

ECONOMIC AND INTERNATIONAL LEGAL ASPECTS OF HAZARDOUS WASTE MANAGEMENT REGULATION

Liudmyla Golovko¹, Viktor Ladychenko², Olena Yara³

Abstract. It is evident that the implementation of effective climate change mitigation and environmental protection policies is contingent upon the rational management of hazardous waste. Empirical evidence suggests that the legal regulation of such waste at the national level is inadequate. Consequently, there is a pressing need for enhanced international cooperation and the establishment of robust international legal frameworks to address this issue. The *purpose* of the article is to analyse the existing international agreements governing hazardous waste management, identify their advantages and disadvantages, and propose changes necessary to improve the management of this type of waste. This included analysing statistical data on hazardous waste management. For a better understanding of the situation, an analysis of international court decisions was also carried out, which helped to identify the depth of the problems in this area. *Methodology.* General theoretical methods were mainly used in the study. Analysis and synthesis, systematic interpretation, and theoretical generalisation helped to summarise international approaches to hazardous waste management. *Results.* The article examines the content of international treaties in the field of hazardous waste management and the practice of their implementation. *Practical implications.* Based on the doctrinal provisions and the norms of current international law, the author identifies the main range of problems existing in the field of hazardous waste management and suggests possible ways of their solution. *Value / Originality.* It is determined that an important step in improving the effectiveness of international treaties in the field of hazardous waste management is to strengthen control over their implementation, since in practice there is a systematic violation of them.

Keywords: international law, waste, international legal regulation of waste management, economic aspects of waste management.

JEL Classification: K00, K10, K30, K33

1. Introduction

Hazardous waste can cause significant damage to the environment and, in particular, to human health. Therefore, the management of these wastes should receive considerable attention not only at the national level but also at the international level. This is confirmed by the fact that a significant number of cases of improper handling of hazardous waste have occurred, resulting in the death of people and damage to the health of the population. War has increased the amount of hazardous waste. Construction waste and waste containing heavy metals are among the most toxic substances affecting the state of the

environment. Therefore, it is increasingly important to study the international legal regulation of hazardous waste management.

This research paper focuses on international treaties in the field of hazardous waste management, their advantages and disadvantages. The proposals are made *de lege ferenda*. The article was partially based on the scientific work of the following scholars: P. Gailhofer, J. Krueger, S. Kidalov, O. Gulac, and others.

The purpose of the study is to analyse the existing international legal regulation of hazardous waste management, identify its shortcomings and make proposals for its improvement.

¹ National University of Life and Environmental Sciences of Ukraine, Ukraine

E-mail: liudmylagolovko10@gmail.com

ORCID: <https://orcid.org/0000-0002-3742-2827>

² National University of Life and Environmental Sciences of Ukraine, Ukraine (*corresponding author*)

E-mail: ndi_land_law@ukr.net

ORCID: <https://orcid.org/0000-0002-7823-7572>

³ National University of Life and Environmental Sciences of Ukraine, Ukraine

E-mail: olenas.yara@gmail.com

ORCID: <https://orcid.org/0000-0002-7245-9158>



2. Statistical Data Analysis

International agreements and EU legislation, in particular the Waste Framework Directive (Directive 2008/98/EC), require the reduction of waste production, its maximum treatment and safe disposal. Consider the statistical data provided by Eurostat to analyse the fulfilment of the above tasks.

The average amount of waste produced in the EU is 4.8 tonnes per person. However, if one looks at the Eurostat data, it can be seen that some countries significantly exceed this figure. These countries include Finland (where the amount of waste produced is more than four times higher than the EU average), Bulgaria (more than three times higher), Sweden, Luxembourg and Estonia (almost three times higher). Waste management reports from these countries attribute this state of waste generation to the significant amount of mining and quarrying in these countries. Construction and demolition also significantly increase the amount of waste (Eurostat, 2023). Thus, there is a disparity in the amount of waste produced across EU Member States.

