



Environmental Pollution as a Risk Indicator to Public Health

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Abstract:

Environmental pollution is one of the most prominent contemporary health challenges, as it is considered one of the main factors contributing to the deterioration of human health and the rise in rates of chronic and infectious diseases. Air, water, and soil pollution lead to respiratory disorders, heart disease, and cancer. Reports from the World Health Organization indicate that millions of premature deaths annually are attributed to preventable environmental factors. Accordingly, pollution has become a decisive indicator by which the level of environmental threat to public health is measured, necessitating comprehensive intervention at both national and international levels. Confrontation tools include enacting strict environmental legislation, activating monitoring, strengthening scientific research in the field of environmental health, in addition to raising community awareness of the importance of preserving ecosystems as a basic condition for ensuring human health and well-being.

Keywords: *environmental pollution, health, environmental protection, human rights, conferences, agreements*

La pollution environnementale comme indicateur de risque pour la santé publique

Résumé :

La pollution environnementale est l'un des défis sanitaires contemporains les plus importants, car elle est considérée comme l'un des principaux facteurs contribuant à la détérioration de la santé humaine et à l'augmentation des taux de maladies chroniques et infectieuses. La pollution de l'air, de l'eau et du sol entraîne des troubles respiratoires, des maladies cardiaques et des cancers. Les rapports de l'Organisation mondiale de la santé indiquent que des millions de décès prématurés chaque année sont attribués à des facteurs environnementaux évitables. En conséquence, la pollution est devenue un indicateur décisif permettant de mesurer le niveau de menace environnementale pour la santé publique, ce qui nécessite une intervention globale aux niveaux national et international. Les outils de lutte contre la pollution comprennent l'adoption d'une législation environnementale stricte, la mise en place d'un système de surveillance, le renforcement de la recherche scientifique dans le domaine de la santé environnementale, ainsi que la sensibilisation des communautés à l'importance de la préservation des écosystèmes comme condition fondamentale pour garantir la santé et le bien-être humains.

Mots clés : *pollution environnementale, santé, protection de l'environnement, droits de l'homme, conférences, accords*



Introduction:

In Islam, preserving the environment is considered a duty, as great importance is given to protecting the environment, considering it part of the trust that God has placed upon man on earth, as He says: *“He produced you from the earth and settled you in it”* (Surah Hud, verse 61), which places upon man the responsibility of building the earth, not corrupting it. The issue of environmental protection is an integral part of human rights issues, and the growing recognition of the right to a sound environment is attributed to the deep interconnection between environmental issues and human rights and fundamental freedoms, and to the growing awareness of the seriousness of environmental degradation experienced by natural systems in which man lives. This has made this right an integral part of the internationally recognized system of rights.

Global environmental degradation has prompted many countries to develop national programs and strategies aimed at addressing this escalating threat and reducing its negative effects on human health and societal stability. Algeria is among the countries that have taken the initiative to adopt a set of preventive and intervention measures, within the framework of an environmental policy aimed at reducing pollution levels and strengthening the protection of natural resources, in line with its international commitments and enshrining the citizen’s right to a safe and sound environment.

Perhaps the most important reasons that prompted us to choose this topic, despite the scarcity of research and

studies, is to understand the danger of environmental pollution on human health.

The study of this topic raises the following problem: To what extent can environmental pollution be considered a fundamental indicator for measuring the impact of the environment on human health? And what are the most prominent efforts exerted to guarantee the human right to live in a sound and safe environment?

The nature of the subject requires reliance on the descriptive-analytical method through our presentation of the legal texts that dealt with the phenomenon of environment and environmental pollution, analyzing and interpreting them in order to provide a descriptive study on the necessity of protecting the human environment from all forms of degradation and pollution.

Thus, we will address our subject through a binary plan divided into two axes, whereby in the first axis we address the environmental manifestations of pollution and their health impacts, while in the second axis we address international and national policies to protect health in the face of the challenges of environmental pollution.

1. Environmental Manifestations of Pollution and Their Health Impacts

In light of industrial progress and rapid urban expansion, the issue of environmental pollution has become one of the topics and issues addressed at both the international and national levels due to its connection with the universe in which all living beings exist.



