LEGAL DISSECTION OF THE LEGAL REGIME ON HAZARDOUS WASTES IN NIGERIA: LESSONS FROM OTHER JURISDICTIONS

By

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Abstract

The paper examined the Legal Regime of Hazardous Waste in Nigeria. The paper defined Hazardous Waste as any waste that possesses a substantial threat to human health or the environmental due to its physical, chemical, or biological characteristics. This work which employed the doctrinal research methodology found that the effective and sound management of wastes will require the active participation for all major key players at local, national, regional and international levels. The study also found that in order to have a desired outcome, the national hazardous waste management plan holds a critical position. It was recommended inter alia, that it is necessary to implement all existing international agreements on hazardous waste, promote the generation of adequate science-based knowledge on health and environmental risks of chemicals and make it available to all stakeholders, and promote efforts to prevent illegal traffic in hazardous wastes.

Keywords: *Legal, Hazardous Waste, Offences and Penalties.*

1.0 Introduction

The second half of the 20th century has brought increased awareness about the ways in which the human environment is fragile and vulnerable to damage by pollution. Because some parts of the human environment, for example, the atmosphere and the oceans, are shared by all nations, any controls or environmental protection measures must be employed globally to be effective.[1] This notion has led to the creation of several international legal principles and undertakings aimed at preserving the human environment. Some of these principles and undertakings have been applied in the control of environmental pollutants including radioactive wastes. Several principles of international environmental law are particularly worth noting in this context: One established principle is that States are required to take adequate steps to control and regulate sources of serious global environmental pollution or transboundary harm within their territory or subject to their jurisdiction. This principle was first articulated in the *Trail Smelter Arbitration of* 1941 between Canada and the United States, where it was decided that Canada was responsible for damage from copper smelter fumes that transgressed the border into the USA.[2]

The principle was later confirmed during the United Nations Conference on the Human Environment, in Stockholm in 1972, where States declared that it was their responsibility to respect the environment of other States. More specifically, under section 21 of that declaration, States have a responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits. This so-called "no harm" principle has in the meantime developed beyond traditional *ex post facto* State responsibility. It is now one of diligent prevention and control, a so-called

[1] G. Lindsley and W. Tonhauser, 'An Expanding International Legal Regime: Environmental Protection and Radioactive Waste Management'. https://www.iaea.org Accessed 9 October 2023.
[2] United Nations, Trail Smelter Case (USA, Canada) https://legal.un.org Accessed 9 October 2023.

"precautionary approach". The second principle is that States are required to cooperate with each other in mitigating transboundary environmental risks. This principle goes back to the *Lac Lanoux Arbitration* of 1954 between France and Spain[3] where the Tribunal held that France had complied with its obligations under a treaty and customary law to consult and negotiate in good faith before diverting a watercourse shared with Spain.

Two further principles are important to note -- namely the "polluter pays" principle and the principle of equal access and non-discrimination in the treatment of domestic and transboundary effects of polluting activities. They are part of the increasingly significant developments in environmental law.[4] All these principles apply to the conduct of nuclear activities and are, in one form or another, reflected in nuclear safety-related conventions, such as the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. However, the international community has sought to protect humans and the environment from the harmful effects of radioactive wastes in a number of additional international undertakings. These undertakings further specify or even go beyond the principles established under international environmental law.

This article reviews the expanding legal framework for protection of the human environment from potential harmful effects of hazardous and radioactive wastes. It briefly describes major international and regional undertakings and looks at emerging issues and future directions that may further expand and improve the effectiveness of the regime.

2.0. Conceptual Clarification

a. Hazard Waste

Simply defined, a hazardous waste is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment. Hazardous waste is generated from many sources, ranging from industrial manufacturing process wastes to batteries and may come in many forms, including liquids, solids gases, and sludges.[5] Hazardous waste according to the National Environmental (Food, Beverages and Tobacco Sector) Regulations is any solid, liquid or gas waste that can cause death, illness, or injury to people or destruction of the environment if improperly treated, stored, transported or discarded.[6] Substances are considered hazardous waste if they are ignitable (capable of burning or causing a fire);[7] corrosive (capable to corrode steel or harm organisms because of extreme acidic or basis properties); reactive (able to explode or produce toxic cyanide or sulphone gas), or toxic (containing substances that are poisonous). Mixtures, residues, or materials containing hazardous wastes are also considered hazardous wastes.

[3] United Nations Environmental Programme, https://leap.unep.org 9 October 2023.
[4] (n1).
[5] United State Environmental Protection Agency, https://www.epa.gov/hw/learn-basics-hazardous-waste Accessed 9 October 2023.
[6] Reg. 54 National Environmental (Food, Beverages and Tobacco Sector) Regulations.
[7] Reg. 106 National Environmental (Sanitation and Wastes Control) Regulation 2009.

Criteria for Identifying Regulated Hazardous Wastes

The general criteria for recognizing ‘‘regulated’’ hazardous wastes are contained in the National Environmental (Sanitation and Wastes Control) Regulation 2009 and other industry-specific Regulations. A waste is hazardous if it falls within and possesses such pre-determined ‘listed’ UN Code characteristics as defined in Schedule XIV of the National Environmental (Sanitation and Wastes Control) Regulation 2009 classifications. Using the UN classifications, hazardous wastes are identified and characterized as such when it is either explosive, oxidizing, highly inflammable, corrosive and organically peroxides as stipulated in Schedule 12 of the 2009 Regulations.[8] Hazardous waste is defined to include clinical emulsions, wastes oil/water, hydrocarbons/water mixtures, resins, latex, plasticizers glues and adhesives, wastes resulting from surface treatments of metal and plastics, wastes arising from industrial waste disposal operation, wastes which contain certain compounds such as copper, zinc, cadmium, mercury, lead and asbestos, UEEE and radioactive substances.[9]

Healthcare Waste

Healthcare waste or medical waste (HCW) is a by-product of healthcare that includes sharps, non-sharps, blood, body parts, chemicals, pharmaceuticals, medical devices and radioactive materials. It also includes the waste originating from ‘‘minor’’ or scattered sources such as that produced during health care undertaken in the home (dialysis, insulin injections etc.) It is defined in the National Environmental (Sanitation Waste Control) Regulations to mean waste ‘‘(a) which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological experiments;[10] (b) generated in medical and health institutions (dispensaries, hospitals, polyclinics and outpatient departments, dental clinics, veterinary stations, pharmacies, patent medical shops etc.) as a treatment and prevention of diseases in humans and animals.’’ Healthcare waste is subject to regulation because of its hazardous properties and if it is not properly managed, it can expose the healthcare workers, waste handlers and the community to infections, toxic effects and injuries. HCW could further be classified or characterized into eight broad categories. These are infectious waste, pathological waste, sharps, pharmaceutical waste, genotix waste, chemical waste, waste with high content of heavy metals, and radioactive wastes.[11]