Comparing the amount of waste generated in the EU in 2020 compared to 2004, a decrease of 0.4% is observed, which may not seem like a big figure. At the same time, in some areas, an increase in the amount of waste generated is indeed significant: in agriculture, forestry and fisheries – a decrease of 66.7%, mining and quarrying – a decrease of 28.3%, manufacturing – a decrease of 30.5%, and energy – a decrease of 46.5%. At the same time, there has been a 12.5% increase in waste generation in construction and a 12.4% increase in households (Eurostat, 2024).

Looking at the statistics of hazardous waste generation in the EU, in 2020 it will amount to 95.9 million tonnes (4.4% of total waste generated). Compared to 2010, the generation of hazardous waste will increase by 5.1% (from 90.8 million tonnes to 95.5 million tonnes). Most hazardous waste is produced in Bulgaria (12%) and the least in Romania (0.5%). Regarding countries that are not Member States of the EU, Turkey (28.5 %), North Macedonia (28.2 %), Montenegro (27.6 %), Serbia (19.3 %) and Norway (13.3 %) have a significant share of hazardous waste in the total amount of waste generated (Eurostat, 2024). All this points to a significant number of problems in the field of hazardous waste management.

The high figures for Estonia (6.7 tons per capita) can largely be attributed to oil shale, and in the case of Bulgaria (1.8 tons per capita) to copper ore mining. With the exception of these special cases, the production of hazardous waste in EU Member States ranged from 22 kg per capita in Greece to 747 kg per capita in Luxembourg in 2010 (Eurostat, 2015).

The US produces about 35 million tonnes of hazardous waste each year. Statistics from 2001-2019

show that most hazardous waste is wastewater. Another significant segment of hazardous waste is medical waste, batteries and pesticides (HWH Environmental, 2024). These statistics indicate a significant amount of hazardous waste produced in the US, which exceeds the EU indicators by more than 27%.

Each person in the world generates about 60 kg of hazardous waste per year, and this is growing rapidly. In just one generation, chemical production has increased by 40,000% from 1 million to 400 million tonnes (The World Counts, 2024). According to the World Health Organization, 15% of the total amount of waste generated by healthcare activities is hazardous waste (World Health Organization, 2018).

Hazardous waste must be properly disposed of. However, not all countries have the capacity to dispose of them safely, and they face the issue of transporting these types of waste. International agreements in the field of hazardous waste management are mainly dedicated to the issue of transportation. The following part of the article will analyse them.

3. International Legal Regulation of Hazardous Waste Management

In 1989, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted. The Basel Convention provides legal regulation of the control of transboundary movements of hazardous wastes at the international level. There are 191 states that are parties to the Convention, which demonstrates that the international community understands the importance of regulating transboundary transport at the international level and that states are ready to cooperate in this area. The Basel Convention establishes a mechanism for prior notification and consent for the export, import and transit of hazardous wastes and prohibits any transboundary movement of hazardous wastes between States Parties, as well as between States Parties and countries that are not parties to the Convention. It also allows states to ban the import of hazardous wastes into their territory. The adoption of the Basel Convention was also a response to the practice of exporting increasing amounts of hazardous waste from the Global North to the Global South (Gailhofer, 2023). In order to gain economic benefits, less economically developed countries tend to agree to the import of hazardous waste into their territory (Gulac, 2022; Kidalov, 2019; Krasnova, 2017). Therefore, international legal regulation of this issue is necessary.

The scope of the Convention covers two categories of waste – hazardous waste and other waste. Hazardous wastes are those listed in Annex I,

which includes both certain types of waste and certain hazardous compounds contained in the waste (e.g., copper, zinc, mercury, etc.). At the same time, they are not considered hazardous if they do not have any of the properties listed in Annex III (explosive, flammable, oxidising, toxic, etc.). In addition, wastes that are not listed in Annex I but are defined as such in accordance with the national legislation of the export, transit or import country are also considered hazardous. The states inform each other about the adoption of such legislation through the secretariat established under the convention.

