

Received: May 2023 Accepted: June 2023  
DOI: <https://doi.org/10.58262/ks.v11i3.047>

## International Conventions and Local Efforts to Combat Crimes of Hazardous, Toxic, and Radioactive Waste: An Analytical Study

Salem Talib Al-Hammami<sup>1</sup>, Ghaleb Mubarak Al-Hammami<sup>2</sup>, Saleh Mohammed Al-Hammami<sup>3</sup>

### **Abstract**

*This analytical study research addresses international agreements and local efforts in combating hazardous, toxic, and radioactive waste crimes. It consists of an introduction and two main sections. The introduction includes definitions of the research terms, while the first part examines international agreements aimed at addressing hazardous, toxic, and radioactive waste crimes. The second part centers on local initiatives and actions taken to combat these types of crimes. The research has yielded several results, including the effective and active role played by international organizations, particularly the United Nations, in environmental conservation and protection from pollution caused by hazardous, toxic, and radioactive waste. This is evident in their contribution to the development of international environmental protection regulations and the provision of suitable platforms for environmental conferences and the conclusion of international environmental agreements. The Kingdom of Saudi Arabia has made substantial efforts to protect the environment. The research concludes with recommendations, emphasizing the necessity of working to protect the environment from pollution through international cooperation and taking appropriate measures to protect and improve the environment. It also highlights the importance of raising environmental awareness among various segments of society as one of the most effective means to prevent these crimes and to optimally preserve the environment from hazardous, toxic, and radioactive waste.*

**Keywords:** Hazardous Waste, Radioactive Waste, Toxic Waste, Waste Crime.

### **Introduction**

The issue of hazardous, toxic, and radioactive waste poses a significant challenge for countries worldwide, particularly developing nations, as it serves as a major source of pollution. This type of waste directly contributes to environmental pollution, impacting both human health and the natural environment. Moreover, these waste materials originate from various sources and carry substantial chemical and organic hazards. They also have the capacity to persist for long periods and necessitate specialized methods for handling and disposal to prevent adverse effects on health and the environment.

In response to the deteriorating global environment, the United Nations initiated the first international conference on the environment, known as the Human Environment Conference, held in Stockholm, Sweden in 1972. The conference aimed to establish common principles for guiding global efforts in preserving and developing the human environment. It also sought to encourage governments and international organizations to take essential steps to protect and enhance the environment and achieve sustainable development. Subsequent conferences, agreements, and concerted efforts in this area followed.

---

<sup>1</sup>Instructor at Najran University, Saudi Arabia. ORCIDID: <https://orcid.org/0009-0003-5823-8365>, Email: [stalhammami@nu.edu.sa](mailto:stalhammami@nu.edu.sa)

<sup>2</sup>Assistant Professor of Administrative System, Najran University, Saudi Arabia. ORCIDID: <https://orcid.org/0009-0001-8981-4603>, Email: [gmalhammami@nu.edu.sa](mailto:gmalhammami@nu.edu.sa)

<sup>3</sup>Assistant Professor of Civil System, Najran University, Saudi Arabia. ORCIDID: <https://orcid.org/0009-0005-3751-347X>, Email: [smalhamame@nu.edu.sa](mailto:smalhamame@nu.edu.sa)

Notably, Saudi Arabia's Vision 2030 prioritizes environmental protection and sustainable development as key objectives in its efforts to enhance its political, developmental, and economic status. The vision underscores the importance of environmental preservation as a religious, national, and human duty toward future generations. It is also recognized as a fundamental element for improving quality of life and reducing pollution levels in the environment. Hence, there is a commitment to explore the initiatives aimed at addressing waste crimes by analyzing the international treaties and local initiatives in combating hazardous, toxic, and radioactive waste crimes

### **Research significance**

The research holds significant importance for several reasons. Firstly, hazardous, toxic, and radioactive waste crimes have substantial harmful effects and are regulated by legal provisions, posing a threat to the state, as well as the safety and security of individuals and society. Additionally, the matter of hazardous, toxic, and radioactive waste has attracted attention from a range of international legislations, as it deals with a top-priority issue due to its direct impact on human life.

### **Research Rationale**

The choice of this topic is motivated by several factors. Firstly, it centers on environmental concerns, particularly the issue of hazardous, toxic, and radioactive waste, which is of great significance within both the Saudi and international systems. Secondly, the scientific value of the research topic is notable, given the limited number of prior studies that comprehensively examine the hazardous components present in hazardous, toxic, and radioactive waste. Lastly, there is a keen interest in delving into subjects related to pollution resulting from hazardous, toxic, and radioactive waste.