Offences and Penalty

It is an offence for any person to own or operate any HCW facility or for any facility that generates HCW to operate without a valid license from the Agency. It is also an offence for any facility not to separate the waste at the point of generation and at all stages thereafter as prescribed under Schedule 16 to the Regulation.[12] Similarly, it is an offence for any generator of HCW not to treat or cause to be treated such waste in the manner prescribed under the Regulation or to fail to submit a waste management report within

[8] National Environmental (Sanitation and Wastes Control) Regulation 2009; Sch. 12
[9] Ibid.
[10] National Environmental (Sanitation and Wastes Control) Regulation 2009; Sch. 16.
[11] Ibid, Sch. 16.
[12] Ibid.

six (6) months of its operation and thereafter every quarter to the Agency.[13] Any person in breach of any of these offences shall be guilty of an offence and shall on conviction be liable to pay a fine of N250,000 or imprisonment for eighteen (18) months or to both fine and imprisonment.[14]

Electronic Waste

The UN defines e-waste as any discarded product with a battery or plug, and features toxic and hazardous substances such as mercury, that can pose severe risk to human and environmental health.[15]

E-waste, electronic waste, e-scrap and end-of-life electronics are terms often used to describe used electronics that are nearing the end of their useful life, and are discarded, donated or given to a recycler. The UN defines e-waste as any discarded products with a battery or plug, and features toxic and hazardous substances such as mercury, that can pose severe risk to human and environmental health.

According to the UN, in 2021 each person on the planet will produce on average 7.6 kg of e-waste, meaning that a massive 57.4 million tons will be generated worldwide. Only 17.4% of this electronic waste, containing a mixture of harmful substances and precious materials, will be recorded as being properly collected, treated and recycled. Many initiatives are undertaken to tackle this growing concern, but none of them can be fully effective without the active role and correct education of consumers.[16] The International Telecommunication Union (ITU) also indicates that e-waste is one of the largest and most complex waste streams in the world. According to the Global E-waste Monitor 2020, the world generated 53.6 Mt of e-waste in 2019, only 9.3 Mt (17%) of which was recorded as being collected and recycled. E-waste contains valuable materials, as well as hazardous toxins, which make the efficient material recovery and safe recycling of e-waste extremely important for economic value as well as environmental and human health. The discrepancy in the amount of e-waste produced and the amount of e-waste that is properly recycled reflects an urgent need for all stakeholders including the youth to address this issue.[17]

The United Nations Environment Programme (UNEP) also estimated in a 2015 report "Waste Crimes, Waste Risks: Gaps and Challenges in the Waste Sector" that 60-90 per cent of the world's electronic waste, worth nearly USD 19 billion, is illegally traded or dumped each year.[18] E-waste can be toxic, is not biodegradable and accumulates in the environment, in the soil, air, water and living things. For example, open-air burning and acid baths being used to recover valuable materials from electronic components

[13] Ibid, Reg. 86 – 93.
[14] Ibid, Reg. 104.
[15]Geneva Environmental Network, 'The Growing Environmental Risk of E-Waste.' https://www.genevaenvironmentnetwork.org/resources/updates/the-growing-environmental-risks-of-e-waste/ Accessed 9 October 2023.
[16] International Electrotechnical Commission, 'The Need for s Global Standard for E-Waste' https://www.iec.ch/blog Accessed 10 0ctober, 2023.
[17] A. Chanthadavong, 'UN Reports on Global E-Waste,' https://www.zdnet.com/article/un-reports-global-e-waste-production-soared-beyond-53-million-tonnes-in-2019/ Accessed 10 October 2023.
[18] UN Report, llegally Traded and Dumped E-Waste Worth up to $19 Billion Annually Poses Risks to Health, Deprives Countries of Resources, Says UNEP | UNEP | 12 May 2 https://www.unep.org/ Accessed 10 October 2023.

release toxic materials leaching into the environment.[19] These practices can also expose workers to high levels of contaminants such as lead, mercury, beryllium, thallium, cadmium and arsenic, and also brominated flame retardants (BFRs) and polychlorinated biphenyls, which can lead to irreversible health effects, including cancers, miscarriages, neurological damage and diminished IQs.

According to the report, the improper handling of e-waste is resulting in a significant loss of scarce and valuable raw materials, including such precious metals as neodymium (vital for magnets in motors), indium (used in flat panel TVs) and cobalt (for batteries). Almost no rare earth minerals are extracted from informal recycling; these are polluting to mine. Yet metals in e-waste are difficult to extract; for example, total recovery rates for cobalt are only 30% (despite technology existing that could recycle 95%). The metal is, however, in great demand for laptop, smartphone and electric car batteries. Recycled metals are also two to 10 times more energy efficient than metals smelted from virgin ore. Furthermore, mining discarded electronics produces 80% less emissions of carbon dioxide per unit of gold compared with mining it from the ground.[20]

In 2015, the extraction of raw materials accounted for 7% of the world's energy consumption. This means that moving towards the use of more secondary raw materials in electronic goods could help considerably in reaching the targets set out in the Paris Agreement on climate change.[21]

2.1 Legal Control of E-Waste

Regulatory control of electronic and electrical waste in Nigeria is fixed in the National Environmental (Electrical, Electronic Sector) Regulations, 2011 and the National Electrical Waste (E-Waste) Action. The Regulations which aimed at preventing and minimising pollution arising from all operations and ancillary activities associated with Electrical and Electronic sector regulates the importation, handling, and disposal of e-wastes across the country. It prohibits the importation of end-of-life, unusable or unserviceable electrical and electronic equipment (EEE), cathode ray-tube (CRT) e-waste.[22] It imposes registration requirement on every e-waste collection centre or recycling plant and requires operators to provide the Agency with necessary information such as name and activities of the organisation including partners and other investors, location and capacity of the facility, approval by the relevant control authority, EIS, evidence of equipment certification by the relevant authority and proof that the operator has not been previously convicted of any offence under the Regulation.[23] Operators are also required to comply with the guidelines set out in Schedule XII. It further imposes a duty on every importer and technician of used electronics and electronic equipment to ensure that the handler of e-waste is a registered person or corporate

[19] Ibid.
[20] Cewaste Project Final Report, 'A contribution to future critical raw materials recycling | World Resources Forum | 2021 https://cewaste.eu/wp-content/uploads/2021/04/CEWASTE-Final-Public-Raport.pdf Accessed 10 October 2023.
[21] UNEP Report, 'Waste Crime, Waste Risks: Gaps in Meeting the Global Waste Challenge: A Rapid Response Assessment| UNEP | 2015 https://wedocs.unep.org Accessed 11 October, 2023.
[22] NEEES Reg 34(2) (3).
[23] Ibid, Reg 35(b) (39)(1); Sch. XII.Agency.

orgnisation with the Agency.[24] It is a requirement under this Regulation that everybody corporate or organisation generating e-waste must separate or segregate such waste from other wastes streams.[25]

