

Pollution and its Impact on Sustainable Development

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Abstract: Pollution, with its direct and indirect detrimental impacts on both humans and animals, stands as a paramount concern that researchers are diligently exploring for innovative solutions. Consequently, research endeavors illuminate the definition of pollution, its origins, environmental repercussions, and its various forms, notably radioactive, industrial, and household waste, along with their associated risks. Emphasis is placed on the issue of air pollution stemming from emissions such as fumes, smoke, and gases discharged by vehicles, industrial facilities, volcanic activities, and other sources. Additionally, attention is drawn to soil and water pollution resulting from inadequate treatment of industrial and domestic waste, as well as the usage of chemical fertilizers and pesticides that pose hazards to water bodies, air quality, and soil health. The investigation also delves into the realm of noise pollution, pinpointing its causes which include excessive sound levels from sources like radios, televisions, automobiles, aircraft, and various forms of music.

Keywords: Pollution, development, soil, noise, water, air.

I. INTRODUCTION

The study of pollution and its manifestations and impact on human life is one of the most vital topics at the present time, due to its close relationship with human life on the economic, social and environmental level. Despite human attempts to avoid the dangers of pollution, the exacerbation and multiplicity of its causes, cannot be reduced or controlled, especially after the industrial and economic development achieved by a number of developed countries. At the same time, other countries lacked the ingredients to avoid or reduce the risks of pollution caused by these developments. The research discusses the concept of pollution and its causes and impact on sustainable development. Its dimensions and objectives aimed to develop all the elements of life that meet the basic human needs and modern civil welfare requirements.

The research focuses on the types of radioactive and chemical pollution result from industrial waste, cars, fumes, gases, smoke, etc., and the impact of environmental pollution of air, soil and water in achieving sustainable development. It also deals with the causes of pollution and the effects resulting from it, and the attempts and means to reduce its effects. It also tackles noise pollution, the causes, and means for dealing with it in the light of its negative effects on human life, and the general environment

The concept of pollution

Generally, pollution means everything that negatively affects the elements of the living environment, including humans, plants and animals, and the composition of inanimate natural elements such as air, seas and rivers, soil, etc. . It refers to the spoiling of the environmental components that cause fundamental changes as a result of the presence of energy out of its correct location, time and appropriate quantities. It is the presence of internal materials that change the physical properties that can be observed, and measured without the need

for accurate measurement methods, as well as the chemical properties that are represented by the ability of a substance to combine with others or convert to another substance. Biomaterial features are represented by materials manufactured as an alternative to work in a direct contact with body tissues and organs, for all or some of the environmental components. So, they are transformed from useful elements to harmful elements that lose their role, importance and value in making life. This results in harmful effects on humans, animals, plants and the ecosystem alike .

Environmental pollution is one of the forms of corruption caused by humans. God Almighty mocked everything in the surrounding environment for human service. Yet, Man, through his wrong and unconscious behavior, causes a lot of damage to himself on the one hand, and the environment around him with all its resources and capabilities on the other hand. This matter has negatively affected all living organisms, including plants and animals. The human being is primarily responsible for the pollution of the surrounding environment, and he is the real interest in protecting and preserving it from deterioration and decrease .

In this context, the hole in the Earth's atmosphere (ozone - natural gases that protect the earth from ultraviolet radiation) is attributed to the activities of the industrially developed countries. Its ill effects were not limited to those countries only, but also affected all the inhabitants of the planet. From this standpoint, the interest in the issue of the environment and its protection became a vital matter that aroused the concern of all countries of the world, regardless of their political affiliations and economic development. The developed countries have shown an exceptional interest in their economic programs for the problem of environmental pollution compared to the developing countries, because their population has reached high levels of prosperity and economic growth that has made them strive to protect the environment from the negative effects of the industrial and technological advances that they have reached. Hitherto, the developing countries have not yet reached the fulfillment of the necessary needs and desires of their inhabitants in terms of food and clothing, and their attention has focused on environmental problems and means of satisfying those needs. They aim to preserve their natural resources from deterioration and shortages, without any consideration of the environmental problems that could result from the exploitation of its natural resources.

