



The Impact of E-Waste amid Global Health Crises on the Right to Health Enjoyment under the 2020 Constitutional Amendment: A Study in Light of International and National Standards.

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Abstract :

This study aims to analyze the impact of pollution resulting from E-waste amidst the spread of pandemics and emerging diseases, considering it a modern threat to Health Security and the Right to Health Enjoyment, which is a fundamental human right. Global health crises, particularly the COVID-19 pandemic, have exposed the fragility of both environmental and health systems. This context makes E-waste management a doubled challenge that threatens the right to a clean environment and safe health. Scientific studies indicate that E-waste contains numerous types of heavy toxic chemical substances, gases, and plastics. Unscientific handling or the arbitrary disposal of such waste leads to the dispersion of pollutants into the air, soil, and water, thereby escalating the risks of chronic and infectious diseases among individuals. This research endeavors to highlight the correlation between unregulated technological development and health threats within the context of pandemics, focusing on the necessity of adopting legislative policies that ensure a balance between the demands of technological development and the protection of the right to health and Environmental Security.

Keywords: E-Waste, Right to Health, Health Security, Technological Developmen

L'impact des déchets électroniques dans le contexte des crises sanitaires mondiales sur le droit à la santé en vertu de l'amendement constitutionnel de 2020 : une étude à la lumière des normes internationales et nationales.

Résumé :

Cette étude vise à analyser l'impact de la pollution résultant des déchets électroniques dans le contexte de la propagation des pandémies et des maladies émergentes, en la considérant comme une menace moderne pour la sécurité sanitaire et le droit à la santé, qui est un droit humain fondamental. Les crises sanitaires mondiales, en particulier la pandémie de COVID-19, ont mis en évidence la fragilité des systèmes environnementaux et sanitaires. Dans ce contexte, la gestion des déchets électroniques représente un double défi qui menace le droit à un environnement propre et à une santé sûre. Des études scientifiques indiquent que les déchets électroniques contiennent de nombreux types de substances chimiques toxiques lourdes, de gaz et de plastiques. Une manipulation non scientifique ou une élimination arbitraire de ces déchets entraîne la dispersion de polluants dans l'air, le sol et l'eau, augmentant ainsi les risques de maladies chroniques et infectieuses chez les individus. Cette recherche s'efforce de mettre en évidence la corrélation entre le développement technologique non réglementé et les menaces pour la santé dans le contexte des pandémies, en mettant l'accent sur la nécessité d'adopter des politiques législatives qui garantissent un équilibre entre les exigences du développement technologique et la protection du droit à la santé et à la sécurité environnementale.

Mots clés : *déchets électroniques, droit à la santé, sécurité sanitaire, développement technologique*



Introduction :

The world has witnessed an accelerating technological development over recent decades, deeply reflected across various aspects of life. The **Digital Revolution** has contributed to providing effective solutions for numerous contemporary societal challenges in the economic, social, and health fields. However, this remarkable progress has given rise to a new environmental and health challenge: E-waste, which has become one of the most hazardous types of modern industrial waste.

The danger of this waste lies in its containment of hundreds of toxic chemical elements, such as mercury, lead, and cadmium, which leave devastating effects on both humans and the environment . This occurs through processes like burning, which leads to the emission of toxic air pollutants, or through landfilling, which results in the leakage of harmful substances into the soil and groundwater, negatively impacting human health.

Amid the spread of **cross-border pandemics** and diseases, this issue has become more complex. The fragility of environmental systems contributes to the exacerbation of health risks and increases the probability of contagion and epidemic diseases, thereby making the **Right to Health** and the **Right to a Clean Environment** two complementary facets of **Human Security**.

The enjoyment of fundamental human rights, foremost among them the Right to Health, presupposes the existence of a clean environment free of pollutants and hazardous waste. This principle has been affirmed by international

human rights conventions, which link environmental integrity with the achievement of **Sustainable Development** and the assurance of a dignified life.

Accordingly, this study seeks to analyze the impact of E-waste on the Right to Health Enjoyment, particularly amid global health crises, while focusing on the effectiveness of the international and national legal framework in guaranteeing this right.

The research problem stems from the following central question:

To what extent does E-waste affect the Right to Health Enjoyment amid health crises, and what is the effectiveness of the international and national legal framework in protecting this right?

Study Outline:

- Conceptual and Legal Framework of E-Waste.
- The Impact of E-Waste on the Right to Health Enjoyment amid Global Health Crises.

