

Sustainable Use of Water Hyacinth for Community Welfare: Ecological, Economic, and Social Benefits from PT Pertamina's CSR Program at DPPU Adi Sumarmo

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ABSTRACT

Water Hyacinth (*Eichhornia crassipes*) causes negative impacts in the Cengklik Reservoir area because it is considered an invasive weed with very fast growth and ability to spread very efficiently. Although hyacinths have some benefits, there are also significant negative impacts. The existence of wild hyacinths has a negative impact on the tourism sector, accelerating water reduction, fisheries, and fishermen etc. The study aims to investigate the impact and potential use of water hyacinths in sustainability, ecological, economic, and social frameworks, taking into account the principles of Maqashid Sharia. CSR PT Pertamina Patra Niaga DPPU Adi Sumarmo encourages the Community Group of Sobokerto Village, Ngemplak, Boyolali to implement effective management strategies to control the growth of water hyacinths and mitigate their negative impacts by making biogas and organic fertilizer from water hyacinths. The research method used is qualitative, focusing on a deep understanding of people's perceptions and experiences related to hyacinth sustainability. The study found that hyacinth sustainability is not just about achieving favorable economic outcomes, but also respecting the ethical, ecological and social justice principles underlying Maqashid Sharia, so as to provide holistic benefits to the environment and local communities. Thus, hyacinth management can be a positive example in achieving a harmonious balance between environmental sustainability and community welfare in accordance with Islamic teachings. Proper management of hyacinths can maximize their benefits and reduce their negative effects on society and the environment.

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Introduction

Hyacinths (*Eichhornia crassipes*) are called aquatic plants that can grow quickly in freshwater environments [1]. Although known as an invasive water weed, hyacinths have the potential to provide ecological, social, and economic benefits to the community [2]. The implementation of sustainable studies in the context of safeguarding Maqashid Sharia and improving the welfare of the general public covers three main aspects: ecological, economic, and social [3].

Hyacinths have a significant phytoremediation ability [4]. By helping to clean and maintain water quality, hyacinths are able to absorb excess nutrients and pollutants in water [5]. So that the sustainability of hyacinth plants can support Maqashid Sharia, especially in maintaining the preservation of nature and the environment [6]. Wise hyacinth management can be an ecological solution that supports the purpose of nature conservation in accordance with Islamic principles [7]. In the article by [8], Hyacinth ecology research shows a positive impact in maintaining the balance of aquatic ecosystems. Hyacinths can act as a natural filter, reduce levels of pollutants, and provide a place to live for aquatic species. This study emphasizes the importance of sustainable ecological management to support the principles of Maqashid Sharia in maintaining environmental sustainability.

In terms of economy, hyacinths have great potential [9], [10]. This plant can be used as a source of animal feed, bioenergy materials, and raw materials for the paper industry [11], [12], [13]. With the economic potential of water hyacinths in a sustainable manner, new jobs can be created and increase community income. This is in accordance with the principle of Maqashid sharia economic welfare, whose aim is to encourage fair and sustainable economic development in society [12], [14]. Community participation is very important in water hyacinth management [15], [16]. In strengthening social relations by involving local communities in planting, maintaining, and utilizing water hyacinth. In addition, training and education programs related to water hyacinths can increase people's insight and skills, in accordance with the principles of social welfare maqashid syariah [17], [18].

One of the tourist attractions in Soboketo Village, Cengklik Reservoir faces the problem of water hyacinth which almost covers the entire surface of the reservoir. Efforts to find solutions for sedimentation of these reservoirs focus on biogas and water hyacinth organic fertilizer. One of the reasons for the sedimentation of reservoirs is water hyacinth weeds. As a result, the reservoir water discharge is decreasing, which has an impact on the water discharge used for irrigation of farmers' rice fields. In addition, fishermen also experience difficulties because water hyacinth hampers their boats. Upwelling that causes the death of farmed fish in cages is also caused by water hyacinth. Through the DPPU Adi Sumarmo CSR program in Sobokerto Village, focusing on the communities assisted by the Ngudi Tirto Lestari Pokmas (Community group) program, efforts were made to use water hyacinth as biogas and organic fertilizer.

