

THE EFFECT OF ENVIRONMENTAL POLLUTION ON THE QUALITY OF PUBLIC HEALTH

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ABSTRACT

Environmental pollution is one of the most influential factors on the balance of ecosystems and human life. RI Law No. 32 of 2009 concerning environmental management article 1 paragraph 14 states that, environmental pollution is the entry or inclusion of living things, substances, energy and/or other components into the environment by human activities so that they exceed environmental quality standards. defined life. The implementation of human development is increasing, it turns out that it can contain the risk of environmental degradation and destruction, so that the basic structure and function of the ecosystem can also be damaged because of it. Any activity or activity carried out including industrial activities will certainly have an impact on the environment and public health at large. With the large influence of environmental quality on public health, it is very necessary to develop environmentally sound development. Basically, environmentally sound development is development that is able to bring people evenly to obtain their necessities of life (spiritual and material), including environmental quality that is suitable for habitation, so that people are not affected by diseases due to environmental pollution, and natural resources are increasingly fertile for the survival of the next generation. This paper will comprehensively describe the effect of environmental pollution (pollution of water, soil, air, and food) on public health

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1. INTRODUCTION

Humans as consumption actors will produce waste as a result of their daily life activities, where with the increasing and increasing number of residents and all their activities, the amount of waste produced will also increase, as for some examples are solid, liquid, or can also waste. in the form of gas waste (Adisasmito, 2007). In addition, in connection with the rapid population growth and the spread of community settlements, it will also affect the amount of waste generated by activities in the household, especially more and more the general public who dispose of their waste directly into the environment. This direct disposal is the main cause of environmental pollution, for example there is an increase in river water pollution, especially in rivers that cross urban areas and densely populated settlements (Aryanta, 2014).

The results of Eliana & Sumiati's research (2016), as for the problem point regarding environmental pollution which is still common in the community, especially in several big cities caused by the processing and disposal system of household waste that still uses the traditional way, namely by draining it. directly through the sewer to the city and ends at the beach or sea as a final

sewer. Environmental pollution is one of the most influential factors on the balance of ecosystems and human life. Law of the Republic of Indonesia No. 32 of 2009 concerning environmental management Article 1 paragraph 14 states, environmental pollution is the entry or inclusion of living things, substances, energy and/or other components into the environment by human activities so that they exceed environmental quality standards. defined life. Based on the following statement, the polluted environment can be broadly grouped into several parts, such as water, soil, air, and food pollution (Nurhajati, 2015).

According to Juniah et al., (2012), the increasing implementation of human development can actually contain the risk of environmental degradation and destruction, so that the basic structure and function of the ecosystem can also be damaged by it. This is of course a social burden, because in the end it is the community and the government who must bear the burden of maintaining it, because the maintenance of a good and healthy ecosystem is a responsibility that requires the participation of every member of the community to increase the carrying capacity of the environment. Therefore, wise development must be based on environmental insight as a means to achieve sustainable development and become a guarantee for the welfare of present and future generations. Coupled with the increasing development of industries, such as oil and gas, agriculture, and other non-oil and gas industries, the level of environmental pollution caused by the waste products of these industries is also increasing.

So to prevent and reduce the level of environmental damage caused by several factors above, it is necessary to control environmental pollution, one of which is by setting environmental quality standards. Of course, in this global era, there are many environmental problems that must be faced and are very disturbing to the achievement of optimal environmental health. Once the influence of the environment on human life is so great, it is necessary to take environmental health efforts as a prevention effort in dealing with various adverse effects that can be caused, one of which is disease transmission, but in addition, good environmental health can have a positive impact on the condition of biological elements and the environment. non-biological, because if the environment is not healthy then the elements are sick, but on the contrary if the environment is healthy then the ecosystem in it is healthy too (Notoatmodjo, 2011).

The results of Makkasau's research (2013), regarding environmental problems are the relationship of living things, especially humans with the environment, because this process is often related to local community health factors, because public health is the ideals of the Indonesian nation as stated in the Preamble to the Act. The 1945 Constitution of the Republic of Indonesia, in carrying out sustainable national development in all fields of life which is a series of comprehensive and directed development. Public health development which is one of the national development efforts is directed at achieving awareness, willingness, and ability to live a healthy life for everyone in order to realize an optimal degree of public health.

