



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

# IJIRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 6, June 2021

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 7.512**



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# Groundwater Impact on Human Life Near Copper Mines of Khetri, Jhunjhunu, Rajasthan

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**ABSTRACT:** Groundwater is also being polluted day-by-day by effluents generated from mineral wastes and beneficiation processes in the vicinity of mining sites such as Khetri. Pollutant concentrations were measured in groundwater at the vicinity of Khetri copper mining project, Rajasthan to investigate the influence of copper mining on environment. Pollutant concentrations in groundwater were investigated. Copper metal concentration in water samples were found above the maximum desirable limit. Mining industry has deteriorated quality of groundwater resources in the state of Rajasthan, and these industries are becoming centers of pollution sources which need timely actions at government level so that natural resources such as groundwater can be protected.

## I. INTRODUCTION

Mining can have harmful effects on surrounding surface and groundwater. If proper precautions are not taken, unnaturally high concentrations of chemicals. Large amounts of water used for mine drainage, mine cooling, aqueous extraction and other mining processes increases the potential for these chemicals to contaminate ground and surface water. As mining produces copious amounts of waste water, disposal methods are limited due to contaminants within the waste water. Runoff containing these chemicals can lead to the devastation of the surrounding vegetation. The dumping of the runoff in surface waters or in a lot of forests is the worst option. Therefore, submarine tailings disposal are regarded as a better option (if the waste is pumped to great depth).[1] Land storage and refilling of the mine after it has been depleted is even better, if no forests need to be cleared for the storage of debris. The contamination of watersheds resulting from the leakage of chemicals also has an effect on the health of the local population. The implantation of a mine is a major habitat modification, and smaller perturbations occur on a larger scale than exploitation site, mine-waste residuals contamination of the environment for example. Adverse effects can be observed long after the end of the mine activity.[2]

Destruction of the habitat is the main component of biodiversity losses, but direct poisoning caused by mine-extracted material, and indirect poisoning through food and water, can also affect animals, vegetation and microorganisms. Habitat modification such as pH and temperature modification disturb communities in the surrounding area. Endemic species are especially sensitive, since they require very specific environmental conditions. Destruction or slight modification of their habitat put them at the risk of extinction. Habitats can be damaged when there is not enough terrestrial product as well as by non-chemical products, such as large rocks from the mines that are discarded in the surrounding landscape with no concern for impacts on natural habitat.[3]

## II. DISCUSSION

Biomagnification plays an important role in polluted habitats: mining impacts on biodiversity, assuming that concentration levels are not high enough to directly kill exposed organisms, should be greater to the species on top of the food chain because of this phenomenon. Adverse mining effects on biodiversity depend a great extent on the nature of the contaminant, the level of concentration at which it can be found in the environment, and the nature of the ecosystem itself. Some species are quite resistant to anthropogenic disturbances, while some others will completely disappear from the contaminated zone. Time alone does not seem to allow the habitat to recover completely from the contamination.[4]

Animals can be poisoned directly by mine products and residuals. Bioaccumulation in the plants or the smaller organisms they eat can also lead to poisoning: horses, goats and sheep are exposed in certain areas to potentially toxic concentration of copper. There are fewer ant species in soil containing high copper levels, in the vicinity of a copper

mine. If fewer ants are found, chances are higher that other organisms living in the surrounding landscape are strongly affected by the high copper levels as well. Ants have good judgement whether an area is habitual as they live directly in the soil and are thus sensitive to environmental disruptions. Nevertheless, survival in these conditions will imply a big loss of gene diversity, resulting in a reduced potential for adaptations to subsequent changes. Undeveloped soil in copper contaminated areas could be a sign of reduced activity by soils microfauna and microflora, indicating a reduced number of individuals or diminished activity.[5]

### III. RESULTS

Arbuscular mycorrhiza fungi are especially sensitive to the presence of chemicals, and the soil is sometimes so disturbed that they are no longer able to associate with root plants. However, some fungi possess contaminant accumulation capacity and soil cleaning ability by changing the bioavailability of copper this can protect plants from potential damages that could be caused by chemicals. Their presence in contaminated sites could prevent loss of biodiversity due to copper mine-waste contamination, or allow for bioremediation, the removal of undesired chemicals from contaminated soils. [6] On the contrary, some microbes can deteriorate the environment: which can lead to elevated  $SO_4$  in the water and can also increase microbial production of hydrogen sulfide, a toxin for many aquatic plants and organisms. Mining processes produce an excess of waste materials known as tailings. The materials that are left over after are a result of separating the valuable fraction from the uneconomic fraction of ore. These large amounts of waste are a mixture of water, sand, clay, and residual bitumen. Tailings are commonly stored in tailings ponds made from naturally existing valleys or large engineered dams and dyke systems. Tailings ponds can remain part of an active mine operation for 30–40 years. This allows for tailings deposits to settle, or for storage and water recycling.[7,8]

### IV. CONCLUSION

The mining industry uses sulphuric acid in the extraction and treatment of copper. The extraction processes are called heap and situ leaching; during these processes, particles react with each other to create acidic mists that not only harm people's skin, eyes and lungs, but also destroy crops, deteriorate the quality of the land, and damage nearby buildings. The acid dust both smells and tastes bad. Several epidemiological studies have suggested a correlation between exposure to inorganic acid mists containing sulphuric acid and an increased incidence of laryngeal cancer. The International Agency for Research on Cancer (IARC) has concluded that "occupational exposure to strong inorganic mists containing sulphuric acid is carcinogenic for humans." Copper mining requires the use of large amounts of sulphuric acid to extract the copper from the ores. [9] Especially this creates the phenomenon of acid mists and acid rains, that can fall many miles from the mine and smelters, causing damage to buildings, crops and most important, human health.[10]

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