Special Political and Decolonization Committee

SPECPOL-TOPIC 1: Adressing Radioactive Waste Management Improving Global Frameworks for the safe Storage of Radioactive Waste in Developing Countries

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1. Information about the topic

Radioactive waste is one of the most dangerous kinds of garbage in the world. Disposing this kind of waste is an issue in countries that still use nuclear energy, which is the source of this waste. Countries use radioactive substances for medicine, research and industry or electricity generation. A distinction must be made between different types of radioactive waste. There is low-level radioactive waste such as protective gear and tools, medium level radioactive waste, for example reactor components and high-level radioactive waste, such as spent nuclear fuel from fuel reactors, which requires long-term storage and careful management to protect people and the environment. After 1000 years the highly radioactive waste still emits around five times more radiation than the uranium ore from which the natural uranium was extracted. After 200,000 years, the radioactivity has dropped to the level of natural uranium. Even after this period, the radioactive substances must not enter the food or respiratory tract in large quantities, just like chemical toxins such as lead or mercury. Safe repositories are needed to protect people and the environment from this waste. In many countries, especially developing countries, there are no such secure storage facilities which constitutes a major problem for various reasons. Without secure storage, radioactive materials can be very harmful to people and the environment. They remain dangerous for a long time, which means that accidents or criminal acts can cause lasting health and environmental risks.

2. Which regions are affected

Radioactive waste is a global problem that affects regions all over the world. To date, no country has found a fully safe and permanent method for storing it.

In 1960, France tested many nuclear weapons in Algeria, which caused extensive environmental damage. Large areas of the Algerian Sahara were contaminated, and local populations have suffered serious health consequences. Today, Algeria still struggles with inadequate radioactive waste management, with some radioactive materials being unsafely disposed of in landfill sites.

Ukraine and Japan experienced two of the world's largest nuclear disasters, at Chernobyl and Fukushima, respectively. Many countries lack safe, long-term repositories for radioactive waste, relying instead on above-ground interim storage for many years. This includes countries such as Germany, Japan, the USA, Switzerland, Ukraine, India, Pakistan, Brazil, Iran, and South Africa.Other countries continue to struggle with contaminated sites or unsafe storage facilities from the past such asRussia, Ukraineand Kazakhstan.

Other regions still contain contaminated areas, resulting fromnuclear tests, accidents or remnants of the Soviet nuclear program. Examples include Kazakhstan, India, Iran and Brazil.

Globally, most countries have yet to find an optimal solution. Some flagship countries, such as Finland, are already building repositories or have authorized additional sites.

3. <u>What, particularly, is the issue?</u>

Radioactive waste is one of the most dangerous substances. It is hazardous because it contains or emits radioactive particles, which, if not properly managed, can be a risk to human health and the environment. These substances can disperse into the environment and enter the food chain, which can also lead to health hazards. Safe storage prevents radioactive substances from being released and thus contaminating the environment. Most countries have very few safe repositories.

Overall, it is critically important to store radioactive waste safely, yet most countries do not have secure repositories. This poses significant risks to both human health and the environment.

4.Why is it problematic?

Radioactive waste is highly toxic. In developing countries, storing this waste safely is particularly challenging due to inadequate infrastructure and limited expertise. One component of highly radioactive waste is, for example, plutonium-239. It takes more than 24,000 years for half of its radioactive atoms to disintegrate. The radiation of nuclear waste is extremely harmful to human health: Even minimal exposure to plutonium can increase the risk of lung cancer.

In addition, there is a risk that radioactive waste will fall into the wrong hands: highly radioactive waste primarily consists of solvent material that could be used for weapons. The long half-life of radioactive material means that more weaponizable material can be formed over time, which is particularly dangerous. Secure long-term storage of radioactive waste is essential to prevent misuse and protect against terrorism. However, even temporary storage is problematic as it provides only limited protection against external attacks.

Nuclear disasters such as Fukushima show how unpredictable and risky nuclear power is. However, radioactive material released into the environment from nuclear facilities does not only contaminate flora and fauna in Japan or Ukraine. Many regions of the earth have been and still are heavily exposed to radiation from both civilian and military uses of nuclear energy.. Health problems are rising in the vicinity of nuclear plants. Due to accidents and the disposal of radioactive waste, more radioactive elements are released into the environment. On the one hand, there may be increased external radiation exposure, e.g. by an enclosed radioactive source. On the other hand, if radioactive components are present as dust in scrap materials, they are known as open radioactive substances. Then an employee can also become contaminated with these radioactive substances, for example through their work clothes or direct contact with the skin.