There are two main types of pollution that humans create in the surrounding environment. The first is characterized by its indirect effect on man, especially the pollution of the surrounding environment components of air, water and agricultural soil, and then its reflection on his personality. The second has a direct effect on the human being himself, such as noise pollution, and other pollutants that it causes.

It can be said that the methods of pollution varied from direct to indirect, but their effect is the same, which is harmful to human health and threatening to his life.

In the same context, the danger of pollutants in the surrounding environment varied widely. They ranged from acceptable, dangerous and very dangerous contamination. However, an acceptable pollution is not accompanied by any clear dangers affecting the aspects of life, within the limits permitted by international organizations and bodies on the surface of the earth. This does not cause any environmental problems. It existed in most countries of the world before the start of industrial developments in the mid-eighteenth century. At that time, the self-technology of the environment was able to absorb and contain that degree. Conversely, dangerous pollution is the one in which the environmental pollutants exceed the safe line, which leads to the disruption of the ecosystem as a whole, and the emergence of risks to the components of the environment, whether living or non-living. The emergence of this pollution is associated with industrial developments and the consequent increase in waste and residues arising from the associated industrial and technological development. Its impact continues to this day, at a time when the most dangerous environmental pollutants exceed the dangerous limit to reach the level of destruction.

It appears that the difference in the severity of the pollution did not prevent it from harming humans, animals and plants, and this depends on possessing a strong immune system.

The causes of pollution

The causes of pollution are varied and different according to their sources. They are negatively affected human, animal and environmental health alike.

1. **Radioactive pollution:** It can be considered as one of the main factors of a global impact. It is not limited to soil only, but also to water and air. Humans are exposed to industrially radioactive materials as a result of the fallout of atomic dust from nuclear bombs, or the emissions in the industrial and military use of nuclear energy and other radioactive materials such as uranium. This led to the collection of war remnants using sound scientific methods and a comprehensive radiological survey.
2. **Pollution by industrial and household wastes:** This type results from the industry sector, which represents one of the main sources of pollution, especially water resources, because most industries are designed in their sites or discharged their waste without taking into account the environmental conditions near rivers. Wastewater for industry was characterized by high concentrations of pollutants, most of which were discharged into rivers without treatment. Unprogrammed industrial development devoid of safety measures and taking into account the environment. Random urbanism, population development, and consumer demands exacerbate the problem and increased its damages. This fact necessitates the establishment of advanced factories to burn waste and to fragment them, to enact environmental laws that compel every company or factory to bear the costs of collecting, transporting and treating waste. It is essential to manage industrial waste through the reuse of metals, plastics, paper and glass, taking into account the necessity to avoid the

hazardous effects of flammable, and reactive or toxic waste.

3. **Population growth:** Population growth pushed the unnatural exploitation of natural resources to provide the basic requirements for daily life, and increase public wealth and economic growth. The increasing demand per person depleted the production of goods and services, results in a waste of materials and energies.
4. **The nature of modern technology:** It has been closely linked in recent years with the environmental crisis. The productive technologies of World War II, which had severe impacts on the environment, replaced the earlier, less destructive technologies. This led to the emergence of non-biodegradable synthetic materials such as plastics, chemical nitrogen fertilizers, synthetic detergents, synthetic fibers, large cars, petrochemicals and other environmentally harmful industries.
5. **Agricultural and industrial development:** Agricultural development has contributed to the expansion of agricultural lands and the increase in productivity due to the development of modern scientific technologies. The increase in the production and use of chemical fertilizers, the expansion in the fields of irrigation, and the development of high-yield varieties of seeds create dangerous environmental problems. The industrial development, which represented a criterion of modernity and a necessary element for the socio-economic development of society, led to the problems of environmental pollution. The rapid rate of industrialization led to the rapid exploitation of natural resources and the increase in industrial production.
6. **Urbanization:** The displacement of people from rural areas to urban centers have expanded due to industrial development and led to environmental degradation and pollution in developed and developing countries. The concentration of the population began to increase in a limited area, which led to an increase in buildings, roads, streets, sewage drainage, storms, vehicles (cars, trucks, buses, motorcycles ... etc.), and an increase in the number of factories, waste, smoke, dust and sewage water.

