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ENVIRONMENTAL HAZARDS ASSOCIATED WITH INDUSTRIAL EFFLUENT DISCHARGE: A PAPER REVIEW

[1]Gumel ABUBAKAR ALI
[1]Department of Environmental Sciences and Engineering, Near East University, Mersin 10
Turkey
Email:abugumel02@gmail.com
[2]Fidan ASLANOVA
[2]Department of Environmental Sciences and Engineering, Near East University, Mersin 10
Turkey
fidan.aslanova@neu.edu.tr
[3]Gumel Muhammad LAWAN ALI
[3]East Coast Environemntal Research Institute, Sultan Zainal Abidin Tarrengganu
Malaysia.
aalgumel02@gmail.com

Abstract*:* Treating waste water is vital to safeguard human and environmental health. The purpose of this paper is to review the past studies of environmental hazards associated with industrial effluent discharge; however, some numbers of studies were consulted during the study. Traces of cd, U, and V in sea water as a result of planned and unplanned discharges affected the lives of frogs, fishes, birds and earthworms as well as surface and ground water. Materials used for the study are online articles related to the review. The study discovered that, The industrial discharge transports a variety of toxins to the river, lake, and groundwater. Some notable pollutants from different industries across the globe include methods such as arsenic metals such as chromium, cadmium, zinc, copper, lead etc. Wastewater treatment effluents are one of the most polluting sources on a global scale. Some notable impacts include: Pollution's environmental and health effects have long been a serious concern around the world. Nitrogen, phosphate, heavy metals, detergents, pesticides, and hydrocarbons are the principal chemical contaminants found in wastewater. Nitrogen and phosphorus are two of the most prevalent nutrient-limiting compounds. Wastewater from nearly all industries in India is released untreated on land or into waterways. The effect of various concentrations (0, 5, 10, 15, 20, 25, 50, 75, and 100 percent) of distillery effluent (raw spent wash) on seed germination percent, speed of germination, peak value, and germination value in some vegetable crops suggestions, including tomato, chili, bottle gourd, cucumber, and onion, was investigated in a laboratory experiment.With concentrations more than 50%, germination was hindered in all five crops studied. The effluent, on the other hand, had a favorable influence on onion seed germination at a concentration of 10% Therefore, the study had come up with good suggestions to overcome the problems associated with the topic.

Keywords: Effluent, Industrial, Environment, Hazards, Health, plants, animal

1.0 INTRODUCTION

Water treated or untreated is characterized as industrial waste, often known as effluent. which flows out of a treatment facility, Sewer industrial outfall, which flows from a treatment facility. Industrial effluent is classified as exceedingly complex mixtures containing both inorganic and organic components, and it varies in both flow and pollution strength (Xu, S., Liu, W., & Tao, S. (2006).

For several years, many industrial effluents have been disposed inThis is a shallow gulf in the southern Mediterranean Sea, located on the shore of the Gulf of Gabès . These coastal industrial expansions, along with rapid population growth, have resulted in a significant increase in the number ofThese industrial expansions along the coast, along with increasing population growth, have resulted in a significant increase in the marine pollution, predominantly as a result of the flow of urban and industrial effluents into water bodies, such as seawater, resulting in an increase in the diversity of pollutants, including metals.(Zouch, H., Cabrol, L., Chifflet, S., Tedetti, M., Karray, F., Zaghden, H., ... & Quéméneur, M. 2018.)

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1.1Background

Massive industrial entities and their indiscriminate discharges represent a serious hazard to the environment. Industrial effluent not only degrades soil, crop, and environmental quality, but it also poses a direct threat to human, animal, and marine life. The quality of crops is harmed by the unplanned release of industrial wastewater. The total area irrigated using raw or diluted wastewater in fifty nations is estimated to be around 20 million hectares, or nearly 10% of all irrigated land.(Hossain, M. A., Uddin, M. K., Molla, A. H., Afrad, M. S. I., Rahman, M. M., & Rahman, G. K. M. M. (2010).

The specific aim of this paper is to review previous researches on the above topic and identify any gap in knowledge. Data used would be secondary data Reviewing and analyzing previous works and papers. No primary data would be used in this paper. The objective is to combine different qualitative researches regarding the above-mentioned topic in order to analyze views and knowledge from various similar paper

2.0 Materials and Methods

The research would be conducted by reviewing different previous works done by other researchers in the aforementioned topic. Papers would be collected to review their aim, objectives and methodologies.

Papers were randomly selected and studied. Articles were carefully studied for necessary and relevant information in respect to the above-mentioned topic.

3.0REVIEWS AND DISCUSSIONS

3.1. Environmental Hazards Associated with Effluent Discharge

3.1.1. Acidic Industrial Wastewater's Impact On Microbial Ecology and Trace Metal Dynamic During Coastal Sediment Suspension

According to Hana et. al's research sediments are important for trace metals sink, this aids in reducing their bioavailability in marine environments. Microbes are fundamentally important in marine environment's functioning changes in ecosystem conditions as well as organic and inorganic chemicals contaminations.