Every person or facility operating as a collection centre shall ensure that the e-waste are not burnt openly or stored longer than one year onsite or not disposed in trash receptacles or at a dump-site and/or landfill. Similarly, e-waste collected for recycling are transported to the re-designated cycling centre.[26] It is also the responsibility of every operator of e-waste collection centre and transporter to re-cycling plant keep record of the manifests and/or receipts of all e-waste and to forward a signed copy of such manifest within 30 days of waste removal to the Agency.[27] It is unlawful and illegal to discard or throw out or drop any e-waste anywhere except in a designated bin, collection centre and point.[28]

A violator of the provisions contained in Regulation 61(1) shall on conviction be liable to pay a fine not exceeding Five Hundred Thousand Naira (N500,000.00) or to a term of imprisonment not exceeding two years or both fine and imprisonment.[29] Also any person found to have committed an offence shall upon conviction be liable to pay a fine not exceeding N200,000 or a term of imprisonment not exceeding 6 months or both fine and imprisonment and an additional sum of N5,000 for every day the offence subsists. Where the offence is committed by a body corporate, it shall on conviction be liable to pay a fine not exceeding N1,000,000.00 and an additional N50,000 for every day the offence subsists.[30] Finally, as a mode of commendation, anybody corporate or organisation that demonstrates environmental leadership, adopts environmentally responsible practices, demonstrates commitment to environmental quality and maintains exemplary environmental compliance records shall be recognised and encouraged by the Agency.[31]

3.0. Legal Instruments

International Legal Instruments

a. London Convention, 1970

For many years the oceans were used for the disposal of industrial wastes, including radioactive wastes. In the 1970s, the practice became subject to an international convention which had the aim of regularizing procedures and preventing activities which could lead to marine pollution. Following the United Nations Conference on the Human Environment in Stockholm in1972, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1972, formerly referred to as the London Dumping Convention) was established and entered into force in 1975. The London Convention prohibits and regulates the disposal of radioactive pollutants into the marine environment.[32] Notable

[24] Ibid, Reg. 34(1).
[25] Ibid Reg. 34(7).
[26] Ibid, Reg. 34(4).
[27] NEEES, Reg 34(5).
[28] Ibid, Reg. 36(1).
[29] Ibid, Reg 67(1).
[30] Ibid, Reg67(2) (3).
[31] Ibid, Reg. 68.
[32] IMO, Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter' https://imo.org Accessed 10 October 2023.

characteristics of the London Convention are the provision of minimum international standards and the establishing of an international forum (the London Convention Consultative Meeting) to supervise dumping.

For the regulation of materials to be disposed of in the marine environment, "black" and "grey" lists were established. The disposal of substances on the "black" list (Annex I to the Convention) was prohibited except in trace quantities.[33] Substances on the "grey" list (Annex II to the Convention) were subject to "special care" measures to ensure that their disposal - which had to be carried out under the provisions of a "special permit" -- would not have adverse effects on the marine environment.[34]

High-level radioactive wastes (HLW) were included in the "black" list. The IAEA -recognized by Contracting Parties to the London Convention as the competent international body in matters of radioactive waste disposal and radiation protection -- was entrusted with the responsibility for defining HLW unsuitable for sea dumping.[35]

Radioactive wastes and other material not on the "black" list (low- and intermediate-level wastes) were included in the "grey" list. In issuing the special permits for the dumping of these types of radioactive wastes, countries were advised to take the recommendations of the IAEA fully into account.

By the early 1980s, there was increasing disquiet among many of the Contracting Parties to the London Convention over the continuing practice of sea dumping of low-level radioactive wastes. This led to a proposal made at the Convention's 1983 Consultative Meeting to prohibit all sea dumping of radioactive wastes. After a vote, the meeting adopted a voluntary moratorium on the sea dumping of all types of radioactive waste pending a review of the safety of the practice which was to be carried out by an independent panel of scientific experts. The Consultative Meeting of Contracting Parties in November 1993 was characterized by an extensive debate which was inflamed by reports of the illicit dumping of liquid radioactive waste in the Sea of Japan in October 1993.[36] The meeting adopted, by a majority vote, a decision on the prohibition of dumping of all types of radioactive waste to come into effect on 20 February 1994. The meeting also adopted a decision on the prohibition of dumping of industrial wastes to come into effect by 1 January 1996.

b. United Nations Convention on Law of the Seas (UNCLOS).

After the termination of solid industrial and radioactive waste disposal into the oceans, the only remaining route by which wastes can legally enter the marine environment is by effluent discharges to rivers and from coastal locations.

International law, as reflected in the provisions of UNCLOS and elsewhere, sets forth rights and obligations of States and provides the international basis upon which to pursue the protection and sustainable

[33] Annex 1, London Convention.
[34] Annex 2, London Convention.
[35] International Atomic Energy Agency, https://www.iaea.org Accessed 10 October, 2023
[36] UEPA, 'Ocean Dumping: International Treaties' https://www.epa.gov Accessed 11 October 2023

development of the marine and coastal environment and its resources.[37] In accordance with general international law, while States have the sovereign right to exploit their natural resources pursuant to their environmental policies, the enjoyment of such rights shall be in accordance with *inter alia* the relevant provisions of UNCLOS.[38]

In practice, this means that discharges of wastes into the marine environment can take place, but that States which enjoy the benefits of being granted sovereign rights over living and non-living resources within the limits of an exclusive economic zone and a continental shelf also have been given the corresponding duty to protect and preserve the marine environment within these areas.

c. The Montreal Guidelines.

The Montreal Guidelines for the Protection of the Marine Environment Against Pollution from Land-Based Sources (1985) is a non-binding instrument drafted by the United Nations Environment Programme (UNEP).[39] The Guidelines are a "checklist" for the development of bilateral, regional, and multilateral agreements, and of national legislation. They are the main international documents concerned with this subject, although they also come within the scope of several regional conventions. Recognizing the potential sensitivity of coastal environments to pollutants, the Montreal Guidelines recommend that pollution -meaning the introduction by humans of substances to the marine environment from land-based sources which are likely to cause harm to living resources and marine ecosystems and hazards to human health -- should be eliminated. The Guidelines allow the discharge of small amounts of harmful substances provided that "pollution" is not caused by the discharge. The guidelines do not have the status of an international convention; rather they are recommendations to governments.

The United Nations Conference on Environment and Development (UNCED), also known as the 'Earth Summit'. The Conference adopted three documents by consensus: the Rio Declaration on Environment and Development, which is a statement of 27 principles; "Agenda 21", which is an 800page document setting out objectives and activities with 40 programme areas and which reflects a global consensus at the highest level;[40] and the "non-legally binding authoritative statement of principles for global consensus on the management, conservation, and sustainable development of all types of forests".

Rio Declaration.

