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A Review: Toxic Waste (Types & Treatment)

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❖ Abstract -

The issue of toxic waste has grown to be one of great concern because it is harmful to both the environment and human health. In biomedical laboratories, handling dangerous and pathogenic agents is routine. The environment is constantly being affected more and more by their effects. Waste that is deemed toxic comprises solid, liquid, sharp, and pathological waste. Workers in the medical, agricultural, and fishing industries are particularly at risk of being exposed to dangerous biological agents the capability of contaminating rivers and lakes. The terms "toxic waste and "this term" are frequently used interchangeable to refer to abandoned materials that could pose long-term threats to human health and the environment. Nowadays, almost all manufacturing processes depend on chemicals, making the proper management and treatment of chemical waste a top priority. This is especially true given the national trend to expand the petrochemical industry and capitalise on natural resources. In this paper types, impact and treatment of toxic wastes have been discussed.

❖ Keywords- Waste, Environmental, Hazardous, industries etc.

❖ Introduction-

In emerging nations, improper management of toxic waste has become a significant problem. Most of those cities in those countries are industrialising quickly, which is increasing the production of toxic waste. Regulations governing the final disposal of hazardous materials and the treatment of toxic waste have not been implemented properly, which has put the environment, ecology, and public health at danger. Depending on the scope, source, and qualities of the dumped garbage, different effects may result. The burning of sewage sludge, chemical, medical, and municipal waste generates a significant amount of contaminants as well, which can be classified as particles and gases, metals, and organic compound. The impact of toxic waste on our environment.. Toxic waste is dangerous for people, animals, and plants in another way than only contaminating the environment. Toxic waste can be categorised according to its physical, chemical, and infectious characteristics as well as the potential of injury during handling and disposal

❖ Types of toxic waste

[1] Cancerous toxic waste -

Those who are exposed to such leaking materials are more likely to develop cancer since toxic waste contains compounds that are carcinogenic and can be contracted through exposure. People must contend with such dangerous compounds in groundwater and waterways, and some toxins, like mercury, persist in the environment without degrading or building up. Whereas organic carcinogens found in toxic waste can be removed by burning at high temperatures, the process is unfortunately expensive and humans and animals frequently consume poisons when eating fish. [1-3]

[2] Pharmaceutical waste -

Pharmaceutical waste is made up of unwanted, contaminated, and out-of-date pharmaceutical products such as medicines and vaccines. Additionally, it comprises waste products from the handling and manipulation of medications, such as gloves, masks, gowns, vials, bottles, and bags containing residue. Medical, nursing, dental, veterinary, laboratory, pharmaceutical, podiatry, tattooing, body piercing, brothels, emergency services, blood banks, and other fields produce clinical . [4]

[3] Household and laboratory Chemical waste

This is the waste produced by dangerous chemicals in hospitals and other healthcare facilities. It is toxic to people, pets, and other living things as well as to the environment. It encompasses all of the chemicals that are administered or the end products made from solid, liquid, and gaseous chemicals that are currently being utilised in experimentation, research, therapy, and diagnostics. In general cleaning tasks for offices and clinics, or for the sterilisation or disinfection of wounds etc. [5-9] Waste from hospitals and healthcare facilities that contains dangerous substances that are damaging to people, animals, and organisms in the environment. [9-12]

[4] Genotoxic waste

- There are very hazardous wastes have mutagenic, carcinogenic, and teratogenic characteristics and are frequently employed in cancer treatment. It consists of cytotoxic or anti-cancer medications used during chemotherapy and radiation. [13]

❖ Impact of toxic Elements on Environment

Mismanagement of hazardous waste can put the environment in grave danger and lead to pollution of the land, air, and water, which eventually has an impact on people and other living things. The risks associated with this are more serious, than those brought on by improper municipal trash management. primarily the staff members in these professions are particularly vulnerable to this risk. As a result, the pollutants that are to blame are divided into three groups: biological, chemical, and radioactive. Effects of dangerous substances on air, water, and land Discussions about radio and health. [14]

[1] Air pollution - Different pollutants, mostly biological, chemical, and radioactive ones, are to blame for air pollution. which significantly alter the ambiance both inside and outside. Biological, chemical, and radioactive pollutants are the main types of pollutants that cause air pollution. [15]

[2] Water pollution- Landfills are being built in order to handle trash properly. Landfills are stacked with the best materials to prevent contamination of the soil and groundwater nearby. However, incorrect garbage disposal somehow contributes to water pollution. Any sharp object thrown into a landfill can readily rip through the covering, and during the rainy season, any waste contamination may seep into the soil, causing ground water to become contaminated. Waste liquid produced while Various activities, when released in an untreated state into a river or freshwater, can also result in water toxicity . What causes changes in water's qualities like pH, BOD, COD, etc. [16]

[3] Soil pollution - The primary causes of soil contamination are biomedical waste containing outdated medications, cultural waste, chemicals, insecticides, metals, building materials, industrial waste, and other pollutants. Waste that contains too many trace elements and heavy metals like lead, cadmium, and mercury enters the soil, endangering the health of plants, animals, and people. Therefore, the only method of waste reduction is pre-treatment before disposal and waste minimization . [17]

❖ Treatment of toxic waste

1. Landfilling -

one of the ways to get rid of solid trash is to dump it in potholes that have been constructed for this reason or landfills. Methane and carbon dioxide, among other gases, are released into the atmosphere as a result of the breakdown of garbage. To keep rainwater from getting to these potholes when they are filled, soil and mud are placed on top of them. The area can be utilised for leisure purposes or as picnic spots.