There has been a lot of research that discusses the use of hyacinths [19], [20], [21], [22], [23], [24]. There was also a discussion about economic empowerment in the water hyacinth artisan community and how to overcome it, as well as the economic impact felt by the water hyacinth artisan community after participating in the empowerment carried out by Bumi Desa [25]. In addition, there is research that discusses how to use water hyacinths to reduce the chemical oxygen demand content, pH, odor and color in tofu liquid waste which has a positive impact on ecological sustainability [26]. While the social aspect is researched by [27], In his research, the use of water hyacinths in a sustainable way can improve the social welfare of the community. Communities involved in the project can benefit positively from a cleaner environment and sustainable resources. Therefore, researchers reviewed this study because there has been no research that discusses the impact and potential use of water hyacinths in the framework of sustainability, ecology, economy, and social, taking into account the principles of Maqashid Sharia. Thus, hyacinth management can be a positive example in achieving a harmonious balance between environmental sustainability and

community welfare in accordance with Islamic teachings. Proper management of hyacinths can maximize their benefits and reduce their negative effects on society and the environment.

Method

The research method used is qualitative, focusing on a deep understanding of people's perceptions and experiences related to hyacinth sustainability. Sobokerto Village was chosen because it is a location directly affected by the growth of water hyacinths in Cengklik Reservoir. Dukuh Turibang was identified as the main focus in the village. The sustainability of water hyacinths in Cengklik Reservoir has a significant impact on the livelihoods and welfare of the surrounding communities, and the choice of this location is relevant to the purpose of the study.

The study participants involved local communities, hyacinth management groups, fishermen, and other related parties who have knowledge about ecology, economics, and social related to water hyacinths. Participants were selected based on their ecological, economic, and social experience and knowledge, as well as their involvement in hyacinth-related activities.

Data Collection Techniques

1. In-depth Interview

In-depth interviews were conducted with participants to understand their views, attitudes, and experiences regarding hyacinth sustainability.

2. Participatory Observation

Participatory observation was used to gain first-hand insight into daily practices related to hyacinth management and their impact.

3. Document Analysis

Document analysis is performed against secondary data such as government documents, reports, and related literature to support understanding of context.

Results and Discussion

On the ecological aspect, the growth of hyacinths (*Eichhornia Crassipes*) can have a serious impact on the local ecosystem in Cengklik Reservoir, especially if the growth is not controlled. Hyacinths tend to form dense piles on the surface of the water, causing blockage of water circulation. This can impede water flow and reduce oxygen exchange, which impacts the health of aquatic ecosystems. Excessive growth of hyacinths can lead to a decrease in oxygen levels in the waters. When hyacinths die and rot, bacteria involved in decomposition use large amounts of oxygen. This can lead to hypoxic conditions, endangering other aquatic life. The dense leaves of hyacinths can cover the surface of the water, reducing the sunlight reaching the aquatic plants below. This can inhibit the process of photosynthesis and the growth of other aquatic plants, as well as harm the organisms that depend on those plants.

Hyacinth growth can change habitat structure and local species composition. These plants may replace native aquatic plants, reduce biodiversity, and damage aquatic ecosystems. Hyacinths can be a breeding ground for bacteria, viruses and other pathogens. This can increase the risk of spreading disease, both in aquatic organisms and in humans who have contact with those waters. Hyacinth growth can interfere with human activities such as fishing, water transportation, and recreational activities. The buildup of hyacinths in

the waters can also complicate ship navigation and access to certain water areas. Local ecosystems can experience a decrease in water quality due to the decomposition of hyacinths that produce compounds that can pollute water, such as ammonia and organic compounds.

CSR PT Pertamina Patra Niaga DPPU Adi Sumarmo encourages the Community Group of Sobokerto Village, Ngemplak, Boyolali to implement effective management strategies to control the growth of water hyacinths and mitigate their negative impacts. The community worked collaboratively to form the Ngudi Tirto Lestari Community Group (POKMAS) which was fostered by PT Pertamina Patra Niaga DPPU Adi Sumarmo's CSR in managing the wild-growing water hyacinth. This collaboration can include the exchange of knowledge, resources, and experience to promote better outcomes. The community is actively involved in various stages of managing, utilizing, and processing hyacinths. Not only that, the community was assisted by BBWSBS (Balai Besar Wilayah Sungai Bengawan Solo) in cleaning water hyacinths. During the rainy season, wild-growing hyacinths develop quickly, therefore it takes extra energy in utilizing wild-growing hyacinths. This activity is not just cleaning, but also creates awareness of the importance of maintaining the cleanliness of the environment.

