UNEP

United Nations Environment Programme

Regulation of Chemical Waste

Overview

Since the Industrial Revolution, chemical pollutants have been regularly emitted by factories and industrial complexes. However, over the past 50 years, this release and dispersal have increased significantly. Chemical waste refers to any unwanted or discarded material containing substances with harmful properties. These substances can be solid, liquid, or gaseous and may arise from industrial processes, agricultural practices, healthcare facilities, or households. The responsible handling of chemical waste is imperative for environmental sustainability, human health, and economic well-being. Although there is no denying the advantages of synthetic chemicals in daily life, economic progress is directly responsible for both purposeful and unintended releases of these compounds into the environment. Carbon dioxide (CO2) emissions are a prominent example of the long-term impacts on climate, atmosphere, and seas that these compounds have; however, emissions from agriculture and industry have released many other substances as well. Mining, mineral processing, farming, building, and energy production release trillions of tons of chemically active material into the atmosphere.[1] As such, the UNEP strives to tackle this issue before it further damages our already endangered environment.

The United Nations Environment Programme

The United Nations Environment Programme (UNEP) is a global institution that sets environmental policy, highlighting environmental concerns in the context of sustainable development, and serving as a reliable voice for the environment. UNEP seeks to improve the quality of life for countries and their citizens while preserving that of future generations by encouraging teamwork in environmental conservation. Its power is granted by the UN

[1] Naidu, R. et al. “Chemical pollution: A growing peril and potential catastrophic risk to humanity.” *Environment international*, 2021, https://doi.org/10.1016/j.envint.2021.106616

Environment Assembly, which is the world's leading body for tackling environmental issues.[2] With its 193 Member States, UNEP works closely to tackle environmental concerns.

Chemical waste frequently includes dangerous compounds that can pollute soil, water, and air, making it a serious threat to human health and the environment. Negative health impacts, pollution, and harm to ecosystems are just a few of the dire outcomes that can result from improper handling and disposal of chemical waste. UNEP strives to limit the harmful effects on the environment and public health by developing and putting into action policies, guidelines, and programs that support responsible chemical management. Through international collaboration, UNEP works to reduce the hazards connected with chemical waste in order to build a more sustainable and healthy future.

The Dangers of Chemical Waste

Although much chemical waste is used and disposed of by large corporations and governments, their carelessness can lead to average citizens experiencing negative effects. One example of this is the famous Dupont Chemical Factory case, wherein the titular factory distributed a chemical known as PFOA and dumped sludge into a landfill that leaked into a river that ran through Parkersburg, West Virginia, USA. This resulted in local livestock dying rapidly of chemical-caused diseases from drinking the polluted river water, as well as residents acquiring harmful diseases themselves, such as cancer. While lawyer Robert Billot was able to expose this information to the EPA (US Environmental Protection Agency), causing the company to be sued, their negligence caused long-lasting and harmful effects in tens of thousands of people.[3] Governments worldwide must focus on preventing such environmental disasters through careful monitoring of private chemical companies, as well as implementing strict laws and punishments preventing circumvention of regulations.

---

[2] "Why does UN Environment Programme matter?" UNEP, https://www.unep.org/about-un-environment/why-does-un-environment-matter#:~:text=The%20United%20Nations%20Environment%20Programme,authoritative%20advocate%20for%20the%20global

[3] Rich, Nathaniel. "The Lawyer Who Became Dupont's Worst Nightmare." The New York Times, January 6, 2016, https://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html.