### **Research Objectives**

- 1- Highlighting the severity of environmental pollution caused by hazardous, toxic, and radioactive waste, which threatens the existence of humans and other living organisms. This is due to the global increase in the production of hazardous, toxic, and radioactive waste, as well as the rising rates of its transboundary transport from developed countries to developing ones.
- 2- Understanding the Saudi regulatory stance on environmental pollution caused by hazardous, toxic, and radioactive waste.
- 3- Examining the efforts of relevant international organizations and agreements in protecting the environment from pollution caused by hazardous, toxic, and radioactive waste. This includes addressing and safely disposing of such waste to preserve natural resources and achieve sustainable development.

### **Previous Studies**

This research aligns with Al-Badri's (2010) study in its examination of environmental protection within the Saudi system and its exploration of international agreements. However, it diverges by focusing on international agreements specific to the environment, while the current study delves into international agreements and local initiatives concerning hazardous, toxic, and radioactive waste. Similarly, it shares common ground with Al-Malkawi's (2009) work in its coverage of pertinent international agreements related to environmental pollution protection. Nevertheless, it differs by providing a definition of the environment and omitting the discussion of hazardous, toxic, and radioactive waste, which are addressed in the present research. Furthermore, it does not encompass the definition of waste crimes or address Saudi legislative texts. In comparison to Al-Shahrani's (2018) study, our research aligns with its examination of environmental protection within the Saudi system and its presentation of select international agreements. However, it diverges by addressing the definition of the environment and not encompassing the definitions of waste crimes, hazardous, toxic, and radioactive waste, as well as local

efforts related to these issues.

## **Research Methodology**

The research methodology involves an analytical approach, encompassing the following steps: the collection and analysis of regulatory texts related to the research topic, direct citation of scholars' texts and opinions, and proper referencing of quoted statements or opinions. Clarity of expression will be ensured, and linguistic integrity will be maintained throughout the written content. The research concludes with standard technical indices. The research plan includes an introduction, two main sections, a conclusion, and standard technical indices.

## **Hazardous Waste**

Waste in language refers to what is far from something due to its impurity. It also refers to remnants, surplus, or what exceeds the need. For example, it is from the refuse of the people and their dregs. "Nafaya" of rain refers to its downpour, and someone from the refuse of the people is from their lowly individuals. "Nafaya" of cigarettes refers to their ashes (Reda, 1958). Therefore, the definition of waste in language revolves around what is far from something due to its impurity and the remaining part of the thing.

Waste has been defined in several ways, including as the residues left from industrial, mining, artisanal, and commercial processes, as well as household waste, hospital waste, and radioactive waste (Faraj, 2018). The Saudi regulator defines waste as a discarded or neglected substance not exempted under Article 4 (j-1), which must be disposed of for one of the reasons listed in the first appendix. It can be disposed of by one of the processes mentioned in the second appendix. The discarded or recyclable materials also include those that are collected and accumulated before being recycled or burned for energy extraction or used as fuel or for fuel production.<sup>1</sup>

Hazardous waste is defined in various ways, such as special waste containing significant amounts of toxic substances that have harmful effects on the natural environment. Examples include dust and flour from mills, complex organic residues, surface treatment baths containing chromium, mercury waste, and CFCs (substances that cause the greenhouse effect or ozone depletion (Ananzah, 2002). According to the Saudi regulator, waste refers to residues from various activities and operations that are considered hazardous to the environment, health, and public safety<sup>2</sup>. Consequently, any solid, liquid, or gaseous waste can present current or potential hazards to human health or the environment due to its quantity, concentration, composition, or chemical properties when improperly processed, stored, transported, or disposed of.

## **Toxic waste**

Waste in both in language and in technical terms, has been defined in the previous context, so there is no need to repeat it. As for toxic waste, it has been defined in various ways. They are perceived as materials or waste that cause or may cause direct or delayed harm to the environment by accumulating in living organisms or through their toxic effects on biological systems (Ministry of Defense and Aviation, 1423 AH). All chemical substances have a certain degree of toxicity, and the health risk posed by a chemical substance primarily depends on its toxicity and the duration and intensity of exposure to it. In some cases, even tiny amounts of potentially toxic compounds like dioxins are sufficient to cause harm to health after a short exposure period. Conversely, it may be difficult for even large doses of compounds such as iron oxide or magnesium to cause any problems except after prolonged exposure periods (Abu Kaf, 2013).

---

<sup>1</sup> (Article No. (1) The General Environment Law and its Executive Regulations issued by Royal Decree No. (M/34) on 7/28/1422 AH.

<sup>2</sup> See of Paragraph (59) of Article One of Royal Decree No. 34 of 1433 AH, which includes (24) articles. There is an executive regulation that includes (22) articles, and in addition, there are (6) annexes. Appendix IV relates to rules and procedures for hazardous waste control.

