

Managing Policy of Extended Producer Responsibility (EPR) Implementation to Reduce Plastic Waste in Indonesia

Enis Tristiana¹, Imam Koeswahyono², Moh. Fadli³

1. (Faculty of Law, University of Brawijaya, Malang, Indonesia)

2. (Faculty of Law, University of Brawijaya, Malang, Indonesia)

3. (Faculty of Law, University of Brawijaya, Malang, Indonesia)

Corresponding Author: Enis Tristiana

Abstract: Indonesia takes the second place in the world in producing plastic waste brought to the sea. This issue receives immediate follow-up from the government through its policies, one of which is the system of extended producer responsibility (EPR) system as provided in Law Number 18 of 2008 on Waste Management and Government Regulation Number 81 of 2012 on Domestic Waste and Similar Waste Management although this policy has not been implemented to date. This research is aimed to formulate implementable policy to enable EPR system to be implemented in Indonesia by considering the balance of interests among enterprises, government, and societies. This research found several impeding factors regarding the implementation of the EPR system in Indonesia: (1) unchanged end-of-pipe paradigm; (2) limited government funding; (3) unsupportive cultural and social conditions; (4) lack of commitment of stakeholders; and so forth. To tackle those obstacles, transformation in plastic waste management from end-of-pipe into integrated end-of-pipe and 3R (reduce, re-use, recycle) is required. In addition, several policies demand to be made, involving: (1) regulatory instruments; (2) economic instruments; and (3) informative instruments. A policy to delegate responsibilities of product packaging waste management from the government to producers and consumers is also required.

Keywords: policy, extended producer responsibility, plastic waste

Date of Submission: 04-07-2017

Date of acceptance: 22-07-2018

I. INTRODUCTION

Plastic is a popular product produced and utilised by thousands of factories and industries in Indonesia due to its affordability, flexibility, and safety. However, since plastic products are not easily degraded, it causes negative impact on human health and environment entirely [1]. According to the latest research conducted by Jambeek, *et al.*, Indonesia is the second largest plastic producer that discharges it to the sea, accounting for 187.2 million tons [2]. This problem leads the priority of reducing plastic waste by the Ministry of Environment and Forestry.

So far, plastic waste management takes 6 ways: (1) discharged to landfill; (2) burned; (3) discharged to rivers and sewers; (4) ending up in piles; (5) discharged to the sea; and (6) recycled [3]. Out of the six methods, recycling seems to work in reducing the volume of plastic waste and it is enviro-friendly although this method has not been optimised due to limited infrastructure, human resources and poor plastic waste management.

To reduce plastic waste volume that is increasingly massive, the government has implemented extended producer responsibility system (EPR). This system is as environmental policy approach, in which the accountability of the producers regarding their products is extended to the state where the products are not used any more by the consumers [4]. The setting of the system is enacted in Article 15 of Law Number 18 of 2008 on Waste Management, stating “producers are obligated to manage product packaging and/or products that cannot be easily decomposed through natural process.” Furthermore, the provision of Article 15 of Law on Waste Management is delegated to Article 12-15 of Government Regulation Number 81 of 2012 on Domestic Waste and Similar Waste Management, but to date, the Ministry of Environment and Forestry has not issued the roadmap of plastic waste reduction especially for packaging waste.

The urgency of the existence of EPR system is in line with the notion of Balthasar Kambuaya [5] in regard to three messages delivered in the Government Regulation Number 81 of 2012 as follows [6]:

1. Since 2013, all the governments of regencies/municipalities should alter open dumping system in the landfill into something more environmentally friendly.
2. Those involved in enterprises such as producers, importers, distributors, and retailers, along with the governments, should immediately realise the implementation of EPR in waste management.

3. Any people in charge of housing, industries, commercial areas, special areas, public places, social facilities, and others are supposed to sort out, collect, and manage the waste of the areas.