1. Conceptual and Legal Framework of E-Waste

1.1. The Conceptual Framework of E-Waste Amid Pandemics

1.1.1. The Legal Definition of E-Waste

Experts and researchers in this field lack a consensus on the naming of this type of waste. Some refer to it as Waste Electrical and Electronic Equipment (WEEE). The terms and definitions covering E-waste vary widely between legislative and jurisprudential approaches, which will be addressed sequentially.



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▪ **Legislative Definition of E-Waste**

Some international and national legislations have addressed the definition of E-waste due to its inherent risks and the wide range of domains it encompasses. Thus, we will first refer to the definitions stipulated in international conventions and organizations, followed by those in national legislations.

A. Definition of E-Waste in International Conventions Amid Global Health Challenges

The Basel Convention defined E-waste as electrical devices and equipment whose use has ended and have been discarded. This includes a wide spectrum of electronic products such as refrigerators, air conditioners, mobile phones, computers, and various household and consumer electronic devices abandoned by their owners after the expiry of their lifespanⁱ.

The European Directive No. 2002/96/EU defined it as : E-waste comprises discarded Electrical and Electronic Equipment (EEE), including all components and sub-assemblies which are part of the product at the time of discarding.ⁱⁱ

The new European Directive No. 2012/19/EU was more specific, defining it as: Products whose operation depends on electric currents or electromagnetic fields, and products for the generation, transfer, or measurement of such currents and fields, which are designed for use with a voltage rating not exceeding 1000 Volts alternating current or 1500 Volts direct current.ⁱⁱⁱ

This includes items such as refrigerators, washing machines, air conditioners, in addition to computers, mobile phones, printers, televisions, and large and small screens.

E-waste is considered one of the most hazardous types of contemporary waste due to its content of toxic components and heavy metals that pollute the environment and directly affect human health. Amid global health crises, such as the COVID-19 pandemic, the volume of this waste has increased due to the intensified use of electronic and medical devices, making its environmental and health impacts more acute. Stemming from the Algerian Constitutional Amendment of 2020 ^{iv}, which consecrated in Article 63 the State's commitment to "protecting the health of citizens, especially the disadvantaged, and preventing and combating epidemic and infectious diseases," it becomes clear that addressing the phenomenon of E-waste falls within the core of the State's responsibility to protect the Right to Health and prevent environmental hazards. Furthermore, Article 68 recognized the right of all citizens to a "sound environment" and the State's obligation to preserve it, which directly links environmental protection with public health protection. Exposure to untreated electronic waste is considered an infringement of the constitutional right to a sound environment, and consequently, of the Right to Health guaranteed by the Constitution. From this perspective, activating the constitutional obligations stipulated in Articles 63 and 68 requires formulating effective national policies for E-waste management within the public health prevention system, thereby achieving a balance between the requirements of economic development and the protection of public health and the environment, especially in the context of global health crises.



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effective national policies for E-waste management within the public health prevention system, thereby achieving a balance between the requirements of economic development and the protection of public health and the environment, especially in the context of global health crises^v.

D. The Jurisprudential Definition of E-Waste in Light of Health and Environmental Considerations

Jurisprudence has addressed the issue of E-waste with multiple definitions, depending on the perspective from which its nature and effects are viewed.

One stream of jurisprudence defines it as :

The remnants resulting from the use of electrical and electronic devices and equipment that are no longer fit for consumption or have lost their functional value, whether due to obsolescence, malfunction, or incompatibility with modern technological developments.^{vi}

Another perspective holds that E-waste includes everything discarded from electronic devices and components after the end of their lifespan or damage, including items that are recirculated, sold, or dismantled for the purpose of extracting metals or recycling. This often leads to the emission of toxic substances that affect the environment and human health^{vii}

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II. Characteristics of E-Waste and its Health Dimensions
Amid the Spread of Epidemics E-waste is characterized by a set of features that make it one of the most dangerous types of new waste in the modern era. Its most prominent characteristics can be summarized as follows:

A. New Waste of Technological Origin : E-waste is a direct result of rapid industrial and technological development. It was not a subject of deep concern or study in previous decades due to the limited use of electronic devices at that time. With the expansion of digitization and electronic transformation, the volume of this waste has increased unprecedentedly, posing a global environmental and health challenge, especially during periods of epidemics when reliance on electronic means escalates.

B. Material and Functional Diversity : It is considered one of the multi-form industrial wastes, as its nature varies between solid, liquid, and gaseous, depending on the type of device and its components. This complicates the processes of safe collection, storage, and treatment in ways that align with public health prevention requirements.