## Radioactive Waste

Radioactive waste has been defined in various ways, including as those radioactive materials that advanced countries work to transport after determining their inability to be used in any activity, whether military or peaceful, which is referred to as enriched uranium (Al-Zoubi, 2010). The physical scope of the Basel Convention includes a category of waste that is considered to be materials or other items that are being disposed of or are required to be disposed of according to the provisions of the national system. This includes both the waste specified in Annex I of the Convention and waste that is considered hazardous under the domestic legislation of the party to the Convention, as well as waste specified in Annex II, except for radioactive waste and waste resulting from the normal operations of ships, as they are subject to another regulatory system (UNEP, 2007). It can be said that radioactive waste is the radiation and radioactive materials in the natural environment, which can also be man-made. These materials have a wide range of beneficial applications, ranging from power generation to uses in the fields of medicine, industry, and agriculture. These activities produce radioactive waste in various forms—gaseous, liquid, and solid—and the waste is considered radioactive because the particles in the waste are unstable.

## Waste Crime

Firstly, the term "crime" has its origin from the word "jarm" which means to earn and to cut, and "jarm" also means sin. It is said to be a Persian word that has been assimilated into Arabic (Al-Jawhari, 1987). "Al-jareemah" and "al-jareem" mean the earner, and "fulan ajrama" means he earned sin. "Al-jareemah" and "al-jareem" mean the earner, and "fulan ajrama" means he earned sin. The term "al-jareemah" means crime and sin (Al-Zubaidi, 1900). The term "crime" in legal jargon has been defined as an act that causes harm to an interest protected by the penal system and results in a criminal impact in the form of punishment (Salama, 1979). It is criticized for only encompassing actions punishable under the penal system, while there are other laws that criminalize certain actions and impose specified penalties, such as customs regulations and other special laws. This means that the definition only includes criminal offenses and neglects civil offenses, administrative offenses, and disciplinary offenses. Some have defined it as prohibitions sanctioned by God with a prescribed punishment or retribution (Zaheer, 1415 AH).

## Waste Crime an additional compound

In light of the general definition of waste, the additional compound definition of waste crime can be described as the legal or regulatory characterization of actions involving the disposal, neglect, or misuse of waste materials, including hazardous, toxic, or radioactive substances, with the intention to cause harm or damage to humans or the environment. Such actions constitute a prohibited violation under religious law or legal regulations.

## International Convention to Combat Hazardous, Toxic and Radioactive Waste Crimes

### *Stockholm Conference (Sweden 1972)*

The international efforts to protect the environment began to manifest clearly through international conferences. The declaration issued at the Stockholm Conference, held from June 5th to 16th, 1972, with the participation of 113 countries, emphasized that humans are both the product of the environment and its creator. It also favored rapid and decisive advancement in science and technology, noting that humans have the capability to change their environment through unprecedented means (Al-Jawhari, 1987). In reality, international concerns for the environment did not take on a form of organization and continuity until December 1968, when the United Nations General Assembly called for a global conference on the environment to seek solutions for environmental problems, pollution, and other threats that endanger the Earth. The Stockholm Conference was the culmination of these efforts (Shalal, 2010). After the General

Assembly issued Resolution 2398 on December 3rd, 1968, to convene a conference on human environment, a preparatory committee was formed. After four preparatory sessions (from March 1970 to March 1972), the conference opened on June 5th, 1972 (United Nations, 1972), in Stockholm, Sweden, and continued until June 16th, 1972, under the theme "Only One Earth" (Merah, 2007). The conference focused on several issues, including human impact on the natural environment, pollution control, resource conservation, and the need to focus on social and economic development. Developing countries were urged to direct their development efforts while considering their priorities and the need to protect the environment (Mukhaimer, 1986). At the conclusion of the conference, the Stockholm Declaration on the Human Environment was issued, containing the first international document outlining the principles of intergovernmental relations concerning the environment, how to address it, and the responsibility for the damages it incurs (Muhammad, 2008).

The Stockholm Declaration represents the first comprehensive review of the overall human impact on the environment, aiming to provide a fundamental and comprehensive approach to addressing the challenge of preserving and enhancing the human environment (Schell, 2010). This declaration consists of a preamble and 26 principle (Abu Al-Ata, 2008).

### **United Nations Convention on the Law of the Sea (1982)**

The United Nations Convention on the Law of the Sea in 1982, later known as the Law of the Sea Convention, is often likened to a constitution for the oceans. Since coming into effect almost seventeen years ago, it has provided guidance to the international community in its efforts to preserve the oceans' ability to meet the diverse and extensive needs of society. However, the detrimental impacts of human activities are increasingly pressuring ocean life. Overexploitation of marine resources, climate change, pollution from various activities, and hazardous substances all present significant threats to the delicate marine environment. Additionally, the rise in criminal activities, such as piracy, has serious implications for maritime security and the safety of sailors <sup>1</sup>.

The Law of the Sea Convention is widely acknowledged and establishes the legal framework for all activities in the oceans and seas. It is strategically important as a basis for national and regional cooperation. Nonetheless, limited capacities hinder countries, particularly developing nations, from both benefiting from the oceans and their resources in accordance with the convention and fulfilling the obligations outlined in it. Therefore, the need for capacity-building in marine science, ocean affairs, and the Law of the Sea remains critically important for countries (Secretary-General, 2010).