Pokmas Ngudi Tirto Lestari is wise and innovative in utilizing water hyacinth as a resource of double value, namely as organic fertilizer and raw material for biogas production. Initially, hyacinths that grew wild were only used as animal feed. In 2022, the village government received training assistance in utilizing water hyacinths into biogas and organic fertilizer. After gaining this knowledge, the Sobokerto community only formed Pokmas Ngudi Tirto Lestari totaling 24 members from Sobokerto Village. In addition to providing training, Pokmas Ngudi Tirto Lestari also received equipment and other necessities needed in water hyacinth management from PT Pertamina Patra Niaga DPPU Adi Sumarmo CSR. After gaining insight and knowledge about hyacinth management, Pokmas implemented the knowledge into fertilizer first. After successful trials of making solid and liquid fertilizer from hyacinths, just tried to make biogas. DPPU Adi Sumarmo also conducted laboratory tests on the fertilizer to ensure its content. After laboratory tests, it is known that the fertilizer content meets the standards of the Ministry of Agriculture. As many as 30 farmers in Sobokerto Village have been tested in using organic water hyacinth fertilizer. Meanwhile, biogas has also been used by Pokmas ngudi tirto lestari as an alternative to cooking in the kitchen.

The community developed a local market to sell organic fertilizers and supply biogas to the local community. In addition, cooperation with local businesses or regional markets opens up opportunities to increase marketing of hyacinth-based products. This process empowers people economically by creating additional sources of income. Community members can be involved in the entire value chain, from hyacinth collection to final product distribution. The use of hyacinths for organic fertilizers and biogas not only provides economic benefits, but also supports environmental sustainability. People understand the importance of maintaining the balance of water ecosystems and reducing pollution. The enthusiastic level of community participation in the management and utilization of hyacinths reflects a strong commitment to contribute to environmental sustainability and positive use of natural resources. This community is not only the guardian of the environment today, but also provides inspiration for future generations to participate in nature conservation efforts. Good waste management efforts are an important step to maintain environmental sustainability [28]. The importance of environmental sustainability is closely linked to the

sustainable development goals set by the United Nations in the SDGs. One of the main objectives of the SDGs is to ensure that economic, social, and environmental development goes hand in hand to improve human well-being without harming future generations. Environmental sustainability is key to achieving this goal [29].

The use of water hyacinth as a source of energy and organic fertilizer has a number of positive impacts felt by the people of Sobokerto Village, including:

1. Renewable Energy (Biogas):

a. Kitchen Cooking: Biogas produced from fermented hyacinths can be used as an energy source for cooking in households. This can reduce dependence on fossil energy sources and help people to switch to renewable energy.

b. Street Lighting: Biogas can also be utilized to generate electricity, which can then be used for street lighting. This increases accessibility and security in Sobokerto Village.

2. Organic Fertilizer:

a. Quality Crops: Organic fertilizers produced from hyacinths are rich in nutrients and increase soil fertility. The use of this organic fertilizer can increase agricultural yields and crop quality, as well as reduce dependence on chemical fertilizers that can damage the environment. For example, vegetables grown in Sobokerto Village grow more lush and healthy because organic fertilizers contain various natural nutrients.

b. Waste Reduction: The use of hyacinths as organic fertilizer helps reduce the amount of waste in the waters. These plants can absorb excess nutrients, reduce eutrophication (increased nutrition) and help maintain the balance of aquatic ecosystems.

3. Community Empowerment:

a. Job Creation: The process of producing biogas and organic fertilizer from water hyacinths can create job opportunities at the local level, such as the management and maintenance of biogas installations and the production and distribution of organic fertilizers.

b. Improved Welfare: The use of hyacinths not only empowers the community in terms of energy sources and sustainable agriculture but can also improve the economic welfare of local communities.

Sustainable use of hyacinths not only provides solutions to environmental problems but also helps create a better life for the community. Meanwhile, the application of the concept of Maqashid Sharia in the sustainability of water hyacinths used as organic fertilizers and biogas reflects a holistic approach that embraces broad Islamic goals. The purpose of Maqashid Sharia is to provide guidance and principles that cover spiritual, moral, and social aspects in the lives of Muslims [30]. According to Imam al-Shatibi there are five things that are indicators of maqashid sharia namely *hifz al-nasl*, *hifz al din*, *hifz al mal*, *hifz al-'aql*, *hifz an-nafs* [31]. By detailing the main objectives, we can understand more deeply the meaning and expectations contained in the Maqashid of Sharia. Here are some concepts of Maqashid Sharia that are relevant in this context:

a. *Hifz al-Mal* (Property Protection):

The community seeks to protect natural property, in this case, aquatic ecosystems from the negative impact of uncontrolled growth of hyacinths. The use of water hyacinths as a sustainable economic resource also involves the protection and maintenance of natural wealth owned by the community.