1.1. The Concept of Environmental Pollution and Its Types:

Environmental pollution is considered one of the most prominent contemporary challenges threatening natural balance and human health alike. The law has defined pollution as any direct or indirect alteration of the environment caused by any act that creates or may create a harmful situation for the health and safety of humans, plants, animals, air, atmosphere, water, land, and collective and individual property. From this we conclude that environmental pollution is the introduction of harmful materials or energy into the components of the natural environment at unusual concentrations, leading to ecological imbalance and deterioration of quality of life (air, water, soil). These pollutants may arise from natural sources such as environmental disasters, or from increasing human activities such as industry, agriculture, and transportation. Its danger lies not only in its impact on the environment, but also in its health effects (respiratory diseases, heavy metal poisoning, developmental disorders in children).

Environmental pollution is one of the most significant challenges facing societies, given its multiple types, namely:

- **Air pollution:** Air pollution results from several factors that may be natural or man-made. The American Public Health Association defined air pollution as an increase in the concentrations of substances foreign to the basic composition of air that affect the individual's health and cause damage to his property. The legislator also defined it in Article 04 of Law 03/10 as: the introduction of any substance into the air or atmosphere due to the emission of gases,

vapors, fumes, or liquid or solid particles that may cause harm or danger to the living environment.

- **Water pollution:** Water pollution is one of the most significant environmental challenges facing societies, as water covers about three-quarters of the earth's surface and is therefore one of the most important factors of life. The World Health Organization defines water pollution as the presence of substances or microorganisms in water in amounts or concentrations that negatively affect human health or other uses of water. The Algerian legislator defined water pollution as the introduction of any substance into the aquatic environment that may alter the physical, chemical, and/or biological properties of water, causing risks to human health, harming wild and aquatic animals and plants, affecting the beauty of sites, or hindering any other natural use of water.
- **Soil pollution:** Soil is one of the most important natural resources representing a source of food and sustenance, yet man often misuses it through unsustainable practices that negatively affect its ecological balance. Soil pollution occurs either as a result of natural disasters such as volcanoes and earthquakes, or as a result of direct human intervention, especially through the accumulation of solid waste and materials resulting from industrial, agricultural, and domestic activities, leading to the deterioration of its physical and chemical properties and threatening its productive capacity.



1.2. 2) Analysis of the Health Effects Associated with Each Type (Respiratory Diseases, Infectious Diseases, Cancer, Sleep Disorders...):

The health impacts resulting from environmental pollution represent a serious challenge to public policies, especially in countries striving for sustainable development without compromising human rights.

- **Effects of water pollution:** Water pollution contributes to the spread of waterborne epidemics, and is closely linked to the emergence of health problems in humans, as water is an effective medium for transmitting microorganisms that cause diseases. When water sources are polluted, these organisms are transmitted to humans through consumption or direct use, contributing to the spread of infections and threatening public health, especially in environments lacking effective treatment and monitoring systems. Diseases often resulting from water pollution include:
 - Waterborne diseases: such as cholera, typhoid.
 - Heavy metal poisoning: such as lead and mercury, causing neurological and developmental problems.
 - Digestive system disorders: resulting from drinking water contaminated with bacteria or chemicals.
 - Effects on reproductive health: some pollutants affect fertility and increase the risk of birth defects.
- **Effects of air pollution:** Air pollution leads to diseases that harm human health and physical well-being. Air pollution is represented by unacceptable

changes in the natural, chemical, and biological properties of the air humans breathe, which causes harm to their lives. The most harmful elements are carbon dioxide, fine particles, nitrogen oxides, and carbon monoxide. These pollutants result in several diseases, including:

- Respiratory diseases: such as asthma, chronic bronchitis, and lung cancer.
 - Cardiovascular diseases: due to prolonged exposure to fine particles (PM_{2.5}) and nitrogen oxides.
 - Neurological disorders: especially in children, where air pollution is linked to reduced cognitive abilities and increased risk of autism.
- **Effects of soil pollution:** Soil pollution harms human health and other environmental components alike, as it is one of the real environmental risk sources due to its association with the accumulation of pollutants resulting from industrial activities, mining, and the use of chemicals. These pollutants lead to the deterioration of soil's biological and physical properties, threatening ecosystem integrity and exposing humans to direct health risks through the food chain or direct contact with contaminated soil. Soil pollution and degradation affect the environment where plants cannot grow, live, or reproduce, turning land into barren areas characterized by desert-like features. Among the impacts of this pollution are:
 - Chronic poisoning: due to exposure to substances such as cadmium and arsenic through food.



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- Skin and respiratory diseases: especially in areas near landfills or factories.
- Growth effects in children: due to absorption of toxic elements from soil through food or playing in polluted environments.

Thus, water, air, and soil pollution are among the most prominent sources of risk to public health, as these forms of pollution contribute to the spread of respiratory and digestive diseases and the exacerbation of chronic poisoning, especially among vulnerable groups such as children and the elderly.