In 1992, the duty of States to protect the marine environment was reaffirmed by the United Nations Conference on Chapter 22 of Agenda 21 specifically addresses the safe and environmentally sound management of radioactive wastes.[41] States are called upon to support efforts within the IAEA to develop and promulgate radioactive waste safety standards or guidelines and codes of practice as an internationally accepted basis for the safe and environmentally sound management and disposal of radioactive waste.

[37] Unclos III, 1982
[38] E. B. Weinstein, 'The Impact of Regulation of Transport of Hazardous Waste on Freedom of Navigation' https://brill.com Accessed 11 October 2023.
[39] UNEP, 'United Nations Environment Programme' https://digitallibrary.un.org Accessed 11 October 2023
[40] P. Schrader, 'Review of Montreal Guidelines' https://heinonline.org Accessed 11 October 2023
[41]Agenda 21, The Rio Declaration

Policies and practical measures should be promoted to minimize and limit, where appropriate, the generation of radioactive wastes; provision should be made for their safe processing, conditioning, transportation, and disposal; and safe practices should be promoted by facilitating the transfer of relevant technologies to developing countries and/or the return to the supplier of radiation sources after their use, in accordance with relevant international regulations or guidelines.

d. The Global Programme of Action

At an intergovernmental conference sponsored by UNEP in 1995, a Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities was established. The GPA is designed to be a source of conceptual and practical guidance to be drawn upon by national and/or regional authorities in devising and implementing sustained action to prevent, reduce, control and/or eliminate marine degradation from land-based activities.[42] To facilitate the implementation of the GPA, a clearinghouse mechanism was proposed for disseminating relevant information, practical experience and scientific and technical expertise relevant to developing and implementing strategies to deal with the effects of land-based activities.[43] The IAEA has been identified as the lead international organization for developing the clearinghouse mechanism for radioactive substances.

e. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

The principal international legal undertaking between States concerned with the safe management of radioactive waste, and hence the protection of individuals and the environment from its potential effects, is the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. It was adopted and opened for signature in 1997. Through July 2000, it has been signed by some 40 States, but has not yet been ratified by a sufficient number to enter into force. The objectives of the Joint Convention are: to achieve and maintain a high level of safety worldwide on spent fuel management and radioactive waste management, through the enhancement of national measures and international cooperation, including where appropriate, safety-related technical cooperation; to ensure that during all stages of spent fuel and radioactive waste management there are effective defenses against potential hazards so that individuals, society and the environment are protected from harmful effects of ionizing radiation, now and in the future, in such a way that the needs and aspirations of the present generation are met without compromising the ability of future generations to meet their needs and aspirations; to prevent accidents with radiological consequences and to mitigate their consequences should they occur during any stage of spent fuel or radioactive waste management.[44]

The scope of the Joint Convention is defined in Article 3. The Convention applies to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors.[45] However,

[42] UNEP, 'Governing the Global Programme of Action' https://www.unep.org Accessed 11 October 2023.
[43] B. Meier-Wehren, 'The Global Programme of action for the Protection of the Marine Environment from Land-Based Activities [2013]' https://www.nzlii.org Accessed 12 October 2023.
[44] IAEA, 'The Joint Convention' https://www.iaea.org Accessed 11 October 2023.
[45] The Joint Convention, Art 3

spent fuel held at reprocessing facilities as part of a reprocessing activity is not included in the scope unless the Contracting Party declares reprocessing to be part of spent fuel management. Moreover, the Joint Convention shall apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, the Joint Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source, or it is declared as radioactive waste for the purposes of the Joint Convention by the Contracting Party. Also, the Joint Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defense programmes, unless [46]declared as spent fuel or radioactive waste for the purposes of the Joint Convention by the Contracting Party. However, the Joint Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defense programmes when such materials are transferred permanently to, and managed within, exclusively civilian programmes. The Convention also applies to discharges.

The principal articles of the Joint Convention dealing with the safety of spent fuel management and the safety of radioactive waste management are based on the IAEA Safety Fundamentals *The Principles of Radioactive Waste Management* (1995).[47] Articles on general safety provisions in the Joint Convention are consistent with the recommendations of the relevant IAEA Safety Standards and especially the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* (1996). Requirements to ensure the safe transboundary movement of spent fuel and radioactive waste and for the safety of disused sealed sources are the subject of two articles, namely Articles 27 and 28 of the Joint Convention.

f. The Basel Convention.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 and came into force in 1992. It is the most comprehensive global environmental agreement on hazardous wastes and other wastes. With 175 Parties (as at 31 March 2011), it has nearly universal membership.[48]

The Convention aims to protect human health against the adverse effects resulting from the generation, transboundary movements and management of hazardous wastes and other wastes. The Convention regulates the transboundary movements of hazardous wastes and other wastes and obliges its Parties to ensure that such wastes are managed and disposed of in an environmentally sound manner.[49]

The Convention covers toxic, poisonous, explosive, corrosive, flammable, ecotoxic and infectious wastes. Parties also have an obligation to minimize the quantities that are transported, to treat and dispose of wastes as close as possible to their place of generation and to prevent or minimize the generation of wastes at source.

[46] Ibid. Art 28
[47] Ibid. Art 27
[48] UNEP Report, 'Base Convention' https://unep.org Accessed 12 October 2023.
[49] E. Benson and S. Mortensen, 'The Basel Convention: From Hazardous Waste to Plastic Pollution' https://csis.org Accessed 12 October 2023.

The Basel Convention attempts to regulate hazardous waste trade but not to halt the transboundary movement of toxic materials. As such, international critics have claimed the convention falls short. Nevertheless, the Basel Convention remains the only legally binding global instrument designed to protect human health and the environment through controlling the movement of toxic waste.[50]

Regional Legal Instruments in Africa on Hazardous Wastes

a. 1989 Lome Convention

The Lome IV Convention is a trade agreement between European Community and Africa, Caribbean and Pacific States that absolutely prohibits the direct and indirect export of hazardous wastes and radioactive waste from European Community to Africa, Caribbean and Pacific States and import such waste from EC or from any other country. The Convention was opened for signature on March 22, 1990.[51]

b. Bamako Convention

The Bamako Convention on Transboundary Movement and Management of Hazardous Waste Within Africa, like the Basel Convention, seeks to create a framework for State obligations in respect to the control of hazardous waste, the prevention of transboundary movement or importation of hazardous waste and the taking of precautionary measures against reoccurrence of such waste in Africa.[52]

The Convention differs in a major respect. It absolutely prohibits trade in hazardous waste. It requires parties to prohibit the importation of all hazardous wastes into Africa from non-contracting parties and deems such import illegal and criminal. Parties must ensure that hazardous waste to be exported are managed in an environmentally sound way in the state of import and transit and that only authorized persons may store such waste.[53]

The definition of waste under this Convention is broadened. It banned waste to be used as raw materials for re-cycling and recovery from being exported and parties must appoint a national body to act as 'Dumpwatch' to coordinate governmental and non-governmental bodies. The Convention dispenses with the requirement of prior written consent adopted under Basel Convention.[54] Prior notification however is applicable to transboundary movement from a party through a State or States which are not parties.[55]

c. The Antarctic Treaty.