Despite the policy of EPR, special management and strategy are needed. Moreover, to reduce plastic waste, strategy and vision are required to implement the EPR system to re-formulate how industries produce, use, and recycle plastic waste, to improve plastic design, and to add values related to reusing and recycling. The government is responsible to reformulate the policy and guidelines to implement and develop the system and infrastructure to collect, sort out, and recycle plastic waste. The societies should also be actively and passively involved in reducing plastic waste. This introduction leads to initiating a policy and model of EPR systems to reduce plastic waste in Indonesia by considering the difference of interests among enterprises, government, and societies.

II. LEGAL FRAMEWORK OF EXTENDED PRODUCER RESPONSIBILITY MANAGEMENT AND POLICY NEEDED TO REDUCE PLASTIC WASTE IN INDONESIA

II.1. Legal Framework of Extended Producer Responsibility Management in Indonesia

The government is now taking measures to change the paradigm of waste management in Indonesia from end-of-pipe to the combination of end-of-pipe and 3R (reduce, re-use, recycle). The transformation of the paradigm is based on the fact that the end-of-pipe is a poor method in which the waste pile is getting increasingly huge, contributing to global warming since the greenhouses gases also increase. The rising number of greenhouse gases are contributed by the release of methane gas coming from the waste pile [7]. Law Number 18 of 2008 on Waste Management only regulates pile waste reduction before the waste problem is taken care of [8]. Article 20 Paragraph 1 of Law on Waste Management regulates the waste management methods through the following ways: (1) limiting waste pile; (2) recycling waste; and (3) reusing the waste commonly known as 3R method.

The implementation of 3R method requires co-operative measures taken by government, communities, and producers (those involved in enterprises). Waste is a global problem, where the government is obligated to provide a lot for waste piles, while producers must be responsible for the waste they produce, and societies should raise their awareness of environmental health. Regarding the responsibility of producers, Article 15 of Law on Waste Management contains the provision of the responsibility of producers to manage packaging or products that are not easily degraded through natural process. Therefore, the producers should attempt to recycle their non-degraded waste, or degradable materials should be considered.

The responsibility to manage waste is regulated in Article 15 of Law of Waste Management, which is commonly known as Extended Producer Responsibility (EPR). Adopted from another country, EPR is a strategy taken to protect environment from negative impact caused by products in the way that producers are encouraged to be responsible for all process of producing, recycling, and dumping it onto the earth [9]. Extended Producer Responsibility (EPR) is an environmental policy approach, in which the responsibility of the producers in terms of their products are extended to a point where the products are not used by the consumers anymore [10].

In terms of the implementation of EPR concept, furthermore, the provision of Article 15 of Law on Waste Management is delegated to Article 12-15 of Government Regulation Number 81 of 2012 on Domestic Waste and Similar Waste Management:

Article 12

Producers are obligated to limit waste pile by doing the following:

- a. Planning and/or limiting waste pile dumped by industries and/or caused by their activities; and/or
- b. Producing products with packaging that is easily degradable through natural process and producing as little waste as possible.

Article 13

(1) Producers must recycle waste by doing the following:

- a. Planning a program to recycle waste dumped from industries and/or caused by their activities;
- b. Using degradable raw materials; and/or
- c. Recollecting waste from products or packaging to be recycled.

(2) Producers are allowed to appoint another party to recycle waste as mentioned in Paragraph (1).

(3) Another party appointed to recycle waste as mentioned in Paragraph (2), must have a business licence to do so.

(4) In recycling food packaging, the recycle process must follow the regulation of Law under Drug and Food Control.

Article 14

Producers must reuse waste by doing the following:

- a. Planning a program set to reuse waste dumped by industries and/or caused by their activities according to the policy and strategy of waste management;
- b. Using degradable raw materials; and/or
- c. recollecting waste from products or packaging for recycling.

Article 15

- (1) Using raw materials for products and packaging that are degradable through natural process and producing as little waste as possible. The waste should be recyclable and/or reusable as mentioned in Article 12 to Article 14, done gradually according to the roadmap.
- (2) The stages as mentioned in Paragraph (1) are regulated by the Minister that perform the tasks in environmental management and protection.
- (3) To set a roadmap as mentioned in Article (1), the minister responsible for tasks in environmental management and protection works with the Industry Minister to hold public consultation with producers.
- (4) Further provisions regarding waste reduction are regulated in Minister Regulation related to environmental management and protection following the coordination with the Industry Minister, and public consultation with producers is required.