The exporting state must inform the competent authorities of the importing state and the transit state of any planned transport of hazardous waste, indicating the information specified in the Convention. Any export of hazardous wastes is possible only if there is written consent for a specific transport of hazardous wastes from the importing and transit states, as well as confirmation from the importing state that a contract between the exporter and the person responsible for waste disposal exists. At the same time, waste management must be environmentally friendly and may not harm the environment. Waste exports are prohibited if there are grounds to believe that their use will not be carried out in an environmentally safe manner (so that human health and the environment are protected from possible negative impacts of waste). In 1999, the Protocol to the Basel Convention on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and Their Disposal was adopted to regulate liability for damage caused by illegal transport of hazardous wastes and their improper use. The disadvantage is that the Protocol only regulates civil liability. State liability for breach of obligations under the Basel Convention has been left out, which is certainly a disadvantage. Unfortunately, the Protocol has not been ratified by a sufficient number of states, so it has not yet entered into force.

Scientists also often point to the fact that there are often cases of abuse, when hazardous waste is considered as waste that is transported to another country for processing (Puthucherril, 2012). J. Krueger points to the lack of accurate information on the causes of hazardous waste transport (Krueger, 1998). M. Islam points out the lack of effective implementation mechanisms (Islam, 2020). Another drawback is the lack of a uniform definition of what should be considered hazardous waste.

Article 4 of the Convention requires each Party to take appropriate measures to: ensure that the generation of hazardous and other wastes is minimised, taking into account social, technological and economic aspects; ensure the availability of adequate facilities for their disposal; ensure that transboundary movements of hazardous and other wastes are

minimised in accordance with environmentally sound and efficient management of such wastes.

Unfortunately, the Basel Convention is often not implemented properly. For example, due to the difficult economic situation in Ukraine, there is no modernisation of industrial enterprises, introduction of modern equipment and low-waste technologies. There were no changes in reducing the amount of waste generated before the armed aggression of the Russian Federation. Military operations have certainly increased the amount of waste. According to the Basel Convention, the most effective way to protect human health and the environment from the hazards of hazardous wastes is to reduce their generation to a minimum in terms of quantity and potential hazard. It should be noted that, first of all, Ukraine does not properly comply with the basic provisions of the Convention. Despite the fact that appropriate measures are not being taken to reduce the generation of waste, there are still no specialised landfills for the disposal of hazardous waste in Ukraine, and the number of enterprises processing such waste, both for the purpose of disposal and for the purpose of reducing its potential hazard for further burial, is extremely insufficient.

In July 2023, the new Law of Ukraine "On Waste Management" No. 2320-IX came into force, launching a waste management reform in the country. This was a necessary step to adapt Ukrainian legislation to EU law, but at the same time, it is hoped that it will help improve the implementation of the Basel Convention. The purpose of the new Law of Ukraine "On Waste Management" is to protect human health and the environment from the negative impact of waste; to implement waste management measures without endangering human health and causing damage to the environment within the established standards of harmful effects of physical factors; to comply with the waste management hierarchy; and to introduce extended producer liability. The Law also defines the waste management hierarchy and provides for a sequence of waste management actions: prevention of waste generation; preparation for reuse; recycling; disposal in other ways, including incineration of waste to generate heat or electricity; and landfilling. Implementation of the waste management hierarchy involves introducing new waste management methods and obtaining additional funds and raw materials for waste processing, bringing landfills in line with European standards, and improving the waste processing infrastructure.

According to the Law, hazardous waste is waste that has one or more properties that make it hazardous, as listed in the List of Properties that Make Waste Hazardous (Annex 3 to the Law). After the Law enters into force (July 9, 2023), business entities that collect and treat hazardous waste are required to obtain

a licence for this type of activity. In order to obtain this licence, business entities must undergo a mandatory inspection of the compliance of their material and technical facilities with the established requirements.

Hazardous waste management is an activity that includes a range of operations for the collection and treatment of hazardous waste or the collection and storage of hazardous waste for its subsequent removal for recycling or disposal. The adoption of this law introducing the waste management hierarchy was a necessary step in bringing Ukraine closer to international standards. The tasks are very ambitious, so there are practical problems in implementing the Law (lack of a waste management system, corruption schemes, lack of investment in the industry, weak control over the activities of business entities), and, in particular, in the field of hazardous waste management (lack of modern warehouse equipment for storing hazardous waste and facilities for its disposal).