In its development, there has been a change in orientation in health development, where environmental health efforts which were originally focused on healing (curative) efforts have gradually developed towards integrated health efforts that are evenly distributed and affordable by the community, as explained in the Law of the Republic of Indonesia Number 66 2014 concerning environmental health, that the Environmental Health Regulation aims to realize a healthy environmental quality, both from the physical, chemical, biological, and social aspects, which allows everyone to achieve the highest degree of health (Muliani & Rijal, 2018). However, looking at the

current facts, people seem to lack awareness in managing their own environment. Many of them do not understand the cleanliness of the environment, by carrying out several activities that can certainly endanger environmental safety such as disposing of waste from bathing, washing, and various other activities that we consider trivial but produce residual waste that can endanger human health. So based on these problems, researchers are interested in conducting research as a continuation of the research road map regarding the effect of environmental pollution on the quality of public health.

2. METHOD

This study uses a qualitative method with the aim that there is greater spontaneity and better adaptation of the interaction between researchers and research sources in obtaining answers to research questions. In addition, qualitative research is also research that can be used to examine people's lives, history, behavior, organizational functionalization, social movements, or kinship relationships (Gunawan, 2022; Yulianah, 2022). Meanwhile, according to Bogdan and Taylor (1992:21), qualitative research is a research procedure that is able to produce descriptive data in the form of speech, writing, and behavior from the people being observed. Qualitative data analysis methods provide a way to distinguish, examine, compare, contrast, and interpret meaningful patterns or themes. The meaning in this study is determined by certain goals and objectives of the research theme related to the effect of environmental pollution on the quality of public health. Next, the researcher begins activities systematically to collect, process, and conclude data by using certain techniques to find answers to the problems at hand. The secondary data itself is obtained from articles, journals, and books related to health sciences, health development, and public health (Nugrahani & Hum, 2014).

3. RESULTS AND DISCUSSION

Water pollution

Water is a basic human need after air, where water is often used to meet the needs of human life such as drinking, cooking, washing, bathing, industrial purposes, agriculture, fire fighting and others. However, as a result of the density of human activities, the water quality has decreased, is contaminated and often smells bad. As for the government regulation of the Republic of Indonesia No. 82 of 2001 concerning water quality management and control of water pollution, it is stated that what is meant by water pollution is the entry or inclusion of living things, substances, energy, and or other components into water and or changes in the water order. by human activities, so that the quality of the water drops to a certain level which causes the water to be unable to function according to its designation.

If there is water pollution, either in the form of germs (bacteria, viruses, parasites) or toxic and dangerous chemicals, it will be able to cause health problems and disruption of the water ecosystem contaminated with pathogenic microbes consumed by the community can cause various infectious diseases. In addition to infectious diseases, the use of water contaminated with hazardous or toxic chemicals will trigger the occurrence of non-communicable diseases. For example, cases of poisoning due to consuming water contaminated with toxic chemicals such as cases of cobalt poisoning which can result in heart failure, high blood pressure, bent ankles, and damage to the thyroid gland. Then Minamata disease, which is caused by mercury (mercury) that

pollutes water can result in physical disabilities and water can also act as a nest for insects that spread disease to the community. Insects of this type are called disease vectors. Some of the diseases that are spread by disease vectors include dengue fever (Dengue Haemorrhagic Fever) with symptoms of fever and bleeding, where this disease spreads among the community through a vector in the form of the *Aedes aegypti* mosquito (mosquito that likes to nest in clean water).

Next is filariasis, known as elephantiasis (Elephantiasis). The cause of this disease is small round worms (filaria). The vector of this disease is the *Culex fatigans* mosquito. Filaria can cause blockage of the lymphatic channel which causes body fluids to not flow, resulting in swelling that gets bigger and harder, and finally malaria, where this disease is caused by the *Anopheles* mosquito vector. Water contaminated with radioactive substances as a waste of nuclear technology applications is very hazardous to public health (Purbosari et al., 2021).

Human activities in order to meet their needs, inadvertently add inorganic materials to the waters and pollute the water. For example, the disposal of detergents into the waters, the use of pesticides in agriculture can have a negative impact on aquatic ecosystems and public health. Then human activities that affect water quality are the disposal of waste or sewage into water bodies, and several types of human activities that can produce waste are from the residential sector, mining industry, trade, agriculture, recreation, and transportation. Furthermore, waste water management that does not undergo proper treatment will be able to cause unwanted impacts on the wider community such as contamination and pollution of surface water and water bodies used by the community, then interfere with life in water, kill aquatic animals and plants, can cause harm to aquatic life. odor as a result of the decomposition of organic and inorganic substances and produces mud which can lead to silting of water, resulting in blockages that can cause flooding.

As for water pollution control efforts, the community can take several approaches, where this process can actually minimize the negative things caused by water pollution activities, including through a technological approach, namely water pollution control efforts aimed at the source from which the waste is generated. For this reason, the development and use of efficient technology is needed to minimize or eliminate the occurrence of pollutants in the production process and eliminate them in waste treatment. For example, the black waste recycling process from several textile factory activities. And the second is through an economic approach where this instrument places more emphasis on additional taxes, namely (1) emission taxes (for each pollutant unit issued to water bodies), and (2) product taxes (added to the price of products or production raw materials which are the manufacturing process causes water pollution), in addition, it is necessary to apply strict legal sanctions to every perpetrator of water pollution.