It is noteworthy that the Law of the Sea issue was addressed by the Asian-African Consultative Organization following an initiative from the government of Indonesia in 1970. Since then, it has been a priority item in the organization's successive annual sessions. The Consultative Organization can take pride in the fact that many new concepts, such as exclusive economic zones, archipelagic states, and non-coastal state rights, originated and evolved in the organization's annual sessions before being documented in the Law of the Sea Convention.

After the adoption of the Convention in 1982, the work program of the Consultative Organization was directed at assisting Member States in matters relating to their accession to the Convention on the Regime of the Seas and other related matters. With the commencement of implementation of the Convention in 1994, the process of establishing institutions as envisaged in the Convention on the Regime of the Seas Monitoring studies of these developments have been initiated, and the Secretariat of the Consultative Organization has prepared monitoring studies of these developments, and Secretariat documents at the annual sessions of the Consultative Organization have noted the progress made in the work of the International Seabed Authority (ISBA), the International Sea Regime Tribunal (the Sea

---

Sea Regime Convention in relation to Article 308 (1), which entered into force in November 1994<sup>1)</sup>

Regime Tribunal), the Commission on the Limits of the Continental Shelf, and the meeting States parties to the Convention on the Regime of the Seas and Other Related Developments (United Nations, 2007) and the aim of the Convention was to develop and review the international environmental regime in several areas, including the issue of transport of hazardous and toxic waste (Talbi, 2012).

### **Basel convention (1989)**

International endeavors within global organizations and conferences led to the adoption of the Basel Convention under the United Nations Environment Programme. This initiative laid the groundwork for establishing specific regulatory frameworks and guidelines aimed at safeguarding the environment from hazardous waste. Moreover, the Basel Convention played a key role as a primary reference for integrating these regulations into the domestic legislation of nations. It was notably the first agreement aimed at globally regulating the movement of hazardous wastes, marking a significant milestone in modern-era efforts towards international oversight and management of the cross-border transport of such materials (Abdel-Hafez, 2006).

The signing of this convention represented a worldwide effort to prevent the severe environmental consequences posed by hazardous wastes, particularly stemming from inadequate management and unauthorized movements (El Shafie, 2006). The Conference of Plenipotentiaries, held in Basel, Switzerland, from March 20 to 22, 1989, was attended by representatives from 116 countries, various United Nations entities, and numerous international governmental and non-governmental organizations, resulting in the adoption of the final draft of the convention (Kummer-Bairy, 2012).

Following this, the convention was made available for signing by all participating countries, including Namibia. Signings occurred at the headquarters of the Swiss Ministry of Foreign Affairs from March 23 to June 30, 1989, and at the United Nations headquarters in New York from July 1, 1989, to March 22, 1990 (Basel convention, 1989). After the signing deadline had passed, countries and organizations engaged in political and economic integration were offered the opportunity to join the convention by submitting their accession documents to the Secretary-General of the United Nations (Basel convention, 1989, Article 28). It's noteworthy that the definitive text of the convention was signed by 104 out of 116 countries, along with the European Economic Community. Among the attendees at the conference were 33 out of 40 African countries and 35 European countries.

The agreement was formulated as a singular, principal version accessible in English, Arabic, Chinese, Spanish, French, and Russian (Basel convention, 1989, Article 29). This sole original edition was submitted to the Secretary-General of the United Nations and officially came into force on May 5, 1992. As of January 1, 2011, its membership had broadened, encompassing 175 nations. Consisting of twenty-nine articles, the Basel Convention is complemented by nine additional annexes attached to the accord.

The primary aim of the convention is to protect human health and the environment from the harmful impacts arising from the creation, movement across borders, and handling of hazardous waste. This goal relies on two fundamental principles: establishing a worldwide mechanism to oversee the transboundary transfer of hazardous waste and ensuring proper waste management. The Basel Convention aims to govern the cross-border movement of waste using diverse approaches, including the implementation of a prior informed consent system for parties intending to export hazardous waste and other types of waste. Additionally, it mandates that other involved parties offer written approval, known as "prior informed consent," before allowing shipments of such waste to cross or enter regions under their legal authority (UNEP, 2007).

### **Protocol to the Treaty on Prevention of Marine Pollution by Dumping of Wastes and Other Materials (1996)**

The United Nations Convention on the Law of the Sea, referred to here as the Law of the Sea

Convention, entered into force on November 16, 1994, twelve months after the deposit of the sixtieth instrument of ratification with the Secretary-General of the United Nations. As of January 10, 2016, a total of 167 parties had ratified the convention. One of the implementing agreements was adopted (Schell, 2010, Article 308). The United Nations held the first Conference on the Law of the Sea in Geneva in 1958, resulting in the conclusion of four international agreements (Abu Al-Ata, 2009): the Geneva Convention on the Continental Shelf, which became effective on June 10, 1994; the Geneva Convention on the High Seas, which entered into force on September 30, 1992; the Geneva Convention on the Territorial Sea and Contiguous Zone, which became effective on September 10, 1994; and the Geneva Convention on Fishing and Conservation of Living Resources, which came into force on March 20, 1999.

