

Environmental Quality Protection in the Period of Industrialization to Realize Environmental-Based Industry

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Abstract : *This study aims to analyze the impact of industrialization in Indonesia on environmental quality. The method used in this study was an empirical juridical method. This study employed both primary data obtained from field research and secondary data taken from library research. The results found that industrialization has a significant impact on the deterioration in the quality of environment as current technological developments are focused on efforts to exploit nature by emphasizing human domination on environment. This can be proven by various kinds of environmental damage and degradation in Indonesia caused by industrial activities. In brief, environmental problems caused by industrialization include air pollution, water quality and availability, and land quantity and quality. Hence, it is necessary to create new breakthroughs that can overcome environmental problems in this industrial period. One of the ways that can be applied is by realizing environmental-based industrial activities. Yet, this effort is still facing various obstacles, especially in terms of the lack of knowledge and human resources owned by business actors in implementing an environmental-based industry.*

Keywords : *Industrialization, Environmental-based Industry, Environmental Damage.*

Perlindungan Kualitas Lingkungan Hidup di Masa Industrialisasi untuk Mewujudkan Industrialisasi Berwawasan Lingkungan

Tujuan penelitian ini untuk menganalisis serta mengkaji bagaimana pengaruh dari adanya industrialisasi di Indonesia terhadap kualitas lingkungan hidup. Metode penelitian yang digunakan adalah yuridis empiris, dimana data yang dipakai dalam penulisan artikel ini bersumber dari data primer yaitu data yang diambil langsung dari lapangan dan data sekunder yaitu data yang diambil dari studi kepustakaan. Hasil penelitian menemukan bahwa industrialisasi pada masa sekarang memiliki dampak yang signifikan terhadap penurunan kualitas lingkungan hidup, pengembangan teknologi saat ini telah difokuskan pada upaya untuk mengeksploitasi alam sekaligus mempertegas dominasi manusia terhadap lingkungan. Hal tersebut dapat dibuktikan dengan berbagai macam kerusakan dan penurunan kualitas lingkungan hidup di Indonesia yang diakibatkan oleh aktifitas kegiatan industri. Simpulan, bahwa permasalahan lingkungan yang diakibatkan oleh karena faktor industrialisasi, yaitu berupa permasalahan lingkungan dibidang udara, ketersediaan air hingga kuantitas dan kualitas tanah. Sehingga perlu adanya terobosan-terobosan baru yang dapat mengatasi permasalahan lingkungan dimasa industri ini, langkah-langkah yang dapat dipakai yaitu dengan mewacanakan kegiatan industri yang ramah lingkungan, namun wacana tersebut masih mengalami berbagai kendala, terutama dalam segi minimnya pengetahuan dan sumber daya yang dimiliki oleh para pelaku usaha dalam melaksanakan sebuah industri yang berwawasan ramah lingkungan.

Kata Kunci : Industrialisasi, Industri Ramah Lingkungan, Kerusakan Lingkungan.

INTRODUCTION

Currently, environmental damage is a very interesting issue to discuss as it has become a global issue in the sense that environmental problems are now the responsibility of all humans on the earth. In this regard, the main environmental problems can be classified into 5 (five), including¹:

1. Land damage caused by deforestation, illegal logging, land conversion for plantations and industrial plants, oil mining, industry and settlements;

¹ Suwari Akhmaddhian, Penegakan Hukum Lingkungan dan Pengaruhnya Terhadap Pertumbuhan Ekonomi di Indonesia (Studi Kebakaran Hutan Tahun 2015), *Jurnal Unifikasi*, Vol. 03 No. 1 Januari 2016, 3-4

2. The existence of riverbank abrasion phenomenon caused by traffic of large and fast ships;
3. The existence of a river siltation caused by erosion, abrasion and sedimentation;
4. There is disturbance in surface water flow pattern due to land use conversion and the presence of ports, docks, and logponds;
5. There is a decrease in water quality due to industrial wastewater disposal, domestic ballast water disposal, and domestic solid waste disposal.

