iskandar, H. (2022). Analisis Potensi Ekowisata Di Taman Wisata Alam Gunung Pancar Dengan Menggunakan Metode Analisis Ado-Odtwa. *Jurnal Inovasi Penelitian*, 2(8), 2621- 2630.
- Ariesandy, K. T. (2021). Pengaruh Pembelajaran Luar Kelas (Outdoor Learning) Berbentuk Jelajah Lingkungan dan Motivasi terhadap Hasil Belajar Biologi Siswa. *Jurnal Matematika, Sains, dan Pembelajarannya*, 15(1), 110–120, e-ISSN 2549-6727.
- Bethary, R. T., Saputra, A., Nurhafidah, W., Ramadhani, M., Juwita, I., Maldini, M., ... & Iqom, S. (2022). Penanaman Pohon Mangrove sebagai Mitigasi Bencana Abrasi di Pantai Cihasem, Desa Sawarna, Kabupaten Lebak. *Civil Engineering for Community Development (CECD)*, 1(1), 8-15.
- Hayati, R. S. (2018). Potensi Rammang Rammang Maros Sebagai Sumber Belajar Melalui Ecotourism. *Prosiding Seminar Nasional Biologi dan Pembelajarannya: Inovasi Pembelajaran dan Penelitian Biologi Berbasis Potensi Alam*, 527-532.
- Hanum, F., Dienaputra, R. D., Suganda, D., & Muljana, B. (2021). Strategi Pengembangan Potensi Ekowisata di Desa Malatisuka. *Jurnal Master Pariwisata (JUMPA)*, 8(1), 22-45.
- Irnaningtyas & Sagita, S. (2022). *IPA Biologi Untuk SMA/MA Kelas X*. Jakarta: Erlangga.
- Ismail, Y. (2021). Creating Sustainable Natural Tourism Destinations. *Geo Journal of Tourism and Geosites*, 39, 1331–1335.
- Julianti, F. R., & Somantri, L. (2017). Pengaruh Metode Outdoor Study terhadap Sikap Peduli Lingkungan di Taman Nasional Gunung Gede Kabupaten Cianjur. *Prosiding Seminar Nasional Pendidikan Geografi*, 69–74.
- Kurnia, I., Fajari, M. F., Qohhar, J. A., Rahmawati, N., Affandi, M. R., & Aeni, A. Z. K. (2024). Keanekaragaman Jenis Burung di Kawasan Wisata Pantai Sawarna Kecamatan Bayah Kabupaten Lebak Provinsi Banten. *Konservasi hayati*, 20(1), 48-61. <https://doi.org/10.33369/hayati.v20i1.32199>
- Murianto., & Masyhudi, L. (2021). Identifikasi Potensi Pengembangan Ekowisata Desa Karang Sidemen untuk Mendukung Berkelanjutan di Lingkar Geopark, Lombok Tengah. *Jurnal Ilmiah Hospitality*, 10(1): 79-86.
- Perry, A. & Hammond, N. (2002). Systematic Review: The Experience of a PhD Student. *Psychology Learning and Teaching*, 2(1), 32–35.
- Ramdan, M. R., & Nuraeni, E. (2021). Identifikasi Morfologi Ulva intestinalis dan Acanthophora spicifera di Kawasan Pantai Tanjung Layar, Sawarna, Bayah, Kabupaten Lebak, Banten. *Tropical Bioscience: Journal of Biological Science*, 1(1), 1-10.
- Rustama, A., & Ribawati, E. (2024). Perkembangan Desa Wisata Sawarna Tahun 2002–2020. *Reslaj: Religion Education Social Laa Roiba Journal*, 6(4), 1727-1741.
- Savira, A. N., Assegaff, M., Syania, L., Furqon, C., Marseli, F., Gunawan, B. H., & Maghningtias, A. L. (2023). Studi Kelayakan Pantai Sawarna sebagai Destinasi Wisata

- untuk Meningkatkan Perekonomian Masyarakat Setempat. *Siwayang journal*, 2(2).
<https://doi.org/10.54443/siwayang.v2i2.1111>
- Setyawati, M., Angin, R. B. P., & Wijaya, A. I. (2023). Potensi Dan Strategi Edu-Ekowisata Madu Di Dusun Gunung Padang, Desa Karyamukti. *UG Journal*, 17(5).
- Sihombing, S. O., & Suwu, S. E. (2023). Community-based ecotourism in Sawarna tourism village. *Enrichment: Journal of Management*, 13(1), 258- 269.
- Silvitiani, K., Yulianda, F., & Siregar, V. P. (2018). Perencanaan Pengembangan Wisata Pantai Berbasis Potensi Sumberdaya Alam Dan Daya Dukung Kawasan Di Desa Sawarna, Banten (Coastal Tourism Development Based on Natural Resources and Carrying Capacity in Sawarna Village, Banten). *Jurnal Manusia Dan Lingkungan*, 24(2), 66-72.
- Suharyana, Y., & Hermawan, A. A. (2022). Pengelolaan Sektor Pariwisata Melalui Pendekatan Partisipasi Stakeholders di Kawasan Wisata Desa Sawarna Kabupaten Lebak Provinsi Banten. *Jurnal Kebijakan Pembangunan Daerah*, 6(2), 91-111.
- Suleman, D., Panal, A. H., & Rival, S. (2022). Menanamkan Rasa Peduli Lingkungan Melalui Kegiatan Outdoor Study Ciptakan Kebersamaan di Desa Biluhu Timur Kabupaten Gorontalo. *Jurnal Pendidikan Masyarakat dan Pengabdian*, 02(2), 581–592.
- Sutisno, A. N., & Afendi, A. H. (2018). Penerapan Konsep Edu-Ekowisata sebagai Media Pendidikan Karakter Berbasis Lingkungan. *Ecolab*, 12(1), 1-11.
- Tresna, Z., & Riani, W. (2022). Eksternalitas Keberadaan Objek Wisata Pantai Sawarna Bagi Masyarakat Desa Sawarna Kecamatan Bayah Kabupaten Lebak Provinsi Banten. *Bandung Conference Series: Economics Studies*, 2(2). <https://doi.org/10.29313/bcses.v2i2.3556>
- Tuasikal, T. (2020). Strategi Pengembangan Ekowisata Pantai Nitanghahai di Desa Morela, Kabupaten Maluku Tengah. *Jurnal Agrohut*, 11(1), 33-42.
- Yanti, M., Egok, A. S., & Firduansyah, D. (2022). Penerapan Metode Outdoor Study dengan Pembelajaran Inkuiri dalam Pembelajaran IPA Sekolah Dasar. *Jurnal Basicedu*, 6(3), 4451-4460, ISSN 2580-3735.