Article 15 Paragraph (1) of Government Regulation Number 81 of 2012 assigns several ministries to make a roadmap every ten years to encourage the producers to be more responsible to minimise the volume of non-degradable waste. However, to date, the Ministry of Environment and Forestry has not issued Minister Regulation regarding the roadmap of waste reduction by means of Extended Producer Responsibility (EPR). In 2018, the government will release a regulation regarding the roadmap to reduce plastic waste especially the packaging waste produced by producers. The Minister Regulation is still in discussion, for it involves several related parties [11].

II.2. Legal Framework of Policy of Plastic Waste Reduction in Indonesia

Plastic waste problem is present not only as an issue of the nation, but it has been global concern that requires attention from the government. Indonesia is the second largest plastic waste producer to China. According to a data in 2015, waste pile in Indonesia accounted for 175,000 tons per day [12]. In general, plastic and other types of waste management is regulated in law Number 18 of 2008 on Waste Management, law Number 27 of 2007 on Management of Coastal Areas and Small Islands, Law Number 10 of 2009 on Tourism, Law Number 32 of 2014 on Marine, and Law Number 23 of 2015 on Regional Government.

From several laws mentioned above, Law Number 32 of 2014 on Marine specifically regulates marine plastic waste reduction according to Presidential Decree Number 16 of 2017 on Indonesian Marine Policy that has intended to form Indonesia's Plan of Action on Marine Plastic Debris (2017-2025). To reduce plastic waste that ends up in the sea, through National Plan of Action, the government has formulated several strategies to reduce plastic waste as follows:

1. Behavioral Change [13]
 - a. Educating Youths
 - b. Increasing Stakeholder Awareness
 - c. Instigating Intergovernmental Collaboration
 - d. Promoting Cross Sector Collaborations
 - e. Engaging Citizens in Clean-Up Actions
2. Reduced land-based leakage

Plastic waste can come from both industries and households sent to the sea through sewers. Experts have analysed the dangers caused by the plastic waste when they pollute marine biota, ecosystems, and even human. The plastic substance on which fish feed may be contaminating people who consume the fish, which can contribute to cancer disease. Therefore, the government is trying to suppress plastic products to reduce plastic waste brought to the sea [14].