E-Waste

One of the most significant players in toxic waste concerns today is e-waste. As electronics have become a necessity to the modern consumer, electronic waste (e-waste) is becoming ever more prevalent. Cellular phones, computers and household appliances, among other electronics, eventually reach the end of their service and need to be discarded. However, disposing of these items is particularly harmful, as many electronic devices contain various precious elements whose separation can lead to toxic fumes, polluted waters and other harm to the biosphere.[4]

Regulations

International

Hazardous waste transportation across international borders is governed by the Basel Convention. The main source of worry was waste shipped from developed countries for inexpensive disposal at poorly prepared sites in underdeveloped countries. The Basel Convention was thus established with three main goals: reduction of hazardous waste generation, ensuring its proper disposal and reducing the international movement of hazardous wastes. The national government creates rules and regulations that outline acceptable emission levels, required labelling, and appropriate disposal techniques. Ensuring adherence to these standards requires strong monitoring and enforcement systems.[5]

Furthermore, by incentivizing businesses to voluntarily adopt sustainable practices, industry self-regulation through programs such as Responsible Care may improve chemical waste management. Responsible Care is a voluntary project of the worldwide chemical industry to foster continuous improvement in safe chemical management to attain excellence in environmental, health, safety, and security performance. Since its inception in Canada in 1984,

---

[4] Campanella, Sam. "What Is E-Waste?" TechTarget, July 18, 2023, https://www.techtarget.com/sustainability/definition/e-waste.

[5] "Basel convention on the control of transboundary movements of hazardous wastes and their disposal." *Government of Canada*. June 8, 2023, https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/international-commitments/basel-convention-control-transboundary-movements.html

many countries worldwide have implemented Responsible Care initiatives in their economies.[6] A culture of safe chemical waste management is further fostered by public awareness campaigns and educational initiatives.

The absence of uniformity and consistency in international standards is one of the most significant barriers to handling chemical waste rules. This problem is aggravated by differences in national legislation, enforcement capacities, and hazardous substance categorization among nations. Country differences, such as varying economic and regulatory infrastructures, lead to major discrepancies in the implementation of appropriate chemical waste management.

E-waste and National Regulation

Personal and regional chemical waste are often regulated in one of four ways: landfilling, incineration, recycling or exportation. The landfills lead to ground and water pollution as the toxicity from the waste leaches into the soil. For this very reason, many European countries have banned the landfilling of e-waste even though it is the easiest form of local disposal.[7] Furthermore, incineration of the combustible aspects of e-waste has been found to be a viable solution. This helps reduce the volume of waste prior to landfilling, and several metals can be reclaimed using the residual ash. However, the flue gases—which are the resultant gases after combustion—can have a negative impact on the environment as heavy metals and other toxicants contained in electronic components are emitted into the air. These emissions primarily include copper, lead, and antimony which can negatively affect the health and safety of the workers involved.[8]

Exportation is the easiest form of disposal, as waste is deposited in large dumps often in developing countries, where labour is cheap, there is enough wasteland, and the governments have fewer restrictions for environmental protection. Hundreds of thousands of people have been employed in dismantling electronic junk in harsh conditions in such developing nations. A prime example of this is the Agbogbloshie e-waste dump in Ghana, which is the largest e-waste dump

---

[6] "Responsible Care." International Council of Chemical Associations, October 30, 2023, https://icca-chem.org/focus/responsible-care/

[7] Nyamrunda, G. C. "Dealing with electronic waste in developing countries." UNDP, January 16, 2020, https://www.undp.org/blog/dealing-electronic-waste-developing-countries

[8] Stewart, E., & Lemieux, P. "Emissions from the Incineration of Electronics Industry Waste." North Carolina: Office of Research & Development, 2003, http://dx.doi.org/10.1109/ISEE.2003.1208088

in the world and has some of the most established manual processes for recycling and disposal. Here, electronics are dismantled into reusable parts while the non-reusable sections are incinerated.[9]

Although this is one potential solution, developing nations have seen millions of tonnes of toxic e-waste being dumped illegally on their shores, with most coming from large polluting nations. Africa and Asia are key players in the large-scale shipment of hazardous waste for dumping, but also sometimes for recycling. Ghana and Nigeria, two West African countries, are amongst the largest recipients in the world. Asian countries like China, Pakistan, India, Malaysia, and Vietnam are the hotspots of illegal e-waste shipments. Recently, Malaysia sent back 1800 tonnes of toxic waste originating from Romania, which was falsely labelled as concentrated zinc. [10] Though many of the developing nations have started to learn how to recycle e-waste and get commercial value for their obsolete electronics in a quasi-safe manner, the emphasis must be on ensuring this industry becomes completely environmentally friendly and safe for humans.