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, which entered into force in 2004, concerns certain hazardous chemicals and pesticides that are traded internationally. It also aims to protect human health and the environment from possible harm by introducing a prior informed consent procedure before exporting chemicals listed in Annex III to the Convention. Without official consent, transboundary movement of these chemicals is prohibited. The disadvantage of the Rotterdam Convention is that it contains a very small list of toxic chemicals. The Convention does not cover the regulation of chemical weapons, which is also a disadvantage, as the importance of limiting the use of these substances as weapons increases during military conflicts.

The Stockholm Convention on Persistent Organic Pollutants is a multilateral international agreement aimed at protecting human health and the environment from the harmful effects of a number of hazardous, highly toxic chemicals, including pesticides and dioxins. POPs are toxic chemicals that have a negative impact on human health and the environment. They are spread through the air and water, so they can affect people and wildlife at a considerable distance from the point of use and from the point of release into the environment. Persistent organic pollutants do not biodegrade over many years and can accumulate and be transmitted through the food chain. The international legal regulation of the use of these substances is important because of the danger to human health and the environment and the long-range transport of POPs. The Stockholm Convention aims to limit the use of these substances. Annex A of the convention lists chemicals to be phased out; Annex B lists chemicals whose use should be restricted; Annex C lists chemicals whose unintentional production should be

minimised. The lists are constantly updated with the development of science. As required by the Stockholm Convention, states must take measures to ensure that chemicals listed in Annexes A or B are imported only for environmentally sound disposal. They shall also take measures to reduce cumulative releases from anthropogenic sources of each of the chemicals listed in Annex C with a view to their permanent minimisation and, if possible, their eventual elimination.

The above requirements contribute to reducing the use of hazardous substances and thus protecting the environment, but they also contain shortcomings. Developing countries and countries with economies in transition need assistance to eliminate and manage the POPs listed in the Stockholm Convention. The provision in Article 13 that developed countries 'shall provide new and additional financial resources' to developing countries and countries with economies in transition is too general and does not impose serious obligations on developed countries, which is a shortcoming. In addition, the Convention would greatly benefit from a control mechanism in the form of national registers of POPs production and use.

The revision of national regulations on POPs and their waste in some countries is necessary to ensure better implementation of the Convention's provisions, as violations of international obligations occur from time to time. This also applies to Ukraine. An example is the case of pesticides in the Kalynivka Oblast (Skrypnyk, 2008).

There are also regional instruments aimed at protecting the environment from hazardous waste. The Bamako Convention, which entered into force in 1998, is a treaty that prohibits the importation of any hazardous and radioactive waste to the African continent. However, even in countries that have signed this convention, there are cases of illegal dumping of illegal waste. These will be discussed in the next part of the article.

4. International Case Law

One of the most high-profile cases in the field of illegal waste management is the *Trafigura* case. In 2006, toxic hazardous waste was unloaded from the *Probo Coala*, a vessel owned by *Trafigura* (the world's third largest independent trader registered in the Netherlands), in Côte d'Ivoire without any further treatment, causing thousands of people in Abidjan to suffer serious health damage. During the court action in the UK in 2009 it was proved that *Trafigura* expected a significant profit by refining the coker naphtha which it bought through caustic washing and as result producing toxic waste. *Trafigura's* management knew about the danger of the refining process. It has difficulties to find the place where to carry out this process. An attempt to do this in Tunisia failed due to a waste

leakage in the port. That is why Trafigura's management decided to process coke oven gasoline at sea, despite not knowing where to dispose of the hazardous waste that would be generated as a result of the processing. Trafigura attempted to discharge the hazardous waste in four countries, concealing information about the properties of the waste.