Long-term effluent produced from fertilizer industrial waste contaminated with trace metals has an impact on the coastal marine ecosystems of the Gulf of Gabès (southern Mediterranean Sea).The results demonstrated that resuspended surface polluted silt from the Sfax coast resulted in high levels of Cd, U, and V in brackish water. CD levels were found in high amounts in surface sand collected in front of mixed wastewater released into the seas, as in previous research on surface sediments from the Sfax southern coast (Zouch, H., Cabrol, L., Chifflet, S., Tedetti, M., Karray, F., Zaghden, H., ... & Quéméneur, M. 2018.).

3.1.2. Implications of Wastewater Discharges On Degrading the Risk to Food Security from Natural Resources

Industrial discharge generated from various industrial and commercial establishments poses major hazards to the en vironment, M. Anwar et al.ecosystem, particularly in urban and semi-urban settings. It is a pollutant source for surface and subsurface water, soil, and the atmosphere. Industrial wastewater releases inadvertently impair the quality of farm food. The study's findings pointed to higher amounts of heavy metals in water. The majority of respondents (80%) in industrial areas stated that there are medium to high levels of fish, bird, and earthworm deaths, as well as drops in bug and frog populations of 70% and 60%, respectively.

Based on the data and their local interpretation, it can be inferred that industrial facilities are rapidly expanding in Bangladesh's urban and semi-urban areas, producing large amounts of effluents. Surface and ground water, soil, crops, insect pests, animal and human lives are all harmed by their indiscriminate discharges. The quality of our main source of drinking water, ground water, is also impacted. As a result, it is imperative that special attention be paid to the treatment of industrial wastewater.(Hossain, M. A., Uddin, M. K., Molla, A. H., Afrad, M. S. I., Rahman, M. M., & Rahman, G. K. M. M. 2010).

3.1.3. The Environmental Problems of Industrial Effluents

Through the building of plants and factories, industrialization has become a significant role in a country's economic development. However, the industrial effluents emitted from them is extremely harmful to the environment since it comprises a variety of pollutants that pollute surface water, ground water, and soil quality. The trash is not safely treated for a variety of reasons. One of the main reasons is the unavailability of highly effective and cost-effective

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therapeutic solutions. Different sorts of pollutants are deposited in rivers, lakes, and groundwater sources by industrial effluent. Freshwater sources must be of excellent quality because it is heavily consumed by humans for drinking, residential needs, and agricultural purposes, among other things.

Some common pollutants from various industries around the world include heavy metals s such as arsenic, chromium, cadmium, zinc, copper, lead etc. from juru river in Malaysia, chemical products such as papers and printing batteries as well as The effects of these industrial effluents to freshwater through rivers, lakes, and groundwater include textiles and leathers, fertilizers, herbicides, and insecticides. (Ho, Y. C., Show, K. Y., Guo, X. X., Norli, I., Abbas, F. A., & Morad, N. 2012).

3.1.4. Effects and Treatment Processes of Effluent Discharge

Worldwide, the industrial wastewater that is released One of the most significant sources of pollution is from treatment systems. some common effects include: Pollution's ecological and health consequences have always been a big issue around the world. These effects can be divided into two categories: ecological and health effects .Nitrogen, phosphate, heavy metals, detergents, pesticides, and hydrocarbons are the most common chemical pollutants in effluents. The presence of nitrogen in effluents can be irritating due to its ecological and public health implications. Ammonia and organic nitrogen, both soluble and particulate, are the main sources of nitrogen in untreated effluents. Phosphorus, a vital component of living organisms, can be found in high concentrations in open surface water sources.

Healthwise, Animal and human feces are the source of the bulk of waterborne microorganisms that cause human disease. These include a wide range of pathogens that could be washed into drinking water supplies or receiving bodies of water. Local and industrial effluents are key sources of effluents that are released into receiving water bodies on a regular basis worldwide, due to fast increase in industrialization and increasing human density. Appropriate wastewater treatment strategies are crucial for ensuring successful water quality control. Appropriate wastewater treatment strategies are critical for ensuring successful water quality management. Most wastewater treatment plants at the time were designed to remove nutrients by adding chemicals. However, because chemical methods have a number of drawbacks, including increased sludge volume, sludge with poor settling and dewatering capabilities, and pH drop, biological treatment has become increasingly popular in recent years.(Akpor, O. B. (2011.)

3.1.5.The Impact of Industrial Effluents on Crops

In emerging countries, industrialization is critical. Getting rid of industrial effluents will become a global challenge as industries become more global. It's known for creating a lot of rubbish, having a restricted number of treatment sites, and having high treatment technology prices. Effluents from practically all industries are released into bodies of water untreated.

