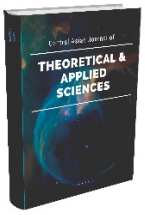

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The Impact of Population Growth and Development on Environmental Damage

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Abstract: *Population increase is influenced by several factors, including births, deaths, and mi-gration. Natural variables include birth and death, while non-natural elements include migration. Growth based on a set quantity is greatly influenced by the number of babies born, but it is also influenced by deaths that can occur at a given age. Population growth, lifestyle changes, the rapid advancement of technology in the creation of objects, and abundant material needs have all contributed to the emergence of new problems that require special attention, namely the presence of objects or goods that have been used and are no longer used, resulting in waste. Development that aims to improve residents' welfare cannot be avoided by the use of natural resources, but exploitation of natural resources that are not effectively managed and exceed the carrying capacity of the environment can lead the ecosystem to lose natural stability and environmental sustainability. The current worldwide environmental problem is the outcome of the continued growth and dominance of nature by a population that continues to expand. Humans consume a lot of energy and resources, generating pollution and environmental damage (Holdren, & Ehrlich, 1974). Numerous human wants must be met for a person's life to be fulfilled (Constanza et al, 2007). Food, housing, clean water, clean air, and other necessities are among these requirements. The rapid population increase harms human life, particularly in terms of socioeconomics (Fischer et al, 2005). The consequences of the population explosion include limited sources of basic needs (food, clothing, housing, and proper sanitation); insufficient social facilities and inadequate health (schools, hospitals, sightseeing spots); and various other life support facilities; and insufficient social facilities and inadequate health (schools, hospitals, sightseeing spots); and insufficient social facilities and inadequate health (schools, hospitals, sightseeing spots); and insufficient social facilities and inadequate health (schools, hospitals, sightseeing spots Inadequate employment for the workforce, which occurs in the field, increases the number of diseases and has a negative influence on social quality of life (many homeless people, beggars, increased crime and others). To overcome the explosion that occurred in a country, several actions and efforts can be made, including strengthening health, education, communication, and transportation facilities, as well as increasing employment prospects for the populace. Organizing KB (Family Planning) programs to lower birth rates and transmigration to ensure an even population distribution in each area.*

Key Words: *Population Growth, Environmental Sustainability Natural, Resouces, Pollution, Transmigration, Migration*

INTRODUCTION

A country's population growth can be both favorable and harmful. A country's potential will be realized if its population is proportional to its resources and it has a high standard of living. On the other hand, if the population exceeds the country's capacity, big population growth can result in a population explosion, which has a significant impact on the population's quality of life and degree of welfare in an area or country. The population growth dynamic balance is a balance between factors that increase and forces that decrease population (Lopes et al, 2009). Population increase is influenced by several factors, including births, deaths, and migration. Natural variables include birth and death, while non-natural elements include migration. The number of babies born has a significant impact on population growth, but it is also influenced by the number of deaths that can occur in all age categories. A huge population, for the most part, indicates something unexpected, because it may be exploited as a source of development, and the economy will increase if the number of workers is large (Boserup & Chambers, 2014). The problem, in this case, is related to the fulfillment of needs which will continue to be more and more because this coincides with the explosion of population growth that occurs. Therefore, a similar consideration is also supported by Malthus' theory which explains that population development is based on geometric progression and the development of food for daily needs based on arithmetic. This pessimistic thinking concludes that it is not prosperity that will be obtained but instead the misery that will be encountered if the population is not controlled properly. The majority of the population is still young, their capital and technology are still low, work productivity will decrease, and employment-related problems will occur as a result of cases that arise in the field of population.

The Indonesian people and countries with strong population growth are currently dealing with two issues: population concerns and environmental harm. This is because humans are an intrinsic part of the ecology in which they live by exploiting their surroundings (Cloud, 2013). The demand for natural resources will increase as the world's population grows (Müller et al, 2008). Similar to the increase in food consumption brought on by population growth, which can lead to a reduction in natural resource availability as a result of rising demand. As a result of a change in one or more ecosystem components, the interaction of these components changes, resulting in changes in the ecosystem's organizational structure and functional qualities.