Air pollution

Together with water, air (especially oxygen) is the most important substance in providing life on the earth's surface, where normal air consists of 78.1% nitrogen, 20.93% oxygen, and 0.03% carbon dioxide, while the rest is argon gas, neon, krypton, xenon, and helium. In addition to these types of gases, other gases in small quantities which are also air components are methane, nitrogen oxides, hydrogen, sulfur dioxide, ozone, nitrogen dioxide, ammonia, carbon monoxide, and iodine, and if air pollution occurs, it will affect the ecosystem. and health of living things. Meanwhile, according to the Decree of the Minister of Environment No. 02/MENKLH/1/1993, air pollution is the entry or inclusion of living things, substances, energy, and or other components into the air and

or changes in the air structure by human activities or natural processes, so that air quality drops to to a certain level, which causes the air to become deficient or unable to function as intended.

The effect of air pollution on public health has existed for a long time, as in the 1930s, to be precise, in Belgium there was an outbreak of lung disease caused by air pollution. In the years that followed, air pollution caused death and illness in epidemic proportions in several parts of the world. From 1930 to 1956, there were seven air pollution disasters in several places in the world. The air pollution disaster causes various diseases in the community, especially diseases belonging to the respiratory tract disease. Currently, the amount of carbon dioxide released into the air continues to increase, of course this is caused by the density of various activities carried out by humans, resulting in the greenhouse effect or a very high temperature increase on earth.

The increase in temperature on earth causes the snow in the polar regions to melt, so that sea levels rise, this can trigger frequent floods on earth. Then the release of chemicals such as carbon monoxide produced by motorcycle and car exhaust causes the blood's ability to carry oxygen to the body's tissues to decrease, the release of sulfur dioxide increases in the atmosphere causing pneumonia, bronchitis, and heart failure, and the process of making lead. For industry, it can cause poisoning if it has accumulated in the body for a long time, besides high concentrations of lead in the body cause the body to lose control of the hands and feet, cramps (Surahman et al., 2016).

On the other hand, the process of air pollution itself can be divided into general effects, effects on ecosystems, effects on health, effects on plants and animals, effects on weather and climate, and effects on socio-economics. As for the effects of air pollution on human life, among others (1) increase morbidity and mortality in humans, flora and fauna (2) affect the quantity and quality of sunlight that reaches the earth's surface and affect the photosynthesis process of plants (3) affect and changing the climate due to an increase in CO₂ levels in the air, resulting in a greenhouse effect (4) damaging paint, rubber, and being corrosive to metal objects (5) disturbing vision and increasing the number of traffic accidents on land, rivers/ sea, and air, (7) cause the color of fabrics and clothes to quickly blur and stain. As for a class of air pollution that is biological in nature, it often occurs in non-free air, such as in residential areas, hospitals, factories, office buildings, and several other places.

Efforts to control air pollution can actually be done through several approaches, such as technology development, application of environmentally sound economic policies, and enforcement of laws and regulations. However, it is further explained that to overcome air pollution, it can be taken using a technical approach (process changes in the emission source system and emission source control), a planological approach (regulation of industrial zones, settlements, urban areas, offices and transportation routes), an environmental law approach (need to the implementation of laws relating to air pollution), and an educational approach (guidance, motivation and public awareness are urgently needed to participate in preserving the environment).

Basically the control of air pollution can be determined from the air pollution, for example, air pollution due to the residue from burning motor vehicles and factory fumes, can be prevented and overcome by reducing the use of fuel oil, and replaced with environmentally friendly fuels, such as vehicles. electrical energy. In addition, efforts are made to record and limit the number of motorized vehicles that are fit to operate, and control the exhaust fumes and exhausts of motorized vehicles.

Industrialization and Public Health Dynamics

The increasing implementation of human development carries the risk of decreasing and destroying the environmental ecosystem, so that the basic structures and functions in it can be damaged and disrupted. This is of course a social burden, because in the end it is the community and the government who must bear the burden of maintaining it. Maintaining a good and healthy ecosystem is a responsibility that requires the participation of every member of the community to increase the carrying capacity of the environment. Therefore, wise development must be based on environmental insight as a means to achieve sustainable development and become a guarantee for the welfare of present and future generations.