2. International and National Policies to Protect Health in the Face of Environmental Pollution Challenges

In the context of confronting the challenges arising from environmental pollution, preventive policies and mechanisms emerge as a fundamental pillar for protecting public health. These measures are adopted through enacting strict environmental legislations, and enhancing sustainable urban planning that takes into account health and environmental dimensions. Environmental justice also constitutes a tool to ensure equitable distribution of protection, especially for vulnerable groups. These policies are supported by practical systems that include environmental monitoring and continuous risk assessment, in addition to health education campaigns and encouraging scientific research linking pollution indicators and diseases. The effectiveness of this approach requires institutional integration between the health, environmental, and educational sectors, to ensure the sustainability of

interventions and to secure a healthy environment for future generations.

2.1. The International Framework for Combating Environmental Pollution

Environmental pollution is one of the most prominent risks facing the international community in its endeavor to protect environmental human rights, as it constitutes a direct violation of the right to a sound and safe environment. The increasing negative effects of pollution, whether on public health or on ecosystems, have led to intensifying international efforts to hold conferences and conclude multilateral environmental agreements, represented in:

1) International Conferences:

- **Stockholm Conference:** Considered the first international conference held under the supervision of the United Nations with the aim of addressing environmental issues from a human and rights perspective, convened in Stockholm, Sweden, on June 6-7, 1972. This conference came in response to a General Assembly resolution, with representatives of 113 states participating. The conference adopted the slogan *One Earth*, reflecting the growing global concern for environmental protection. The conference resulted in the issuance of the "Declaration on the Human Environment," which received unanimous approval, and included 26 principles and 109 recommendations of great importance, to be followed by states and specialized international and regional organizations, as they addressed various aspects of the relationship between man and the environment,



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and emphasized the need for balance between economic development and the preservation of natural resources. This declaration constituted a fundamental international reference in building international environmental law and contributed to consolidating the concept of the “right to a sound environment.” In conclusion, the Stockholm Conference of 1972 can be considered a pivotal station in the development of the international system, as it marked a decisive turning point towards integrating the environmental dimension into global policies. This conference launched an unprecedented collective dynamic represented in the adoption of international measures and recommendations aimed at protecting the human environment from the dangers of pollution, and establishing the right to a sound environment as part of the fundamental human rights.

- **Nairobi Conference:** The Nairobi Conference was established between May 10 and 18, 1982, in the capital of Kenya, and came as a complementary step to the outcomes of the Stockholm Conference, as it sought to evaluate the progress made in the field of environmental protection after a decade of international efforts. The members of this conference agreed to establish an implementation mechanism they called the *Nairobi Declaration*, consisting of ten articles that defined the main environmental problems and how to address them. This conference focused on strengthening cooperation between developing and developed countries, and

emphasized the importance of integrating the environmental dimension into development policies, stressing the need to achieve environmental justice among peoples. It is also considered a strategic step towards enabling Africa to play an active role in global climate governance, reflecting its aspirations to achieve environmental and developmental justice through the Nairobi Declaration issued at the conclusion of the African Climate Summit in September 2023. Thus, the Nairobi Declaration is an advanced step towards strengthening international environmental law and consolidating the principles of international cooperation, as it called upon the peoples and governments of the world to shoulder their historical responsibilities in facing environmental challenges, whether at the collective or individual level.

- **Rio de Janeiro Conference:** The Rio de Janeiro Conference was held in Brazil from July 3 to 14, 1992, at the invitation of the United Nations Conference on Environment and Development. Representatives of 178 states participated, including 116 heads of state and government, and for this reason, the conference was called the Earth Summit (*Sommet de la Planète*). This conference constituted the first serious global attempt to link environmental issues with sustainable development within a comprehensive legal and institutional framework, and was considered a pivotal turning point in the course of building international environmental law. It resulted in the adoption of a set of themes, the most important of which were:



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- Protection of the atmosphere (climate change – global warming – depletion of the ozone layer – transboundary air pollution).
- Protection of land resources (combating deforestation – soil loss – desertification and drought).
- Protection of biological diversity.
- Protection of freshwater resources.
- Improving the quality of life and human health, eliminating poverty, and combating environmental degradation.

The scope of actors in environmental governance was also expanded to include developing countries and civil society. Thus, the Rio de Janeiro Conference contributed to establishing the foundations of international cooperation in confronting transboundary environmental challenges, and also contributed to paving the way towards developing more effective legal mechanisms to enhance environmental justice at the global level. This was confirmed by most reports issued by environmental and human rights experts, which emphasized that the right to the environment includes guaranteeing a suitable environment that enables humans to live with dignity, with the provision of the minimum elements of a healthy and sound environment necessary for the continuation of life.