Although no general international convention yet exists in this area, the Antarctic Treaty is an important regional instrument for clarifying the world's responsibility to protect the environment from the harmful effects of radioactive waste. Signed in 1959, the treaty aims at the use of Antarctica exclusively for peaceful purposes and at the promotion of international cooperation in scientific investigation in this area.[56] Regarding radioactive wastes, it prohibits the disposal of such waste in Antarctica.

[50] Ibid.
[51] O. G. Amokaye, 'Environmental Law and Practice in Nigeria'(MIJ Professional Publishers Ltd 2014, Lagos) 477
[52] Ibid.
[53] Bamako Convention, Art 4(3)(i)
[54] Bamako Convention, Art 6(6)
[55] Bamako Convention, Art 7
[56] National Science Foundation, The Antarctic Treaty/NSF – https://www.nsf.gov Accessed 12 October 2023

Nigerian Legal Instruments

a. Constitution of the Federal Republic of Nigeria, 1999.

The constitution, as the national legal order, recognizes the importance of improving and protecting the environment and makes provision for it. Under section 20 it is an objective of the Nigerian State to improve and protect the air, land, water, forest, and wildlife of Nigeria. Section 12 establishes, though impliedly, that international treaties (including environmental treaties) ratified by the National Assembly should be implemented as law in Nigeria.

Sections 33 and 34 which guarantee fundamental human rights to life[57] and human dignity respectively, have also being argued to be linked to the need for a healthy and safe environment to give these rights effect.[58] According to section 17(d), the exploitation of human or natural resources in any form whatsoever for reasons, other than the good of the community, shall be prevented.[59]

b. National Environmental Standards and Regulations Enforcement Agency ACT 2007 (NESREA).

The NESREA Act empowers the Agency to be responsible for enforcing all environmental laws, guidelines, policies, standards and regulations in Nigeria, as well as enforcing compliance with provisions of international agreements, protocols, conventions and treaties on the environment including climate change, biodiversity, conversation, desertification, forestry, oil and gas, chemicals, hazardous wastes, ozone depletion etc.[60]

The Act prohibits the discharge in such harmful quantities of any hazardous substance into the air or upon the land and the waters of Nigeria or at the adjoining shorelines, except where such discharge is permitted or authorized under any law in force in Nigeria.[61] The Act provide for the establishment, protection and development in Nigeria and other related matters.[62]

The Act empowers the Agency to make regulations and some of which are: National Environmental (Hazardous Chemicals and Pesticides) Regulations S. 1. No. 65, 2014; National Environmental (Healthcare Waste Control) Regulations B2565-2592; National Environmental (Sanitation and Wastes Control) Regulations S. 1. No. 28, 2009; National Environmental (Permitting and Licensing System) Regulations S. 1. No. 29, 2009; National Environmental (Ozone Layer Protection) Regulations S. 1. No. 65, 2022; National Environmental (Food, Beverages and Tobacco Sector) Regulations S. 1. No. 33, 2009; National Environmental (Chemicals, Pharmaceuticals, Soap and Detergent Manufacturing Industries) Regulations S. 1. No. 36, 2009 and so on. These regulations main objectives is to protect human health and the environment from harmful effects of hazardous chemicals and pesticides, and other agro-chemicals. It also contributes to the sustainable development of agriculture and the conservation of other living and non-

[57] CFRN 1999, s.33
[58] CFRN 1999, s.34
[59] CFRN 1999, 17(d)
[60] NESREA Act 2007, s.7(c)
[61] Ibid, s.27
[62] Ibid, s.37

living resources. For instance, the National Environmental (Electrical/Electronic Sector) Regulations S. 1. No. 79, 2022 aims to prevent and minimize pollution from operations and ancillary activities of the Electrical/Electronic Sector. This Regulation covers both new and used Electrical/Electronic Equipment (EEE/UEEE). Section 7 provides authority to ensure compliance with environmental laws, local and international, on environmental sanitation and pollution prevention and control through monitory and regulatory measures. Section 8 (1)(K) empowers the Agency to make and review regulations on air and water quality, effluent limitations, control of harmful substances and other forms of environmental pollution and sanitation. Section 27 prohibits, without lawful authority, the discharge of hazardous substances into the environment. This offence is punishable under this section, with a fine not exceeding, N1,000,000 (One Million Naira) and an imprisonment term of 5 years. In the case of a company, there is an additional fine of N50,000, for every day the offence persists.

c. Environmental Impact Assessment Act, 1992

The environmental assessment Decree No 86 of 1992 (as it then was) has come as a fitting compliment to the FEPA Decree (now NESREA Act) in the important area of land utilization and siting of industries. The principal goal of this enactment was stated under section 1 which is to ensure that possible negative impacts of development projects are predicted and addressed prior to any project take-off.[63] The effect of this is to promote sustainable development.[64]

The second phase of this assessment is referred to as environmental audit. This process which culminates in the writing of an environmental audit report compliments the process of an environmental impact assessment and in some instances supplement it. In furtherance of the objectives of this Act, NESREA established an environmental impact assessment department in 1993. The department was saddled with the responsibilities of ensuring enforcement and compliance with provision of the act in every aspect of the nation's development efforts.

Under regulation 6 of the EIA Regulations, a developer can ask the planning authority to give an EIA screening opinion before any application for planning permission is made. The planning authority must respond to such requests within three weeks unless an extension is agreed.[65] This Act provides machinery for enhancing sustainable development in Nigeria but how far has this been achieved not to be exercised arbitrarily.[66] There is a provision for giving a hearing to interested parties and members of the public if their interest would be injuriously affected.

It is important to note that Section 2 (1) requires an assessment of public or private projects likely to have a significant (negative) impact on the environment. Section 2 (4) requires an application in writing to the Agency before embarking on projects for their environmental assessment to determine approval. Section

[63] EIA Act 1992, s.1
[64] N. A. Keftin and Others, 'An Assessment of Compliance of Building Construction Projects with Environmental Impact Assessment Requirements in Nigeria' (FUTY Journal of the Environment, Yola) 4, (1) 2009.
[65] Reg. 6 EIA Act 1992
[66]R. E. Munn, 'Environmental Impact Assessment: Principles and Procedures. Scope Workshop Report 5, Toronto, 1975

13 establishes cases where an EIA is required, and Section 60 creates a legal liability for contravention of any provision.

d. Mineral and Mining Act, 2007

The process of minerals and mines exploration and exploitation is one that can result in serious environmental degradation and damage. S.65 of the Act prohibits the pollution and causing to be polluted any water or water course by any person in the course of mining or prospecting for minerals.[67] Furthermore, section 33(4) mandates any holder of a prospecting right upon completion of prospecting operations to fill up any shafts wells, holes or trenches made by him and to restore the land to its original state.[68] Section 254(1) of the Act provides for the establishment of the mines field police[69] (drawn from Nigerian police) for the purpose of enforcing compliance with the provision of the Act and of regulation made there under.[70] All the above provisions, inter alia, are geared towards sustainable use and exploitation of the environment. We however wonder as to the failure to establish the minefield police as provided under the section.[71] One then wonders if all the minefield which has constituted into death of many were not dug by miners and are they not still there. And the important question at this juncture is, how many arrest have been made by mine police since the inception of the above provision.

