ISSN 2664-4002 (Print) & ISSN 2664-6714 (Online)
South Asian Research Journal of Humanities and Social Sciences
Abbreviated Key Title: South Asian Res J Human Soc Sci

| Volume-7 | Issue-3 | May-Jun -2025 | **DOI: https://doi.org/10.36346/sarjhss.2025.v07i03.002**

Original Research Article

Nuclear Radiation Pollution and International Protection Against its Harm

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Article History
Received: 02.04.2025
Accepted: 07.05.2025
Published: 15.05.2025

Abstract: States can exercise their rights in nuclear energy for comfortable activities as the legalized action of international public law as long as they ensure control in their territories to ensure nuclear energy side effects are contained to non-involvement of areas beyond their borders. In such situation there is nothing possible to be done about any damages even though the use of nuclear energy continues to be restricted. States possessing an international responsibility to bear all arising damage from energy consumption in material and moral terms because they must compensate whoever is exposed to international law who suffers such damage. Such legal instruments provide an objective way to handle nuclear damage liability such that states are liable to pay compensation to suffers of nuclear operations undertake by them.

Keywords: International Protection, Harm, Radiation Pollution.

INTRODUCTION

The world deals with a critical radioactive pollution problem which is one of the most dangerous and complex problems for humanity to be exposed to possible danger. This has been one of the longest enduring problems as far as society has been concerned. Out from human origins this phenomenon arose when people began to cause it during development of their technologies. The effectiveness of the modern technology and its relevance to the needs of the man is now well established. Nuclear technology stands first in importance because its energy exploitation ranks it as the first type of technology. The wrong use of such energy leads to significant environmental degradation due to radioactive material exposure. The key question in this inquiry is to define environmental contamination with the radioactive substances. The negative consequences of nuclear energy use become nationalless since when they manifest themselves, the destructive nature begins to show up. A national nuclear accident has consequences which radiate into neighboring countries through their borders. The region's geographical boundaries cannot restrict the international responsibility based on the cause of multiple problems of concept concerning the sovereignty and legal basis. This research project acquaints with studying the legal base of international responsibility for nuclear radiation pollution damages as the modern judicial thinking about this issue hinders the identification of concrete bases.

The research looked at nuclear radiation pollution, pinpointing its primary sources and explains health and environmental impacts and then reviews legal and international nuclear pollution control measures. The assessment will measure national and international response to radioactive pollution by means of holistic analysis that will produce protective recommendations for nuclear radiation and associated risks. Research Problem: Technology moderns and increasing nuclear power uses fail to see off nuclear radiation pollution from risking human as well as environmental safety. As nuclear accidents occur the peril rises and when poor radioactive waste management is combined with weak safety systems on the part of several countries the situation is made worse. The research analyses both the level of nuclear radiation pollution threats to human beings and environmental systems and existing global solutions proffered by means of international treaties and state laws.

The investigation demands correct scientific steps to be followed for accuracy at all levels as the study proceeds. A descriptive analytical approach will be used for gathering dates by means of scientific methodologically documented sources including scientific publications and reports authored by the environment and global health protection organizations. A scientific study taking its origin from this analysis will be documented. The research endeavors to look at radioactive pollution by studying its origins, variety and human impact, especially that of enduring consequences from ionizing radiation released from nuclear and industries sources. The focus of the research is the contemporary global and the Arab environment insomuch as it analyses international agreement and conventions as well as historic events.

The research was broken into two sections to give easier understanding of the topic of the study. The focus of the research started from study on characteristics of nuclear radiation pollution in two different parts. The First research section highlighted pollution by nuclear radiation with research on its definition and various forms while the second research section focused on the origin of nuclear radiation pollution. The research covered two aspects of international protection for the environment to nuclear radiation pollution. Two specific requirements were discussed. The paper studied two aspects concerning the international protection of international organizations and the international agreements and treaties against nuclear radiation. The findings and recommendations made resulted from this research investigation.

The planet is affected by two forms of naturally occurring radioactive pollution, electrical activity from the radiation that comes to the earth from space and running out radioactive gases. Nuclear radiation is produced both by natural and human endeavors like explosions in the process of nuclear test. Radioactive pollution in other words emanates from nuclear power plants and nuclear reactors and radioactive nuclear material and waste and radioactive nuclear isotopes for agriculture, medicine and industry as well. Radioactive pollution has two sources: incidents involving nuclear materials as well as incidents involving radioactive operations. This section will have both the two parts due to the topic of the subject.