C. Classification as Hazardous Waste : E-waste falls under the category of hazardous waste due to its content of chemical substances and toxic metals such as mercury, lead, cadmium, copper compounds, and arsenic. These materials were included in the Basel Convention's Annex I of hazardous wastes. The danger lies in the fact that the leakage of these elements into the air, soil, or water leads to direct environmental pollution that reflects on human



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health, exacerbating the potential for the spread of both epidemic and chronic diseases

D. The Dual Value of E-Waste : Environmental Hazard vs. Economic Return** E-waste is characterized by its threat to humans and the environment if it is not scientifically recycled and utilized correctly. This is due to its content of dangerous chemical materials, in addition to its high-value materials such as gold, silver, and platinum. It has become a commodity that is traded, especially towards developing countries, and has found great demand in this field.^{viii}

2. The Impact of E-Waste on the Right to Enjoy Health Amid Epidemic Crises

Clarifying the impact of E-waste on the Right to Enjoy Health requires addressing the concept of this right in international treaties and covenants, followed by outlining the impact of this waste on the right itself. This will be explained by examining the concept of the Right to Enjoy Health in international treaties and covenants.

2.1. The Concept of the Right to Enjoy Health in International Treaties and Covenants

The Right to Enjoy Health is considered one of the most prominent rights accorded great importance by international treaties and covenants, particularly the International Covenant on Economic, Social and Cultural Rights of 1966^{ix}

It is considered one of the fundamental pillars of human rights, representing a vital and indispensable necessity for every individual and society, as it stems from and complements the Right to Life. Enjoying an adequate

standard of health constitutes an essential condition for guaranteeing this right, and thus, protecting human health is a key entry point for safeguarding other fundamental rights, given that it provides the elements of a dignified life and the ability to participate effectively in social and economic life

Given the paramount importance of the Right to Enjoy Health within the human rights system, Article 12 of the International Covenant on Economic, Social and Cultural Rights of 1966 stipulated that State Parties must take all necessary measures to realize this right, including improving the health, environmental, and social aspects associated with it. As affirmed by the Universal Declaration of Human Rights of 1948, in its Article 25, everyone has the right to a standard of living adequate for health and well-being.^{xi}

2.2. The Impact of E-Waste on the Right to Enjoy Health

E-waste is considered one of the most dangerous types of contemporary waste due to its content of chemical compounds and heavy metals in high concentrations that threaten humans and environmental safety. These materials include lead, cadmium, mercury, beryllium, arsenic, and other toxic elements that leak into the air, groundwater, and soil when electronic devices are improperly disposed of.

Mercury : Mercury is considered one of the most hazardous chemical elements as it is used in flat screens, batteries, and electronic circuits. Exposure to it poses a direct risk to public health, whether through rising vapors during unregulated waste burning operations or through leakage into water and soil. In the short term, mercury exposure leads to respiratory system disorders, damage to lung



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tissues, nausea, and vomiting. In the long term, exposure leads to damage to brain and kidney cells and negatively affects fetuses in pregnant women, causing congenital malformations and serious disorders^{xii} This makes it an issue that fundamentally violates the essence of the Right to Enjoy Health in its comprehensive concept as enshrined in international covenants. Therefore, a legal and moral obligation falls upon states to process it in a safe manner.

Beryllium : This is a rare physical element characterized by its ability to conduct electricity and heat, and is used extensively in the motherboards of electronic devices and metal handles. Despite its industrial value, it has serious health effects even when exposed to minute quantities. It leads to a chronic sensitization known as berylliosis or chronic beryllium disease, a condition that causes progressive destruction of lung tissues and nervous system disorders. Hence, it is considered an occupational disease with an epidemic dimension in industrial and technological environments^{xiii}

Furthermore, the cases previously mentioned show the direct impact of E-waste on human health when there is exposure to its hazardous components. However, human health can also be affected indirectly, which occurs when E-waste is improperly disposed of, whether by burning it, burying it in the soil or in open dumps, or indiscriminately discarding it. This allows the contaminants to spread into the air or leak into the soil and mix with groundwater, which is subsequently used by individuals for drinking, irrigation, and raising livestock. Consequently, these toxic and dangerous substances enter the human food chain , which indirectly endangers human health and life.

Conclusion

This research sought to highlight the close relationship between E-waste and the Right to Enjoy Health, considering the latter as one of the fundamental rights enshrined in international covenants and national constitutions. The study demonstrated that technological development, despite the developmental and economic gains it has achieved, has created a growing environmental and health challenge represented by E-waste, which has become one of the most dangerous new industrial wastes due to its content of toxic chemical substances and heavy metals that threaten both the environment and public health.