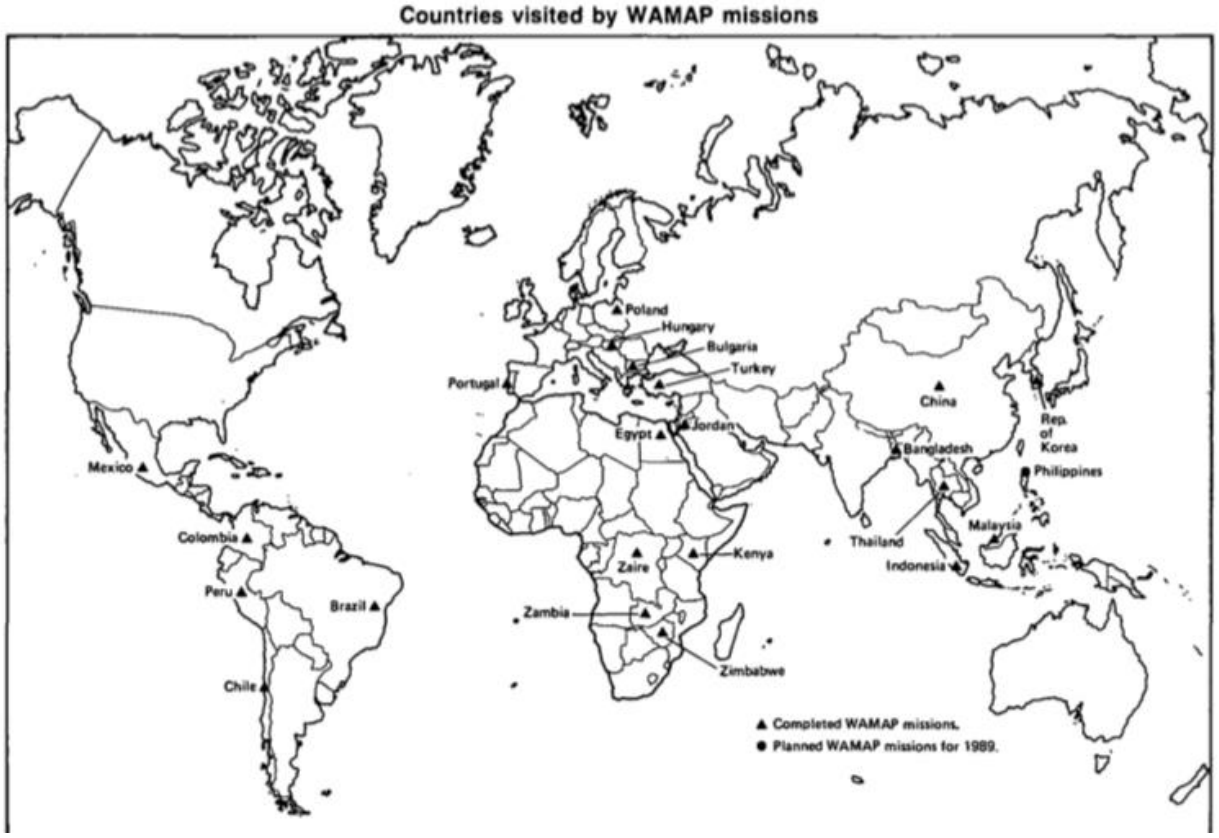
In the event of contamination, there is always a risk of absorption of radioactive substances into the human body. For example, these substances could be inhaled.

5.What has been done so far to make a difference?

A number of things have already been done to improve the situation with nuclear waste in developing countries. Countries with research programs or smaller nuclear programs, including for medical purposes, store their waste in temporary storage facilities.Examples include Ghana, Nigeria, Sudan. In the 1980s and 1990s industrialized nations often tried to export their own radioactive waste in developing countries such as Somalia. This practice was then restricted by the Basel Convention. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was opened for signature on 21 March 1989. It entered into force on 5 May 1992. Transboundary Movement and Management of Hazardous Wastes within Africa is a treaty of African nations prohibiting the import of any hazardous (including radioactive) waste. The convention was negotiated by twelve nations of the Organisation of African Unity at Bamako, Mali in January 1991 and came into force in 1998.