Thus, it is clear that industrialization has become one of the causes of environmental degradation occurring in Indonesia. According to Big Indonesian Dictionary (KBBI), industrialization comes from the word “industry” which means an activity of processing an item by using equipment in the form of machinery.² From its history, industrialization firstly appeared in the 18th century in the United Kingdom. The development, discovery and use of science and technology are factors supporting the occurrence of industrialization in the UK. In this case, the invention of steam engine became the beginning of various other inventions, such as the construction of railway network, mass production system in textile industry, etc.³ Industrialization in Indonesia is closely related to colonization. In Indonesia, industrialization is marked by the presence of industrial plantations during the era of forced cultivation. Meanwhile, the peak of industrialization in Indonesia occurred after the birth of the Basic Agrarian Law. In this period, foreign investors compete to invest in Indonesia, one of them is a manufacturing industry.⁴ Industry is a sector that will potentially damage the environment. If this issue does not receive serious attention, it will lead to the impression that industry and environment does not go hand in hand, in the sense that the more advanced the industry, the more damage the environment will be.⁵ Industry is closely related to technological advancements. Basically, technological advancements are intended to facilitate humans in managing natural resources in a country. Yet, the use of this technology can be said to have contributed in decreasing the quality of environment in Indonesia. The use of technology and human needs for natural resources have always increased since the industrial revolution in 1750-1850. Beforehand, experts had never thought that an increase in technology use and human needs for natural resources would have an impact on environment. Yet, a few decades ago, experts have begun to research what is really happening in our environment.⁶

Industrialization has had a significant impact on changing the quality of the environment. These changes are motivated by the fact that industrialization has the nature of interaction so that it is more focused on the development and use of information technology. Besides, industrialization has another nature of interaction, namely international trade and specialization of production and innovation. Yet, of all the nature of these interactions, the use and the development of information technology is the one which has had an impact on the quality of the environment. Referring to the background previously described, it is considered necessary to conduct a discussion about the impacts of industrialization on the environment as well as the efforts that can be made to realize industrialization which is in line with environmental interests. The discussion is expected to be able to find out the impact of industrialization on the environment as well as to provide a solution to overcome industrialization problems in Indonesia. Hence, the problem discussed in this study is

² Kamus Besar Bahasa Indonesia

³ Airlangga Hartarto, 2016, *Merajut Asa: Membangun Industri, Menuju Indonesia Yang Sejahtera dan Berkelanjutan*. Jakarta: PT Gramedia Widiasarana Indonesia, p 1.

⁴ Purnawan Basundoro, Industrialisasi, Perkembangan Kota, dan Respon Masyarakat Studi Kasus Kota Gersik, *Jurnal Humaniora*, Vol XIII, No.2 2001, p. 133.

⁵ Valentinus Darsono, 1995, *Pengantar Ilmu Lingkungan*, Yogyakarta, Universitas Atma Jaya Yogyakarta, p. 54.

⁶ Izarul Machdar, 2018, *Pengantar Pengendalian Pencemaran: Pencemaran Air, Pencemaran Udara, dan Kebisingan*, Yogyakarta : Deepublish, p 9

formulated into the following questions; What is the impact of industrialization on the quality of the environment? and What are efforts that can be made to realize environmental-based industries?

RESEARCH METHODS

This study applied an empirical juridical method. Empirical juridical method is a method of research that employs approach from legal side as well as facts in the field. The collected data were analyzed descriptively meaning that results of this study will be presented in the form of a descriptive and systematic description. The data used in this study were primary data and secondary data. Primary data was the data obtained from field research, while secondary data was the data obtained from library research.

RESULTS AND DISCUSSION

1. The impacts of industrialization on the quality of the environment

Many literatures and research results mention that industry has a positive impact, especially in terms of supporting regional economy in which industrial activities will greatly support economic development of the local community.⁷ Besides, the presence of industry in a region will provide a broad access to employment. However, the presence of industrial activities not only have a positive impact, but also a negative impact on the quality of environment. Followings are some problems related to the decline in the quality of environment caused by industrialization:⁸

a) *Problems on air quality*

Air is a mixture of gases that is in a layer surrounding the earth. The mixture refers to the composition of water in the form of steam and carbon dioxide.⁹ One of the impacts of industrialization is air pollution. Air pollution can be said to be a deviation from normal condition, or the increase concentration of certain elements, or the presence of other elements or chemical bonds changing the air quality so that it can harm the environment.¹⁰ Currently, industrial activities have contributed significantly to the problem of air pollution. It is because, in general, industrial activities have consumed 37% of energy and produced 50% carbon dioxide, 90% sulfur dioxide and other various toxic materials.¹¹