Concept and Types of Nuclear Radiation Pollution

The radiation pollution has such an extent that it makes this form of pollution most dangerous. The effects of this pollution to the environment are long lasting. Environment recovers from polluted air sources when air sources have stopped their emissions for a period that takes up several days approximately. Complete elimination is needed of all organic as well as inorganic pollutant in oceanic water bodies. The membership period may extend up to several years hence, we are going to organize the topic into two parts. The first section discusses the concept of nuclear radiation pollution with a description of their various types. The idea of nuclear radiation pollution. Radioactive pollution prevails over its counterparts of pollution since industrial demand for nuclear industry keeps expanding along with demand for nuclear energy and rate of produced radioactive substances by this industry and its scientific applications. Humans are exposed to high risks if radioactive pollution results in, as some specific detection equipment is needed for the purposes of revealing it. Radio active waste maintain its existence for a long time while safe treatment with toxin disposal involve hazardous complex expensive processes [2].

The scientific definition of radiation includes any rays that strike atom neutral states to cause an electrical change known as the ionized body. The emergence of these ions changes normal pathways of biological processes. The process of decomposition of nuclear components through the process of spontaneous radioactive decay leads to the production of nuclear energy and several released particles arising from nuclear division. Decomposed waves and particles are a type of ionizing nuclear or atomic radiation [3]. Environmental contamination in nuclear operations form “corruptions that impact every part of the environment while transforming their attributes and physical characteristics which potentially results in permanent destruction”. The human introduction of nuclear materials and radioactive waste into raw natural environmental entities (soil, air or water) through direct or indirect methods and deliberate or accidental means cause environmental pollution, ultimately impacting human health and plant life, animal life, and resources and ecosystems. There are three major types of nuclear radiation pollution in relation to terrestrial, aerial and aquatic possessions of the environment [4].

The legislation listed ionizing radiation as a substance that contaminates the environmental sectors of water, air and soil. And the Ionizing Radiation Law No. (59) of 1960, and this law defined radiation as “radiation emitted from radioactive materials or from machines such as X-ray or Roentgen devices, reactors, accelerators and all other radiations”, and “Law Regulating Nuclear and Radioactive Activities of 2001”, and we find that the law found a definition of ionizing radiation as “electromagnetic or corpuscular radiation capable of exciting or ionizing atoms or molecules of matter when penetrating them, including alpha particles, beta particles, gamma rays, X-rays, protons and neutrons”. It is established within the scope of French legislation that there is no specialized nuclear law and that the law issued in 1961 related to air pollution is the one from which the legal basis for a nuclear law is taken [6, 7], and that France has (58) reactors used in the production of electrical energy, which makes it the second producer of nuclear energy in the world after the United States of America, but there are dilapidated reactors that have passed the age, which prompted France to consider In stopping some reactors to ensure the safety of the reactor’s operation, which led to stopping (18) reactors in 2016 due to

their danger to the environment, and in order to preserve a clean environment, it turned to alternative energy such as wind and solar energy in order to live in a safe environment [7].

The Iraq Environmental Protection and Improvement Law (2009) has ionizing radiation among mang other parts of definition for hazardous substances, "materials that harm human health during improper use [;] or present environmental hazards through their pathogenic qualities and toxic nature as well as explosiveness or flammability or ionizing or magnetic radiation capability" [10]. The first article under Ministry of Environment Law No. (37) of 2008 gave the definition of ionizing radiation; saying that "radiation that is capable of causing the formation of two ions among both materials and biological substances". The definition of ionizing radiation, as radiation that can produce two ions in the biological materials originates from two different laws. First there is "From ions in biological materials" [11] and second there is Iraqi Atomic Energy Commission Law No. (43) of 2016 which gives "any radiation capable of producing a pair of ions in the substance or biological materials" [12].

Types of Nuclear Radiation Pollution. The legal classification of nuclear radiation pollution dissects into two separate types as follows:

The type of pollution from nuclear activity is the first nuclear pollution. The definition includes anything associated with nuclear science breakthroughs with technology ownership and regulation of nuclear power operation which controls both nuclear site facilities such as reactors and establishments as well as their encased materials and fuel products produced therein as well as radioactive waste substances. A nuclear emergency in this zone is treated as a nuclear accident resulting in implications, which spread beyond the site confines. The safety operations under this category get state leadership and oversight. State authorities assume a responsibility of developing executive capabilities of people authorized to perform the radiation exposure procedure since these authorities are the primary national network that mitigates radiological danger [14]. In all cases, all powers, which monitor such forms of pollution, obtain their power from international and regional agreements as well as from domestic legislation and national laws. These treaties are full of administrative and civil provisions but criminal law is a last resort to restrain offenders. The legal language to refer to this action is nuclear law or nuclear activity law which means "a set of rules based on science technology and law while including social control pathways over man's new environmental relationships". Germinated fundamental principles are part of nuclear law governance such as safety, security, permission, compensation, responsibility, permanent control, compliance, sustainable development, transparency, and interethnic cooperation. The texts of treaties together with relevant legislation specify what human beings and elements of life can be rewarded as the primary cure of this legal attempt [15]. Second: Radioactive pollution as the second category appears due to radioactive sources and radioactive devices and equipment's. Nuclear radiation exposure produces this type of pollution following laboratory interaction with radioactive or radioactive devices and equipment, and any other entity using radioactive source hence compromising the public members and consumer and the production of radioactive waste. The regulatory body that oversees this field operates either under the Ministry of Health or the Ministry of Environment, or operate in concert with regional energy agencies. The incidents that occur in radiation fields lead to smaller radioactive accidents which are also localized to the precise site. Chaotic scientific changes of atomic elements in to new elements are the radiation flows. Both living organisms and non-living things are subject to incessant effects from the flow of constant radiation as part of several energy factors. Radiation has varying energetic levels that directly correspond to wavelength variations ranging from thousands of meters down to a billionth meter, wavelengths of which a reduction creates more energy.