e. The Harmful Waste (Special Criminal Provision Etc.) Act 1988

The Act was enacted with the specific object of prohibiting the carrying, depositing and dumping of hazardous wastes on any land, territorial waters and matters relating thereto. This Act is essentially a penal legislation. The offences are constituted doing any of the act or omission stated in the section 12 of the act.[72] The jurisdiction of the Act is far reaching as it sought to remove any immunity conferred by diplomatic immunities and privileges Act on any person for the purpose of criminal prosecution. It however important to note that despite its far-reaching jurisdiction, it focuses mainly on criminal prosecution of damage and does not provide compensation to the victim of the damage. Section 6 of the Act provides a very stringent sentence of life imprisonment and in addition the forfeiture of any aircraft, vehicle or land connected with or involved with the violation.[73] However, it was observed that there had never been a decided case of any person whether natural or artificial, prosecuted pursuant to the provision of this Act. It is equally presumptuous to hazard the assumption that no hazardous waste had found its way into Nigeria as contemplated by the Act since its enactment.

5.0 Analysis of the Institutions on Hazardous Wastes in Nigeria

a. National Environmental Standards and Regulations Enforcement Agency (NESREA). This Agency has responsibility for the protection and development of the environment, biodiversity conservation and sustainable development of Nigeria's natural resources in general and environmental technology including

[67] MMA, s. 65
[68] Ibid, s.34(4)
[69] Ibid, s. 254(1)
[70] MMA, s.254(1)
[71] Ibid.
[72] HW Act, s.12
[73] HW Act, s.6

coordination and liaison with relevant stakeholders within and outside Nigeria on matters of enforcement of environmental standards, regulations, rules, laws, policies, and guidelines.[74]

Some functions of the Agency are to:

- enforce compliance with laws, guidelines, policies and standards on environmental matters;
- coordinate and liaise with, stakeholders, within and outside Nigeria on matters of environmental standards, regulations and enforcement;[75]
- enforce compliance with the provisions of international agreements, protocols, conventions and treaties on the environment including climate change, biodiversity conservation, desertification, forestry, oil and gas, chemicals, hazardous wastes, ozone depletion, marine and wildlife, pollution, sanitation and such other environmental agreements as may from time to time come into force;
- enforce compliance with policies, standards, legislation and guidelines on water quality, Environmental Health and Sanitation, including pollution abatement;[76]
- enforce compliance with guidelines, and legislation on sustainable management of the ecosystem, biodiversity conservation and the development of Nigeria's natural resources;

b. The National Agency for Food and Drug Administration and Control (NAFDAC)

The National Agency for Food and Drug Administration and Control (NAFDAC) was established by Decree No. 15 of 1993 as amended by Decree No. 19 of 1999 and now the National Agency for Food and Drug Administration and Control Act Cap N1 Laws of the Federation of Nigeria (LFN) 2004. The act mandates the Agency to regulate and control the manufacture, importation, exportation, distribution, advertisement, sale and use of Food, Drugs, Cosmetics, Medical Devices, Packaged Water, Chemicals and Detergents (collectively known as regulated products). The Agency was officially established in October 1992.[77]

Functions of NAFDAC

- The functions of NAFDAC as provided in the enabling law that establishes it are to:[78]
- Regulate and control the importation, exportation, manufacture, advertisement, distribution, sale and use of food, drugs, cosmetics, medical devices, bottled water, Chemicals and detergents (Regulated Products);
- Conduct appropriate tests and ensure compliance with standard specifications designated and approved by the Council for effective control of quality of regulated products and their raw materials as well as their production processes in factories and other establishments;

[74] NESREA, 'Our Functions,' https://www.nesrea.gov.ng/our-functions/ Accessed 23 October 2023.
[75] D. Okpalifo, 'The Role of NESREA Act 2007 in Protecting the One Earth' https://www.linkedin.com/pulse/role-nesrea-act-2007-protecting-one-earth-daniel-chukwunemerem Accessed 23 October 2023.
[76] (n75).
[77]NAFDAC, 'Overview of NAFDAC Mandate' https://www.nafdac.gov.ng/about-nafdac/nafdac-organisation/nafdac-functions/ Accessed 23 October 2023.
[78] Ibid.

- Undertake appropriate investigation into the production premises and raw materials for regulated products and establish relevant quality assurance systems, including certification of the production sites and of the regulated products;
- Undertake inspection of imported regulated products and establish relevant quality assurance systems, including certification of the production sites.

c. Standard Organisation of Nigeria (SON)

The Standards Organization of Nigeria (SON) was established by an Enabling Act Number 56 of December 1971 – the Standards Organization of Nigeria cap 412 of the laws of Federal Republic of Nigeria, with a commencement date of 1 January 1970, when the Organization started to function.[79] The Act has three amendments: Act No. 20 of 1976, Act No. 32 of 1984 and Act No. 18 of 1990 and Act No. 9 of 2004.Act No. 9 of 2004 has been repealed and replaced with Act No. 14 of 2015.

SON's governing body is known as the Standards Council of Nigeria. This is the Policy making body for supervising the administration and financial management of the Organization. The Director General of the Organization is the Chief Executive whose responsibilities revolve around the day-to-day administration of the Organization within the broad guidelines approved by the Council.

The Legal Requirements:

1. POWERS OF THE MINISTER – Power to give directives to SON; power to declare established standard as binding, power to direct a supplier to recall a defective commodity on the recommendation of the Organization, etc.
2. POWERS OF STANDARDS COUNCIL OF NIGERIA – Power to designate, establish and approve standards in respect of metrology, materials, commodities, structures and processes for the certification of products in commerce and industry throughout Nigeria. Power to authorize the recognition of quality certification bodies, inspection bodies, testing laboratories, calibration laboratories and qualified personnel related to these activity areas operating legally. Power for establishment of an import and export product surveillance and to carry out any other functions imposed on it under this Act or any other written law; power to make rules.
3. POWERS OF SON- Power to organize tests, investigate into the quality of facilities, materials and products, ensure reference standards for calibration and verification of measures and measuring instruments, register and regulate standard marks and specifications. Administer and enforce provisions of the Act. etc.
4. POWERS OF DIRECTOR GENERAL – Power to enforce standards, quality control of products, science of measurement and all matters relating to metrology; investigate quality of products etc. seize, seal, destroy or prohibit the sale of substandard products; right of access to any premises, including all Nigerian Seaports, Airports and Borders where industrial or commercial undertaking