b) *Problems on water quality and availability*

Humans will always need water in their daily lives, especially drinking water. Drinking water is a part of global water cycle which includes the functions of abiotics and biotics.¹² Water is the source of life and is considered as the most essential natural resource.¹³ However, the existing water resources have been gradually polluted and are not available due to human and industrial activities. The problem faced in the context of water which becomes a major environmental problem for human throughout the world is the increasing level of contamination on the existing water resources with thousands of chemical compounds produced by industry.¹⁴ Besides, industry has also

⁷ Agnes Fitria Widiyanto, Saudin Yuniarno, Kuswanto, Polusi Air Tanah Akibat Limbah Industri Dan Limbah Rumah Tangga, Jurnal Kesehatan Masyarakat, Vol. 10 No. 2 Tahun 2015, p. 247

⁸ Ita Rustiati Ridwan, Dampak Industri Terhadap Lingkungan Dan Sosial, Jurnal Geografi GEA Vol. 7 No. 2 Tahun 2007, p. 4

⁹ Srikandi Fardiaz, 1992, *Polusi Air & Udara*, Yogyakarta: Kansius, p 91

¹⁰ Anna Catharina Sri Purna Suswati dan Stefanus Yufra M. Taneo, Respon Masyarakat Penghuni Pemukiman Sekitar Industri Keramik Terhadap Pencemaran Udara Akibat Aktivitas Pembakaran Keramik, jurnal Manusia dan Lingkungan, Vol. XI, No. 3, November 2004, p. 104

¹¹ Izarul Machdar, *Opcit* halaman 2

¹² Agnes Fitria Widiyanto, Saudin Yuniarno, Kuswanto *opcit*, p. 248

¹³ Kumar Reddy and Lee, Water Pollution and Treatment Technologies, J Environ Anal Toxicol Volume 2 Issue 5 p. 103

¹⁴ *Ibid.* p.103

caused the unavailability of water in human life due to an enormous consumption of water by various industrial companies. For example, Tangerang city which is one of the largest industrial cities in Indonesia requires water for industrial purposes of at least 82,259 m³/month or 987,103 m³/year.¹⁵ Hence, it is reasonable to say that industrialization is one of the factors causing water crisis in the community.

c) Problems on land quality and quantity

The impact of industrialization on land quality can be seen from the fact that industrial activity is one of the causes of land pollution. Land pollution caused by industrial activities relates to the waste produced. Industrial waste that can cause land pollution comes from manufacturing industries, small industries, and housing industries in which the waste can be liquid or solid waste. Solid waste is industrial waste in the form of solids, mud, and slurry that comes from a processing, such as the processing of pulp, sugar, crayon, paper, plywood, fruit preservation, fish, etc. Meanwhile, liquid waste is a result of a production process, for example the remnants of the metal coating industry and other chemical industries. Lead, copper, chromium, arsenic, silver and boron are substances resulting from the metal coating industry process.¹⁶

Further, the impact of industrialization on the quantity of land can be seen from the existence of land depreciation from time to time caused by industrial development. For example, in Yogyakarta, there is land depreciation caused by land use conversion from agricultural sectors to non-agricultural sectors. A data issued by the Central Bureau of Statistics of Yogyakarta in 2016 proved that the agricultural areas in the Special Region of Yogyakarta in the last ten years, namely in 2006-2015, has decreased by 4.82% with an average rate of decline of 0.48% per year. This land use conversion was due to an increase of land demand for various non-agricultural sectors in which one of them was for industrial purposes.¹⁷