Future Action and Countries' Responses

One way to hold manufacturers accountable for the chemical waste they produce is to require them to produce and maintain records of the waste they generate, handle and dispose of and make such records available for scrutiny by the regulators.[11] One example of such a regulator is India's Central Pollution Control Board. This body of India's Ministry of Environment, Forest, and Climate Change is in charge of monitoring key consequences of pollution such as water and air quality.[12] By requiring that companies provide the government regulator with records of their chemical waste disposal, the government can be assured that their guidelines for safe disposal are being followed.

---

[9] Minter, A. "The Burning Truth Behind an E-Waste Dump in Africa." Smithsonian Magazine, 13 January 2016, https://www.smithsonianmag.com/science-nature/burning-truth-behind-e-waste-dump-africa-180957597/

[10] "Illegally Traded and Dumped E-Waste Worth up to $19 Billion Annually Poses Risks to Health, Deprives Countries of Resources, Says UNEP." UNEP, May 12, 2015, https://www.unep.org/news-and-stories/press-release/illegally-traded-and-dumped-e-waste-worth-19-billion-annually-poses

[11] "E-Waste Management Rules." Central Pollution Control Board, *Ministry of Environment, Forest, and Climate Change of Government of India*. March 23, 2016. https://cpcb.nic.in/displaypdf.php?id=RS1XYXN0ZS9FLVdhc3RlTV9SdWxlc18yMDE2LnBkZg==

[12] "Functions." Central Pollution Control Board. August 28, 2018. https://cpcb.nic.in/functions/

E-waste has been a primary focus for international responses as well. Some environmental advocacy entities such as the Basel Action Network (BAN), Silicon Valley Toxic Coalition (SVTC), and Electronics Take-Back Coalition (ETBC) have launched initiatives like "e-Stewards." E-Stewards is an organization that audits and certifies recyclers of e-waste and take-back programs (where companies take back old electronics to dispose of them) so that conscientious consumers can choose ones that meet high standards. These standards include the prevention of illegal e-waste exportation to developing countries as well as a requirement for safety protocols in recycling and refurbishing plants.[13]

Another solution was deployed by Rwanda, where six collection sites were designated for members of the public to drop off unwanted electronic products. Within six collection sites, 3,000 tonnes of e-waste were collected and Rwanda was on track to set up 30 more sites by the end of 2022.[14] Furthermore, Rwanda just opened its first e-waste recycling and refurbishing facility which has the capacity to recycle up to 10,000 metric tons of e-waste per year.[15]

On a global level, the aforementioned Basel Convention has 175 nation signatories, making it a nearly universal membership in terms of acceptance. This convention also focuses on preserving and protecting the environment and human health against the effects of the movement of hazardous waste. Each party involved has their own responsibilities such as treating and disposing of waste as close as possible to the place where the waste was generated.[16] Nations worldwide must focus on both improving national efforts and cooperating with foreign countries to solve this universal issue, as only through proper regulation of chemical waste can an unhealthy earth be properly prevented.

---

[13] "About." E-Stewards. Accessed February 15, 2024. https://e-stewards.org/.

[14] Kovacevic, Michelle. "Rwanda setting example for electronic waste recycling." Trade for Development News, July 06, 2020, https://trade4devnews.enhancedif.org/en/impact-story/rwanda-setting-example-electronic-waste-recycling

[15] Rosenberg, L. "Rwanda Is One of Few Countries to Manage and Regulate E-Waste on a National Level." GreenMatters. February 26, 2021. https://www.greenmatters.com/p/rwanda-e-waste

[16] "Basel convention on the control of transboundary movements of hazardous wastes and their disposal." UNEP, December 9, 2011, https://www.unep.org/resources/report/basel-convention-control-transboundary-movements-hazardous-wastes.