Air pollution

Air cleanliness is closely linked to human health, comfort and enjoyment. This is what can be clearly felt when the individual moves from a crowded and populated city to the countryside or coastal areas of the sea. The difference between the two is distinguished in the purity of the air. It can be said that air pollution is an expression of a change in the physical and chemical composition of the air, which may be in the form of particles in the air such as dust, vapors, carbon dioxide, gases. The sources of this pollution differ according to the nature of the achieved action that it causes, and its effects lie in:

1. He exhaust from transport cars, whose danger has reached a high level and even fatal in some countries, according to the study presented by the University of Birmingham, England. There is a close correlation between individual deaths and vehicle exhaust pollution. In 2005, a study indicated more than three hundred and ten thousand people died in Europe due to air pollution and their affliction with lung diseases, respiration, allergies, asthma, narrowing of the

arteries of the heart and others. This required a number of countries to enact environmental laws to limit car exhaust emissions and limit their movement on the roads .

2. Gases results from various forms of manufacturing processes are one of the main causes of air pollution, which is more widespread than the rest of the other types of pollution, due to its easy transfer and spread in different regions.
3. Construction operations, such as demolishing buildings, roads, and various projects are an important and major source of stirring dust and the dispersal of its fine particles into the atmosphere and causing pollution. The sources of gas emissions and air pollution can be classified into the following :
 - a. Manufacture and transportation of construction materials.
 - b. Energy consumed in construction equipment.
 - c. Energy consumption that is used to treat building process of input sources.
 - d. Method of disposal of waste result from construction operations.
4. Volcanic eruptions and ground earthquakes are another cause of air and environmental pollution that comes from nature. Its residues of dust, gases and heat emissions are the causes of air pollution. Man is considered the first and most influential source of air pollution due to the uncontrolled activities he performs in his productive work or his daily life practices. This is confirmed by the Organization for Economic Co-operation and Development which indicates that human subtraction of carbon dioxide through his various activities is responsible by about (60%) for the increase in the phenomenon of pollution and high temperatures of the air and the globe.

Pollution of soil and water

Information released by the institutions of soil science and water resources reveals that soil pollution is the entry of foreign objects that leads to a transformation in the chemical and physical composition. This results from the use of pesticides, fertilizers, and acid precipitation that change the pH of the soil - measuring its acidity - and dumping radioactive waste, etc .On the other hand, pollution affects water sources, whether oceans, seas, lakes, rivers, and groundwater, causing direct and indirect harm to all living organisms. Water pollution has become the main problem all over the world, and has become a major cause of death and disease, not only in poor and developing countries, but also in industrialized and developed countries.

Governments have struggled through their various institutions and civil organizations to address the problem of water pollution. In this regard, the World Health Organization has indicated startling figures about the role of polluted water in killing about five million people annually in the world, which is more than what is caused by the acquired immune deficiency disease (AIDS), which kills three million people annually. Typhoid, gastroenteritis, diarrhea and vomiting, hepatitis and brain infections, prostate, lymph nodes, liver diseases, rashes, hormonal problems and others are the most prominent diseases that result from water pollution that affects humans and leads to death.

The sources of water pollution in the world are many and different due to the diversity of methods that led to the pollution. Yet they can be determined mainly as follows:

- ✚ Various industrial processes lead to direct or indirect pollution of water, such as throwing industrial waste or water used in manufacturing processes into natural waterways in violation of the law and environmental regulations. This leads to human harm depending on the nature of the material and the waste. If water is drunk directly or through filtering and sterilization processes that do not meet the appropriate health conditions, the damage will be reflected on humans, fish and other aquatic and non-aquatic organisms that live in or consume it directly. The impact of the industry and its uncontrolled processes on the water, especially the emission of smoke and toxic gases from factory chimney towers, lead to air pollution. Also, acid rain that results from human activities can interact in the atmosphere and mix with particles Pollutants in the air to lead to soil pollution. Then, its slope to waterways leads to the death of plants and aquatic animals, and perhaps humans as well.
- ✚ Human errors in dealing with machinery, machines and various means of transportation, extractive and transformational processes of raw materials, and the leakage of oil from large and giant oil tankers have increased the degree of water pollution and their impact on human beings and aquatic and natural animals. It also includes the field of oil extraction and the transportation of its derivatives on ships across oceans and seas, and between the oil-producing and the oil-consuming countries.
- ✚ The use of chemical fertilizers to help agricultural crops grow quickly and in a larger size that are added to the soil and sprayed on plants can seep into the groundwater as a result of rain or watering, and eventually reach different waterways and leading to water pollution.
- ✚ Solid (heavy) waste leak from homes directly into natural water streams, especially in poor cities that do not contain infrastructure to protect the environment such as sewers or earth-tight box tanks to preserve the waste and withdraw it through the designated pond cars for this.