Radiation may even effect living organisms differently depending on type of radiation which comes in two forms

1. The ionizing radiation bestows enough the atomic structure of matter with energy for excitation that will set the electrons free from the atoms. The radiation has energy that is high enough to penetrate and damage the living cells as it causes genetic mutations within the genetic material. It can also cause cancer. Ecosystems obtain ionizing radiation through natural radioactive element depots due for disintegration in the Earth's crust. Gamma and X-rays are examples of human produced radiation forms along with natural, ionizing forms that exist [16]. There are different types of ionizing radiation including the following categories:
    A. A heavy radiation is the nucleus of helium that makes up Alpha rays (a). Alpha rays are –"positive nucleus of helium elements moving at about 20,000 kilometers per second". These rays demonstrate poor living tissue penetration properties but deposit large quantities of hazardous energy into the cells that they may come across.
    B. The concentration of Beta rays (B) is seven five hundred times less strong than that of alpha rays. The sole charge of Beta rays (B) remains either negative or positive, and gamma rays (Y)
    C. As electromagnetic waves without charge as compared to sunlight- have only 2mm of penetration into tissue. The fact that gamma rays have a shorter wavelength also means that they have more energy than ultraviolet rays.
    D. X-rays (X-rays) are electromagnetic waves that have characteristics and effects similar to the gamma rays. X-ray radiation causes serious damage to cells and genetic features of fetal development. Pregnant females are cautioned to shun all X-ray exposure from the medical profession, but this caution remains critical for their first pregnancy trimester.

E. Neutrons (n): As parts of an atom these constituents do not possess either positive or negative electrical charge. In the Uranium or plutonium nuclear fission neutrons are released producing the slightest of radioactive energy bursts in a cascading effect to cause atomic bomb detonations. Ionization in biological systems caused by contact between neutrons and hydrogen atoms available in cellular water results in a higher level of damage than exposure alone could have engendered. Gamma rays [17].

Iraq has two devastating war campaigns inflicted upon by a U.S led coalition that used banned weapons such as white phosphorus and depleted uranium on massive scale. The armed conflicts created huge destruction ranges along with huge number of deaths and colossal amounts of abandoned rescue materials. Most of the war produced waste had suffered damaging exposure of radioactive elements. Radioactive contaminated Iraq contained (315) sites in 2005 as shown by the Radiation Protection Centre. According to The Environmental Encyclopedia, in 2022 figures on the amount of radioactive weapons used by the US Department of Defense in Iraq conflicts are still secreted. The environmental destruction that Iraqis have to undergo from the conflict becomes self evidentiary even without the need to prove for its environmental disaster [18].

Various sources of radiations emit toward the humans with natural and artificial elements. Radiation doses measurements depend on three major factors. his or her natural environment together with the industrial state of his or her county and the means of employment in the daily life field. The quantity of dosage received by one individual becomes different at various national countries and different geographical areas. The radioactive pollution arises from natural and artificial sources as two separate groups of such contamination. There are two sections of the discussion on pollution sources. natural pollution, and then artificially polluted.

Natural Sources of Pollution

Natural origin across our planet is the biggest source of radiation exposure within ecosystems. Becoming the largest proportion of earth's radiation exposure are forming elements that naturally emerged since creation started when the earth was first created. There are three core original elements of the natural radiation pollution, which are cosmic rays, Earth crust radiation and radioactive substances in our bodies. Other sources of radiation include volcanic eruptions and natural forest fires in addition to lightning strikes and acid rain and groundwater that penetrates through rich rocks. With uranium [19]. Every form of natural radiations creates itself by random events without the interference of the man. Radioactive isotopes which are natural elements contain unstable characteristics since they possess excessive energy in terms of the proportions that are not matched between atoms and neutrons in their elemental nuclei. Radioactive isotopes will only emit nuclear particles at specific frequencies referred to as alpha gamma and beta until stable. The outcome forms new nuclei which may prove unstable. The emitting of radiations goes on until radioactive elements come to a state of stable new nucleus. In this process of transformation these isotopes transform into new elements that have lower weight and different physical and chemical properties. Uranium and thorium act as examples of the elements found in the outer Earth crust. The presence of granite rocks has higher concentrations of these; to those found in sandstone rocks. Small traces of the radioactive element's calcium [48] and potassium [40] are found in the composition of the Earth's crust. Natural radiation includes two cases of radioactive gas that diffuse out of the ground and concrete structures, and other commodity materials also decompose. Businesses release two radioactive air particles radon (222) and thoron (220) when radium and thorium decay. Both these gaseous substances are alpha particle emitting. When humans breathe in liquids containing these two gaseous substances it has direct damages to their body cells. The highest radiations contain Mineral water in areas together with black sands and volcanic lava rocks [20]. Section two of the study consists of the Industrial pollution sources including the industrial matters or nuclear field man- made activities that lead to the environmental radio activity contamination. These sources are as follows:

The present and even future time pays much attention to nuclear reactors due to significant purposes in power generation. The human development and operational base is used for several industries as a criterion for determining individual status in social structures. Human consumption of traditional energy sources such as coal, oil and natural gas has destroyed traditional energy resources and has compelled man to find infinite sources of renewable energy and additional ways of protecting their environment. Nuclear reactors contribute to the contemporary power industry by producing electricity but discharges radiation and thereby injures the personnel who are employed in nuclear facilities and the populace surrounding, as well as broader regional / to the world areas in case of a radioactive event. Employees who work as uranium miners moving to operations in nuclear fuel production facilities and support of nuclear reactors and end up with specialists that deal in radioactive waste storage and disposal are the key recipients of the effects of radiation in this industry. Nuclear industry observes safety regulations in accordance with the set of procedures whose purpose is to reduce worker exposure to international levels and prevent pollution related incidents at their sites while reducing the level of exposure in proximity to plant regions [21].

Nuclear Experiments and Explosions:

Experimental nuclear blowing is a type of contamination source for nuclear contamination. The category of experimental nuclear explosions includes two separate groups; namely, those of ground explosions and such of air explosions. The first category involves all explosions within the earth or in expalletomast in yet the second deals with all explosions above the earth or in their waters or space. The second explosive type has hundreds of more environmental damage and disadvantages than the first one so scientist with many experts in environmental conservation study it extensively [23].

There was a Nuclear Weapons Testing conference held in Geneva during the year of 1958. A nuclear test and explosion prohibition treaty came into action with nuclear powers in the world other than China and France, which prohibited all nuclear events in atmosphere and space or underwater. The restriction does not apply for underground nuclear test. Nuclear matter and explosions may continue to expose small, radioactive substances that can be carried into the groundwater and be dispersed into aquatic areas through watercourses and into water systems that have been polluted. Most radioactive isotopes have very extensive radioactive half-lives, which are greater than several thousand years [25]. The humans have deserted the material to neglect. Every discarded matter that has the status of hazardous waste contains compositions that have devastating impacts on the environment and human endurance as well as an extended life on the environment. Medical waste hospital waste and pharmaceutical factory waste and any chemical waste exhibits toxic chemical properties. The various types of environmental damage and human wellness threats include various forms of these substances which exhibit toxic behavior.

The roots of waste present other dangers than nuclear or radioactive waste because its dangerous nature is multi-sourced and its highly poisonous basis. Most chemical substance-sensitive industries produce surplus as its end product. The nuclear and radioactive waste is commposed from the abandoned materials obtained from both atomic and nuclear reactions. Such dangerous radioactive substances are largely found in countries that produce nuclear electricity, and have any type of military nuclear activities or a form of technical infrastructure. The broad deployment of nuclear power plants in different countries has created a high blowing environmental problem that adversely impacts all types of environments such as air, water and the soil known as nuclear waste. According to Vienna Convention on Civil Liability for Damage from Atomic or Nuclear Energy radioactive waste is described as: “Any radioactive material, including biological material resulting or causing radiation exposure or contamination or the emission of radiation from radioactive contamination, produced by use of nuclear fuel or by radiation exposure to material during production or use processes or as a result of radioactive contamination excluding radioactive isotopes that have reached the final stage of manufacturing and are suitable for use in any scientific, medical, agricultural, commercial or industrial purpose” [26].

Regardless of where one looks, all nations across the world are confronted by the grim fact of radioactive accidents with the radioactive material or sources themselves finding their way far and wide across many diagnostic and therapeutic areas and industrial environments and research outlets. Outstanding growth provides constant and identical radiation control and security approaches alongside the dissemination of underlying concepts of radiation safety across various disciplines. There are numerous protective actions that all radiation control areas do undertake but accidents can occur and other people can be exposed apart from workers and members of the public. The house-breaking explosion of Russian nuclear plant at Mayak in 1957 created a disaster in the vicinity of Ural mountains. A pressurized water reactor operating at Three Mile Island in America caused the worst nuclear accident in the country in 1979. The 1986 Chernobyl disaster at Ukraine that caused one of the greatest accidents to ever occur in human history saw the explosion that spread radioactive material across the atmosphere. In 2004 an accident at a nuclear facility occurred at Mihanna power station Japan after critical cooling water in the reactor turbine was dissipated another disaster happened at Fukushima plant Japan in 2011 from ocean waves generated by Japanese earthquake: it destroyed the entire urban area [27].

