

Handling Plastic Waste based on Sustainable Tourism in the Legal Framework of Telematics

FENTY U. PULUHULAWA^{1*}, JUFRYANTO PULUHULAWA²,
MOHAMAD RUSDIYANTO U. PULUHULAWA³, AMANDA ADELINA HARUN⁴

Faculty of Law,
State University of Gorontalo,
Jl. Jend. Sudirman No.6, Dulalowo Tim., Kec. Kota Tengah, Kota Gorontalo, Gorontalo 96128,
INDONESIA

**Corresponding Author*

Abstract: - The research proposes an integrated solution to the persistent plastic waste challenge by combining sustainable tourism principles with telematics-based legal interventions. This approach aims to surpass previous policies, leveraging technological advancements, economic incentives, and legal frameworks for a comprehensive waste management strategy. The study emphasizes a shift in legal paradigms toward community-oriented relations, bridging legal substance, structure, and culture. Empowering local communities through heightened awareness of environmental asset protection's broad impact, the research promotes ownership and responsibility. Through strategic social media utilization and effective communication, the study seeks to amplify community engagement, fostering a self-reinforcing cycle of positive change. Additionally, the study strives to establish a link between the proposed approach and economic growth in regional tourism, showcasing the potential for sustainable waste management to drive economic advancement. In summary, the research encompasses an innovative waste management model, long-term sustainability impact, integrated technological, economic, and legal factors, paradigm shift, community empowerment, social media synergy, and economic stimulus through enhanced regional tourism.

Key-Words: - Plastic, Waste, Sustainable, Tourism, Telematics, Law

Received: March 17, 2022. Revised: August 26, 2023. Accepted: September 29, 2023. Available online: October 26, 2023.

1 Introduction

Today, the world confronts various environmental issues that threaten land and natural resource production, [1]. Speaking within the country's scope, Indonesia is one of the countries that spreads the most plastic waste into the sea in the projected time between 2010-2025, [2]. This study is also further emphasized, [2], who reported that "an estimated 3.22 million metric tons of plastic waste was dumped into the sea around Indonesia in 2010 and is predicted to increase to 7.42 million metric tons of plastic waste in 2025, [3]. Indonesia's plastic waste originates from three sectors, they are the industrial sector, plastic waste imported into Indonesia and the consumer sector including Municipal Solid Waste (MSW). [4], Plastic needs about 100 to 500 years to perfectly decompose, [5], on the other side, modern lifestyles tend to produce plastic waste, [6]. Plastic waste is generated even from single-use consumption, [7]. This makes Indonesia the second-highest country producing plastic waste pollution in the sea, [8].

The Indonesian government certainly does not turn a blind eye to this sad condition. In response to the situation, the Government of Indonesia has stipulated a Waste Management Decree Number SK-01//PS/KU/11/2020 concerning the Strategic Plan of the Directorate of Waste Management of the Ministry of Environment and the Year 2020-2024, which is a mandate from Law Number 25 the Year 2004 concerning the National Development Planning System regarding the implementation of the 2020-2024 National Medium-Term Development Plan (RPJMN) has been stipulated in Presidential Regulation Number 18 of 2020.

The resolution of plastic waste issues tends to emphasize the role of society as consumers, whereas addressing the plastic waste problem requires synergy from all components, [9]. As is widely recognized, the worldwide production of petroleum-based plastics is on the rise, especially for inexpensive, disposable uses, thanks to their durability, light weight, and versatility, [10], [11]. While the plastic consumption has been steadily

rising, and the use of plastic materials is expanding into various applications, the handling of waste generated from this consumption still faces significant shortcomings, [12]. The steps taken by the Indonesian Government through the issuance of several legal policies are indeed commendable, considering one of the contributing factors to the high spread of plastic waste in developing countries like Indonesia, is the weak law enforcement, [13]. Therefore, the legal interventions carried out by the Indonesian Government to synergize stakeholders in addressing this plastic waste issue are certainly deserving of appreciation.

Unfortunately, the strategic plan made by the Government of Indonesia through the Ministry of Environment and Forestry is not yet optimal, especially in suppressing plastic waste composition. "The composition of plastic waste nationally has shown an increasing trend in the last ten years, from 11% in 2005 to 15% in 2015, [14]. When referring to the achievement of waste management performance in 2021, comprising 228 regencies/cities throughout Indonesia, "there is a waste generation of 28,654,799.96 tons/year where plastic waste is included in the percentage of waste composition based on the type of waste, the second largest after food waste/organic waste, with a percentage of 17.3%, [15].

The waste composition by type of waste is illustrated in following Figure 1.

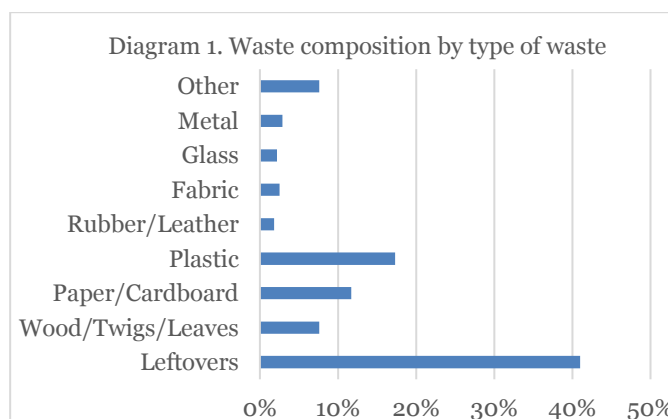


Fig. 1: Waste composition by type of waste

The data presented in Figure 1 further emphasizes that the performance achievement of plastic waste management does not exhibit a systematic, comprehensive, and sustainable process between the reduction and handling of plastic waste on a national scale, considering the significant amount of waste generated from various sources, [16].