1) Agreements:

International agreements are considered one of the most important legal sources for protecting the human environment, as they contributed to consolidating international legal principles that oblige states to take necessary measures to put an end to pollution through the

conclusion of a set of multilateral agreements, among the most important of which are:

- **Montreal Protocol on Substances that Deplete the Ozone Layer:** The first conference in which the problems of the ozone hole were discussed under the auspices of the United Nations was held in Montreal, Canada, in 1988. This is the Montreal Protocol on Substances that Deplete the Ozone Layer, signed by 31 adopting states. This protocol came in response to the serious threats posed by ozone-depleting chemicals to human health and ecosystems. Its objectives were to gradually reduce the production and consumption of ozone-depleting chemicals, such as chlorofluorocarbons and halons, and to support developing countries through a funding mechanism and provision of alternative technologies. The practical experience of this protocol proved its effectiveness, as it contributed to a significant reduction in the production and use of ozone-depleting substances, and it is regarded today as a successful model for implementing international environmental law.
- **Basel Convention:** The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal was adopted in 1989 and entered into force in 1992. This convention is considered one of the most comprehensive environmental agreements in the field of regulating the management of hazardous and other wastes, with 181 member states, giving it a global character and enhancing its effectiveness in addressing transboundary environmental challenges. Among its



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main objectives is to reduce the generation of hazardous wastes in terms of quantity, as well as to prevent the export of such wastes to developing countries without prior informed consent. The convention encourages the disposal of wastes as close as possible to their source to avoid transboundary pollution. In addition, it emphasizes the necessity of environmentally sound management of wastes at all stages, from production through transport to final disposal. As of March 31, 2011, 14 regional and coordinating centers had been established under the Basel Convention.

- **Paris Agreement:** The Paris Agreement, also known as COP21, is considered the first comprehensive international agreement concluded to address climate change. It was reached following intensive negotiations during the United Nations Climate Change Conference held in Paris on December 12, 2015, and entered into force on November 4, 2016, adopted by 197 states. Among the most important points in this agreement are limiting global warming, achieving balance between emissions and carbon absorption, and enhancing the ability to adapt to the negative effects of climate change. It also referred to the provision of financial and technical assistance to developing countries.

2.2. The National Framework for Combating Environmental Pollution

Algeria relies in its fight against the phenomenon of environmental pollution on a multi-dimensional national

strategy aimed at achieving a balance between development requirements and the protection of the environment and public health. This strategy is based on a set of complementary axes, most notably:

- **Enhancing Environmental Information and Awareness (Sensitization):** Algeria has given increasing importance to strengthening environmental information and awareness, considering them as essential tools for instilling environmental culture in the citizen. Environmental awareness was included in public policies through the organization of information and study days aimed at spreading environmental awareness culture. Environmental education was also integrated into curricula, and conferences and many lectures on environmental health were organized. The *Environment Train*, known as *Dounia Train*, was launched, visiting most of the country's provinces and carrying drawings and models embodying how to protect the environment. It witnessed a large turnout from citizens, reflecting the extent of Algerian citizens' awareness of the seriousness of the situation.
- **The Legislative Framework (Field of Law):** Algeria has ratified several international agreements that stipulate the protection of the environment (Basel Convention, Paris Agreement, Vienna Convention, and the Montreal Protocol). Algeria also issued several environmental laws regulating and defining activities with environmental impact, most notably Law No. 03-10 related to environmental protection within the framework of sustainable development. Algeria also established the Ministry of Environment



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and Quality of Life and several governmental ministerial institutions entrusted with protecting the environment (National Waste Agency, National Observatory for Environment and Sustainable Development, General Inspectorate of Environment).

- **Public Health (Physical and Psychological):** Public health, in both its physical and psychological aspects, is one of the areas most negatively affected by environmental pollution. This reality has led to a shift from considering environmental protection as an independent goal, to considering protecting humans through protecting their environment an urgent necessity. Continuous exposure to pollutants leads to the exacerbation of respiratory and skin diseases, and contributes to psychological disorders such as anxiety and depression. Thus, the importance of integrating the health dimension into environmental policies is an obligation, since ensuring a sound environment is a basic condition for a dignified life, and enhances human well-being and physical and psychological safety.