The analysis indicated that both international and national legislation addressed the definition of E-waste from multiple angles, with agreement on the hazardous nature of this waste and the necessity of managing it according to precise scientific and legal standards. The jurisprudential approach also showed that the mismanagement of this waste is considered a direct violation of the Right to Health and constitutes a breach of the principle of non-harm to the environment stipulated in international environmental law. This places legal responsibility on states for their failure to implement effective policies for prevention and treatment.

Consequently, the protection of the Right to Enjoy Health in the context of global health crises can only be achieved by strengthening the legislative and institutional framework related to E-waste management and ensuring the strict application of the principle of prevention and precaution. This is necessary to achieve a balance between the demands of technological development and the protection of the



health and environmental security of individuals and communities

Recommendations

Based on the findings of this research, we propose the following recommendations:

1. **Establishment of a Comprehensive National Strategy for E-Waste Management:** Based on the principles of inventory, classification, and tracking, identifying its sources and risks, while adopting effective technical and legal mechanisms for its safe processing and disposal.
2. **Strengthening the Algerian Legislative Framework:** By including an explicit definition of E-waste within the Environment Law or issuing a special regulatory text that specifies the methods of its collection, treatment, and the responsibility of economic actors regarding it.
3. **Activation of Algeria's International Obligations:** Under the Basel Convention, the Stockholm Convention, and other environmental instruments, to ensure the harmonization of national legislation with international standards for protecting health and the environment from hazardous waste.
4. **Development of Administrative and Criminal Oversight:** Over illegal E-waste disposal operations, and the establishment of the **Extended Producer Responsibility (EPR)** principle, whereby the manufacturer or importer bears part of the cost of recycling and treatment.

5. **Encouragement of Scientific Research and Innovation:** In the field of green technology and safe recycling techniques, thereby contributing to reducing the volume of E-waste and preserving public health.
6. **Dissemination of Legal and Environmental Culture:** Among individuals and institutions regarding the risks of E-waste and its health effects, by integrating it into educational programs and national awareness campaigns

Footnotes

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- iii The European Directive No. 2012/19/EU of the European Parliament and of the Council of 4 July 2012, on Waste Electrical and Electronic Equipment (WEEE Recast Directive), Official Journal of the European Union, No. L 197, dated 24 July 2012, p. 38.
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- vi Kossa Djamila, "The Effects of E-waste on Environmental Security and Public Health", *Journal of Studies and Research – The Arab Journal in Humanities and Social Sciences*, Vol. 12, No. 01, January 2020, p. 1183.
- vii Malek Nour El Din, "The Role of Environmental Management Strategies in E-Waste Management: A Study of a Group of Algerian Economic Institutions", Master's Thesis in Management Sciences, Faculty of Economic Sciences, Commercial Sciences and Management Sciences, Mohamed Boudiaf University, M'Sila, 2015/2016, p. 18.
- viii Adel Mahmoud Ali Al-Khalfi, "Criminal Protection of the Environment from E-Waste as a Hazardous Waste", Research presented to the Law and Environment Conference, Tanta University, pp. 10, 11.
- ix International Covenant on Economic, Social and Cultural Rights, dated December 16, 1966, ratified pursuant to Presidential Decree No. 89-67 dated May 16.
- x Article 12 of the International Covenant on Economic, Social and Cultural Rights stipulates: "The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health. The steps to be taken by the

States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for:

- The provision of conditions which would assure to all medical service and medical attention in the event of sickness.
- The improvement of all aspects of environmental and industrial hygiene.
- The prevention, treatment and control of epidemic, endemic, occupational and other diseases.
- The creation of conditions which would assure to all medical service and medical attention in the event of sickness."

- xi Universal Declaration of Human Rights, issued by the United Nations General Assembly on December 10, 1948.
- xii Saad bin Nasser Mohammed Al-Zahrani, "The Level of Awareness of High School Students in Mecca - The Holy Capital - of the Harms of E-Waste", Master's Thesis in Curricula and Methods of Science Teaching, College of Education, Umm Al-Qura University, 1428/1429 AH, p. 27.
- xiii Amal Fawzy Ahmed Awad Mahmoud, "Electronic Pollution and Mechanisms for Prevention, Protection, and Transition to Clean Technology", *Journal of Legal Studies and Research*, Issue 08, p. 17.