Means of preventing pollution

Incineration is used in special furnaces that built from refractory bricks, which represent a mass of ceramic fused lining furnaces and stoves to withstand the high temperatures that guarantee the killing of microbes and insects and the disposal of waste and garbage residues. Ash residues are received in areas far from the population and farms, especially in uninhabited desert areas or by filling ponds, swamps and canals to be disposed of, after treating them chemically to kill their microbes and insects and to cover them with quantities of sand three centimeters thick in distant areas. As it is a salty area, it is not suitable for cultivation until about forty-five days of treatment and drying.

In order to avoid the spread of diseases that are transmitted to humans through polluted water used for irrigation of fruitless agricultural crops on the one hand, and to maintain long-term fertility of the soil on the other hand, it is necessary to treat sewage water before its use in irrigation . On the other hand, wastes such as (manure - food remnants in the rumen) and (dung - what the hoof excrement brings) are collected and transported outside the city away from the slaughterhouse in places designated by the municipality, then it is buried in trenches and covered with a layer of soil not less than half a meter. It can be used as agricultural fertilizers

Waste disposal depends on the following methods:

- ✚ The unfit waste are collected and the appropriate disinfectants are put on it. Then, they are put in boxes and disposed of by burning or burial under the supervision of the municipality concerned in the region. The provision of small cars, equipment, supplies and specialized manpower is also taken into consideration.
- ✚ The space allocated for containers carrying waste behind the slaughterhouse from the level of the natural surface is reduced about by about 1.80 meters to facilitate unloading the contents of small cars in it.
- ✚ An appropriate system for disposing of wasted water outside the slaughterhouse area is provided after treating it chemically, and then disposing of it in the public sewers of the city.
- ✚ Meat transport vehicles are sold to prevent contamination.

These methods are of great importance to prevent or reduce pollution, if they are adopted according to sound principles.

Noise pollution and its health and psychological impact

Our civilized world is facing another type of environmental pollution on the social, cultural and scientific level, results from an unwanted sound that can affect human health by negatively affecting his psyche. It leads to discomfort and aggressive behavior, or even exposure to high blood pressure or sleep disturbances that sometimes lead to severe depression. Frequently, the source of this pollution is the transportation systems, construction, machinery and equipment used in many fields. The poor urban planning of cities is one of the causes of this type of pollution, especially in London Heathrow Airport, which is located about twenty kilometers from the center of the capital in the western direction, within the surrounding residential neighborhoods. London has suffered from the noise of airplanes landing very close to their surfaces.

Other sources of noise pollution that would have a negative impact not only on the psyche and comfort of the human being, but even on the hearing sense of those working in these professions, such as loud concerts, emergency sirens, the sound of alarms in cars, construction and demolition of buildings, animal sounds, etc.,

Health and psychological effects of noise pollution

- ✚ **Psychological effects:** The high volume of voice above the normal range leads to a lack of vital activity, excitement, anxiety, tension, confusion, disharmony and lack of thinking. However, this depends on several factors, including the length of exposure, the intensity of the voice, the location of the hearer from the source of the sound, and the sudden sound.
- ✚ **Neurological effects:** The effect of noise reaches through nerve fibers to the central cells of the brain and irritates them, which is reflected in the body's organs, especially the heart, the nervous and digestive systems .
- ✚ **The effect on hearing:** When a person is exposed to a sound of very high intensity, he begins to get upset and complain about it, which causes a weakness in the sense of hearing.