International Nuclear Radiation Pollution Control for the Environment

The peculiar nature of nuclear damage elevated cross-border compacts to mitigate effects that may occur both within and outside the nuclear incident country territory. There have been several global meetings accompanying nuclear radiation pollution while developing many principles and recommendations as part of the action plans. Many international agreements and treaties set protocols for international radiological hazard and risk cooperation, which include particular care with respect to radioactive pollution. Not all nations have the ability to enter into international or regional or global environmental protection agreements. However nations cannot take legal cover with respect to environment preservation which is still the common inheritance of whole mankind.

Formulation of appropriate environmental regulations is key to them. These regulations are necessary and need to be developed irrespective of the existence of the legal regulations because they are in framework agreements (Convention – Cadre) that need legislative action in order to provide needed details. When the convention offers its content being related to an environmental risk it assigns certain rules for this area. National rules should consider the remaining environmental pollutants which threaten the environment. The peril of nuclear dust from within geographic borders from accidents spreads

into radioactive clouds that move farh through the atmosphere until the dangerous presence has settled on land surfaces or water bodies and man is affected [28]. Nuclear development and several uses forced every country to realize that their existing nuclear monitoring systems do not provide complete protection to radiological threats.

Countries are keenly interested in nuclear activity framework formulation and its subsequent legal control execution because of the specific risks of nuclear threat as well as its malicious nature. During one hundred years, the scope of consumption that humanity had of coal and oil based natural resources increased until it threatened near exhaustion of its availability. The areas of medicine and industry based on agriculture and nutrition and other important spheres require general pacific use of nuclear energy [29]. This essay has two parts exploring the interventions by the international organizations against nuclear radiation and international agreements and treaties on nuclear radiation defense; The first part is: The attempts to protect from nuclear radiation from the part of the international organizations. International law broadened from restricted state-to-state relations to an institution-ordering institution for international organizations that hence brought questions of authority over international organizations. It goes without saying that international organizations have the following role in radiation protection because if they exert a constant diligence with their access to materials, then they are in a position to create protective means that will bring the human race and the man's habitat beyond nuclear and radioactive effects. Iraq like any other member of the international community limp from both international bodies and obligations to the international bodies. The nation maintains international legal requirements derived from both agreements and forms of traditional customs, and forms of international laws that it must be likely to respect and enforce. I will describe the protecting actions of some selected international organizations, which are involved in the nuclear radiation battle and damage reduction [30].

The International Labor Organization and the World Health Organization's Role on Nuclear Radiation Protection

To Enlarge nuclear safety and radiation protection, international institutions must set every necessary precaution and procedure that prevent people from any nuclear-accident and radiological-emergency while minimizing its impacts. International conventions concerning radiation protection include main components of protecting people from nuclear radiation, as well as acknowledgment for the international community of this significance [31]. This essay looks at the working of the International Labor Organization as well as the World Health Organization in nuclear radiation protection as explicated below.

The Role of the International Labor Organization in Protection of Nuclear Radiation

Workers get protection against occupational ailments and accidents with the provisions contained in the constitution of the International Labor Organization. The organization implemented some protection measures to protect employees and facility workers from nuclear station from radiation hazard exposures, which is a hazard of industrial use of nuclear power as an occupational hazard to the nuclear station personnel and facility workers. The organization had Recommendation No. (112) which it brought into force in 1959 to back medical care programs on workers work proximity to nuclear radiation. In 1959 the organization ratified Recommendation No. (114) which provides signatory members should implement domestic legislation provisions from the recommendation to reduce work-related radiation exposure to its minimum level. This policy became effective in 1960.

Ionizing radiation exposure among employees in work environments necessitates technical barriers.

The measures lack standard working procedures and States lack an exclusive authority to carry out the measures. The International Labor Office requires notification of the technical measures to become aware of the effects of such measures. 2. The preventive measures comprised of 2 elements – the first comprises monitoring of air pollutants by measuring levels of radioactive materials, whereas the second is the establishment of continuous assessment of elevated radiation dose levels in workplace surroundings. The Convention has been able to establish several provisions designed to protect and lobby for rights of workers that are exposed to radiation while performing work. The law therefore must regulate a procedure of informing one's workers about the work environments in which one uses the services of workers who happen to be exposed to ionizing radiation when carrying out work. By Article 9 of the Convention it is stated that crucial warning systems with notifications must be given to workers for the purpose of protecting their safety from perils of ionizing radiation. World Health Organization has a basic stand in nuclear radiation safety protection services.