During the conference, it was realized that the high seas area was most susceptible to nuclear pollution, being free areas not under the sovereignty of any state. Therefore, it was essential to prevent technologically advanced countries from conducting nuclear tests or disposing of their radioactive waste in these areas.

Article 24 within the Convention on the High Seas mandated the need for contracting parties to establish ship regulations aiming to prevent marine pollution caused by discharging petroleum substances and from petroleum pipelines. Similarly, Article 25 in the same Convention ensured measures for averting radioactive and other hazardous substance pollution. Countries individually or collaboratively adopt these regulations. Moreover, the Convention on the Continental Shelf includes provisions for safeguarding the marine environment against pollution and ensuring its safety (Ashry, 1989). Furthermore, the 1994 United Nations Convention on the Law of the Sea, specifically addressing Part XI implementation, was signed on July 28, 1994, and came into effect on July 28, 1996. Another treaty available for signature was the 1995 United Nations Fish Stocks Agreement, signed on December 4, 1995, and put into force on December 11, 2001. Alongside these fundamental agreements, the United Nations Convention serves as an extensive regulatory framework governing various activities in oceans and high seas. This interconnected system, bolstered by the United Nations Convention on the Law of the Sea, highlights the interdependency of oceanic regions and underlines the responsibility of all nations to adhere to globally accepted regulatory standards governing these areas. Consequently, this system is widely acknowledged as the oceans' constitution (Secretary-General, 2010).

## **Local Efforts to Combat Hazardous, Toxic, and Radioactive Waste Crimes**

### ***The Saudi Environmental Awareness Project and Aramco's Eco-Protection Initiative***

The Kingdom of Saudi Arabia acknowledged the significance of addressing environmental concerns, with King Salman bin Abdulaziz Al Saud - may God safeguard him - demonstrating a keen interest in safeguarding the environment and fostering sustainable development. This led to the issuance of royal directives on May 7, 2016, to establish the Ministry of Environment, Water, and Agriculture through the renaming of the Ministry of Agriculture and the transfer of responsibilities related to environmental and water activities. This move aligned with the objectives outlined in Saudi Arabia's Vision 2030. Aligned with the Custodian of the Two Holy Mosques' environmental commitment, the initiation of the King Salman Environmental Awareness and Sustainable Development Program was announced on January 21, 2016, corresponding to 11 Rabi' Al-Awwal 1437 AH. The program aimed to bolster community engagement in promoting sustainable development within the Kingdom (Almowaten, 2016). Additionally, a national program was launched to enhance the capabilities of governmental bodies in monitoring and evaluating indicators for localized sustainable development in Saudi Arabia.

Moreover, His Highness - may God support him - endorsed the hosting of the 5th Gulf Environmental and Sustainable Development Forum and Exhibition in Riyadh from May 24th to 26th, 2015,

corresponding to 6th to 8th Sha'ban 1436 AH. The forum, featuring the participation of more than 200 local and international experts, engaged in discussions covering diverse subjects such as advocating for sustainable use of natural resources, managing medical and industrial waste, promoting beneficial recycling, advancements in water resources, water management, fostering partnerships, joint initiatives, collaborative efforts among GCC sectors, traditional energy, managing renewable resources, as well as monitoring and reducing emissions (Ghazi, n d).

In relation to government initiatives, the King Abdulaziz City for Science and Technology, acting as a national autonomous scientific institution, highlighted environmental research. This emphasis was particularly directed towards cutting-edge research dedicated to resolving current environmental challenges effectively. Moreover, the city concentrated on laying the groundwork for an advanced environmental technology sector to elevate the Kingdom's global competitiveness. Within this context, the establishment of the Institute of Biological and Environmental Research was a step toward supporting research in environmental and life sciences.

The forthcoming endeavors of this center aim to pinpoint appropriate remedies for prevailing environmental concerns and evolve them to foster sustainable environmental progress. These initiatives encompass creating and advancing an air pollution diagnostic system, employing geographic information systems for monitoring and alleviating desertification, assessing environmental hazards, simulating soil pollution from fuel leaks, repurposing waste into value-added resources, converting carbon dioxide into eco-friendly products, and progressing clean fuel technology applications (Almowaten, 2016).

Aligned with global practices, the Kingdom of Saudi Arabia demonstrates substantial commitment to environmental preservation. This dedication is evidenced by the establishment of the National Commission for Wildlife Conservation and Development on the 12th of Ramadan, 1406 AH, corresponding to 1986.