3. Reduced Sea-based Leakage

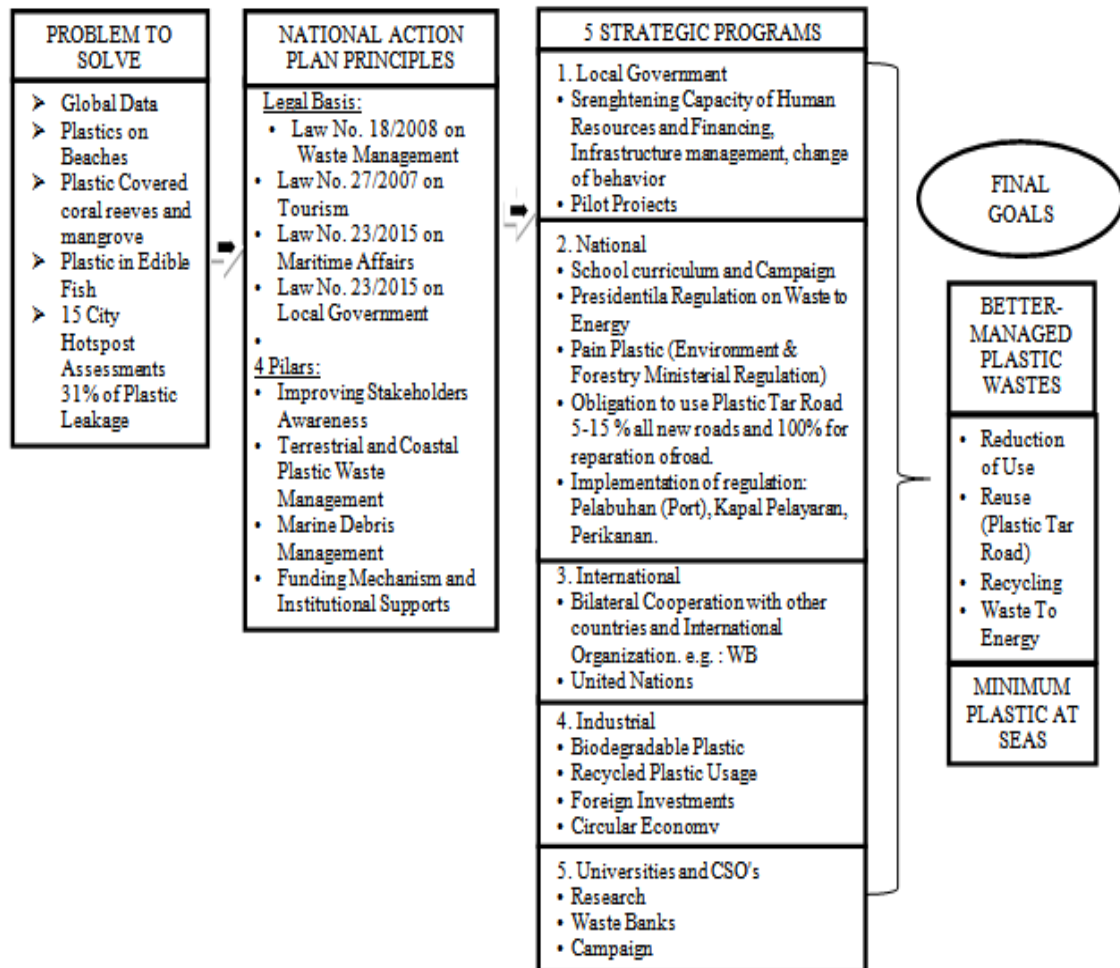
Plastic waste can also come from huge vessels or cruise ships. When this is the case, bilateral and regional diplomacy are required to control the amount of plastic waste dumped. The utilisation of technology is considered important to optimally clean the plastic waste in the sea. Raising awareness through education is also an essential key to marine waste reduction and management [15].

4. Enhanced Law Enforcement and R&D [16]
 - a. Introducing Paid Plastic Bags

- b. Encouraging Manufacturers to Use Recycled Plastics as Input Materials as much as possible
- c. Producing More Biodegradable Plastics from Cassava, Seaweed and Palm Oil [17]
- d. Developing Plastic-Tar Roads (Started in June 2017)
- e. Pursuing Waste to Energy Solution

Moreover, the details regarding the roadmap of marine plastic waste management is elaborated in Figure 1 as follows.

Diagram 1. Marine Plastic Debris Management Road Map [18]



All measures taken by the Indonesian government through related policies are addressed to build a government commitment to reduce waste by means of 3R to 25% in 2025 and to reduce marine plastic waste as much as 70% in 2025. This commitment was addressed by Joko Widodo on July 7, 2017 in the Leaders Retreat, G20 Summit, in Hamburg, Germany [19].

III. IMPEDING FACTORS IN IMPLEMENTING EPR SYSTEM TO REDUCE PLASTIC WASTE

EPR system used to reduce plastic waste in Indonesia has not been optimally implemented, as several obstacles are encountered:

1. End-of-pipe paradigm has not totally changed

Waste management formerly implemented by the government involved collecting-loading-dumping. This waste management system is performed in three stages as mentioned without any further waste processing. This fact has led to waste piles in landfill, while the space for landfill does not develop in size. This management system has caused three landslide incidences in three landfill areas in Bantar Gebang Bekasi, Leuwigajah Cimahi, and Rancamaya Bogor [20]. The waste management paradigm in Indonesia has changed since the issuance of law Number 18 of 2008 on Waste Management, and the new paradigm sees waste as a useable resource [21].