The World Health Organization (WHO) showed pioneering behaviour because it conducted important health check-ups following the Chernobyl incident in 1986. The organization carries out research on radioactive contamination, which arrives through nuclear peace applications and through the movement of radioactive materials and sources. The organization aims to assist member states as they develop their national health programs which protect against nuclear radiation directly to their health authorities. The Food and Agriculture Organization in collaboration with this organization had come up with warnings including regulatory practices for controlling foodborne radiation [34]. The organization assists in saving patients, along with workers and public audiences around the globe from severe radiation exposure by providing technical assistance that provides evidence-based advices and tool to membership that deals with the issue of radiation protection with a primary emphasis on public health. The organization manages the whole process of checking radiation

risks and their management and reporting activities. By developing the latest versions of International Basic Safety Standards, the organization makes its key responsibility progress in "setting norms and standards and promoting and monitoring their implementation". The BSS works hand in hand with seven other international organizations in sponsoring this standard and passed it for approval while it now directs efforts toward states to implement international basic safety standards [35].

The Food and Agriculture Organization of the United Nations and the International Atomic Energy Agency (IAEA) in Protection against Nuclear Radiation. The UN agencies show essential significance in nuclear radiation protection as they monitor nuclear control systems along with radiation practices and nuclear security functions, as well as nuclear proliferation activities and import/export regulations, and maintain regulatory records and develop protection strategies for nuclear emergencies by means of conferences and executive meetings and comprehensive studies. The following discussion discusses the protection related work of the food and agriculture organization of the United Nations (FAO) as well as the protection effort by International Atomic Energy Agency (IAEA's) from the radiations of nuclear.

The Function of the Food and Agriculture Organization of the United Nations (FAO) in Protection from Nuclear Radiation

The organization goes beyond nuclear application of energy development and development of agricultural food operations among the responsibilities. Specialized scientific bodies together with the organization carried out studies whilst it undertook research which measured the impact of nuclear radiation contamination to nutrition and agriculture in entirety. The Food and Agricultural Organization of the United Nations (FAO) has an extremely close relationship with the agency. Joint FAO/IAEA Centre for Nuclear Technology is jointly managed by these organizations since their inauguration in 1964.

Nuclear in food and agriculture. This collaboration conducts dual mandates and united purposes as well as harmonious financial procedures and programs development and integrated administration operations. The Joint Center with its affiliated laboratories works under the agreed agreements, which the Director General of FAO and Director General of the agency has signed. Both FAO and the Agency carry out their program and budget with the approval of their legislative bodies during planning phases in a climate where the planning operations proceed with mutual consultation and cooperation with their Member States as well other units in the Organization.

The Joint Center enables full digital exploitation of technological assets which exist between the two organizations as they work on joint missions with the Member States (36). The Joint Centre carries out its work in accordance with FAO and IAEA two-year program outlines, learning-from-experience approaches are applied, and legislative body approval is required. The Joint Centre structures its work based on program structures and implementation guidelines of the two organizations. The expenses for financing the Joint Centre and its program are assigned by the Directors-General of both organizations. Fishermen make their contributions in terms of assessed budgets of FAO and IAEA member states and where the extrabudgetary is concerned. The Joint Centre has general direction from a Steering Committee consisting of top level staff representatives of the two organizations. This committee addresses programme and budget development issues alongside organisational structure and staffing issues making appropriate recommendations to each Director-General directly through their officials. A staff structure of the whole Joint Centre consists of one hundred personnel working through offices, laboratories and divisions. The staff of the FAO and IAEA share the headquarters accommodation and louts for the purposes of performing the duties of both institutions at the Agency facilities. Joint centre is run by consultants together with free experts and fellows alongside interns and students from member countries. Staff can acquire Vienna or Seibersdorf laboratory experiences to research or study new technology which they deliver to be executed in their home countries through the Member program [37].

The Part of The International Atomic Energy Agency in Protection from Nuclear Radiation

The International Atomic Energy Agency began its operation in 1957. In 1956, the statute of the international conference presented in the United Nations headquarters was approved. The statue came into effect after the submission of the ratification documents from a total of [18] signatory states plus [3] member countries from Canada, France, Soviet Union, United States of America, Britain. The professional cooperation between the IAEA and the United Nation was agreed on through the conference of the two institutions in 1957. The International Atomic Energy Agency aims to promote the peaceful uses of atomic energy under Articles [2] and [3] of its Statute through the means of preventing non-peaceful use of nuclear assistance. The IAEA engages in development of nuclear field research as wells as expertise information sharing while supplying required equipment materials through facilities to enable it meet goals. The agency also effects nuclear hazard safety and health security.