b. *Hifz al-Nafs* (Protection of the Life):

Proper management of aquatic ecosystems involves the sustainability of ecosystems that can affect human well-being and the economic sustainability of communities. The use

of biogas as an energy alternative can also be linked to the protection of public health through reducing air pollution from fossil fuels.

c. Hifz al-Aql (Sense Protection):

The community carries out organic farming practices by using organic fertilizer from water hyacinth, which helps maintain the balance of nature and soil health. The use of biogas as a renewable energy source also reflects smart and sustainable thinking in meeting energy needs.

d. Hifz al-Nasl (Protection of Heredity):

By maintaining the balance of water ecosystems, communities also involve the protection of offspring through the sustainability of natural resources for future generations.

e. Hifz al-Din (Religious Protection):

Good management of aquatic ecosystems can be considered part of a religious responsibility to safeguard and protect God's creation. Sustainable and environmentally friendly economic activities also reflect concern for religious values.

The use of hyacinth as organic fertilizer and biogas provides direct benefits to the community in terms of economy, energy, and environment. Sustainability in the use of natural resources like this is in line with the concept of *maslahah* or benefits for the community. Justice in the concept of *Maqashid Sharia* also includes the fair distribution of resources. The use of hyacinths as a resource must be done equally for the community, and the results must be shared fairly.

The application of *Maqashid Sharia* concepts in the sustainability of water hyacinths as organic fertilizers and biogas helps create a model of balanced and sustainable development, meeting the needs of today's society without sacrificing the interests of future generations.

Conclusion

The application of the concept of *Maqashid Syaria*h in the sustainability of water hyacinths used as organic fertilizers and biogas is as follows:

1. **Ecosystem Protection:** The application of *Maqashid Syaria*h in hyacinth management reflects a commitment to protect local ecosystems. This is in accordance with the objectives of *Maqashid Sharia*, especially *Hifz al-Din* (protection of religion) and *Hifz al-Nafs* (protection of souls), because healthy ecosystems also support human life and well-being.
2. **Wise Utilization of Resources:** The concept of *Maqashid Sharia*, especially *Hifz al-Mal* (protection of property), encourages wise use of natural resources. The people of Sobokerto Village use water hyacinth not only as a source of energy and organic fertilizer, but also by paying attention to sustainability and ecosystem balance.
3. **Community Empowerment:** Through the establishment of Pokmas Ngudi Tirta Lestari, the community is actively involved in the management and utilization of water hyacinths. This reflects the concepts of *Hifz al-Nafs* (protection of the soul) and *Hifz al-'Aql* (protection of reason), where the economic empowerment of society and the improvement of its technical knowledge can be considered as protection of the intellectual interests and welfare of society.

4. **Local Economic Development:** The application of the concept of Maqashid Sharia also includes Hifz al-Mal (protection of property) in the context of local economic development. The use of hyacinths creates jobs, increases people's incomes, and supports sustainable economic development.
5. **Balance Between Sustainability and Benefit:** The use of hyacinths for organic fertilizer and biogas creates a balance between environmental sustainability and benefit for the community. This is in accordance with the principles of Maqashid Sharia which emphasizes the importance of the sustainability of natural resources and their utilization for the welfare of mankind.

Through the implementation of Maqashid Sharia concepts, the people of Sobokerto Village succeeded in creating a development model that not only pays attention to economic aspects but also social, environmental, and religious aspects. The use of water hyacinths is a clear example of how Islamic principles can be integrated into sustainability practices, providing long-term benefits for future generations.