In the regional scope of Gorontalo Province, the waste problem is chronic. According to data from the Central Statistics Agency for 2020, "every day the

volume of transported waste in 2018 has a presentation of 51.87% of the estimated daily waste production, while in 2019 the volume of transported waste is only around 49.6%, [5]. Moreover, in 2020, "the rate of waste generation in Gorontalo Province is around 543 tons/day or 198,032 tons/year, of which approximately 11% or 21,463 tons/year is plastic waste, [6]. The non-optimal waste transportation and the high rate of plastic waste generation will undoubtedly hurt the quality of the environment, [17]. This portrait of the potential for environmental degradation caused by plastic waste in Gorontalo Province and can be seen in Figure 2.



Fig. 2: Plastic Waste Pollution Portrait

This situation is further exacerbated by the absence of regulations regarding the reduction of single-use plastic waste in Gorontalo Province, especially in Gorontalo City, even though on a national scale, "there have been 40 regencies/cities/provinces that have enacted regent regulations/mayor regulations/governor regulations/regulations areas related to the reduction/limitation of single-use plastics, [7]. It seems that the handling of plastic waste needs to be taken seriously to "achieve a sustainable environment as the Fourth Mission of the President of the Republic of Indonesia, [8].

The seriousness of the Gorontalo Provincial Government in general and, in particular, the Gorontalo City Government has become crucial, especially in the legal aspect. This legal intervention is essential, considering that the area of Gorontalo Province has tourism potential, which of course, if its management can be optimized, could be one of the answers to removing Gorontalo Province from the "list of the top 10 regions the highest poverty rates in Indonesia until March 2022, [9].

Plastic waste was not only polluted land but also sea, [18]. Sea tourism is so stunning because of

its location: the Sulawesi Sea flanks on the north and Tomini Bay on the south. Marlenny Sirait also explained that "the area of coral reefs in the waters of Gorontalo Province is 24,910, 96 ha spread over five districts and one city which is a type of fringing coral reef, [10], which, of course, factually adds to the maritime selling value of Gorontalo Province. Tourist attractions must have their uniqueness and a preserved environment, [19]. Not to mention several tourist attractions have historical value to increase the bargaining power of tourism. Last but not least, an equally intriguing aspect is the potential of sports tourism, where the synchronization of tourism and sports, if developed effectively, can have a significant impact on regional economic growth, [20]. The small-scale reality within Indonesia is evident in Lombok, West Nusa Tenggara, where the presence of the Mandalika Circuit has a significant impact on the local economy, [21].

Proper handling of plastic waste will undoubtedly impact various sectors, [22], especially the tourism sector. This is based on the idea that sustainable tourism has a long-term impact because "it is not only the tourism sector that gets its impression but also has implications for socio-economic, cultural and environmental sustainability aspects, [11].

Therefore, legal intervention is needed so that the implementation of plastic waste based on sustainable tourism can be elaborated optimally, especially the telematics law. The legal viewpoint of telematics is anticipated to bring forth a fresh and inventive approach to tackling plastic waste, with a significant emphasis on the sustainable tourism concept, given the widespread application of information technology during the digital transformation era. Moreover, the management of plastic waste within the framework of sustainable tourism, specifically through the legal aspects of telematics, represents a unique and relatively unexplored research domain. Consequently, this article stands out for its capacity to address these matters innovatively and make a meaningful contribution to the ongoing dialogue on plastic waste management.

The methodology employed in this research, aligned with its focal point, is normative legal research. The approach method used in reviewing this problem is "the method of statute approach, namely research conducted by examining all laws and regulations related to the legal issues being handled", [23]. Also uses a theoretical approach, namely "research conducted by examining theories related to the legal issues studied", [24], and uses a

conceptual approach which in its analytical study focuses on legal concepts, [25].

2 Discussion

2.1 Discourse on Plastic Waste Management within the Concept of Sustainable Tourism

Plastic, considered essential for daily activities, leads to significant environmental problems due to its widespread use and waste accumulation, [26]. Talking about plastic waste as if it will never end if it is pulled back to the past, "in 1959, Sten Gustaf Thulin created plastic bags intending to help the environment and preserve natural resources because the properties of plastic are pretty strong and can be used repeatedly, [27]. But now, its non-degradable nature, compounded by the increasing use of plastic as packaging, has become a problem for the environment, [28].

Regarding available data, globally, "about 500 billion to one trillion plastic bags are used worldwide. It is estimated that each person consumes 170 plastic bags every year, and more than 17 billion plastic bags are distributed free of charge by supermarkets around the world every year, [29]. Scope of Indonesia, "the assumption of the Ministry of Environment (KLH), every day, the Indonesian population produces 0.8 kg of waste per person or a total of 189 thousand tons/day. Of this amount, 15% is in the form of plastic waste, or a total of 28.4 thousand tons of plastic waste/day, [30].