After the cargo was unloaded in the port of Amsterdam, it was tested and the toxicity of the waste was determined. Trafigura was not satisfied with the announced price for processing the waste (1,000 USD/m³), and was ordered to load the waste back onto the ship. Dutch law prohibited this. However, the cargo was loaded back onto the ship. In order to make a profit, Trafigura disposed of hazardous waste in Côte d'Ivoire by signing a contract with a local company, Tommy, knowing full well that the local company did not have the technical capacity to properly dispose of the waste. Under the contract, the price for the treatment of toxic hazardous waste was 30 USD/m³ for MARPOL waste and 35 USD/m³ for chemical waste (Joint Report, 2012). In the days that followed, tens of thousands of people suffered from respiratory, neurological, digestive and other illnesses, and 15 people died. Trafigura denied any responsibility and claimed that it trusted the local company to dispose of the hazardous waste properly. Given the significant difference in price between the company in the Netherlands, which had real capacity for environmentally friendly waste disposal, and the company in Côte d'Ivoire, this claim is not credible.

The Dutch court found Trafigura guilty of illegally exporting hazardous waste from the Netherlands, but did not address the issue of illegal dumping in Côte d'Ivoire. The civil claims in the UK were settled out of court. The actions of the Ivorian government are also surprising. In 2007, it signed a settlement agreement with Trafigura to receive 95 billion CFA francs for damages and clean-up work. In exchange, the state dropped all possible future lawsuits against the company (for approximately 200 million USD) (Amnesty International, 2012). The local population was not involved in the negotiation of this settlement, and a large number of people have not received compensation for the damage to their health.

In 2016, three non-governmental organisations filed a lawsuit against Côte d'Ivoire with the African Court on Human and Peoples' Rights. On 5 September 2023, the Court ruled that Côte d'Ivoire had failed to provide adequate compensation to those who suffered health damage, ordered the establishment of a compensation fund from the amounts paid by Trafigura and compensate the affected parties. Unfortunately, Côte d'Ivoire is likely to ignore the court's decision.

This case shows that, despite the existence of international agreements on hazardous waste

management, they do not contain mechanisms for effective compensation to persons who have suffered damage as a result of their violation. This is a major drawback.

In the Lebanon case, a waste management contract was awarded to a private company that was allegedly close to several members of the government. The company was allowed to open a landfill in Naama, which will receive waste from Beirut and Mount Lebanon (Isarin, 2023). Only minimal sorting and recycling took place. Despite the poor performance with serious environmental and health consequences, the government renewed the contract three times at exorbitantly high rates (150/tonne, one of the highest rates in the world) (Chaaban, 2016). Here it can be observed that the requirement for environmentally sound waste management is being violated due to corruption.

5. Conclusions

Statistics show that, despite the adoption of the European Green Deal and progressive environmental legislation, the amount of hazardous waste generated annually is growing not only in developing countries, but also in the EU and other economically developed countries. The adoption of the Basel Convention and its ratification by the vast majority of countries is a significant success and demonstrates the efforts of states to control the movement of hazardous waste. However, the Convention has its drawbacks. The definition of hazardous waste in the Basel Convention allows for the modification of this term by the national legislation of individual states, resulting in a lack of uniformity in this matter, which complicates the implementation of the Convention and may cause its intentional or unintentional violation. Another disadvantage of the Convention is that it does not regulate the issue of liability and compensation for damage caused by violation of its provisions. These shortcomings need to be addressed. The provisions of the Bamako Convention are similar to those of the Basel Convention. The Bamako Convention completely prohibits the import of hazardous waste, including radioactive waste, to the African continent. However, as can be seen, in practice, there are violations of this ban. Moreover, not all African countries have ratified the Convention. High-profile cases of improper disposal of hazardous waste in developing countries indicate that there are shortcomings in the international legal regulation of this type of waste management and insufficient steps in its implementation. The case of Côte d'Ivoire shows that sometimes the authorities of countries think more about their economic benefits than about environmental protection. All of this demonstrates the need to regulate the issue of

responsibility for violations of international law in this area. The next drawback is that only the Bamako Convention considers the transport of hazardous waste in violation of the Convention's provisions to be a criminal offence. This provision is not found in the Basel Convention. Such a provision should also be added to the Basel Convention. The Rotterdam Convention has the disadvantage that it contains a very small list of toxic chemicals and does not

address the regulation of chemical weapons. The Stockholm Convention would greatly benefit from a control mechanism in the form of national registers of POPs production and use.

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