Many developing countries receive help through international organizations. The IAEA Technical Cooperation Program helps, for example, with the development of storage capacities and security systems.
Another program is WAMAP (Waste Management Advisory Program). This program has been supporting developing countries in setting up safe systems for the storage of radioactive waste since 1997. Experts visit the countries and help them find better solutions for managing radioactive waste.

Features



6. <u>What approaches were taken to address this issue and who was involved?</u>

International aid organizations play a central role in this issue, especially WAMAP, a sub-organization of the IAEA (International Atomic Energy Agency). Since 1987, WAMAP has been sending expert teams to developing countries to analyze and adapt or improve the current systems. Among other things, legal framework conditions, safety precautions and storage capacities are assessed during these missions. Specific recommendations are then made for national authorities.

The aim here is to create a long-lasting and sustainable waste system. Their tasks also include:

- Legislation, such as enabling acts and regulations
- Waste segregation, collection, storage

- Uranium mining and milling waste management
- Decontamination and decommissioning of nuclear facilities

A major contribution from WAMAP is that it creates an awareness in the countries about the institutional and human requirements for safe radioactive waste management programs. On-the-spot discussions on a range of topics are held between the international experts and national authorities throughout the missions. Strengths and weaknesses are pointed out and follow-up actions are recommended to promote sound practices and to build up the confidence of those that are nationally responsible for waste management activities so that potential incidents can be prevented. Overall, the missions take into account each country's technological resources and stage of development. The regulatory, scientific, technical, and organizational recommendations are thus made with a view that they can, in fact, be implemented. The missions especially emphasized the safe handling and disposal of radioactive sources that have been used in industry or medicine.

In addition to WAMAP, many national nuclear authorities and UN organizations are also involved and trying to find a solution.

7.What were the consequences of the efforts and why is there still an issue?

a. Consequences

Following the intervention of several organizations, the situation has improved considerably in various respects.

The developing countries received technical assistance, new safety guidelines and acquired new knowledge about the safe storage radioactive waste through training programs. Many countries have created or improved existing nuclear regulatory authorities based on recommendations. New storage technologies have been created with the help of international partnerships. For example, liquid waste from medicine or industry is encapsulated in concrete, a process known as cementation. New technological solutions were brought into life. Examples are:

- Near Surface Disposal (NSD)
- Modular storage units
- Chamber storage in former mines

The topic received increased attention, especially in politics, raising awareness of its extent and leading to improved safety precautions.

Some steps have been taken to improve the situation, particularly through the involvement of organizations, but there are still problems with waste storage.

b. Issue

Most developing countries do not have enough capacity to build safe repositories. There is a lack of technical, logistical and financial resources.

An unstable government makes implementing a safe waste management policy very difficult. Frequent changes of government or uncertain regulatory frameworks make it difficult to develop long-term, secure plans for safe repositories. Even when international organizations provide funding, initiatives often fail due to political blockades or insufficient commitment. Corruption is also a major problem, as funding is not used for the construction of new repositories, for example.

There is also often a lack of specialists for radiation protection or storage and monitoring.

If an unsafe storage practice is implemented, neighboring countries may be affected and tensions may arise.

Despite some improvements and significant support from abroad and from international organizations, the safe storage of radioactive waste remains a very complex issue.Much more focused and determined effort is needed to develop sustainable, long-term solutions. .

8.Who needs to handle the issue/ take action?

Various actors are responsible for improving the situation. The first one is the government. They need to create a safe approach, including stricter laws and stronger national supervisory authorities. To help the government improve this system, international organizations are also very important. They can help to develop new and better concepts for storing the waste. However, developing countries must be willing to cooperate with these organizations to achieve long-term solutions.

States who have a well-functioning radioactive waste system, like Finland, should help developing countries, for example through technology transfer and financial support.

Nuclear technology companies need to recognize their responsibility and prioritize sustainability and the protection of people. Companies must base their business practices on these principles.

9.Useful links

https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull34-3/34304681618.pdf

https://www.sciencedirect.com/science/article/pii/S0301479723017814#:~:text=Moreover%2C%20the%20reduction%20of%20available%20public%20funds,budget%20cuts%20(%20Carbonara%20and% 20Pellegrino%2C%202018).

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