[79] Nigeria Trade Hub, https://nigeriatradehub.gov.ng Accessed 23 October 2023.

is being carried out to perform her functions, while every officer of the Organization shall have the power, rights, privileges and protection equivalent to that of a Police Officer.[80]

Mandate or Functions of SON

1. Evaluation of quality assurance activities, including certification of systems, products and laboratories throughout Nigeria.[81]
2. Designation, establishment, approval and declaration of standards in respect of metrology, materials, commodities, structures and processes.
3. Certification of products in commerce and industry throughout Nigeria.
4. Certification and conformity assessment scheme.
5. Quality control of products, weights and measures.
6. Matters relating to metrology- ensure reference standards for calibration and verification of measures and measuring instruments.
7. Investigation of quality of products etc.
8. Enforcement of Standards.
9. Quality management.
10. Registration and regulation of standard marks and specifications etc.
11. Compilation of an inventory of products in Nigeria requiring standardization
12. Establishment of an import and export product surveillance.
13. Establishment of a mandatory conformity assessment programme for locally manufactured products in Nigeria.
14. Registration and regulation of standards, marks and certification; and
15. Establishment and maintenance of Laboratories.
16. Compilation and publication of Scientific or order data.
17. Sponsoring national and international conferences.
18. Proffering professional advice to government of the federation or state on specific problems relating to Standards specifications.
19. Research.
20. Establishment of Standard Library.

f. The Court

Environmental laws are put in place to mitigate the threatening environmental problems resulting from human activities. To checkmate these human activities, courts are established by governments with jurisdictions to entertain environmental litigations to protect and redress environmental wrongs in Nigeria.

On May 13, 2005, the Centre for Oil Pollution Watch (COPW) commenced legal action against the Nigerian National Petroleum Corporation (NNPC). The plaintiff alleged that although the defendant contained the spillage on the surface, it failed to clean up or reinstate the Ineh/Aku streams/river. Furthermore, the

[80] Nigeria Trade Portal, https://trade.gov.ng/en/custom-pages/about-son Accessed 23 October 2023
[81] Ibid.

plaintiff averred that the respondent was negligent in both the causation and containment of the oil spillage; that the spillage had harmful effect on living resources, marine life, human health and other usage of the streams.[82]

The respondent challenged the plaintiff's standing to sue and sought an order striking the suit. On February 9, 2006, the trial court struck out the suit for lack of locus having not suffered any injury at all, let alone any injury above every other member of the Acha community resulting from the alleged oil spillage. On January 28, 20013, the Court of Appeal dismissed the appeal by reaffirming the trial court's ruling. The plaintiffs appealed to the Supreme Court on March 9, 2013. On July 20, 2018, the Supreme Court unanimously granted the appeal in favor of the appellant. The Supreme Court of Nigeria (SCN) held:

1. That the appellant NGO had the standing to sue the respondent, thereby liberalizing or broadening the rule of standing. The Supreme Court specifically highlighted "that public spirited individuals and organizations can bring an action in courts against relevant public authorities and private entities to demand their compliance with relevant laws and to ensure the remediation, restoration and protection of the environment."
2. The Supreme Court further clarified that "Accordingly, every person, including NGOs, who Bonafede seek the due performance of statutory functions or enforcement of statutory provisions or public laws, especially laws designed to protect human lives, public health and the environment, should be regarded as proper persons clothed with standing in law to request adjudication on such issues of public nuisance."
3. The Supreme Court also acknowledged that recognizing public interest litigation will help address some other barriers to access to justice, as poor communities without "the financial muscle to sue" which usually and disproportionately bear the brunt of environmental and climate change problems, will have the benefit of public-spirited persons and organizations fighting their cause.
4. The Supreme Court noted particularly, for the first time, that: "there is no gain saying in the fact that there is increasing concern about climate change, depletion of the ozone layer, waste management, flooding and global warming etc… Both nationally and internationally, countries and organizations are adopting stronger measures to protect and safeguard the environment for the benefits of the present and future … it is on account of this, inter alia, that I am of the firm view that this court, being a court of policy should expand the locus standi of the Plaintiff/Appellant to sue" – Per Aka'ahs, JSC.
5. Further, the national resources of earth… "must be protected and conserved for the benefit of present and future generations through careful planning and management as appropriate"–Per Eko, JSC.
6. The Supreme Court also made significant strides in 'greening' the Nigerian Constitution and confirming the existence and enforceability of environmental human rights in Nigeria, in a manner

[82] Centre for Oil Pollution Watch (COPW) Vs NNPC (2018)

that increases the possibility of successful climate change litigation in the country, especially by allowing public interest litigation. First, the Supreme Court held that Section 20 of the Nigerian Constitution on duty to protect the environment by the State is justiciable when read together with, and in the context of, a provision like section 4(2) of the Constitution, on the power to make laws to give effect to section 20. Second, the Supreme Court explicitly recognized for the first time, that section 33 of the Constitution which guarantees the Right to Life, implicitly includes and constitutes a fundamental right to a clean and healthy environment for all. Third, the Supreme Court explicitly affirmed the enforceability of the environmental right in Article 24 of the African Charter on Human and Peoples' Rights as domesticated in Nigeria by the African Charter Act, Cap. A9 LFN 2004.

7. Finally, the Supreme Court decision in the above case aligns with the Constitutional Human Rights approach to Environmental and Climate Protection taken earlier by the Lower Court/Federal High Court in ***Jonah Gbemre vs Shell and others***.[83] It demonstrates a significant positive paradigm shift in the attitude of the Supreme Court to environmental and climate change related claims. It provides additional human rights and constitutional tools for potential climate litigation in Nigeria.

g. The Organisation for Economic Cooperation and Development (OECD)

The OECD is an international organization that works to build better policies for better lives. Its goal is to shape policies that foster prosperity, equality, opportunity and well-being for all. OECD has supported environmentally sound waste and materials management in member countries through the publication of reports and working papers.[84] Nigeria is not yet a member of the organisation. Based on this work, the OECD's governing body, the Council, has adopted OECD Acts – Decisions and Recommendations – in these and related fields.[85] Key Acts include the following:

h. African Commission on Human and People's Rights

The African Charter established the African Commission on Human and Peoples' Rights. The Commission was inaugurated on 2 November 1987 in Addis Ababa, Ethiopia. The Commission's Secretariat has subsequently been in Banjul, The Gambia.

In addition to performing any other tasks, which may be entrusted to it by the Assembly of Heads of State and Government, the Commission is officially charged with three major functions:

- the protection of human and peoples' rights
- the promotion of human and peoples' rights
- the interpretation of the African Charter on Human and Peoples' Rights.