2. The efforts made to overcome environmental problems during the Industrialization period

Overcoming environmental problems during the industrialization period is a necessity that needs to be realized. Various efforts have been made both at national and international levels to balance human needs and environmental needs because general welfare gained through natural resources management is a global inevitability. At international level, the need for a balance between human needs and environmental needs has long been a concern. It can be seen from the Stockholm declaration in 1972 which produced a common principle that every human being has a fundamental right to obtain healthy and suitable environment for life and the second principle states that every human being has the responsibility to protect the environment for the benefit of the present generation and the future generations. Yet, in fact, these principles were not implemented properly as proven by various environmental problems after the conference. Thus, as a follow up to the ongoing environmental problems, the United Nations held a follow-up conference in Rio de Janeiro that produced a discourse on sustainable development with principles that include:¹⁸

1. The principle of intergenerational justice,
2. The principle of one generation justice,
3. The principle of early prevention,

¹⁵ Livie Achmad Fauzi, Afirsta Yutrisya, Nur Rachmatiyah, Kastana Sapanli, *Analisis Penggunaan Air Untuk Industri Di Tangerang*, Prosiding Seminar Nasional Hari Air Dunia 2018 diselenggarakan di Palembang 20 Maret 2018, p. 62

¹⁶ Muslimah, Dampak Pencemaran Tanah Dan Langkah Pencegahan, *AGRISAMUDRA, Jurnal Penelitian* Vol. 2 No. 1 Januari – Juni 2015, p.14

¹⁷ I Made Yoga Prasada, Tia Alfina Rosa, The Impact Of Wetland Conversion On Food Security In Daerah Istimewa Yogyakarta, *Jurnal Sosial Ekonomi Pertanian* Vol. 14, No. 3, Oktober 2018, p. 211

¹⁸ Adji Samekto, 2008, *Kapitalisme, Modernisme dan Kerusakan Lingkungan*, Yogyakarta:Genta Perss, p 101

4. The principle of biodiversity protection, and
5. The principle of internalizing environmental costs.

At national level, the Rio de Janeiro conference has been the background of the birth of Law No. 32 of 2009 concerning Environmental Protection and Management. Yet, it does not sufficient to limit the dominance of human needs on the environment as proven by various cases of pollution and environmental damage occurred in Indonesia. In 2015, the 70th General Assembly held by the United Nations in New York, the United States of America, became a new history in global development. 193 heads of state and governments around the world are present in order to agree on a new universal development agenda stipulated in a document entitled “Transforming Our World: The 2030 Agenda for Sustainable Development”. The document contains 17 Goals and 169 Targets that will be valid in 2016 until 2030. The document is well known as the Sustainable Development Goals or SDGs.¹⁹ The Sustainable Development Goals or SDGs carry 5 (five) fundamental principles that try to balance economic, social, environmental, and governance dimensions which include People, Planet, Prosperity, Peace, and Partnership. These five basic principles are known as 5P coping 17 Goals and 169 Targets that are inseparable, connected, and integrated with each other in order to realize a better human life.²⁰

As a follow up of the Sustainable Development Goals or SDGs, the Indonesian government has issued a legal umbrella in the form of Presidential Regulation (Perpres) No. 59 of 2017 concerning the Implementation of Sustainable Development Goals. The Perpres outlines the goals, global and national targets of RJPM of 2015-2019 consisting of 17 goals, namely²¹:

1. End all forms of poverty everywhere;
2. End hunger, achieve food security and nutrition, and promote sustainable agriculture;
3. Ensure a healthy life and promote well-being for all residents of all ages;
4. Ensure the quality of education which is inclusive and equitable and promote lifelong learning opportunities for all;
5. Achieve gender equality and empower women;
6. Ensure the availability and sustainable management of clean water and sanitation for all;
7. Ensure access to affordable, reliable, sustainable and modern energy for all;
8. Promote inclusive and sustainable economic growth, productive and comprehensive employment opportunities, and decent work for all;
9. Build resilient infrastructure, promote inclusive and sustainable industries, and encourage innovation;
10. Reduce inequalities within and among countries;
11. Make cities and settlements inclusive, safe, resilient and sustainable;
12. Ensure sustainable production and consumption patterns;
13. Take urgent action to tackle climate change and its impacts;
14. Preserve and sustainably utilize marine and ocean resources for sustainable development;
15. Protect, restore and enhance the sustainable use of terrestrial ecosystems, manage forests sustainably, stop desertification, restore land degradation, and stop biodiversity loss;
16. Strengthen inclusive and peaceful communities for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels;