Plastic has transformed from something with a positive value to something seen as unfavourable. "Plastic waste is currently a public problem. If it cannot be adequately handled with a comprehensive method, it can cause various problems in the form of environmental damage, such as land, water, and air pollution, [31].

Seeing the reality of factual data confirmed by the author's observations in the field, it appears that handling plastic waste is not only the government's responsibility on a national, regional, and local scale but also requires community involvement. This is emphasized by Rumana Hossain and her team, that "The future of plastic waste management not only relies on the effectiveness of local government and recyclers, but also community involvement, and initiatives on a national, regional, and global level", [32].

A shift in approach and a paradigm shift is needed, which in turn requires the intervention of various elements of society. This has also been

embodied in Article 70 of Law Number 32 of 2009 concerning Environmental Protection and Management, which emphasizes that "the community has the same and most comprehensive possible rights and opportunities to play an active role in environmental protection and management."

A good and healthy environment is the most fundamental human right, [33], in the national context, this is as mandated in Article 28H of the 1945 Constitution of the Republic of Indonesia. If examined from the perspective of national economic development, the constitution mandates its implementation based on the principles of sustainable development and with an environmental perspective.

Various concepts and methods have then been formulated to be later realized, such as in the scope of the legal field, namely the concept of law enforcement and the imposition of sanctions. Maria Ibella Vianka states that

"Environmental law enforcement is carried out through three legal instruments, namely administrative sanctions, civil sanctions, and criminal sanctions. Unfortunately, the applied sanctions are not stringent, leading to a lack of compliance from both the public and businesses with the established legal regulations", [34].

The local community's legal culture approach has also been echoed, [35], while "handling plastic waste that has been widely applied is the 3R concept (Reuse, Reduce and Recycle), [36]. Moreover, another alternative that has been widely researched is the recycling of plastic waste into fuel oil and gas, [37]. Therefore, the exciting thing in this research is the novelty of the research, where the handling and management of plastic waste are emphasized in the concept of sustainable tourism, which is strengthened by telematics legal intervention in its implementation.

The concept of 3R (Reuse, Reduce, and Recycle) has been implemented in many places in Indonesia, [38], and the conversion of plastic waste into fuel has also been carried out. However, the current reality is that plastic waste is still rampant and a never-ending problem. On that ground, breakthrough and out-of-the-box thinking is essential. In the author's mind, it is necessary to look at the tourism sector which is combined with digitization within the legal framework of telematics in handling and managing plastic waste, especially in Gorontalo Province and Indonesia.

This thinking is based on the fact that the tourism sector is one of the most significant contributors to foreign exchange in Indonesia, as evidenced by the amount of foreign exchange in the

tourism sector "In 2016 it was 11.206 billion US dollars, 2017 increased to 13.139 billion US dollars and 2018 was 16,426 billion US dollars, [39]. Tourism is "Indonesia's mainstay sector in terms of foreign exchange earnings. Even during this Covid-19 pandemic, the most significant contribution to the country is tourism, which reaches 43 billion US dollars, [40].

The tourism sector's extraordinary contribution emphasizes the need to optimize plastic waste handling and formulate solutions. Such approaches are to remove the stigma of Gorontalo as one of the poorest provinces in Indonesia because, through the tourism sector with a sustainable tourism-based approach, the community will be affected. From the economic aspect, if the community's welfare increases due to an advanced and well-managed tourism sector reflected in a clean and waste-free environment, especially plastic waste, people will be aware of environmental sustainability as they can benefit much from economic boost. Environment, and then this concern will be transformed into a culture. The culture that compels all tourism development stakeholders to take on responsibilities, resulting in the achievement of a sustainable environment, also influences sustainable tourism [41].

Therefore, the most crucial point in this thought is to "realize the concept of sustainable tourism in the community, not only focusing on the development of the tourism sector alone, [42]. The most basic idea of a sustainable tourism-based approach is to "include consideration of current and future impacts in tourism development which has implications for the preservation of natural resources and biodiversity, social culture of the community as well as socio-economic benefits, [43].

2.2 Incorporating Sustainable Tourism and Telematics Law Concepts into Plastic Waste Management

Realizing thoughts about handling plastic waste based on sustainable tourism is not as easy as turning the palm. However, this concept is also not impossible to realize a sustainable environment, especially free from plastic waste. This is where legal intervention is needed.

It has become a legal goal to "engineer the community to protect the interests of the community, in this case, social welfare, [44]. If the law succeeds in playing its role, a sustainable environment can be realized, tourism is advanced, and the community will prosper. That is the main goal that correlates with the theory of utilitarianism, namely "the greatest happiness of the greatest

number, which is interpreted as a guarantee of individual happiness that must be given by the state to its citizens and eliminates suffering for the community through legal instruments, [45].