The most important sources of noise and methods of treating it

The factors of human activity, especially the various means of transport that include the land, such as cars, motorcycles, freight carriers, etc., are among the most important sources of noise in addition to construction and urban construction, road paving and service projects, and electrical appliances used in homes and work offices, including television, radio and vacuum cleaners. And others, and finally factories and industrial establishments. Natural factors (thunder, high sea waves, volcanic eruptions, earthquakes) participated in this . The following are among the methods of treating noise pollution:

1. The speed of cars should be restricted to prevent the use of the parking brake, and the loud and annoying noise emitted by them, with the development of traffic regulations to regulate traffic and determine the types of trucks permitted to use the roads.
2. Aircraft noise should be restricted by adjusting flight directions over major cities and moving airports outside them, using the day runway mostly instead of night landing, and supporting housing near airports with buffer walls to reduce noise.
3. The work system and the design of industrial equipment should be reconsidered to reduce noise in factories, as well as the use of protectors to block the sound from the ears of workers or cover the internal walls of factory buildings with covers that absorb sound.
4. The state put laws and regulations that limit noise pollution.
5. Raising awareness through the various media to survey the dangers of noise on public health.
6. The proper urban planning should be taken into account and the sites of schools, hospitals and residential areas that are far from the sources of noise.
7. Increasing green spaces can be achieved by creating gardens around housing, schools and neighborhoods.
8. Keep airports, railway stations and public transport away from city centers and populated areas.
9. A comprehensive traffic plan can be developed to ensures traffic flow and traffic flow to prevent congestion, which is one of the main causes of noise.
10. The use of sound-insulating materials in building homes, work offices, schools and hospitals, especially in crowded and noisy locations.
11. The use of loudspeakers, car alarms, televisions, radios, music, etc should be limited.

The Concept of Sustainable Development

Sustainable development can be defined as a dynamic process consisting of a series of balanced social, economic and environmental measures and changes aim to develop human energies, and protecting the earth, cities and trade. It aims to secure the needs of society, its welfare, security, safety and prosperity, without compromising the ability of future generations to achieve this in the future. Accordingly, it means the creative and productive work conditions that provide the income and a better life for all people. This does not mean reducing them to enhancing economic and material benefit or well-being only, but rather seeks to develop human capabilities in a healthy environment that contributes to raising the scientific, cultural and social level of society.

The main goal of sustainable development is human development, whose goals can be summarized as follow:

- ✚ It Builds a society capable of facing life and its developments in a positive and effective manner.

- ✦ It helps positive thinking and developing its horizons towards depth and inclusiveness.
- ✦ It educates societies on mastering the communicative skills according to sound moral foundations.
- ✦ It enhances the individual's ability to develop his performance and capabilities in accordance with the requirements of his job and his tasks.
- ✦ It emphasizes the value and importance of time, training skills, utilizing energies and talents, drawing life goals, and mastering how to deal with problems in a positive and effective manner .

Negative effects of pollution on sustainable development

Pollution has a significant negative impact on sustainable development, which can be summarized as follows:

- ✦ It leads to decline in agricultural and animal production due to the infection of animals, plants and crops with various pests and diseases.
- ✦ It decreases the labor productivity in various economic sectors as a result of workers suffering of various types of diseases and psychological and social problems.
- ✦ The decrease in the productivity of the economic sectors is accompanied by an increase in spending money to address the social and economic effects of environmental pollution, which burdens the state treasury and contributes to impeding the development process. However, the exacerbation of environmental problems increases with lower development rates and high costs, which necessitated the contribution of society and all stakeholders in the public and private sectors in preserving the environment, in order to reduce the negative effects of environmental pollution that impede the development process .

Economic effects of environmental pollution

In light of the continuing exacerbation of environmental pollution, economists have argued that the degree of overcoming the problem is measured by the size of the real income per person. Formed a criterion for progress is represented by working to raise the average per capita real income, while economic activity does not continue due to the increase in the consumption rates of permeable natural resources. The practice of production and consumption activities leads to the emergence of wastes in nature that require disposal. The more waste, the greater the pollution rates in the environment surrounding humans .

The most important negative effects resulting from environmental pollution are the following:

First: The environmental impacts resulting from toxic waste: Despite the danger of toxic waste, some countries have found the Environmental Depot a solution without costs to dispose of them. The accumulation of toxic waste and not disposing it by scientific methods leads to many environmental problems, especially pollution in all its dimensions. It leads to air pollution with viruses, epidemics, and dangerous diseases .