New waste management system involves processing waste from upstream to downstream, following the collecting-loading-dumping stages. The process firstly starts with sorting out, collecting, loading, waste processing, and final waste processing. The most essential stage in the new waste management is waste processing. This processing stage is to change the waste characteristic, volume, and composition [22].

Government has initiated to implement the new waste management method with 3R system (reuse, recycle, reduce) although this transformation of paradigm has not been implemented entirely. The regulation of integrated waste management has not been implemented in Indonesia, and the infrastructure is limited while there is lack of awareness to develop 3R method.

2. Limited funding from government

Operational cost needed to cover the whole process of waste management starting from taking waste from households to collecting, loading, and processing in the entire country outweighs the cost imposed on societies. There is about 70-80% of budget spent on regular waste processing [23].

To tackle this issue, the regional government collects more funds taken from other sources of state income for waste management. For example, the local government of Cimahi imposed levy on societies in 2016 and the government only managed to collect Rp. 1.2 billions, while it cost about Rp 14 billions to Rp 15 billions [24] to manage waste in Cimahi. In Pekanbaru, the government has prepared Rp. 46.8 billions for waste management in 2018 [25].

3. Poor social and cultural condition

Participation of the people in managing waste is limited, causing imbalance between the volume of waste dumped and limited number of garbage collectors [26]. So far, the government has taken approaches to encourage the participation of the people through:

- a. Publication Material (poster, leaflet, film)
- b. Gerakan Cinta Laut
- c. Beach Clean Up
- d. Facilitation in Pollution Forum
- e. Community Technical Assistance in Plastic Waste Processing

However, due to geographical condition of Indonesia that consists of thousands of islands and a large population, the influence of the approaches has not reached every corner of the state, especially remote areas.

4. Lack of commitment of stakeholders

A clear framework of role and responsibility has not been defined. The government is required to make a strict regulation to sort out the plastic materials that are easily degraded and the materials that need recycling, bio-degradable plastic materials and those that are changeable to compost. Besides, the responsibility of central and regional governments in managing waste has not been clearly mapped. The government should employ multi-tiered approach that involves the active participation of the societies [27].

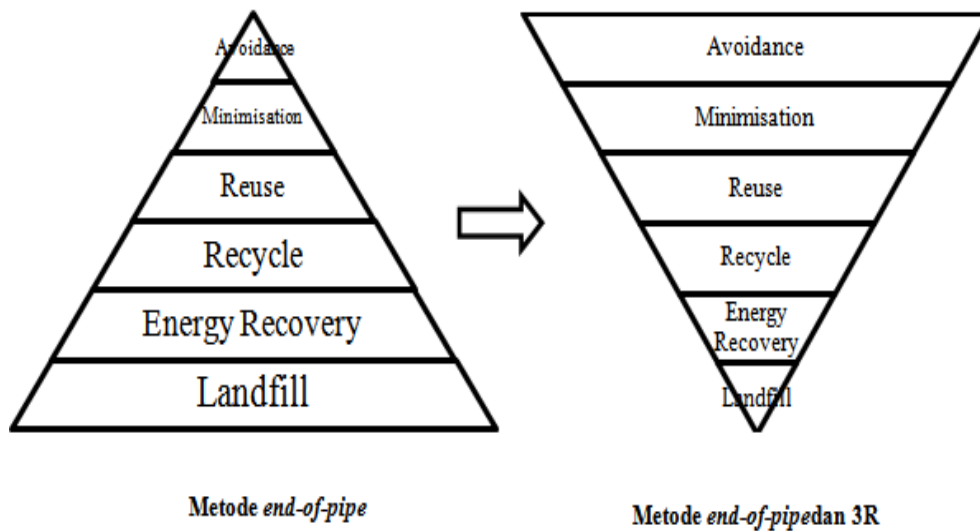
In addition to those four impeding factors mentioned above, there are some more mapped impeding factors as follows [28]:

1. Opposing from industrial sector, because the selling price from a plastic shredder is not worth with the cost of production
2. Clarifying appropriate EPR scheme;
3. Identifying priority product and packaging;
4. How to set up phase of implementation;
5. How to integrate incentive and disincentive scheme into EPR mechanism;
6. How to involve local government and informal sector into EPR
7. There are no environmentally sound technologies to destroy the thin plastic waste such as plastic bags, crackle, etc [29].