Aramco Saudi Arabia established a dedicated Environmental Protection Department to oversee and ensure compliance with the environmental plan. This department has implemented numerous environmental programs aimed at protecting and preserving the environment (Almowaten, 2016). Among these initiatives is the Environmental Awareness Program, which received the Gulf Cooperation Council Award for Best Environmental Practices in 2002. Additionally, its Industrial Waste Management Program secured second place in the Primary Planning Category of the American Academy of Environmental Engineers' 1999 competition titled "Excellence in Environmental Engineering." Aramco also received acclaim from the Arab League for its exceptional efforts in marine management (SAWEA, 2013).

SABIC, as one of the important industrial sectors in the Kingdom, has recognized the significance of the environment within its industrial facilities. Consequently, since its inception, SABIC has proactively chosen the most suitable and modern technologies to reduce and mitigate the negative impacts on the environment within its manufacturing operations. It incorporated environmental considerations and integrated them into the processes of design, implementation, and operation. SABIC developed its environmental systems and obtained the ISO 14001 certification for environmental management in its companies located in both Jubail and Yanbu. Attaining this global certification stands as a significant and commendable achievement in environmental preservation. SABIC was awarded the Best Environmental Research accolade within the Gulf Arab countries. Additionally, some of its factories have been nominated for the Best Factory in Environmental Performance Award within the Gulf Cooperation Council countries (Almowaten, 2016).

### **General authority's projects for meteorology and environmental protection**

The General Directorate of Meteorology in Saudi Arabia was established within the Civil Aviation

Department in 1951, aligning with the economic advancements and aviation development in the country. Over time, the need for meteorological data across various sectors such as agriculture, transportation, industry, etc., increased. Consequently, an independent Meteorological Authority was established in 1966, affiliated with the Ministry of Defense and Civil Aviation. As the demand grew for environmental data concerning air, water, land, and other environmental matters across different sectors in the Kingdom, these responsibilities were assigned to the General Authority for Meteorology and Environmental Protection (GAMEP) in 1981 (National Plan, 2019).

The environmental and meteorological work in the Kingdom of Saudi Arabia is witnessing a notable qualitative shift and sustained engagement. This is evidenced by the earnest implementation of forward-looking plans in line with the Kingdom's ambitious vision. Amid the internal and international emphasis on environmental factors and their impacts on ambitious developmental plans, there's a pronounced interaction between development and environmental conservation, alongside the repercussions of pollution and degradation resulting from rapid economic growth and expansion.

The GAMEP serves as the Kingdom's representative entity, monitoring advancements in environmental protection and meteorology on regional and global levels. The authority plays a prominent role in raising meteorological and environmental awareness across all segments of Saudi society. Moreover, it reflects the national perspective in dealing with global environmental issues, rooted fundamentally in Islamic teachings (The electronic portal of the General Presidency of Meteorology and Environmental Protection, 2016). This underscores the Saudi government's commitment to preserving the environment and its components.

The unwavering support from the government to the responsible body for environmental protection in the Kingdom, namely the GAMEP, has had a clear and tangible impact. This recognition of the environment's importance is evident in its incorporation within the fundamental governing system, as articulated in Article 322, which emphasizes the state's duty to conserve, protect, and develop the environment while preventing pollution. This underscores the government's significant emphasis on environmental initiatives and the conservation of natural resources. It's evident that the Kingdom of Saudi Arabia has achieved a qualitative leap in the fields of meteorology, environmental protection, and preservation of resources, which is not surprising given its dedicated efforts.

### **Environmental Pollution Symposium (Jeddah 2011)**

Environmental pollution, in all its manifestations, stands as one of the gravest threats to our health, the well-being of future generations, and poses a substantial hazard to our environment's safety. The intensity of this pollution varies across cities and regions due to differing volumes, types, and hazardous properties of pollutants.

Despite its adverse impacts on public health, the plans and programs implemented in our country to prevent and address these dangers do not match the enormity of the issue, nor do they align with its severity and consequences. Hence, there is a critical need for collaborative efforts from households, educational institutions, and the broader community to benefit everyone's welfare. Leveraging global expertise is advantageous. It is essential to treat environmental pollution with utmost seriousness and avoid underestimating its significance. In order to illuminate the scale of environmental pollution in the Kingdom and its threats to various aspects of life in our country, a seminar was conducted. This seminar involved specialists and stakeholders from pertinent entities. They unanimously stressed the crucial necessity for all authorities to take decisive action to mitigate this peril. The participants emphasized that the current programs and initiatives being executed are insufficient in addressing the magnitude and risks associated with the problem. Therefore, there's a need for national strategies involving diverse entities and the activation of oversight roles, coupled with imposing strict penalties on offenders without leniency (Muraishid & Al-Ruwais, 2011).

### **King Faisal University's (2018) Workshop on persistent organic pollutants in the Kingdom**

This workshop deliberated on the existing status of hazardous organic pollutants in the Kingdom and aimed to bolster pesticide management and the overall handling of chemicals, including those used in industries. Its objective was to reduce dependence on manufactured pesticides, enhance the safe disposal of environmentally hazardous waste, and explore safe alternatives for organic compounds resulting from prior uses. Led by expert specialists, the workshop extensively covered four key areas.