[83] (2005) AHRLR 151 (NgHC 2005)
[84] OECD Better Life Index, https://www.oecd-ilibrary.org Accessed 23 October 2023
[85] OECDiLibrary, 'Waste Management and the Circular Economy in Selected OECD Countries : Evidence from Environmental Performance Reviews' https://www.oecd-ilibrary.org Accessed 23 October 2023

In the case of *The Social and Economic Rights Action Center and the Center for Economic, and Social Rights v Federal Republic of Nigeria*,[86] the question as to the role of the provisions of the Africa Charter on Human and Peoples' Rights in the protection of the right to a healthful environment was addressed by the African Commission on Human Rights in the above case. This case was a landmark decision because it represents the turning point where the provisions of the Charter were interpreted broadly to incorporate the protection of environment. The fact of this case was that in March 1996, the petitioners filed a complaint alleging series of violations of human rights of the Ogoni people. In particular, the complaint decried the widespread contamination of soil, water and air; the destruction of homes; the burning of crops and killing of farm animals; and the climate of terror the Ogoni communities had been suffering of, in violation of their rights to health, a healthy environment, housing and food. In terms of the African Charter, these allegations included violations of Articles 2 (non-discriminatory enjoyment of rights), 4 (right to life), 14 (right to property), 16 (right to health), 18 (family rights), 21 (right of peoples to freely dispose of their wealth and natural resources) and 24 (right of peoples to a satisfactory environment). The Commission found the Nigerian Government and Multinational oil companies to have violated the rights of the people of Ogoniland to access clean water, food, good health and to adequate standard of living. The commission held that: "pollution and environmental degradation to a level humanly unacceptable has made living in Ogoniland a nightmare.

6.0 Lessons Learned from Hazardous Wastes Management

In the European Union, the United States, Canada, and many other countries, hazardous waste is defined and managed according to government regulations and the rule of law. In the United States for instance, hazardous waste is defined by Resource Conservation and Recovery Act (RCRA) regulations (Title 40 of the Code of Federal Regulations). RCRA defines hazardous waste as belonging to one of two groups: listed wastes and characteristic wastes. Listed hazardous wastes are defined and tabulated in the regulations, and generally they are associated with a specific manufacturing process or specific chemical.[87]

If a waste is not listed, it may still be hazardous by characteristic. There are four categories of hazardous characteristics: corrosivity, ignitability, toxicity, and reactivity. Three of these characteristics—corrosivity, ignitability, and toxicity— are determined by a specific test method.[88]

Both the waste generator and the treatment, storage, and disposal facility (TSDF) have responsibility to satisfy the applicable environmental regulations. But, they must also manage the waste safely. It must be borne in mind that the environmental regulations may not address all of the hazardous properties of the waste. To achieve a satisfactory level of process safety, both the generator and the TSDF must consider the hazardous properties of the waste and may need to take actions that exceed the minimum regulatory standard for environmental protection. This requires that the waste generator identify the chemical constituents in the waste. The generator will understand how the waste was created and should identify to the TSDF the

[86] Comm. No. 155/96 [2001].
[87] RCR Act, Title 40 of the Code of Federal Regulations, 1976, Parts 239–282.
[88] B. L. Cox and Others, 'Lessons Learned from Case Studies of Hazardous Waste/Chemical Reactivity Incidents.' http://www.epa.gov/oem/content/learning/chemical_harzards.htm accessed 8 November 2023.

chemical constituents in the waste.[89] The TSDF should consider how the waste characteristics and the chemical constituents may introduce a chemical reactivity hazard due to treatment and disposal activities.

Hazardous waste, as defined by RCRA, may also be prone toward chemical reactivity hazards, as defined in the field of process safety. Some material that is stable in standard conditions may become reactive when heated or mixed with other materials. Past chemical reactivity incidents might have been avoided if TSDFs and waste generators were more aware of chemical reactivity hazards associated with a hazardous waste, and how the hazards may change during storage, handling, and treatment. For instance, if TSDFs would communicate to the generator that the waste may be heated during storage, handling and/or treatment, it would allow the generator to communicate any known temperature limitations associated with the waste. This information would, in turn, give the TSDF the opportunity to manage the waste so that these limitations are not exceeded.[90] Also, effectively communicating the hazards to those handling the material may have result in more safety conscious decisions.[91]

There are several important lessons for the management of hazardous wastes:

- Environmental regulations may not adequately address chemical reactivity hazards. For each distinct waste stream, the TSDF should consider how their normal treatment and disposal practices may introduce a chemical reactivity hazard.

- The waste generator has an obligation to identify the hazardous chemical constituents in their waste stream.

- The TSDF has an obligation to consider how the type and concentration of chemical constituents in a hazardous waste may introduce a chemical reactivity hazard into their treatment and disposal practices.

- Many waste treatment operations involve heating of the waste; this can lead to a chemical reactivity hazard.

- CCPS guidelines can serve as a sound basis for both the waste generator and the TSDF in the identification, evaluation, and control of chemical reactivity hazards.

7.0 Conclusion and Recommendation

a. Conclusion

Effective environmentally sound management of wastes requires active participation of all key stakeholders at local, national, regional and global levels. This will require a nationally documented road map. A strategic approach and a National Hazardous Waste Management Plan are critical for desired outcomes.

[89] R. A. Ogle and Others, 'Explosion of a Railcar Containing Toluene Diisocyanate Waste, Process Saf Prog 23 (2004) 316 – 320.

[90] USEPA, Handbook for Stabilization/Solidification of Hazardous Waste, EPA/540/2-86/001, June 1986

[91] CCPS/AIChE, Guidelines for Safe Storage and Handling of Reactive Materials, Wiley, New York, 1995.

Approach has a scope that includes:

a. Environmental, economic, social, health and labor aspects of chemical safety.
b. Agricultural and industrial chemicals, with a view to promoting sustainable development and covering chemicals at all stages of their life cycle, including in products.
c. The involvement of all relevant sectors and stakeholders, including at the local, national, regional, and global levels, is key to achieving the objectives of the Strategic Approach, as is a transparent and open implementation process and public participation in decision-making, featuring in particular, a strengthened role for women.
d. The main stakeholders in the Strategic Approach are understood to be Governments, regional economic integration organizations, intergovernmental organizations, non-governmental organizations and individuals involved in the management of hazardous waste from all relevant sectors, including, but not limited to, agriculture, environment, health, industry, relevant economic activity, development cooperation, labor and science. Individual stakeholders include consumers, disposers, employers, farmers, producers, regulators, researchers, suppliers, transporters and workers.

b. Recommendations

Of equal importance on the way forward is to activate and institutionalize Global Plan of Action of the Strategic Approach to Hazardous Waste Management. Other actions include:

a. Facilitate the implementation of existing agreements and work areas.
b. Target issues not currently addressed in existing agreements and work areas.
c. Chemicals or chemical uses that pose an unreasonable and unmanageable risk to human health and the environment based on a science-based risk assessment is no longer produced or used for such uses.
d. The risks from unintended releases of chemicals that pose risks to human health and the environment assessment are minimized.
e. Promote the generation of adequate science-based knowledge on health and environmental risks of chemicals and make it available to all stakeholders.
f. Integrating chemicals issues into the broader development agenda.