The process of industrialization in a country causes changes in various fields of life, while three important factors play a dominant role in it, namely, changes in people's income patterns, population work systems, and waste dumped into the surrounding environment. The three factors above have a major influence on the structure of public health, especially regarding existing disease patterns, health care systems, and education priorities for health workers. In industrialized countries the pattern of disease shifts from infectious to non-infectious diseases and from physical disorders to mental disorders. In addition to emphasizing clinical services for treating chronic non-infectious diseases, the health care system has also developed an intensive monitoring system for the quality of the environment, including water, air, and food issues. In the education of health workers, specialists are prepared to deal with chronic diseases, education for environmental laboratory personnel, especially professional environmental health (Utami et al., 2018).

Basically, industrialization means the process of industrial development that leads to the dominance of the sector in the life of the economic structure of society. Industry brings many changes in social life, one of which is often used as a reference is an increase in the income of the population so that living facilities are getting better and even in some cases show luxury. But whether this kind of influence is universal and always beneficial. As an effort to increase efficiency in the economic world, the industrialization process will utilize as many resources as possible and then be processed as much as possible so that the waste materials released by an industry generally become very concentrated and harmful to the surrounding environment.

Various types of waste materials produced by an industry can no longer be digested by nature with its biological system so that it remains a poison with higher concentrations. In fact, industrial waste is clearly a source of threat to the health of the surrounding community, even the danger of industrial waste can have a wider negative impact on regional, national and even international scales depending on the strength and breadth of the distribution of hazardous waste materials. The use of river bodies for industrial purposes results in a decrease in the quality of river water which is used as raw material for drinking water. This conflict of interest has the same characteristics, namely the conflict of development with quality and development with quantity. This fact can be seen that on the one hand it wants development that simultaneously develops aspects of the quality of life while on the other hand prioritizes growth that results in material growth.

Looking at the conditions in various industrialized countries as a result of the industrialization process, especially in the golden period of industry, which has succeeded in making the population of the country progressively richer, it turns out that there have also been changes in the health of the people. Infectious diseases, which are generally spread by low levels of

environmental hygiene and sanitation due to poverty, have begun to be overcome, especially after the successful development of more potent antibiotics in dealing with infectious germs. Tuberculosis, typhus abdominalis, cholera and the like can be suppressed as low as possible if they cannot be declared no longer found.

The pattern of disease in these rich countries shifts to non-infectious diseases such as cardiovascular and cardiovascular diseases, degeneration, hormonal, allergies, malignancies, pregnancy disorders, and other chronic diseases. In addition, the health problems that initially interfered with the physical aspects were also slowly shifted to mental/psychological diseases, such as neuritis, psychosis, and neuropathy. Abuse of narcotics and other illegal drugs and juvenile delinquency is increasing. Such a pattern of disease, of course, requires a different health care system. Although there has been a shift in disease patterns and sharp changes in the health and education service system, health problems in industrialized countries cannot be separated from chaos due to fundamental social changes, especially those concerning the values of secular life (Axmalia & Mulasari, 2020).

The negative effects of industrialization in Indonesia are increasingly visible, not only on a local scale but also on a wider scale. Cases of river pollution in several places that are sources of drinking water for city residents have reached a vulnerable point only because of the actions of several multi-national industries that are less responsible for managing their waste, so is the case of air pollution in the cement industrial zone which has reached a critical point where around 60% of the population is in the area. complained of respiratory problems compared to the control area which was only 30% not to mention respiratory tract disorders in the form of chronic bronchitis and decreased lung function in the form of obstructive disorders. Then the nuclear reactors that have been operated in Indonesia even though they are small in size are also reported to have changed the radioactive levels around them and are estimated to have an effect on public health. These cases are only a small example of the severity of environmental damage caused by human industrial activities, this gives a strong indication that the negative effects of industrialization have emerged in addition to other facts, namely changes in general ecosystem conditions. Given the various problems above, it is necessary to reorient development strategies in Indonesia to further improve social welfare, including public health in the future.

4. CONCLUSION

Environmental problems are the relationship between living things, especially humans and the environment, where good health is not possible in the community if the environment in which the community is located is unhealthy or polluted. Any activity or activity carried out including industrial activities will certainly have an impact on the environment and public health at large. The condition of public health can be influenced by environmental conditions, which are getting worse, such as water, soil, air and food pollution which is the cause of various diseases or disturbances to public health. To improve the quality of the environment and the quality of public health, it is necessary to prevent and control environmental pollution by the community with the guidance of the government. Various types of waste materials produced by an industry can no longer be digested by nature with its biological system so that it remains a poison with a higher concentration. Even industrial waste is clearly a source of threat to the health of the surrounding

community, for that it is necessary to reorient development strategies that are more friendly to the environment, especially in improving social welfare, including public health in the future.

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