Population problems experienced by several developed and developing countries are population such as problems, high birth rates, and infant mortality, urbanization, uneven population distribution will have an impact on human life, especially environmental sustainability (Stonich, 2021). Population growth, changes in lifestyle, and the rapid development of technology in creating objects and material needs in abundance have all contributed to the emergence of new issues that require special attention, namely the existence of objects or material goods that have been used are no longer resulting in waste generation. Development that aims to improve residents' welfare cannot avoid the use of natural resources, yet improperly managed natural resources and the ecosystem's carrying capacity will lead the environment to lose its stability and sustainability (Karl-Göran et al, 1996). Many factors can lead to the deterioration of the quality of the environment and the destruction of potential natural resources due to the soaring population growth. As a result, the author attempts to discuss population density in general in this article, which is one of the sources of environmental damage.

METHODS

The author attempts to write this scientific article using a way of writing scientific articles based on the methods and types of library research, namely by gathering data or scientific works in the literature that are relevant to population and the environmental ecology.

FINDINGS

Indonesia is a country with an abundant population. Population development that is happening at this time is caused by an increase or decrease in the number of people where it is all the result of births (natality), death (mortality), and population movement (migration). Birth and death describe aspects of the development of nature (Korn, 2002), as well as population movement, which is an aspect of non-natural development. The definition of population dynamics is a change or development of a population that occurs over time and is influenced by factors such as births, deaths, and population movement activities. Natural development, migration development, and total population development are the three types of population development that are commonly used. Based on the theory of Thomas R. Malthus in his book entitled: "An Essay on the Principle of Population" (1872) it is realized that the population development which tends to continue to increase (calculation of geometric series) cannot be balanced with a continuous increase in food production because nature's ability to renew has a limit.

Based on the definition of the environment is the unity of all living and non-living things, which includes various environmental factors, components, and benefits, there is an interaction of all species and the natural energy sources contained therein (Sharma, 2012). According to (Soemarwoto, 2001) Where the environment is everything or something where the items are in a room that we are in and can affect our lives. For (Emil Salim, 1986), the environment refers to all items, conditions, circumstances, and influences that are present in the space we are currently occupying and that have an impact on the life that surrounds them, whether it is animals, plants, or humans. In contrast to the Ecology Dictionary, the term living area or environment refers to the interconnected totality of living and non-living things that exist naturally on earth. The environment, according to Law Number 32 of 2009, is a unitary space containing all objects, forces, situations, and living things, including humans and their behavior, that have an impact on nature, the continuation of life, and wellbeing of humans and other living species. With the numerous interpretations shown above, it can be inferred that an environment is a unit that comprises a range of living things as well as all of their surrounding components, including physical, chemical, socio-cultural, and other factors.

The types of environmental cases have continued to increase, along with increasing population and exploitation of natural resources to meet all kinds of human needs (Armaroli & Balzani, 2007). This problem does not only occur in Indonesia but in all regions of the world. Without us realizing it, the increasing population density will affect the carrying capacity of the environment. Population density can affect the quality of life of the population (Başkan et al, 2017). In areas with high density, efforts to improve the quality of the population will be more difficult to carry out. Because it can bring up socio-economic cases, welfare, security, availability of land, clean water, and food needs. The most serious impact is environmental damage. All human needs are met by the environment because the environment is a natural resource that is exploited to meet the necessities of human life (Tietern & Lewis, 2018).

RESULTS AND DISCUSSIONS

Natural population development is caused by two aspects, namely the birth and death of the population (Meadows et al, 2013). Measurement of natural population development can be calculated by the difference between birth and death rates in one year. Growth is expressed in thousandths. Natural Population Development can be calculated using the following formula :

Pa = L – M

Pa = Natural Population development

L = Number of Birth

M = Number of Death

For example, The population of A's city is 1000 people. The number of natural population increase in the village can be calculated by subtracting the number of births from the number of deaths. For example, the number of children under the age of five who were born was 70, while the number of people who died was 30, therefore using the above formula, the village's population growth is 70-30 thousand, or 40 %.