The primary focus was on assessing the current state of organic chemical pollutants in the Kingdom. Another focal point centered on international environmental agreements related to hazardous chemicals and pollutants. The third area scrutinized the roles of various sectors, both public and private, in managing and minimizing persistent organic pollutants, along with ensuring their safe disposal. Lastly, attention was devoted to the Kingdom's responsibilities under international agreements concerning hazardous chemicals and the practical means of their implementation.

The workshop addressed the challenges of handling unwanted and expired pesticides, resolving associated issues, and preventing their accumulation. Dr. Hassan Al-Shammari provided insights into developing Saudi Arabia's National Implementation Plan (NIP) for the Stockholm Convention. Recommendations underscored the importance of collaborative endeavors among relevant governmental and private sectors, in conjunction with the General Authority for Meteorology and Environmental Protection, to craft the National Implementation Plan (NIP). This plan is designed to fulfill the Kingdom's obligations under the Stockholm Convention, specifically in managing and disposing of hazardous organic pollutants in Saudi Arabia.

Additionally, a recommendation was put forth to establish a national committee comprising governmental and private sectors with vested interests to coordinate efforts in safeguarding the Saudi environment. This committee would oversee the execution of the Kingdom's commitments to ratified environmental agreements. It also emphasized providing educational expertise to institutions and entities for fulfilling the Kingdom's obligations in environmental protection and managing hazardous pollutants. Furthermore, there was a call to increase awareness and disseminate information to citizens, residents, and various societal sectors regarding types of hazardous organic chemical pollutants and effective methods for their safe handling to prevent adverse impacts on human and animal health (Al-Ahsa Today, 1970). We can conclude that the significance of this seminar lies in raising awareness about the negative role and environmental hazards posed by persistent organic pollutants. These pollutants are a type of organic chemicals resistant to decomposition in various forms, contributing to their long-term presence in the soil. These compounds exhibit chemical properties, notably their low solubility in water and high solubility in fats, leading to their storage in the fatty tissues of living organisms, causing significant harm to their health in general and to humans in particular. They are known to be carcinogenic substances.

### **Conclusion**

- 1- Despite the significant volume of legislative texts, the Saudi regulator overlooked establishing a precise and comprehensive definition preventing this type of crime. This definition might assist in identifying the causes and motivations that led to criminalization.
- 2- Nations are responsible for implementing their international obligations related to protecting human health and preserving the environment.
- 3- International organizations, notably the United Nations, played an effective and active role in environmental conservation and protection against pollution from hazardous, toxic, and radioactive

waste. Their effective contribution is evident in developing international environmental protection standards and providing appropriate platforms for conferences and the formation of international environmental agreements.

- 4- Violation by a state of the regulatory commitment to environmental conservation against pollution from hazardous, toxic, or radioactive waste necessitates holding it accountable for the resulting damages, considering such a violation as an unlawful act.
- 5- Saudi Arabia has made substantial efforts to protect the environment.

### **Recommendations**

- 1- Authorities are recommended to work towards protecting the environment from pollution and emphasizing international cooperation to achieve this goal. It is crucial to take all appropriate measures to safeguard and enhance the environment.
- 2- It is important to establish a clear and comprehensive definition for the concept of hazardous waste.
- 3- Encouraging promoting the environmental awareness across various segments of society. This is considered one of the most effective means to prevent these crimes and ensure optimal preservation of the environment from hazardous, toxic, and radioactive waste.
- 4- Noting that national environmental protection from hazardous, toxic, or radioactive waste is not sufficient on its own. There must also be concurrent international protection.
- 5- Suggesting the implementation of additional measures to integrate the environmental dimension into development plans and the Saudi Vision 2030. This includes adopting the principle of environmental assessment for development projects in both the public and private sectors and linking approval to the requirement of adhering to the results of this assessment.

### **Acknowledgment**

The authors are thankful to the Deanship of Scientific Research at Najran University for funding this work, under the Research Groups Funding program grant code NU/RG/SEHRC/12/2.