IV. MANAGING REGULATION OF EXTENDED PRODUCER RESPONSIBILITY TO REDUCE PLASTIC WASTE

In terms of plastic waste reduction by means of Extended Producer Responsibility (EPR), the government plays an essential role in making the regulation, mechanism, and guidelines. The key approach is the need of total change in paradigm of policy and waste management in Indonesia, from end-of-pipe method to the integration of end-of-pipe and 3R (reduce, reuse, recycle) methods. How these two methods are different is shown in Figure 1.

Figure 1. Transformation of Waste Management Policy in Indonesia [30]



There are at least 3 (three) policy instruments that have to be provided by the government to encourage the execution of EPR [31]:

(1) Regulatory Instrument

The government needs to do take-back, make regulation regarding the content standard that is allowed to be recycled, set requirements regarding the utilisation of secondary materials, inform product recovery time, set regulation regarding energy efficiency standard, set regulation of prohibition and restriction regarding the dumped waste, set regulation of prohibition and restriction of materials used to produce products, and set regulation of prohibition and restriction regarding the content of a product produced.

(2) Economic Instrument

The government should manage the initial cost for waste disposal, impose levy on new material, abrogate subsidy for new raw materials, manage the deposit system or refund, and manage the procedures required in enviro-friendly procurement. As a developing country, Indonesia has complicated waste issue due to its huge population. The government should prepare for special budget to manage waste of the state, including coordinating waste management at national level to avoid overlaps between the authorities and other departments. The budget prepared by the regional government for waste management infrastructure must be clearly described in Regional Government Budget (APBD) to let societies monitor the performance of the regional government [32].

Furthermore, the responsibility of businessmen to internalise the cost for waste management must be clearly stated so that businessmen can input special budget for every activity they carry out. The government can make a policy to clarify the type of activities according to the amount of waste produced related to the amount of budget prepared by their companies [33].

(3) Informative Instrument

The government should regulate the information and labelling related to environmental friendly products (environmental choice), energy efficiency, CFC content, recycled content, dangerous products, and expiry.

There are 4 (four) policies to divert the responsibility for product packaging waste management and tax payment to producers and consumers [34]:

1) Deposit Refund System

Deposit refund system can encourage reusing, but at least producers should provide monetary incentive to consumers that return products, and other parties that collect and recycle waste.

2) Targeted Product Taxes

This tax is intended to influence raw materials used. For example, Belgium imposes environmental tax to reduce the use of PVC.

3) Advanced Disposal Fees

This cost exists to influence raw materials selected. This policy can provide big fund that can be used by the government for the environment, while this cost is imposed on consumers.

4) Voluntary Agreements supported by Regulations

Voluntary agreements are the main agreements of industries that prevent from using unwanted materials, and to make recyclable products or to assure that the products are reusable.

In the implementation of EPR policy, several examples are provided related to how EPR policy can be implemented in Indonesia through several instruments of policy that are multidimensional for plastic waste management, economy policy related to the role of producers, and improvement of participation of the societies (see Table 1).

Tabel 1. Examples of the Implementation of EPR [35]

TYPE OF EPR	EXAMPLES
Product take-back programs	Mandatory take-back
	Voluntary or negotiated take-back programs
Procurement/consumer programs	Procurement guidelines and policies;
	Information disclosure programs
Regulatory Approaches	Disposal bans
	Mandated recycling
Voluntary industry practices	Voluntary codes of practice
	Public / Private partnerships
	Leasing and "servicing" (in which companies lease their products or provide services, thereby retaining ownership of the product).
Economic Instruments	Special taxes;
	Product charges;
	Advance disposal fees;
	Deposit/refund schemes;
	Subsidies and tax credits for the production and use of environmentally preferable products