The parties to the States need much more than their mere respect on territorial provision and texts, because the implementation through bodies, institutions and individuals inside the state is compulsory. When institutions violate the rules of such agreements they should be penalized by ensuring that their prestige and rank in treaty is preserved as well as

the other legal resources. The highest level one would ascribe to nuclear treaties as being sources of nuclear legitimacy. The international community members need to come together in regulating energy and exploitation of a peaceful benefit to enhance human welfare. International Nuclear treaties aim primary objectives to protect against threats of using nuclear power as well as offsetting imminent dangers from their militarized use. This power reaches aims in diverse spheres rising from medical departments up to industrial applications down to production activities to different purposes like food production-agriculture. This technology is the necessary prerequisite that will help achieve this goal because it represents a very developed science [41].

The way nuclear accidents are dispersed to spread their harms tilts more towards leaning in nuclear treaties for a basis. Nuclear accidents cause damages across all geographic boundaries due to its effects which travel from the site of an accident to another place nearby or far away. Chernobyl accident is the strongest example of this occurrence. The fact that nuclear accidents do not have geographical boundaries results in our endorsement, that any nuclear catastrophe becomes automatically global catastrophe. This assertion plays a part in supporting globalization since it requires various countries both to scrub away borders and to remove trade and competition barriers. Each of the various control systems implemented for nuclear energy operations have effectively been destroyed due to this advancement [42]. This requirement will be broken up into two parts for researching for this research. The first section is concerned with examining the 1960 Geneva Convention on Protection against Ionizing Radiation, coupled with the 1962 Brussels Convention on the Liability of Operators of Nuclear Ships. This next section goes through the 1967 Nuclear Non-Proliferation Treaty and the 1980 Convention on the Physical Protection of Nuclear Material by topic order.

In Radiation Protection in 1960 Geneva Convention.

As International Labor Organization puts its efforts in protecting the workplace environment and its people. International convention related to worker protection against the air pollution from the ionizing radiation was prepared by the organization. Being promoted through a series of research and debates the convention of 111 was passed by the International Labour Organisation through its [44] session at Geneva Switzerland during 1960 to come into effect in 1962. It entered into force in 1962. This document contains central provisions structured as below:

1. States Parties need to assure proper safeguarding which ensure work protection as well as other health and safety aspects of employees, and those matters concerning physical and health safety in respect to exposure to ionizing radiation.
2. Every State Party should try to achieve the lowest obtainable thresholds of ionizing radiation exposure for workers through the enactment and activation of early protective measures against ionizing radiation preceding the Convention in a manner that conforms to convention provisions [43].
3. The State Parties must establish precise specifications of maximum exposure limits of ionizing radiation and the corresponding exposure of radioactive materials that will ensure employees' safety. Safeguarding these maximum exposure standards should be done periodically against most up-to-date information [44]. The development of appropriate monitoring systems for workplaces and workers becomes obligatory for States in order to assess exposure levels of ionizing radiation and radioactive materials against the allowed limits [45].

National legislation and regulations should explicate any activity listed where the worker is exposed to the ionizing radiation at workdays while providing appropriate warnings that will allow them to take critical safety measures [46]. Second: The responsibility of the operators of nuclear ships is extended under the 1962 Brussels convention to nuclear damage caused by nuclear accidents which occur in the world over reason for nuclear fuel and its residues or radioactive waste in the ships flying a contracting state flag. This article reveals inherent qualities of nuclear pollution arising out of ship operations. Based on the personal scope definition applying to this agreement member states' registered nuclear ships and nuclear ships under member-state operation from their first operations are subject to these liability requirements. For those ships the owner has the legal status of operator. War ships, including those serving the state for non-commercial purposes are outside the limits of this provision. The laws preclude any kind of seizure or confiscation or annexation or interference from effecting these ships. Such circumstances are opposed these rules of justice since nuclear disasters in practice are mostly caused by warcraft including nuclear submarines. According to the Convention's objective coverage, nuclear accidents and damage come into the application requirements boundaries when triggered by the emission of nuclear fuel and radioactive waste created by the nuclear device. According to the provision of the Convention the ship operator is the only party liable for financial commitment.

Nuclears cause horrendous environmental damage that are so horrifying that the obligation to restrict proliferation becomes not only legitimate but an obligation for one state to prevent it but the treaty makes both nuclear and non-nuclear weapon states held responsible. Two obligations from the treaty that nuclear-weapon states must do are: They can not give nuclear weapons or another nuclear explosive devices to any state (and that state or other state may have nuclear weapons or may not). Under this treaty states cannot manage nuclear weapons as well as explosive devices and cannot hold any control or supervision over these assets. The second obligation prohibits states from aiding be it by teaching or leading states into developing and controlling or obtaining nuclear weapons or nuclear explosive devices. The first obligation of

non-nuclear weapon states provided for in Article [2] requires rejection of transfer of nuclear weapon or nuclear explosive device from any carrier and exclusive forbearing from exercising control over such weapons or devices.