Population development that occurs to non-natural residents is generally the result of immigration and emigration activities (Curran, 2002). To determine the development of the non-natural population, a calculation is carried out which is measured based on the difference in population carrying out immigration (in-migration) and emigration (out-migration). Calculation of non-natural population can be used the following formula:

Pm = I – E

Pm = Migration population growth

I = Number of Immigration

E = Number of Migration

For example: In an area of city B, the population is 1000 people. The rate of non-natural population growth in the area will be found by calculating the difference between the number of immigration and emigration so that the rate of non-natural population growth in the area will be found. For example, the number of people who immigrate is 60, on the other hand, the number of people who emigrate is 40, so using the above formula, the population growth in the area is 60-40 thousand, or 20 thousand, or 2%.

The definition of Total Population Growth itself is population development caused by several aspects, namely aspects of birth, aspects of death, and aspects of migration. The development of the migration population can be calculated by the following formula:

P = (L – M) + (I – E)

P = Total Population Growth

L = Number of births

M = Number of deaths

I = Number of immigration

E = Number of emigration

The birth rate of infants can be determined using two methods: The crude birth rate (CBR) is a measure of the number of births per thousand people in a certain period. The General Fertility Rate (GFR) is a figure that illustrates how many infants are born for every 1000 women of reproductive age who give birth between the ages of 15-49 years old. While the death rate (mortality) is defined as the drop in the population over some time due to death-related factors. Three approaches can be used to determine the death rate: The crude death rate (CDR) is a figure that shows the death rate per thousand people in a given year. The Age-Specific Death Rate (ASDR) is a figure that shows the number of deaths in a given age group per 1,000 people in the same age group. The Infant Mortality Rate (IMR) is a figure that represents the number of infant deaths per 1000 infants who were born alive.

According to the Central Statistics Agency (BPS), the average rate of development of the Indonesian population over the last few decades was 1.25 %, based on the findings of the 2020 population census conducted between 2010 and 2020.

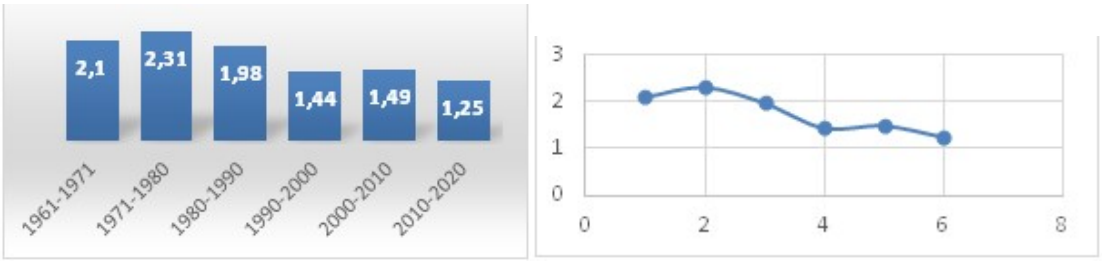

Fig 1. Population Growth Chart in Indonesia

The rate of development of the Indonesian population from period to period tends to shrink, one of the reasons is the government's policy to reduce the rate of population development through the Family Planning Program which began in 1980. Every ten years, Indonesia conducts a population census to determine the average rate of population growth. From 1961 to 1971, the rate was 2.10 %, and from 1971 to 1980, it was 2.31 %.

The average rate of population growth slowed to 1.98 % between 1980 and 1990 and then slowed further to 1.44 % between 1990 and 2000. Although the pace of population growth climbed to 1.49 % between 2000 and 2010, it can be lowered to 1.25 % between 2010 and 2020. Indonesia's population reached 270.2 million people in September 2020, according to the results of the 2020 Population Census. There is an accumulated population of 32.56 million people or an average of 3.26 million each year when compared to the 2010 population census results, or an average of 3.26 million people every year. Indonesia's population is estimated to be 271.35 million people through December 2020.