Breakthroughs have been made in the handling and management of plastic waste through the field of legal science. Some examples include the concept of law enforcement and the imposition of sanctions at the level of legal substance and legal structure, as well as approaches to the legal culture of local communities within the scope of legal culture. These breakthroughs have targeted the three legal subsystems proposed by Lawrence M. Friedman: "the legal substance subsystem, legal structure subsystem, and legal culture subsystem, [46]. Furthermore, the subsystem has been implemented so that this legal component can run well and be more optimal, especially regarding the handling and management of plastic waste based on sustainable tourism, within the legal framework of telematics. It is necessary to add an approach from cybernetics theory which emphasizes the "presence of a legal information system." to reduce the gap between the rule of law and social behaviour, [47].

Once there are so many legal regulations, not to mention the addition of legal policies, the law will undoubtedly be ineffective without a legal information system. Specifically for the environmental field, in the author's search, there are approximately thirty (30) existing national legal regulations that talk about the environment, and even that have not been counted at the regional and local levels. Even though there is a principle that assumes that everyone knows the law (*presumptio iures de iure*), as well as the adage *ignorantia juris non excusat*, which means ignorance of the law cannot be forgiven, "building communication and conveying legal information to the public is still essential", [48]. Such a notion is because awareness The law is built within the community and implemented in the life of the nation and state if the legal provisions have been appropriately communicated. "There will be no legal provisions that can apply effectively during the hustle and bustle of people's lives if the legal information is never properly communicated to the public, [49].

In the current digital transformation era, there are many ways to handle plastic waste based on sustainable tourism within the legal framework of telematics which state policymakers can then apply in this case, especially the Gorontalo Provincial Government and Gorontalo City Government, namely:

1. Legal Convergence

Understanding that the legal subsystem is no longer limited to legal substance, structure, and culture. There is also a fourth subsystem, namely legal information. Thereby, an individual understands that in handling plastic waste based on sustainable tourism in the jurisdiction of Gorontalo Province and the jurisdiction of Gorontalo City, conceptually and theoretically, it is necessary to convergence (convergence) of technological, economic, and legal variables on human relations and society in the digital information age, [50]. It is time for Gorontalo Province and Gorontalo City to have regional regulations related to handling plastic waste in general since the national data. The study, [14], reported no related regulations until this writing was done at the end of 2022, even though the urgency of handling plastic waste is something that cannot be ignored in this era. Industrial Revolution as it is today. Then policymakers must remember that this regional regulation should go beyond accommodating the handling or reduction or management of plastic waste. They must look at the point of view of legal convergence theory on the impact of these regulated policies on people's lives through the incorporation of technological aspects, economic, and legal aspects. Such is to spread the handling of plastic waste at the normative and legal level of community obligations. Because the community has legal awareness that nature through the tourism sector based on sustainable tourism can provide a concrete economic stimulus for the welfare of the community and the region. In accordance with this, consider the perspective of development law theory, the context of environmental and natural resource law formation in the post-reform era is consistently directed towards community capacity (legal culture), social well-being, and the environment, [51]. Therefore, essential to look at the plastic waste problem in the Gorontalo area from a broader perspective. It is no less important to optimize all legal resources. There are legal substance, legal structure, legal culture, and legal information systems, [52].

2. Legal Harmonization

Legal regulations in the national scope must strive to have regulatory synergy with regional and local laws to create harmony, [53], which Plato describes as "the need for something excellent and rational to overcome conflicting signals and irregularities, [54]. Apart from existing legal regulations, it is also necessary to harmonize with various tourism programs based on sustainable tourism. The alignment of this legislation aligns with the

integrative theory, which highlights the convergence of normative systems, behaviors, and values, [55]. Therefore, there is a need for a careful and strategic sustainable tourism policy, which at the culmination point is "to create a tourism condition with high value, but low impact on environmental degradation while preserving local culture and improving the economy and people's welfare, [56]. With the output of legal harmonization, the community is expected to realize that "environmental assets contribute to economic wellbeing, [57].

3. Utilization of Telematics Law

The telematics legal perspective optimizes the current development of science and technology to the fullest. Through the current technology, information, and communication media that are developing through social media networks, legal products, along with policy directions and strategies for implementing sustainable tourism-based plastic waste management programs, can be disseminated to the broader community, especially people in the Gorontalo area and tourists visiting the area. The utilization of social media, which has such a broad scope, [58], can indoctrinate local people to care about their environment as a snowball effect of the economic stimulus obtained from the advancement of regional tourism. On the other hand, social media can broaden the perspective of tourists. They must have a minimal negative impact on the environment and the people they visit, even if it has a positive impact. Interacting in the digital world, i.e., social networks can educate at the preventive level. Still, this approach is a double-edged sword that can provide supervision and social sanctions for people who violate the order of values and norms of social life at a repressive level, [59].

Another consideration of the sustainable tourism approach within the legal framework of telematics in the handling of plastic waste is the limitation of regional boundaries. The current reality is that regional government policies are broadly based on a national scale. Therefore, a breakthrough is needed so that this plastic waste management policy can result in a joint commitment and regions can synergize to overcome plastic waste.