The second requirement is to avoid losing or taking control of, or accruing nuclear weapons and nuclear explosive devices of any form and refusing their production assistance. The second one exists only for non-nuclear-weapon states but it denies them equal right with nuclear states and is improper. The provisions of the Convention expand on ideas that arose out of the First United Nations Conference on the Human Environment conducted in Stockholm in 1972. Addresses arose as a major point in the recommendations made in the Stockholm Conference of 1972 within these, there were numerous commitments made by States and international organizations. The proposals made by the Stockholm Conference of 1972 highlighted a number of the levels of environmental pollution to persuade governments to join hands with each other, on the local and international platforms as well as partnering with specialist organizations in setting standards aimed at protecting the natural resource from pollution through the use of local preventive measures. As a conference decision, we were required to accept all possible measures that prevent harmful substances from polluting ocean spaces killing human health and destroying natural resources and marine life or just reasonable sea purposes [50]. Recommendation No. [75] had been released by the conference after its issuance. A. A review of establishing a register should occur between the International Atomic Energy Agency and World Health Organization to record disposers of significant quantities of radioactive materials into surrounding environments.

The International Atomic Energy Agency together with specialized international organizations should encourage international studies on atomic and nuclear waste problems. Second: The Convention on the Physical Protection of Nuclear Material 1980 declared that all States have the right to use nuclear energy for peaceful purposes, and they have a direct interest in obtained benefits resulting from nuclear power use. The Convention had signatures in March 3rd 1980, in both New York and Vienna. Under the terms of this Convention peaceful purposes nuclear materials stayed in the International transport zone. Articles in this Convention apply to local nuclear material utilization and storage as well as its transport because the Member States want to avoid potential threats from unauthorized use and possession of nuclear material [51].

Regular analysis of international regulatory frameworks demonstrates their capacity to cope with nuclear radiation contamination

International public opinion, which opposed the tragedy of Hiroshima and Nagasaki vigorously, eventually became the predominant influence on international thinking regarding nuclear energy downsizing in sleek areas. The need to shield against adverse side effects of ionizing radiations gets very important, because people are exposed to such detrimental forces from nuclear energy applications. Nuclear security against nuclear radiation is one of the most important issues in nuclear energy since it causes deep agonies to the future of humanity. Such global countries will exponentially improve their non-proliferation nuclear energy through the subsequent years in order to help meet the developing economic and social needs of a population whose numbers swell beyond what is measureable, with traditional resources becoming dangerous to exhaust. Several advanced countries strive to ensure autonomous control over the legislation of nuclear energy while adapting it to discoveries in nuclear application and development of radiation safety together with a demand agreement and an organizational guide.

RESULTS

1. Nuclear radiation pollution directly poses threat to the people's wellbeing and to the quality of the environment because it leads to cancer as well as results in birth anomalies and contaminates soil and water for a multitude of years thereafter. 2 Nuclear accidents continue to be one of the key sources of the radioactive contamination. The disaster that followed caused catastrophic environmental impact, as well as disastrous humanitarian results, resulting from safety system failures during the Chernobyl and Fukushima incidents.
2. International nuclear safety standards demonstrate a weak application in countries that produce either degrading or uncontrolled nuclear plants.
3. International initiatives through which the International Atomic Energy Agency operates with many nations require additional support from member states and clearer measures for tackling common challenges.
4. The major avenues that can be used to minimize the effect of radioactive contamination interference are the international organizations with the updated legislative framework and enhanced technological equipment.
5. The public knowledge of radiation dangers combined with basic understanding of preventive measures needs immediate enhancement in areas around nuclear facilities and the zones of radioactivity exposure.

CONCLUSION

Active management in combination with international cooperation continues to be significant in eliminating the actual threat caused by radioactive contamination. Strategic prevention of radioactive pollution is based on six major strategies which include the improvement of international legislation, the support of the agreement implementation and the rise of transparency measures with the help of the funding resources for the safe technology development. Nuclear radiation

pollution is one of the most serious environmental pollution types to exist because it endangers human survival and sustainability of ecosystems due to its chronic threat to the health and environment health. The findings of research reveal that the dangerous uses of nuclear power and insufficient radioactive waste management and incidents of the nuclear industry have been put together to aggravate this environmental problem. The analysis revealed that the nations had different levels of commitment to nuclear safety protocols against world collaboration that required higher alignment for the full radiation hazard protection.

RECOMMENDATIONS

1. The organization should increase international monitoring of nuclear facilities in its support of the IAEA mission and in its periodic inspections.
2. The legislative frameworks of nuclear energy applications and radioactive wastes storage ought to follow the international standards.
3. A noble idea of developing a revolutionary technology should incorporate issues of designing safe ways of dealing with radioactive waste concurrently reducing its impact on the environment.
4. Awareness programs and the environmental education should be used to teach about the dangers experienced through the radioactive pollution should be covered.
5. Transnational organizations should enhance joint cooperation in order to exchange nuclear safety expertise and assist in responding to rapid radiological emergency situation.
6. Explanation of research regarding preventive programs and treatment to nuclear radiation-related issues must be financially supported.

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