V. CONCLUSION

Plastic waste management is a national issue extended globally, and it deserved special attention from the government. Indonesian government has made several policies to reduce and manage plastic waste through extended producer responsibility (EPR). However, this policy has not been implemented due to technical regulation regarding ongoing discussion and impeding factors encountered in the implementation of EPR: (1) unchanged end-of-pipe paradigm; (2) limited funds from the government; (3) poor social and cultural condition; (4) lack of commitment of stakeholders; and other impeding factors. To overcome those factors, the total change in the paradigm of waste management from end-of-pipe method to the integrated methods of end-of-pipe and 3R is a key to the fruitfulness of EPR implementation. Moreover, the change in the paradigm should be supported by regulation management that comprises: (1) regulatory instruments; (2) economic instruments; and (3) informative instruments. Furthermore, a policy to divert the responsibility of product packaging waste management from the government to producers and consumers is required.

REFERENCES

- [1]. P. Pavani and T. Raja Rajeswari, Impact of Plastics on Environmental Pollution, Journal of Chemical and Pharmaceutical Sciences, Special Issue 3: October 2014, 87.
- [2]. Jenna R. Jambeck, Roland Geyer, Chris Wilcox, Theodore R. Siegler, Miriam Perryman, Anthony Andrady, Ramani Narayan, dan Kara Lavender, Plastic Waste Inputs from Land into the Ocean, Science, Vol. 347, Issue 6223, 2015, 769.
- [3]. PT Sukses Sejahtera Energi, Transformasi Paradigma Penanganan Sampah, (Karanganyar: PT SSE, TT).
- [4]. Organisation for Economic Co-Operation and Development (OECD), Extended Producer Responsibility: A Guidance Manual for Governments, Paris: OECD Publishing, 2001).
- [5]. Prof.Dr. Balthasar Kambuaya, M.B.A. the 9th former Minister of Environment in Indonesia (serving period (2011-2014) during the presidency of Susilo Bambang Yudhoyono.
- [6]. Redaksi Hijauku, November02, 2012, Indonesia Miliki Aturan Sampah Baru, <http://www.hijauku.com/2012/11/02/indonesia-miliki-aturan-sampah-baru/>, accessed on March 6, 2018.
- [7]. Sudarman, Meminimalkan Daya Dukung Sampah Terhadap Pemanasan Global, Profesional, Vol. 8, No. 1, Mei 2010, 54.
- [8]. Article 19 of Law Number 18 of 2008 on Waste Management State Gazette of the Republic of Indonesia of 2008 Number 96
- [9]. Carlo Vezzoli, Ezio Manzini, *Design for Environmental Sustainability*, (Italy: Springer, 2008).
- [10]. Organisation for Economic Co-Operation and Development (OECD), Extended Producer Responsibility: A Guidance Manual for Governments, (Paris: OECD Publishing, 2001).
- [11]. Melisa Riska Putri, December 29, 2017, KLHK akan Siapkan Peta Jalan Pengurangan Sampah Plastik, <https://www.republika.co.id/berita/ekonomi/makro/17/12/29/p1poaq423-klhk-akan-siapkan-peta-jalan-pengurangan-sampah-plastik>
- [12]. PT Sukses Sejahtera Energi, Transformasi..., op.cit., p. 1.
- [13]. Nani Hendiarti, Combating Marine Plastic Debris Through National Plan of Actions – Indonesian Approach, Beyond Plastic Pollution Pathways to Cleaner Oceans Conference, Dockside, Cockle Bay, Oct. 30th – Nov. 1st , 2017, Sydney, NSW 2000, Australia, 11.