One factor enabling the realization of synergy between these regions is the existence of a mutualism symbiosis. Such an approach focuses on the sustainable tourism sector because good tourism development leads to a positive domino effect. Suppose this tourism development is based on sustainable tourism. In that case, the outcome has a snowball effect, which promotes tourism and has implications for regional welfare. Such an approach

ensures prosperity and needs fulfilment as a result of the presence of a good and waste-free environment, especially free from plastic waste. Empathy for the environment will be more massive and respect for the environment. The environment will grow with every human being, so handling waste, especially plastic waste, will be carried out correctly. The long-term effect will shift from anthropocentric, where "humans are the centre of the universe, and only humans have the right to utilize and use nature for their interests and needs, [60]. Shifting to biocentrism, namely "all living things are valuable in themselves so that they deserve moral consideration and care, [61], and finally transformed to ecocentrism, which focuses "environmental ethics on the entire ecological community where humans and nature are inseparable entities, [62].

3 Conclusions

The concept of sustainable tourism has a long-term impact because it is crucial to the tourism sector and socio-economic, cultural, and environmental sustainability. For this concept to be realized within the legal framework of telematics, it is necessary to converge the technological, economic, and legal variables on human and community relations, no longer playing in the realm of legal substance, legal structure, and legal culture. The tactical step previously discussed is a harmonization of law so that people are expected to realize that environmental assets contribute to economic wellbeing and the utilization of social media. Such an approach aims to indoctrinate local communities to care about their environment, culminating in a snowball effect from the economic stimulus obtained from the advancement of regional tourism.

Acknowledgement:

We would like to thank the Ministry of Education and Higher Education through the Directorate General of Higher Education Ministry of Education and Culture Republic of Indonesia (DRTPM) for supporting funds through research in 2022.

References:

- [1] J. N. Ismam and Z. Ismail, "Sustainable construction waste management strategic implementation model," *WSEAS Transactions on Environment and Development*, vol. 10, pp. 48–59, 2014.
- [2] J. B. Lamb, B. L. Willis, E. A. Fiorenza, C. S. Couch, R. Howard, D.N. Rader, and J.D.

- True., "Plastic waste associated with disease on coral reefs," *Science*, vol. 359, no. 6374, pp. 460–462, 2018.
- [3] J. R. Jambeck, R. Geyer, C. Wilcox, T. R. Siegler, M. Perryman, A. Andrady, R. Narayan, and K. L. Law., "Plastic waste inputs from land into the ocean," *Science*, vol. 347, no. 6223, pp. 768–771, 2015.
- [4] Maskun, F. Patittinggi, H. Assidiq, N. H. Al-Mukarramah, and S. N. Bachril, *Plastic Waste Management and Law Enforcement in Indonesia (Pengelolaan dan Penegakan Hukum Sampah Plastik di Indonesia)*, vol. 8. Makassar: UNHAS PRESS, 2023.
- [5] N. Kurniastuti., *Health and Environmental Hazards of Plastic (Bahaya Plastik terhadap Kesehatan dan Lingkungan)*, *Forum Teknol.*, vol. 3, no. 1, 2013.
- [6] F. Puluhulawa, M. R. Puluhulawa, and A. A. Harun, "Good Environment as Part of Human Right : A Case Study on Plastic Waste Post Pandemic," in *3rd International Conference on Law Reform (3rd INCLAR)*, 2022, vol. 2022, pp.10–24, doi: 10.18502/kss.v7i15.12071.
- [7] F. Puluhulawa and M. R. Puluhulawa, "Plastic Waste: Environmental Legal Issues and Policy Law Enforcement for Environmental Sustainability," *E3S Web Conf.*, vol. 259, 2021, doi: 10.1051/e3sconf/202125903006.
- [8] J. E. Mathis, M. C. Gillet, H. Disselkoen, and J. R. Jambeck, "Reducing ocean plastic pollution: Locally led initiatives catalyzing change in South and Southeast Asia," *Mar. Policy*, vol. 143, p. 105127, 2022.
- [9] M. Maskun, H. Assidiq, S. N. Bachril, and N. H. Al Mukarramah, Normative Review of the Application of the Producer Responsibility Principle in the Regulation of Plastic Waste Management in Indonesia ("Tinjauan Normatif Penerapan Prinsip Tanggung Jawab Produsen Dalam Pengaturan Tata Kelola Sampah Plastik Di Indonesia,"), *Bina Huk. Lingkung.*, vol. 6, no. 2, pp. 184–200, 2022, doi: 10.24970/bhl.v6i2.239.
- [10] M. H. Rahman and P. Bhoi, "An overview of non-biodegradable bioplastics," *J. Clean. Prod.*, vol. 294, no. 6, pp. 126–218, 2021.
- [11] A. Pratelli, P. Cinelli, M. Seggiani, G. Strangis, and M. Petri, "Agricultural Plastic Waste Management," *WSEAS Transactions on Environment and Development*, vol. 18, pp. 1312–1319, 2022, <https://doi.org/10.37394/232015.2022.18.124>.
- [12] Maskun, H. Kamaruddin, F. Pattitinggi, H. Assidiq, S. N. Bachril, and N. H. Al Mukarramah, "Plastic Waste Management in Indonesia: Current Legal Approaches and Future Perspectives," *Hasanuddin Law Rev.*, vol. 9, no. 1, pp. 106–125, 2023, doi: 10.20956/halrev.v9i1.3683.
- [13] S. A. Estikomah, *Legal Aspects of Plastic Waste Import ("Aspek Hukum Import Sampah Plastik")*, *Bestuur*, vol. 7, no. 2, pp. 106–113, 2019.
- [14] Directorate of Waste Management, Ministry of Environment and Forestry, Republic of Indonesia. "Strategic Plan for 2020-2024 (Direktorat Pengelolaan Sampah Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia, 'Rencana Strategis Tahun 2020-2024')." Jakarta, 2020. [Online], <https://ppkl.menlhk.go.id/website/filebox> (Accessed Date: April 4, 2022).
- [15] Waste Management Performance Outcomes (Kementerian Lingkungan Hidup dan Kehutanan Direktorat Penanganan Sampah, "Capaian Kinerja Pengelolaan Sampah"). SIPSAN - Sistem Informasi Pengelolaan Sampah Nasional, Waste Management Performance Outcomes (Ministry of Environment and Forestry Directorate of Waste Management), 2021, [Online], <https://sipsn.menlhk.go.id/> (Accessed Date: April 12, 2022).
- [16] Y. A. Fatimah, K. Govindan, R. Murniningsih, and A. Setiawan, "Industry 4.0 based sustainable circular economy approach for smart waste management system to achieve sustainable development goals: A case study of Indonesia," *J. Clean. Prod.*, vol. 269, p. 122263, 2020.
- [17] H. Jouhara, D. Czajczyńska, H. Ghazal, R. Krzyżyńska, L. Anguilano, A.J. Reynolds, and N. Spencer, "Municipal waste management systems for domestic use," *Energy*, vol. 139, pp. 485–506, 2017.
- [18] F. Puluhulawa and M. R. Puluhulawa, "Plastic Waste in Modern Era: Developing Plastic Waste Management for Sustainability," *E3S Web Conf.*, vol. 259, pp. 1–5, 2021, doi: 10.1051/e3sconf/202125903001.
- [19] A. A. Harun, "Bajo'S Living Law on Environmental Preservation To Support Economic Improvement," *Dialogia Iurid.*, vol. 14, no. 1, pp. 076–094, 2022, doi: 10.28932/di.v14i1.5359.
- [20] M. Pauweni, T. Rahayu, M. E. Winarno, Z. Amali, and H. Setyawati, Potential for Sports Tourism in Gorontalo Province ("Potensi