Questions to Consider

1. How does chemical waste affect your country?
2. Has your country been a contributor/victim of chemical waste?
3. What are your country's current environmental laws and how does the regulation of chemical waste fit in?
4. What potential solutions can be deployed in your country to safely regulate chemical waste? Have any of these proposed solutions worked in any similar countries?
5. Can your country collaborate with other nations to implement these solutions?
6. Does chemical production compose a significant part of your country's industrial and economic output? If so, how can you effectively integrate laws that prevent danger while simultaneously allowing development to occur?

Useful Delegate Resources

Why does UN Environment Programme matter? | UNEP

UNEP : United Nations Environment Programme - Office of the Secretary-General's Envoy on Youth

What is e-waste?

Bibliography

"Basel convention on the control of transboundary movements of hazardous wastes and their disposal." *Government of Canada*. Updated June 8, 2023. https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/international-commitments/basel-convention-control-transboundary-movements.html

"Basel convention on the control of transboundary movements of hazardous wastes and their disposal." UNEP, December 9, 2011, https://www.unep.org/resources/report/basel-convention-control-transboundary-movements-hazardous-wastes.

Campanella, Sam. "What Is E-Waste?" TechTarget, July 18, 2023. https://www.techtarget.com/sustainability/definition/e-waste.

"E-Waste Management Rules." Ministry of Environment, Forest, and Climate Change of Government of India, *Central Pollution Control Board*. March 23, 2016. https://cpcb.nic.in/displaypdf.php?id=RS1XYXN0ZS9FLVdhc3RlTV9SdWxlc18yMDE2LnBkZg==

"Functions." Central Pollution Control Board. August 28, 2018. https://cpcb.nic.in/functions/

"Illegally Traded and Dumped E-Waste Worth up to $19 Billion Annually Poses Risks to Health, Deprives Countries of Resources, Says UNEP." UNEP. May 12, 2015. https://www.unep.org/news-and-stories/press-release/illegally-traded-and-dumped-e-waste-worth-19-billion-annually-poses

Kovacevic, Michelle. "Rwanda setting example for electronic waste recycling." Trade for Development News. July 06, 2020.

https://trade4devnews.enhancedif.org/en/impact-story/rwanda-setting-example-electronic-waste-recycling

Minter, A. (2016, January 13). *The Burning Truth Behind an E-Waste Dump in Africa*. Retrieved from Smithsonian Magazine: https://www.smithsonianmag.com/science-nature/burning-truth-behind-e-waste-dump-africa-180957597/

Naidu, R., Biswas, B., Willett, I. R., Cribb, J., Kumar Singh, B., Paul Nathanail, C., Coulon, F., Semple, K. T., Jones, K. C., Barclay, A., & Aitken, R. J. 2021. Chemical pollution: A growing peril and potential catastrophic risk to humanity. *Environment international*, *156*, 106616. https://doi.org/10.1016/j.envint.2021.106616

Nyamrunda, G. C. "Dealing with electronic waste in developing countries." UNDP. January 16, 2020. https://www.undp.org/blog/dealing-electronic-waste-developing-countries

"Responsible care." International Council of Chemical Associations. October 30, 2023. https://icca-chem.org/focus/responsible-care/

Rich, Nathaniel. "The Lawyer Who Became Dupont's Worst Nightmare." The New York Times, January 6, 2016. https://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html.

Rosenberg, L. (2021, February 26). *Rwanda Is One of Few Countries to Manage and Regulate E-Waste on a National Level*. Retrieved from GreenMatters: https://www.greenmatters.com/p/rwanda-e-waste

Stewart, E., & Lemieux, P. 2003. “Emissions from the Incineration of Electronics Industry Waste.” North Carolina: Office of Research & Development. http://dx.doi.org/10.1109/ISEE.2003.1208088

“Why does UN Environment Programme matter?” UNEP. https://www.unep.org/about-un-environment/why-does-un-environment-matter#:~:text=The%20United%20Nations%20Environment%20Programme,authoritative%20advocate%20for%20the%20global