The current worldwide environmental problem is the outcome of the growth and development of a population that continues to outnumber and more dominates nature. Humans consume large amounts of energy and resources, causing environmental damage and pollution (Holdren, & Ehrlich, 1974). There are so many human needs that must be met to fulfill their life (Constanza et al, 2007). These needs include food, shelter, clean water, clean air, and other needs. The rapid population explosion has an impact on human life, especially in the socio-economic field (Fischer et al, 2005).

The following are some of the implications of the population explosion:

1. Limited supply of necessities (food, clothing, housing, proper).
2. Inadequate social and health services (schools, hospitals, tourist attractions), as well as a variety of other life-supporting services.
3. Inadequate employment for the workforce, which occurs in the field, increases the number of diseases and has a negative influence on social quality of life (many homeless people, beggars, increased crime, and others).

The following are some examples of environmental effects caused by population growth:

1. The increase in human population or the number of populations that increases with the dis increase in land availability. On the other hand, the area of land did not increase Because agricultural land is used for residential reasons, population density can make an area of agricultural land continue to shrink.
2. Humans, like all living things, require sustenance. The need for food grows in tandem with the growth of human populations and residents in a given location. If this does happen as a result of the increasing growth of the population, then there is a shortage of food. In general, population expansion outpaces increases in food production. Because there is an imbalance between the two, the population is malnourished or lacking food, an increase in population means an increase in food production, which has a significant impact on the quality of human existence. Malnutrition lowers the body's

resilience to sickness, making it easier to catch a disease.

3. The melting of polar ice is influenced by global warming caused by greenhouse gases, which raises the temperature of the oceans and the earth's surface.
4. Environmental pollution is in the form of air and water pollution by motor vehicle fumes and factory waste which is the result of the disposal of human activities, resulting in water contamination and soil pollution.
5. Decreased need for clean water where water is an absolute necessity for living things. Clean water is used for the needs of residents or households every day. Water that meets quality requirements, including physical, chemical, and biological requirements, is defined as clean (Ummah et al, 2015). Water is free of chemicals that are harmful to human health. The water must always be clear (without changing color), tasteless, and odorless according to the physical criteria. Water does not contain bacteria or disease germs.
6. The reduction of the availability of natural resources to stimulate conflicts between countries and regions.
7. The loss of biodiversity, whether it is in the form of flora or animals due to illegal hunting to meet excessive human needs.
8. Forest ecosystems and natural resources are harmed as a result of deforestation for land use and settlements.
9. The overproduction of CO2 is a direct cause of ocean acidification. The ozone layer's depletion and the greenhouse effect's influence.
10. Acid rain is produced as a result of the combustion of fossil fuels.

Some of the steps and efforts that can be tried to cope with the explosion that occurred in a country :

1. Improvement of health facilities, learning, communication, and transportation, and employment opportunities for the population.
2. Developing jobs for people who live in residential areas
3. Planning, and regulating the birth rate to slow population growth.
4. Carrying out transmigration to equal out population distribution in each region.
5. Carry out village development to limit urbanization and concentrate population in a specific area.
6. Land use planning for agriculture, life, development, and survival who does not affect other living things to maintain sustainability
7. Using the advancement of environmentally friendly technologies to improve the quality of human life.

Solutions and efforts that can be made to overcome environmental cases that come from overcrowding:

1. Promote a small happy prosperous family program that does not conflict with religious life, as well as the socio-cultural conditions of the residents.
2. Clearly and transparently disseminating the meaning of the tiny happy and wealthy family program.
3. Improving the quality of human learning
4. Creating jobs
5. Establishing natural resource management policies that promote area sustainability and community

welfare.

6. Adhere to the rules and regulations in a consistent manner
7. Using environmentally friendly technologies
8. Coordinating economic and environmental development.
9. Creating a more efficient and balanced spatial layout.