- [14]. The Government of Republic of Indonesia, Executive Summary of Indonesia's Plan of Action on Marine Plastic Debris (2017-2025), 3.
- [15]. *Ibid*
- [16]. Nani Hendiarti, Combating Marine Plastic..., *op.cit.*, p. 24.
- [17]. Kementerian Koordinator Bidang Perekonomian Republik Indonesia, Kajian Kebijakan dan Strategi Nasional Percepatan Pengelolaan Persampahan, (Jakarta: PT Arkonin Engineering Manggala Pratama, 2015).
- [18]. Safri Burhanuddin, Improving Solid Waste Management Capacity as a tool for combating Marine Plastic Debris Issue, National Conference on Waste To Energy: "Best International Practices in Waste Management and Waste to Energy Implementation", Jakarta, September 11 – 12, 2017, 6.
- [19]. *Ibid*, p. 5.
- [20]. Faizah, Pengelolaan Sampah Rumah Tangga Berbasis Masyarakat (Studi Kasus di Kota Yogyakarta), Universitas Diponegoro, Semarang, 2008.
- [21]. Explanation of Law Number 18 of 2008 on Waste Management State Gazette of the Republic of Indonesia of 2008 Number 69
- [22]. Faizah, Pengelolaan Sampah..., *op.cit.*, p. 18
- [23]. Masnellyarti Hilman, EPR in Indonesia: Plans and Current Challenges, APRSCP Conference, Yogyakarta, 11 November 2011, p. 1.
- [24]. Ririn Nur Febriani, 8 Februari 2017, Pengelolaan Sampah Sedot Anggaran Cukup Besar, <http://www.pikiran-rakyat.com/bandung-raya/2017/02/08/pengelolaan-sampah-sedot-anggaran-cukup-besar-392932>, accessed on July 4, 2018.
- [25]. Syafruddin Mirohi, February 13, 2018, Pengelolaan Sampah Tergantung Ketersediaan Anggaran, Komisi IV Akan Undang Tim Percepatan, <http://pekanbaru.tribunnews.com/2018/02/13/pengelolaan-sampah-tergantung-ketersediaan-anggaran-komisi-iv-akan-undang-tim-percepatan>, accessed on July 4, 2018.
- [26]. Ni Komang Ayu Artiningsih, Peran Serta Masyarakat dalam Pengelolaan Sampah Rumah Tangga (Studi Kasus di Sampangan dan Jombang, Kota Semarang), unpublished thesis, Master's in Environmental Sciences Postgraduate Program Universitas Diponegoro, Semarang, 2008.
- [27]. *Thomas Wright dan Sarah Waddell, September 5, 2017, How can Indonesia win against plastic pollution?*, <https://theconversation.com/how-can-indonesia-win-against-plastic-pollution-80966>, accessed on July 4.
- [28]. Masnellyarti Hilman, EPR in Indonesia..., *op.cit.*, p. 6.
- [29]. Brahmantya Satyamurti Poerwadi dan Abdul Muhari, The Impact and Implementations of Marine Plastic Debris in Indonesia, Directorate General of Marine, Spatial Management, Ministry of Marine Affairs and Fisheries (MMAF), 11.
- [30]. Masnellyarti Hilman, EPR in Indonesia: Plans and Current Challenges, APRSCP Conference, Yogyakarta, 11 November 2011, 2.
- [31]. Frans Oosterhuis, Frieder Rubik, Gerd Scholl, Product Policy in Europe: New Environmental Perspectives, (United State of America: Kluwer Academic Publishers, 1996).
- [32]. Laode M. Syarif, Kajian Naskah Akademis Rancangan Peraturan Perundang-undangan Pengelolaan Sampah, p. 3.
- [33]. *Ibid*
- [34]. Carl A. Zimring, William L. Rathje, Encyclopedia of Consumption and Waste: The Social Science of Garbage, (United States of America: SAGE Publications, 2012).
- [35]. Masnellyarti Hilman, EPR in Indonesia..., *op.cit.*, p. 6.

International Journal of Humanities and Social Science Invention (IJHSSI) is UGC approved Journal with Sl. No. 4593, Journal no. 47449.

Enis Tristiana" Managing Policy of Extended Producer Responsibility (EPR) Implementation To Reduce Plastic Waste In Indonesia". International Journal of Humanities and Social Science Invention(IJHSSI), vol. 7, no. 07, 2018, pp. 25-32.