2. Recycling-

This is the process of using waste to create new resources. The fact that this approach requires fewer fresh resources is one of its benefits. The energy required to recycle materials is lower than the energy required to make a product using fresh materials, and recycling most importantly lowers the amount of waste that needs to be disposed of by burning or landfill. Metals, glass, and plastics are some of the most crucial items. [18]

3. Converting waste into organic fertilizers -

This technique involves gathering leftover kitchen waste and leaving it out in the open so that aerobic bacteria, insects, worms, and fungi can start analysing the organic materials within it. It also involves flipping the waste occasionally to allow oxygen to permeate it and prevent the bacteria from turning to anaerobic decomposition. Methane and other unpleasant-smelling gases are produced as a result of that. When the decomposition process is complete, the waste transforms into a biological fertiliser that is sometimes referred to as "black gold" and can be added to soil or spread around plants.

❖ Conclusion

Since appropriate waste disposal necessitates the availability of information on the aforementioned waste's qualities as well as the identification of all chemicals used or prepared in the laboratory. Typically, this necessitates the gathering and isolation of Chemical waste should be placed in containers with appropriate labels. The significance of accurately classifying trash and determining its dangers for both small- and large-scale materials. All waste items' identities need to be prepared and accessible. To collect waste, clearly identify it, and store it in a location that does not interfere with regular laboratory operations, special containers must be utilised. Aside from while adding or removing garbage, the lids of the containers should always be kept tightly closed.

Reference –

- [1]. Alberto Salvo, Haoming Liu, Jiaxiu He, (2019). "Severe Air Pollution and Labor Productivity: Evidence from Chinese Industrial Towns." *American Economic Journal: Applied Economics*. 11 (1): 173–201. Doi:10.1257/app.20170286. ISSN 1945-778
- [2]. Aljamali Mahmood Nagham , Alsabri Kareem AlwanAlsabri Imad ,Jawad Mahmood Aseel, MuayadBaqer Mohammed Alfahham,Hussein Ali Hanan.ScientificStudy□Solutions and Recommendations to avoid the Spread of Corona Virus Covid 19 in Iraq) , *Forefront Journal of Engineering &Technology* ,2, 4, 2020, 13-22.
- [3]. Loux N. T, Su Y. S. , and HassanS. M. , "Problems in evaluating environmental exposures to manmade nanomaterials," *International Journal of Environmental Research and Public Health*, 8, 9, pp. 3562–3578, 2011. View at Google Scholar
- [4]. C. A Smith ,McCauley & Hassan, J. R. (2008). .identification system for pharmaceutical trash. Google Patents.
- [5]. Laura, Beil, "Pollution killed 9 million people in 2015 .*Sciencenews.org*. obtained on December 1st, 2017.
- [6] Aljamali Nagham Mahmood ,jawadmahmood Aseel , AlwanAlsabri Imad , *Health Promotion in Hospitals* , First Edition, 2020, Eliva Press ,ISBN: 9798636352129 .
- [7].Damian Carrington, "Global pollution causes 9 million deaths annually and endangers the "survival of human societies."
- [8] . John D, Spengler, Sexton, K. A. (1983). "Indoor Air Pollution from the Viewpoint of Public Health ". *Science*. 221 (4605): 9–17., doi:10.1126/science.6857273.
- [9]. Sungmin, Hong, (1996). " In Greenland Ice, Roman and Medieval Copper Smelting Pollution History is Documented. 272 (5259): 246– 249.,doi:10.1126/science
- [10]. Urbinato David (Summer 1994). ". The earliest "Pea-Soupers" in London. United States Environmental Protection Agency. Retrieved 2006-08-02
- [11]. Jackson Lee , *Old Dirty London: The Victorian Fight Against Dirty* (2014)
- [12] . Mahmood Jawad Aseel, Aljamali Mahmood Nagham., "Innovation, the creation of drug derivatives of cephalixin, and research into infection toxicity and resistance. *International Journal of Psychosocial Rehabilitation*, Vol. 24, Issue 04, 2020, 3754-3767.
- [13] . Houk, V. S. (1992). Industrial effluents and pollutants' genotoxicity . *Mutation Research: Reviews in Genetic Toxicology*, 277(2), 91–138. Doi:10.1016/0165-1110(92)90001-P PMID:1378533
- [14]. T., & Singh, Sadhu, , N. (2003).Unrecognized risk: biological waste poses a danger to the entire community. *The Tribune*
- [15] .J. M, Spengler, Sanet, , J. D. (2003) Indoor climates and health:Moving into the 21st century. *American Journal of Public Health*, 93(9), 1489–1493. Doi:10.2105/AJPH.93.9.1489 PMID:12948968
- [16]. H. V. N., Rao, (1995). Bangalore's hospital waste disposal practises and how they affect the environment.Paper presented at the Third International Conference on Appropriate Waste Management Technologies for Developing Countries, Nagpur, India

[17] . C. Hoppe, A. Ravello Da Silva.M., & Mello, N. (2005). In the southern region of Brazil, managing medical wastes.Waste Management (New York, N.Y.), 25(6), 600–605.Doi:10.1016/j.wasman.2004.03.002 PMID:15993344

[18] . R.E., Jara, C.P.B., Garcia, Guasp , J. Veja, T., Winkle J.P, Smith & Damien, C.H.H. (2005) ,Iraqi desalination using the distillation virus Covid 19. Forefront Journal of Engineering &Technology ,2, 4, 2020, 13-22.