Reference

- [1] R. Wahdah, H. Ellya, and H. Hairina, "Respon Viabilitas Benih Kacang Tunggak Nagara (*Vigna unguiculata ssp cylindrica*) Akibat Pemberian Konsentrasi Ekstrak Akar Eceng Gondok (*Eichhornia crassipes*)," *Rawa Sains: Jurnal Sains STIPER Amuntai*, vol. 10, no. 2, pp. 63–73, Dec. 2020, doi: 10.36589/rs.v10i2.123.
- [2] I. Saridera, "Pemberdayaan Masyarakat Muslim Berbasis Lingkungan," *Anida (Aktualisasi Nuansa Ilmu Dakwah)*, vol. 18, no. 1, pp. 41–60, Jun. 2019, doi: 10.15575/anida.v18i1.5045.
- [3] N. R. Kusuma, Hamidah I, and Fitria N, "Pengelolaan Sumber Daya Alam Berbasis Ekonomi Hijau dalam Perspektif Syariah untuk Mendukung Pembangunan Berkelanjutan di Indonesia," 2022.
- [4] E. Novita, S. Wahyuningsih, and D. A. N. Jannah, "Fitoremediasi Air Limbah Laboratorium Analitik Universitas Jember Dengan Pemanfaatan Tanaman Eceng Gondok Dan Lembang," 2020.
- [5] M. C. Sutandi, A. Genkensiana, and C. C. I. Mayaut, "Pemanfaatan Gulma Eceng Gondok Sebagai Penjernih Air," 2021.
- [6] H. A. Putri, Kisma, Mardiah, and P. Astaman, "Diseminasi Pemanfaatan Eceng Gondok (*Eichornia Crassipes*) Menjadi Pupuk Organik Cair Sebagai Implementasi Pertanian dan Perairan Berkelanjutan," vol. 2, no. 2, 2023, [Online]. Available: <https://ojs.poltesa.ac.id/index.php/Hippocampus/index>
- [7] M. In, N. Melinda Lestari, and M. Hamka, "Perilaku Konsumsi dan Keberlanjutan Kehidupan Dalam Perspektif Ekonomi Islam Berdasarkan Maqashid Syariah," 2023, doi: 10.29040/jiei.v9i2.8437.
- [8] L. Latifah, Y. Marhayuni, P. Studi Biologi, P. Studi Kimia, F. Sains dan Teknologi UIN Sunan Kalijaga Yogyakarta, and J. Marsda Adisucipto, "Bioremediasi sebagai Implementasi Q.S Al-A'raf Ayat 56 dalam Menangani Pencemaran Tanah," *Kaunia : Integration and Interconnection of Islam and Science Journal*, vol. 19, no. 1, pp. 23–28, 2023.

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- [9] B. I. Abdillah, "Briket Sebagai Pengganti Pembakaran Alternatif dengan Eceng Gondok (*Eichhornia Crassipes*)," 2023.
- [10] H. R. Uddin, Ruhadi, and F. Maulana, "Komunitas Pengrajin Kerajinan Eceng Gondok Sebagai Dimensi Modal Sosial dalam Mewujudkan Kesejahteraan Masyarakat," *Formosa Journal of Multidisciplinary Research (FJMR)*, vol. 1, no. 3, pp. 493–502, 2022, doi: 10.55927.
- [11] N. Agutina, I. Dan, and M. Mirwan, "Efektivitas Tanaman *Hydrilla Verticillata*, Rumput Gajah, Eceng Gondok Dalam Pembuatan Biogas Dengan Bahan Dasar Kotoran Sapi," vol. 2, no. 1, 2021.
- [12] M. Jannah, K. Kusyanto, and H. Harjanto, "Pengaruh Ukuran Bahan Baku Eceng Gondok (*Eichornia Crassipes*) Dan Waktu Hidrolisis Pada Proses Pembuatan Kertas," *JURNAL TEKNIK KIMIA VOKASIONAL (JIMSI)*, vol. 3, no. 2, pp. 59–65, Oct. 2023, doi: 10.46964/jimsi.v3i2.548.
- [13] S. Silaban, M. Simorangkir, and J. Rajagukguk, "Pendampingan Kelompok Tani Anugrah Memanfaatkan Eceng Gondok Sebagai Bahan Baku Pakan Ikan Gurame," *Abdihaz: Jurnal Ilmiah Pengabdian pada Masyarakat*, vol. 3, no. 2, p. 80, Dec. 2021, doi: 10.32663/abdihaz.v3i2.2521.
- [14] E. P. Wulandari, K. Saiban, and M. Munir, "Implementasi Maqashid Syariah dalam Pemberdayaan Ekonomi Masyarakat," *Invest Journal of Sharia & Economic Law*, vol. 2, no. 1, pp. 1–15, Jun. 2022, doi: 10.21154/invest.v2i1.3661.
- [15] A. L. Ilmaknun and A. Wijaya, "Peran Bengokcraft dalam Memberdayakan Masyarakat melalui Pemanfaatan Eceng Gondok di Desa Kesongo Kecamatan Tuntang Kabupaten Semarang," 2021.
- [16] A. Saleh and Y. Tanjung, "Konstruksi Sosial Pada Praktik Pemberdayaan Masyarakat Berbasis Green Economic Di Desa Pematang Serai Kabupaten Langkat," 2021. [Online]. Available: <http://jiss.publikasiindonesia.id/>
- [17] K. Manalu, "Pelatihan Pemanfaatan Eceng Gondok Sebagai Pupuk Kompos Bagi Masyarakat Desa Jentera Kecamatan Wampu Kabupaten Langkat," 2021.
- [18] S. Firdaus, "Al-Qur'an dan Pembangunan Lingkungan Berkelanjutan di Indonesia: Analisis Maqashid Syariah untuk Pencapaian SDGs," 2022. [Online]. Available: <https://orcid.org/0000-0002-0011-277X>.
- [19] R. Farika, "Pemberdayaan Ekonomi Masyarakat Melalui Budidaya Eceng Gondok," 2021.
- [20] E. Prihatiningtyas, Asyisyifa, and Susilawati, "Pemanfaatan Eceng Gondok (*Eichornia Crassipes*) Untuk Mengurangi Pencemaran Air Dan Meningkatkan Ekonomi Masyarakat Desa Tungkaran," *Prosiding Seminar Nasional Pengabdian kepada Masyarakat*, vol. 2, 2020.
- [21] A. N. Putra, S. Ristiani, Musfiroh, and M. B. Syamsunarno, "Pemanfaatan Eceng Gondok (*Eichornia Crassipes*) Sebagai Pakan Ikan Nila: Efek Terhadap Pertumbuhan Dan Kecernaan Pakan," *Journal of Local Food Security*, vol. 1, 2020.
- [22] W. Sudana and I. Mohamad, "Karakteristik Seni Kerajinan Eceng Gondok Gorontalo," 2020.