### **References**

- Abdel-Hafez, M. R. (2006). *Basel convention and its role in environmental protection from hazardous waste pollution: an analytical study*. Dar Al-Kotob Al-Ilmiyah. Egypt.
- Abu Al-Ata, R. S. (2008). *The role of the international public system in environmental protection*. Cairo: Dar Al-Nahda Al-Arabiyya.
- Abu Al-Ata, R. S. (2009). *Environmental protection in light of the international system*. Dar Al-Jami'a Al-Jadida.
- Abu Kaf, M. (2013). Hazardous Waste Management. *Electronic Cities Environment Journal*, 4, Al-Ahsa Today. (1970). *Permanent organic pollutants in the kingdom... reality and solution: anticipating the future with anticipated smart visions*. <https://www.hasatoday.com/243588>
- Al-Badri, A. H. (2010). *Systematic environmental protection in the Kingdom of Saudi Arabia: a comparative study*. Institute of Public Administration
- Al-Jawhari, I. B. H. (1987). *Al-Sibab Taj Al-Lughah and Sibab Al-Arabiyyah* (4th ed.). Beirut: Dar Al-Ilm Lil-Malayin.
- Al-Malkawi, I. S. (2009). *Environmental pollution crime: a comparative study*. House of Culture.
- Almowaten. (2016). *This is what the Kingdom has provided to preserve the environment...various agreements and initiatives*. <https://www.almowaten.net/2016/09>
- Al-Shahrani, S. D. M. (2018). *Criminal responsibility for environmental pollution crime in the Saudi system: a comparative study* (Unpublihsed Master's thesis). King Abdulaziz University
- Al-Zoubi, M. S. (2010). *International responsibility for transporting nuclear waste to developing countries* (Unpublished Master's Degree). Middle East University.

- Al-Zubaidi. (1900). *Taj Al-Arous from the Jewels of the Dictionary*. Beirut: Dar Al-Hayat.
- Ananzah, K. (2002). *Hazardous waste and the environment*. Amman: Al-Ahliyya for Publishing and Distribution.
- Ashry, A. M. (1989). *Specialization in protecting the marine environment from pollution* (Unpublished Master's thesis). Zagazig University
- El Shafie, M. I. (2006). The environmental policy and its impact on the competitive situation. *Al-Aman Wal-Nizam*, 14(1).
- Faraj, S. R. (2018). Hazardous waste in Africa: risks and environmental protection challenges. *African Readings Journal*, (35), 50-63.
- Ghazi, S.J. (nd). *General features of the environment and sustainable development strategy in the Kingdom of Saudi Arabia*. United Nation. [https://sustainabledevelopment.un.org/content/documents/3203saudiarabia\\_a.pdf](https://sustainabledevelopment.un.org/content/documents/3203saudiarabia_a.pdf)
- Kummer-Bairy, K. (2012). *Basel convention on the control of transboundary movements of hazardous wastes and their disposal*. Unated relations audiovisual library of International Law.
- Merah, A. A. (2007). *International liability for transboundary pollution* (Unpublished PhD thesis). University of Algiers.
- Ministry of Defense and Aviation (1423 AH). *Rules and procedures for control of hazardous waste, Kingdom of Saudi Arabia*. General Presidency of Meteorology and Environmental Protection.
- Muhammad, M. R. (2008). *The international environment system and the phenomenon of pollution*. Egypt: Dar Al-Kutub Al-Nazimia.
- Mukhaimer, A. (1986). *The role of international organizations in protecting the environment*. Cairo: Dar Al-Nahda Al-Arabiyya.
- Muraishid, S., & Al-Ruwais, S. (2011 September 27). Environmental Pollution". Our Environment is Suffocating. When Do We Move?, *Al-Riyadh Newspaper*, 15800, <http://www.alriyadh.com/670387> cite this reference in APA English
- National Plan. (2019 December, 7). *General Authority of Meteorology and Environmental Protection*. <https://www.pme.gov.sa/Ar/Emergency/Pages/NationalPlan.aspx>
- Reda, A. (1958). *Dictionary of language text*. Beirut: Al-Hayat Library House.
- Salama, M. M. (1979). *Penal Code: General Part*. Dar Al-Fikr Al-Arabi.
- SAWEA. (2013). *Saudi Aramco sponsors and participates in the Arab Water Conference in Al-Khobar*. <http://www.sawea.org/News-Details.php>
- Schell, D. O. (2010). The United Nations Audiovisual Library of International Law. In *Proceedings of the ASIL Annual Meeting* (Vol. 104, pp. 200-205). Cambridge University Press.
- Shalal, S. T. A. K. (2010). *International protection of the environment from the phenomenon of global warming*. Beirut: Al-Halabi National Publications.
- Talbi, A. (2012). *International responsibility for the transboundary movement and disposal of hazardous wastes*. (Unpublished Master's thesis). University of Algiers.
- The electronic portal of the General Presidency of Meteorology and Environmental Protection (2016 August, 5). <https://web.archive.org/web/20160508222711/http://www.pme.gov.sa:80/brief.asp>
- Unep. (2007). *Basel convention on the control of transboundary movements of hazardous wastes and their disposal*. UNEP
- United Nations (1972). *Peace, dignity and equality on a healthy planet*. <https://www.un.org/ar/events/environmentday/background.shtml>
- United Nations. (2010). Secretary-General, in a message for World Oceans Day, says: "Increasing human activities are putting pressure on marine biodiversity.
- Zaheer, A. M. (1415). *Criminal procedures in border crimes in the kingdom of saudi arabia and their impact on establishing security*. Riyadh: Makkah Press.