Effluents, which contain organic and inorganic substances that are dumped into nearby water bodies, are commonly thought of as the principal industrial polluting contaminants. As a result of diverse industries discharging suspended particles, hazardous chemicals, oils, greases, dyes, radioactive wastes, and thermal pollution, water bodies become toxic. implications of distillery wastewater on seed development and growth in certain vegetable crops. The effects of various concentrations (0, 5, 10, 15, 20, 25, 50, 75, and 100 percent) of distillery wastewater on seed germination percentage, speed of germination, highest value, and growth value in certain vegetables such as tomato, chili, bottle gourd, cucumber, and onion were investigated in a laboratory setting. With the exception of tomato, wastewater had no negative effect on seed growth at low concentrations. However, when it comes to the germination of onions, At a concentration of 10%, it was much greater (84%) compared to 63%) in the control group. (Ramana, S., Biswas, A. K., & Singh, A. B. 2002). Regardless of the crop species, full germination failure was seen at higher concentrations (75 percent and 100 percent). Tomato germination was the lowest (29%) and onion germination was the highest (48%) among the five crops. With concentrations more than 50%, germination was hindered in all five crops studied. The effluent, on the other hand, had a favorable influence on onion seed germination at a concentration of 10%.(Ali, S., Akhtar, T., & Alam).

3.1.6. Different Industrial Wastes and Their Effect On Egyptian Soil Quality In Different Locations

In Egypt, there are numerous industrial aggregates close to various agricultural lands. The quality of soil and production in such locations, as well as human health, have all suffered significant losses. It was discovered that the North Nile Delta's alluvial clay soils have significant levels of a number of heavy metals, including (Co, Cr, Cu, Ni

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and Zn). Similarly, there are 67 discharges along the Nile River between Aswan and Cairo, 22 of which are of industrial origin and 45 of agricultural origin.
The total amount of liquid discharged every year is estimated to be around 3882 million m3. Additionally, the total amount of wastewater in volume discharged in the two branches of Nile Delta (Damietta and Rosetta) is about one m3/y. At Helwan city, around 12 million m3 of effluents from the iron and steel industries reach the Nile River The average heavy metal concentrations vary depending on the source of contamination. The following is the decreasing order of such heavy metals' dominance in each area: Fe>Mn>Cu>Pb (Mashali, S., El-Essawi, T., Youssif, T., & Hafz, O. 2009).

Table 1: Table of summaries and authors

COUNTRY	CONTAMINANT	TYPE OF INDUSTRY	AUTHORS
GULF OF GEBES	CD, U, V from fertilizer waste	Fertilizer processing industry.	Zouch, H., Cabrol, L., Chifflet, S., Tedetti, M., Karray, F., Zaghden, H., ... & Quéméneur, M. (2018). Effect of acidic industrial effluent release on microbial diversity and trace metal dynamics during resuspension of coastal sediment. *Frontiers in microbiology*, *9*, 3103.
BANGLADESH	Trace Metals	Unspecified industry	Hossain, M. A., Uddin, M. K., Molla, A. H., Afrad, M. S. I., Rahman, M. M., & Rahman, G. K. M. M. (2010). Impact of industrial effluents discharges on degradation of natural resources and threat to food security. *The Agriculturists*, *8*(2), 80-87.
MALAYSIA	Zinc, copper, arsenic, pesticides etc.	Ternaries, fertilizer industries	Ho, Y. C., Show, K. Y., Guo, X. X., Norli, I., Abbas, F. A., & Morad, N. (2012). Industrial discharge and their effect to the environment. *Industrial waste*, *Intech*, 1-39.
NIGERIA	Nitrogen (ammonium)	Unspecified	Akpor, O. B. (2011, September). Wastewater effluent discharge: Effects and treatment processes. In *Int. Conf. Chem. Biol. Environ. Eng* (Vol. 20, pp. 85-91).

INDIA	Organic & inorganic compounds e.g., Grease, dyes radioactive etc.	Unspecified	Ali, S., Akhtar, T., & Alam, M. The Effect Of Industrial Effluents On Crop Plants: A.
EGYPT	Co, Cr, Cu, N, & Zn Fe, Mn, Cu, & Pb.	& steel industries Agricultural industries	Mashali, S., El-Essawi, T., Youssif, T., & Hafz, O. (2009). Effect of Different Industrial Wastes on Soil Quality at Different Locations of Egypt.

Conclusion and Recommendation

Effluent from different industries is being released into the environment through various channels, in different forms, quantities and concentrations on daily basis. These substances have different forms effect on the environmental quality and health of humans as well as plants and animals. Different industries have different types of effluents. Each contains specific types of contaminants posing different type of environmental and health hazard. This means that the effluent composition of a tannery industry is different from that of a food processing Industries and so on. This poses different levels of threat to underground water quality, surface water as many industries releases the effluents into open water bodies as cost of treating industrial wastewater is capital intensive. This paper was able to highlight different environmental implications of improper disposal of industrial effluent, including its effects on different environmental media's such as water, plants and soil. Summarizing different papers and articles to come up with a vid picture of the problems regarding effluent discharges and the severe lack awareness among people who still use such effluents for agricultural irrigations purposes.

Emphasis should be placed on bio assay on food items sourced from farms located close to industrial layouts to ensure health safety of such food items.

- More effective legislations should be put in place to deal with industries
- Such industries should be slapped with serious fines
- Industries should be compelled to establish treatment facilities and ensured they follow the standards set for their operations.
- External environmental audits should be carried on a timely basis to ensure maximum compliance with set standards and regulations.
- Finally, more awareness should be made on the environmental and health consequences of such actions

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