- Pariwisata Olahraga Di Provinsi Gorontalo”), *Bajra J. Keolahragaan*, vol. 1, no. 1, pp. 31–42, 2022.
- [21] R. E. Caraka, I. W. Wardhana, Y. Kim, A. D. Sakti, P. U. Gio, M. Noh and B. Pardamean, “Connectivity, sport events, and tourism development of Mandalika’s special economic zone: A perspective from big data cognitive analytics,” *Cogent Bus. Manag.*, vol. 10, no. 1, p. 2183565, 2023.
- [22] M. Antoniadou, T. Varzakas, and I. Tzoutzas, “Circular economy in conjunction with treatment methodologies in the biomedical and dental waste sectors,” *Circ. Econ. Sustain.*, vol. 1, pp. 563–592, 2021.
- [23] P. M. Marzuki, *Law research (“Penelitian Hukum”)*, Jakarta: Prenada Media Group, 2011.
- [24] Irwansyah, *Legal Research; Choice of Methods & Practice of Article Writing (Penelitian Hukum; Pilihan Metode & Praktik Penulisan Artikel.)* Yogyakarta: Mirra Buana Media, 2020, [Online], https://opac.fhukum.unpatti.ac.id/index.php?p=show_detail&id=8111 (Accessed Date: March 15, 2022).
- [25] Salim, Erlies Septiana Nurbani, *Application of Legal Theory to Thesis and Dissertation Research (Penerapan Teori Hukum Pada Penelitian Tesis dan Disertasi.)* Jakarta: PT. RajaGrafindo Persada, 2014, [Online], <https://laser.umm.ac.id/catalog-detail-copy/190000185/> (Accessed Date: January 11, 2022).
- [26] F. Puluhalawa, M. R. Puluhalawa, and A. A. Harun, “Legal Culture of Local Community in Plastic Waste Management,” in *3rd International Conference on Law Reform (3rd INCLAR)*, 2022, vol. 2022, pp. 183–191, doi: 10.18502/kss.v7i15.12089.
- [27] S. N. Azzura, *The History of Plastic Bags, Once Save the Earth Now Become a Contributor to Waste | merdeka.com (“Sejarah Kantong Plastik, Dulu Selamatkan Bumi Sekarang Jadi Penyumbang Sampah | merdeka.com.”)*, *Merdeka.Com*, 2019. .
- [28] S. Rhein and M. Schmid, “Consumers’ awareness of plastic packaging: More than just environmental concerns,” *Resour. Conserv. Recycl.*, vol. 162, p. 105063, 2020.
- [29] Utami, R. Meilina, L. Latifah, and N. Widiarti, *Synthesis of Biodegradable Plastic from Banana Peel with Addition of Chitosan and Plasticizer Glisero (“Sintesis Plastik Biodegradable dari Kulit Pisang dengan Penambahan Kitosan dan Plasticizer Glisero”)* *IJCS - Indones. J. Chem. Sci.*, vol. 3, no. 2252, pp. 163–167, 2014.
- [30] S. Sumartono, *Production of fuel oil from Hdpe and Pete 1 Kg plastic waste (Produksi Bahan Bakar Minyak Dari Limbah Plastik Hdpe Dan Pete 1 Kg.)* *J. Rekayasa Mater. Manufaktur dan Energi*, vol. 2, no. 2, pp. 94–103, 2019, doi: 10.30596/rmme.v2i2.3662.
- [31] S. Yana and Badaruddin, *Plastic Waste Management as an Effort to Reduce Environmental Pollution through Transformation that Has Economic Added Value (“Pengelolaan Limbah Plastik Sebagai Upaya Pengurangan Pencemaran Lingkungan Melalui Transformasi Yang Memiliki Nilai Tambah Ekonomi”)*, *Serambi Eng.*, vol. 11, no. 4, pp. 157–164, 2017.
- [32] R. Hossain, M. T. Islam, A. Ghose, and V. Sahajwalla, “Full circle: Challenges and prospects for plastic waste management in Australia to achieve circular economy,” *J. Clean. Prod.*, p. 133127, 2022.
- [33] R. Bratspies, “Do We Need a Human Right to a Healthy Environment?,” *St. Cl. J. Int. Law*, vol. 13, no. 1, pp. 31–69, 2015.
- [34] M. I. Vianka, *Environmental Law Enforcement on Plastic Waste Disposal in Indonesia (“Penegakan Hukum Lingkungan Atas Pembuangan Limbah Plastik Di Indonesia”)*, *Moral. J. Ilmu Huk.*, vol. 7, no. 2, pp. 245–256, 2021.
- [35] L. Gurusi, “Law enforcement on plastic waste pollution in coastal area assessed from article 29 verse (4) law number 18 of 2008 concerning waste management (study in Buton regency of South Sulawesi),” *J. Huk. Volkgeist*, vol. 5, no. 1, pp. 94–103, 2020.
- [36] N. Wichai-Utcha and O. Chavalparit, “3Rs Policy and plastic waste management in Thailand,” *J. Mater. Cycles Waste Manag.*, vol. 21, pp. 10–22, 2019.
- [37] Pramiati Purwaningrum, *Efforts to Reduce Plastic Waste (“Upaya Mengurangi Timbulan Sampah Plastik”)*, *Indones. J. Urban Environ. Technol.*, vol. 8, no. 2, pp. 141–147, 2019.
- [38] Y. Ruslinda, S. Raharjo, Y. Dewilda, and R. Aziz, “Minimization of household hazardous solid waste (HHSW) with 4R concepts (reduce, reuse, recycle and recovery) in Padang City, Indonesia,” in *IOP Conference Series: Materials Science and Engineering*, 2019, vol. 602, no. 1, p. 12055.
- [39] Central Bureau of Statistics, *Total Foreign Exchange in the Tourism Sector (Billion*