CONCLUSIONS

Births (natality), deaths (mortality), and population movement are all factors that contribute to rapid population growth (migration). Births, deaths, and migration all have an impact on population development. The most significant consequence that population density can have is environmental degradation. Because all human needs are met by nature, which is the source of all human needs. Numerous human wants must be addressed to meet life's requirements. Clothing, housing, food, clean water, clean air, and other needs. The rapid population explosion hurts people's lives and the environment, including Reduced agricultural land as a means of food, Air pollution due to pollution from fossil fuel use, and air pollution due to household waste and factory waste where water is the source of life for humans. Deforestation to clear land for residential use, endangering the lives of flora and animals as well as the natural resources contained inside. To combat a country's population growth, several initiatives and efforts can be made, including improving health, education, communication, and transportation, as well as increasing work prospects for the population. Organizing KB (Family Planning) initiatives to minimize the number of births, Conducting transmigration to even out the distribution of the population in each area.

REFERENCES

1. Armaroli, N., & Balzani, V. (2007). The future of energy supply: challenges and opportunities. Angewandte Chemie International Edition, 46(1-2), 52-66.
2. Awan, A. G. (2013). Relationship between environment and sustainable economic development: A theoretical approach to environmental problems. International Journal of Asian Social Science, 3(3), 741-761.
3. Başkan, A. H., Zorba, E., & Bayrakdar, A. (2017). Impact of the population density on quality of life. Journal of Human Sciences, 14(1), 506-518.
4. Boserup, E., & Chambers, R. (2014). The conditions of agricultural growth: The economics of agrarian change under population pressure. Routledge.
5. Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., ... & Snapp, R. (2007). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. Ecological economics, 61(2-3), 267-276.
6. Curran, S. (2002). Migration, social capital, and the environment: Considering migrant selectivity and networks in relation to coastal ecosystems. Population and Development Review, 28, 89-125.
7. Fischer, G., Shah, M., N. Tubiello, F., & Van Velhuizen, H. (2005). Socio-economic and climate change impacts on agriculture: an integrated assessment, 1990–2080. Philosophical Transactions of the Royal Society B: Biological Sciences, 360(1463), 2067-2083.
8. Grabill, W. H. (1944). Effect of the war on the birth rate and postwar fertility prospects. American Journal of Sociology, 50(2), 107-111.

9. Holdren, J. P., & Ehrlich, P. R. (1974). Human Population and the Global Environment: Population growth, rising per capita material consumption, and disruptive technologies have made civilization a global ecological force. American scientist, 62(3), 282-292.
10. Karl-Göran, S. H. C. F., Arrow, K., Jodha, N., Jentoft, S., McCay, B., McKean, M., ... & Young, O. (1996). Rights to nature: ecological, economic, cultural, and political principles of institutions for the environment. Island Press.
11. Korn, R. W. (2002). Biological hierarchies, their birth, death and evolution by natural selection. Biology and philosophy, 17(2), 199-221.
12. Lopes, K. T., Costa, D. F., Santos, L. F., Castro, D. P., & Bastone, A. C. (2009). Prevalence of fear of falling among a population of older adults and its correlation with mobility, dynamic balance, risk and history of falls. Brazilian Journal of Physical Therapy, 13, 223-229.
13. Malthus, T. R. (1872). An Essay on the Principle of Population.
14. Meadows, D. H., Randers, J., & Meadows, D. L. (2013). The Limits to Growth (1972) (pp. 101-116). Yale University Press
15. Müller, A., Schmidhuber, J., Hoogeveen, J., & Steduto, P. (2008). Some insights in the effect of growing bio-energy demand on global food security and natural resources. Water Policy, 10(S1), 83-94.
16. Salim, E. (1986). Pembangunan berwawasan lingkungan.
17. Sharma, P. D., & Sharma, P. D. (2012). Ecology and environment. Rastogi Publications.
18. Soemarwoto, O. (2001). Ekologi, Lingkungan dan Pembangunan. Jakarta: Djambatan.
19. Stonich, S. C. (2021). I am destroying the land!: The political ecology of poverty and environmental destruction in Honduras. Routledge.
20. Tietenberg, T., & Lewis, L. (2018). Environmental and natural resource economics. Routledge.
21. Ummah, H., Suriamihardja, D. A., Selintung, M., & Wahab, A. W. (2015). Analysis of chemical composition of rice husk used as absorber plates sea water into clean water. ARPN Journal of Engineering and Applied Sciences, 10(14), 6046-6050.