Conclusion:

In conclusion, it is clear that the relationship between the environment and human health is an organic relationship that cannot be separated, as any imbalance in the environmental balance leads to direct negative repercussions on the physical and psychological well-being of individuals. From this standpoint, the protection, development, and

purification of the environment from sources of pollution is not merely an option, but is considered one of the most prominent moral and legal duties incumbent upon the international community, within the framework of striving to achieve environmental justice. This responsibility also constitutes a fundamental obligation for the Algerian state, which, in accordance with its national legislations and international commitments, is tasked with ensuring the human right to a sound environment that secures a dignified and safe life, and enhances his well-being and health and social stability.

In this regard, we have seen fit to conclude with some recommendations:

- Strengthening environmental governance through effective legal mechanisms, and transparent institutional oversight that ensures the application of environmental standards and holds actors accountable for health and environmental damages.
- Integrating digital solutions in monitoring pollution sources and analyzing health data to achieve environmental justice.
- Issuing awareness bulletins directed at citizens with the aim of motivating them to modify negative environmental behaviors, through raising awareness, such as educating families on how to sort waste.
- Establishing an international court specialized in adjudicating environmental disputes, in order to accelerate the handling of environmentally related cases on the one hand, and unify international judicial jurisdiction in this field on the other.
- The commitment of industrial states to using clean technology in industry, as well as encouraging



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industrial institutions and companies to preserve the environment by granting them incentive privileges, as one of the effective mechanisms to enhance the environmental responsibility of the industrial sector.

- Making the integration between international legal systems, whether at the global or regional level, a fundamental factor for achieving more effective and comprehensive environmental protection. This principle also applies to national legislations, which should be consistent with relevant international charters and agreements.

List of References:

1. Article 04 of Law 03/10 dated 19 July 2003 concerning environmental protection within the framework of sustainable development, Official Gazette No. 43, issued on 20 July 2003.
2. Najm Al-Azzawi, Abdullah Hikmat Al-Faqar, *Environmental Management: Systems, Requirements and ISO14000 Applications*, 1st edition, Dar Al-Maseera for Publishing, Distribution and Printing, Amman, Jordan, 2008, p. 103.
3. World Health Organization. (1984). *Guidelines for drinking-water quality: Volume 1 - Recommendations*. Geneva: WHO.
4. Article 04 of Law 03/10.
5. Tarek Mohammed, *Environment and Its Degradation Axes*, Shabab Al-Jami'a Foundation, Alexandria, 2008, p. 57.

6. Khaled Mostafa Qasim, *Environmental Management and Sustainable Development in the Context of Contemporary Globalization*, 2nd edition, Al-Dar Al-Jami'iyya, Alexandria, 2010, p. 132.
7. Riyad Saleh Abu Al-Atta, *The Role of Public International Law in the Field of Environmental Protection*, 2nd edition, Dar Al-Nahda Al-Arabiya, Egypt, 2008, p. 92.
8. *Stockholm Declaration on Human Environment 1972: Op. Cit. p. 27. Holman (H) ... Op. Cit. P .40.*
9. Muslimi Nour Eddine, Ben Jalloul Mostafa, *International Interest in the Phenomenon of Environmental Pollution and Its Impact on Environmental Human Rights*, Afaq Journal of Sciences, Vol. 07, No. 01, 2022, p. 401.
10. African Climate Summit (2023), *Nairobi Declaration on Climate Action and Sustainable Development in Africa*, Nairobi, Kenya, African Union.
11. Muslimi Nour Eddine, Ben Jalloul Mostafa, *International Interest in the Phenomenon of Environmental Pollution and Its Impact on Environmental Human Rights*, University of Thaliji Laghouat, Afaq Journal of Sciences, Vol. 07, No. 01, 2022, p. 402.
12. Saleh Mohammed Mahmoud Badr Eddine, *The International Obligation to Protect the Environment from Pollution in Light of International Environmental Law and the Recommendations of International Organizations*, Dar Al-Nahda Al-Arabiya, Egypt, 2006, p. 64.
13. Article 02 of the United Nations Program, *Montreal Protocol on Substances that Deplete the Ozone Layer*, Official Text, Arabic Version, 2018.



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14. Basel Convention. (n.d.). *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal*. Retrieved from <https://www.basel.int>
15. Mohammed Boufatah, Qarinat Ben Chahra, Houria Bouras, *Algeria's Strategy in Combating Environmental Pollution to Preserve the Physical and Psychological Health of Individuals*, University of Thaliji Laghouat, *Ansana Journal for Research and Studies*, Vol. 07, No. 02, December 2016, p. 293.