- US\$), 2019-2021 (*Badan Pusat Statistik, Jumlah Devisa Sektor Pariwisata (Miliar US \$), 2019-2021*), [Online], <https://www.bps.go.id/indicator/16/1160/1/jumlah-devisa-sektor-pariwisata.html> (Accessed Date: March 1, 2022).
- [40] Dewan Perwakilan Rakyat Republik Indonesia, Tourism Sector Earns the Most Foreign Exchange for the Country (“Sektor Pariwisata Berikan Devisa Terbesar Untuk Negara”), *Sekretariat Jenderal DPR RI*, 2020.
- [41] S. E. Suparman, S. E. Muzakir, and S. E. Vitayanti Fattah, *Tourism Economics: Theories, Models, Concepts and Strategies for Sustainable Tourism Development. (Ekonomi Pariwisata: Teori, Model, Konsep dan Strategi Pembangunan Pariwisata Berkelanjutan.)* Publica Indonesia Utama, 2023.
- [42] A. Budeanu, G. Miller, G. Moscardo, and C.-S. Ooi, “Sustainable tourism, progress, challenges and opportunities: an introduction,” *Journal of Cleaner Production*, vol. 111, Elsevier, pp. 285–294, 2016.
- [43] O. A. Yoeti and I. M. A. Gunadi, Sustainable Tourism as a Strategic Instrument in Development Planning An Analysis of the Development of Sustainable Tourism Destinations (“Sustainable Tourism sebagai Instrumen Strategis dalam Perencanaan Pembangunan Suatu Analisis dari Sisi Pengembangan Destinasi Pariwisata Berkelanjutan”), *J. Tour. Destin. Attract.*, vol. 1, no. 1, pp. 37–44, 2013.
- [44] N. Lathif, Legal Theory as a Tool to Renew or Engineer Society (*Teori Hukum Sebagai Sarana Alat Untuk Memperbaharui Atau Merekayasa Masyarakat.*) *Pakuan Law Rev.*, vol. 3, no. 1, 2017.
- [45] E. Pratiwi, T. Negoro, and H. Haykal, Jeremy Bentham’s Utilitarianism Theory: The Purpose of Law or the Method of Testing Legal Products? (“Teori Utilitarianisme Jeremy Bentham: Tujuan Hukum Atau Metode Pengujian Produk Hukum?”), *J. Konstitusi*, vol. 19, no. 2, p. 268, 2022, doi: 10.31078/jk1922.
- [46] L. Ansori, Law Enforcement Reform from a Progressive Law Perspective (“Reformasi Penegakan Hukum Perspektif Hukum Progresif”), *J. Yuridis*, vol. 4, no. 2, 2017.
- [47] E. Makarim, Introduction to telematics law: A compilation of studies. (*Pengantar hukum telematika: Suatu kompilasi kajian.*) Jakarta: RajaGrafindo Pesada, 2006.
- [48] R. Gupta and H. Brooks, *Using social media for global security*. John Wiley & Sons, 2013.
- [49] J. Glennon, *Arresting Communication: Essential Interaction Skills for Law Enforcement*. Calibre Press, 2010.
- [50] D. Budhijanto, Anticipatory Law Formation in the Dimension of Information and Communication Technology Convergence (“Pembentukan Hukum yang Antisipatif Terhadap Perkembangan Zaman dalam Dimensi Konvergensi Teknologi Informasi dan Komunikasi”), *Ilmu Huk.*, vol. 14, no. 2, p. 243, 2011.
- [51] Nugroho Wahyu, Reconstruction of Development Law Theory in the Formation of Post-Reform Environmental and Natural Resources Legislation in the Building of the Rule of Law (“Rekonstruksi Teori Hukum Pembangunan Kedalam Pembentukan Perundang-Undangan Lingkungan Hidup Dan Sumber Daya Alam Pasca Reformasi Dalam Bangunan Negara Hukum”), *J. Legis. Indones.*, vol. 14, no. 4, pp. 369–382, 2017.
- [52] T. Kasakowskij, J. Fürst, J. Fischer, and K. J. Fietkiewicz, “Network enforcement as denunciation endorsement? A critical study on legal enforcement in social media,” *Telemat. Informatics*, vol. 46, p. 101317, 2020.
- [53] M. F. Marikar, “Harmonizing the National Legal System Through the Formation of Ideal Legislation,” *J. Leg.*, vol. 16, no. 2, pp. 167–178, 2023.
- [54] A. Ogus, “Competition between national legal systems: a contribution of economic analysis to comparative law,” *Int. Comp. Law Q.*, vol. 48, no. 2, pp. 405–418, 1999.
- [55] R. Atmasasmita, Understanding Integrative Legal Theory (“Memahami Teori Hukum Integratif”), *Leg. J. Huk.*, vol. 3, no. 2, pp. 1–13, 2017.
- [56] M. Hamsal, B. Abdinagoro, and S. M. Pustaka, *Sustainable Tourism in the New Normal Era (Sustainable Tourism Pariwisata Wisata Di Era Normal Baru.)* Surabaya: Scopindo Media Pustaka, 2021.
- [57] Y. Yorisca, Sustainable Legal Development: Legal Assurance Measures in Achieving Sustainable National Development (“Pembangunan Hukum yang Berkelanjutan: Langkah Penjaminan Hukum Dalam Mencapai Pembangunan Nasional yang Berkelanjutan”), *J. Legis. Indones.*, vol. 17, no. 1, pp. 98–111, 2020.
- [58] M. A. C. Hermawan, Analysis of criminal law enforcement against the spread of COVID-19