- [23] M. Ria Pangaribuan, P. Puspita, and I. Rosyadi, "Pemanfaatan Eceng Gondok Menjadi Olahan Pakan Ternak Produksi Rumah Tangga," 2020. [Online]. Available: <http://jurnal.umj.ac.id/index.php/semnaskat>
- [24] B. R. D. Wulandari, M. D. Ulpiana, I. G. A. M. Apriliany, N. Pratiwi, and R. N. L, "Pemanfaatan Tanaman Eceng Gondok Menjadi Produk Bernilai Ekonomis Berbasis Zero Waste di Kelurahan Semayan," 2021, doi: 10.29303/jpmppi.v3i2.1057.
- [25] H. Mulang, A. As'ad, and R. Razak, "Efektivitas Pemberdayaan Ekonomi Masyarakat Desa Pengrajin Eceng Gondok," *SEIKO : Journal of Management & Business*, vol. 6, no. 1, pp. 403–413, 2023, doi: 10.37531/sejaman.v6i1.543.
- [26] A. Hasibuan, H. Sadia, T. Amalia, P. Studi Ilmu Kesehatan Masyarakat, and F. Kesehatan Masyarakat, "Pemanfaatan Eceng Gondok Untuk Menurunkan Kandungan COD (Chemical Oxygen Demand), pH, Bau, Dan Warna Pada Limbah Cair Tahu Di Indonesia," *JIPDAS : Jurnal Ilmiah Pendidikan Dasar*, vol. 1, no. 2, pp. 1–11, 2023, [Online]. Available: <https://ejournal.lpipb.com/index.php/jipdas>
- [27] Thohiriyah, C. Tri Hapsari, and R. Puji Haryanti, "Konten Kreatif Berbasis Stori Lingkungan Untuk Media Iklan Produk Berbahan Dasar Eceng Gondok Sebagai Upaya Penyelamatan Lingkungan," *Jurnal Kajian Sastra*, 2021.
- [28] F. A. Ghani and M. S. Apriantoro, "A Study of Waste Transaction Practices and Islamic Jurisprudence at Bank Sampah," *International Journal of Humanities and Social Science Studies*, vol. 1, no. 1, pp. 20–27, 2023, doi: 10.31763/ethica.
- [29] D. A. Karimah, M. B. Pamuncak, and M. K. Mubin, "The Role of Waqf in Supporting Sustainable Development Goals: Linking theory and its practices," *SUHUF*, vol. 35, no. 2, pp. 31–38, Nov. 2023, doi: 10.23917/suhuf.v35i2.23018.
- [30] M. N. Iqbal, F. A. Arfa, and A. Waqqosh, "Tujuan Hukum Islam Dalam Perspektif Maqashid Al-Syari'ah," 2023.
- [31] M. Z. Sunarto, P. N. Afrida, and U. Nurianti, "kajian Maqashid Al-Shariah Terhadap Nilai-Niai Islami Pada Sebuah Transaksi," 2022.