¹⁹ Sekar Panuluh, Meila Riskia Fitri, Perkembangan Pelaksanaan Sustainable Development Goals (SDGs) di Indonesia, tersedia pada laman website https://www.sdg2030indonesia.org/an-component/media/upload-book/Briefing_paper_No_1_SDGS_-2016-Meila_Sekar.pdf pada 25 Agustus 2019

²⁰ Ibid

²¹ Suwari Akhmaddhian, Hartiwiningsih and I Gusti Ayu Ketut Rachmi Handayani, The Government Policy of Water Resources Conservation to Embodying Sustainable Development Goals: Study in Kuningan, Indonesia. *International Journal of Civil Engineering and Technology*, 8(12), 2017, pp. 419-428

17. Strengthen the means of implementing and revitalizing global partnerships for sustainable development.

3. The implementation of environmental-based industries as an effort to prevent environmental damage during the industrialization period

Reflecting on the Sustainable Development Goals (SDGs) which try to bring the mission of balance to the economic, social, and environmental dimensions, environmental utilization for economic purposes that are expected to improve social welfare needs to be carried out in a careful and prudent manner. It is done with the purpose to avoid a dominant relationship between environmental needs and human needs. One of the efforts that can be done to balance this relationship is by implementing environmental-based industries. Environmental-based industries are economic activities that are not harmful to the environment. These economic activities can be carried out by applying a policy that begins with determining the criteria for environmental-based industries done by the relevant ministry or department. Some examples of industries that are included in the environmental-based category are agriculture with organic farming systems, mining industry businesses that rehabilitate ex-mining land, and other businesses applying 3R concept (reduce; reuse; recycle). The implementation of environmental-based industries in every sector still encounters various problems, such as the lack of knowledge of environmental sustainability, the low management aspects, the unsupported technical aspects, and the unavailability of environmental-oriented financing sources. These problems are exacerbated by the lack of public awareness to use environmentally friendly products.

The implementation of environmental-based industries is an alternative to overcome environmental problems during the industrialization period. Yet, its implementation which still encounters various problems must be overcome by making a policy that requires the implementation of environmental-based industries by every business actor. Those policies also need to accommodate the obligations of stakeholders to conduct a variety of guidance to business actors so that their businesses can meet the standards for environmental-based criteria. The policy requiring business actors to implement environmental-based industries is expected to provide a moral burden for business actors to implement environmental-based industries. This is in line with the function of law as an instrument of renewal of people's behavior meaning that law must be an instrument to direct the community towards the desired goal, even if necessary, law must be able to eliminate the habits of community that are considered negative. Thus, it means that law covers all aspects of community life. As stated by Roscoe Pound that "law can function as a tool of social engineering."²²

CONCLUSION

The conclusion that can be drawn from the discussion is that industrialization does not only have a positive impact on a country, but has also brought various kinds of problems, especially on environmental quality. Environmental problems caused by industrial activities include problems on air quality, problems on water quality and availability, and problems on land quality and quantity. In order to prevent the occurrence of environmental problems during the globalization era, various efforts have been made at both national and international levels. These efforts include the Stockholm declaration in 1972, the Rio de Janeiro conference, and the Sustainable Development Goals or SDGs that have been agreed at the 70th UN General Assembly. Other efforts that can be done in overcoming environmental problems during industrialization period is through the implementation of environmental-based industries. Yet, the implementation of environmental-based industries still

²² Sekhroni, Penerapan Asas "Premium Remedium" Terhadap Pertanggung Jawaban Pidana Korporasi Industri Pertambangan Di Indonesia, *Jurnal Unifikasi*, Vol. 04 No. 01 Januari 2017, p. 16

encounters various problems, such as the lack of knowledge of environmental sustainability, the low management aspects, the unsupported technical aspects, and the unavailability of environmental-oriented financing sources.

SUGGESTION

Based on the discussion, the authors suggest that the government shall issue policies requiring the implementation of environmental-based industries by every business actor. In this case, both government and stakeholders can carry out continuous guidance for business actors to implement environmental-based industries. Another effort that needs to be done is to provide understanding to the community continuously so that the community can participate in supervising industrial practices that produce waste in carrying out their activities.

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