hoax news through social media (“Analisis penegakan hukum pidana terhadap penyebaran berita hoax COVID-19 melalui media sosial,” *Din. Adm. J. Ilmu Adm. dan Manaj.*, vol. 4, no. 1, 2021.

- [59] M. N. Jeanis, C. N. Muniz, and C. L. Molbert, “Law enforcement and social media usage: An analysis of engagement,” *Polic. a J. policy Pract.*, vol. 15, no. 1, pp. 570–583, 2021.
- [60] Y. R. Yuono, Environmental Ethics: Countering Anthropocentric Environmental Ethics Through Appropriate Interpretation of Creation Theology as a Foundation for Environmental Management-Sustainability (“Etika Lingkungan : Melawan Etika Lingkungan Antroposentris Melalui Interpretasi Teologi Penciptaan Yang Tepat Sebagai Landasan Bagi Pengelolaan-Pelestarian Lingkungan”), *FIDEI J. Teol. Sist. dan Prakt.*, vol. 2, no. 1, pp. 183–203, 2019, doi: 10.34081/fidei.v2i1.40.
- [61] L. S. Grubba and M. Pellenz, “Biocentris, sustainability and alterity ethics,” *Rev. Bras. Direito Anim.*, vol. 16, no. 2, pp. 53–63, 2021.
- [62] R. Kennedy, Progressive Law Discourse in Environmental Law Enforcement and Renewal (“Diskursus Hukum Progresif Dalam Penegakan Dan Pembaharuan Hukum Lingkungan”), *Perspektif*, vol. 26, no. 3, pp. 198–209, 2021.

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors are equally contributed in the present research paper, at all stages from the formulation of the problem to the final findings and solution.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

This study received financial support from the Ministry of Education and Higher Education, Republic of Indonesia, specifically through the Directorate General of Higher Education, for research funding in 2022.

Conflict of Interest

This paper has no conflict of interest to declare.

Creative Commons Attribution License 4.0 (Attribution 4.0 International, CC BY 4.0)

This article is published under the terms of the Creative Commons Attribution License 4.0

https://creativecommons.org/licenses/by/4.0/deed.en_US