Second: The economic impacts resulting from the accumulation of hazardous wastes: There are several economic impacts results from the accumulation of hazardous waste, and failure to dispose of it by scientific methods, including:

1. The length of the bed rotation period in the hospital is prolonged due to the spread of diseases and germs, which leads to the prolonged stay of the patient in the

hospital as a result of air pollution with microbes and epidemics.

2. The per capita health care costs rise, and the increase in the number of injured leads to the absence of workers from production centers, which leads to a decrease in productive capacity.
3. Pollution-fighting costs increase as governments spend huge sums of money to combat pollution resulting from the accumulation of waste. This exacerbates the economic losses of lost materials, energy and processing costs that exceed the budget of some countries.
4. Pollution affects development rates, as its increase contributes to reducing the volume of economic resources allocated to support basic needs and disrupting their employment in the right context.
5. The economic and human impacts result from the explosion of nuclear plants that leave dangerous nuclear and radioactive waste and radioactive quantities in the atmosphere .

The economic costs of environmental pollution

It includes the costs of the measures are taken to manage the environmental impacts that result from the activity of the production unit, as well as the other costs required by the objectives or the environmental requirements of the production unit. Environmental expenditures represent the costs of the steps taken to avoid environmental damage resulting from the exercise of the production unit's activity. It includes the expenses of landfill and disposal of waste, water and air quality conservation and improvement, noise reduction, and the search for products, raw materials and production processes that are more environmentally friendly. In general, the costs are divided into:

Direct environmental costs: It includes (medical treatment of diseases caused by production units, wages and salaries for people with disease due to pollution, damage to agricultural crops in areas affected by pollution, waste disposal operations).

Indirect environmental costs: which serve the production stages as a whole, such as the costs of environmental resources depleted during the production process, especially air, water, plants and animals. The negative effects of pollution are not limited to the material losses it causes, but also include the amount of money spent on getting rid of pollution, combating it, and protecting the environment from it. It depends on the funds allocated to implement development plans.

The impact of environmental pollution and protection of sustainable agro-economic development

At a time when the human being represents the objective of development, he is one of the most important means of achieving it. The preservation of his health and well-being are among the most important objectives of plans and programs. Relevant studies have shown the negative consequences of the human role in polluting terrestrial or aquatic agricultural resources and its impact on the areas of agricultural development in society. In order to achieve the objectives of any development programs, the economic resources available in the surrounding environment (air, water, land) must be better exploited to maintain them from degradation and decline. There is a correlation between economic resources and environmental development, as economic development cannot be achieved without those resources. When the size of economic resources in general and natural resources in particular increases, the opportunities for

development increase, and vice versa. At the same time, the economic resources are only found in an environment with which man interacts and harnesses them to satisfy his human desires. Then, any deterioration in the surrounding environment could lead to the faltering of economic development plans and programs in society. There are many development models that have led to the depletion of environmental resources on which economic development is supposed to be based.

The protection and preservation of natural resources is a humanitarian issue, in which the person is primarily responsible for its pollution and waste, as well as the first victim of its negative effects. At the same time, the responsibility falls on his shoulders to protect and prevent pollution. This leads the human being to the necessity of preserving these resources from depletion and annihilation, and to exploit them with knowledge and rationality in order to achieve his wellbeing. There are several means and methods that can protect and preserve agricultural natural resources from the qualitative degradation resulting from pollution. Preventive ones are based on the use of clean production technology that does not lead to the emission of pollutants. At the same time, there are other procedural means that were based on laws and legislations in protecting natural resources to limit the pollution of available natural resources.

CONCLUSION

The research has yielded significant findings, underscoring pollution as the foremost threat to human, animal, and plant life, both directly and indirectly. Pollution emanates from various sources, including atomic radiation, factory emissions, transportation exhaust, chemical pesticides, and waste disposal. Among these, air pollution stands out as particularly hazardous due to its wide-reaching impact and challenges in containment. Contaminated water usage and indiscriminate pesticide application contribute to soil pollution, while improper disposal of liquid and solid waste poses risks to human health and marine ecosystems. Central to the goals of sustainable development is the pursuit of well-being and prosperity across social, economic, and environmental spheres. However, pollution significantly impedes progress toward these objectives, wreaking havoc on agricultural, industrial, and livestock sectors. Moreover, pollution detrimentally affects human health, diminishing skills and hindering aspirations for a better quality of life and environment.

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