



Effects of Mining activities on Water quality in Tilakhera, District Chittorgarh, Rajasthan,

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ABSTRACT

The mining activity is most harmful to environment in numerous ways. But the most harmful to water because the quality of water are extremely important for health and others. Due to the lack of proper planning and negligence of regulations, an appreciable amount of environmental degradation and ecological damage to water occurs. Estimation of quality of water is extremely important for proper assessment of the associated hazards. Ground water samples of the area of Tilakhera were analyzed to assess impact of mining activities on water quality of the area. pH, conductivity, total hardness, total alkalinity, Ca, Mg, Cl, nitrate as NO₃ water Parameter was analyzed to assess contamination in water resources.

Keywords: Environment, Environmental degradation, Ecological damage, Contamination, Water resources

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INTRODUCTION:

Water is indispensable for our life, so keeping it free from any pollutant is very important. Water is not only essential for the survival of man, but also for other living organism [1]. By the experiment, it can prove that Mining effect quality of water by adding contamination and other compound make the water too unsafe to drink and other purpose and disturb hydrology of the area. Potable water is that water that is free from disease producing microorganisms and chemical substances that are dangerous to health [2]. Due to release of dust and polluted water from mining area damage of forest, fauna and flora of the area and human health occur. Water for human consumption must be free from microorganisms and chemical substances in concentrations large enough to cause environmental imbalance and disease [3]. The World Health Organization (WHO) estimated in 1996 that every eight seconds a child dies from a water-related disease and that each year more than five million people died from illnesses linked to unsafe drinking water or inadequate sanitation [4].

STUDY AREA:

Limestone is an important factor of cement industry. Thus most of cement industry in Rajasthan area situated in Chittorgarh as most of limestone deposition is found in this district. The sources of water in the village are hand pumps, wells and tubewells. Hence it is not a very developed village. Mining lease of Mangrol – Tilakhera Limestone Mine is situated near village Mangrol, Tilakhera, Tehsil – Nimbahera, District Chittorgarh, Rajasthan in an area of 299.20 hectare, and lies approximately between the Latitudes 24° 41' 30" N - 24° 42' 43" N, and longitudes, 74° 41' 02" E- 74° 41' 50" E.

MATERIAL AND METHOD:

A water sample is collected from the mining area for physical-chemical analysis of water. Analyses of water quality were done by collecting water sample from different sources from in and around the mining area during different seasons [5]. Various informal interviews with miners, mining officials, government officials, and local community members (around the source of water pollution) were conducted during the study period.

RESULT AND DISCUSSION

Mining activity disturbs the original water catchment area and creates water logging problems which ultimately affects the ground water recharge.

Table 1: Monitoring water quality:

| Parameter | Parameter (Tilakhera village) | Requirement (Desirable Limits) WHO |
|--------------------------------------|-------------------------------|------------------------------------|
| pH | 8.9 | 6.5-8.5 |
| Conductivity $\mu\text{s}/\text{cm}$ | 1132 | 300 |
| Chloride mg/l | 105.6 | 200 |
| Total hardness mg/l | 724 | 500 |
| Alkalinity mg/l | 370 | 75 |
| Nitrate mg/l | 28.9 | 45 |
| calcium mg/l | 121.5 | 75 |
| Magnesium mg/l | 49.7 | 50 |

According to the study of water parameter pH, conductivity, total hardness, Alkalinity, Calcium, Magnesium crossed the permissible limit which creates harmful effect on water and human health also. Higher values of pH hasten the scale formation in water heater and reduce the germicidal potential of Chlorine [3]. Total hardness beyond the permissible limits causes gastrointestinal irritation problem. Alkalinity itself is not harmful to human being, but the higher alkalinity is responsible for the unpleasant odor of water.

IMPACT ON WATER QUALITY:

The high consumption of water required by mining activity in different process which lead to reduction of water sources around the mining activity area. Mining is also a major activity causing water pollution [6-9].

The waste in the water does not completely sink to the ground, and much of it remains on the surface. As the water on the surface evaporates, the liquid wastes solidify. Meanwhile, relatively wet marble waste, which is subjected to rain and snow, will carry with seeping down into the ground over time, as cited in [10,11].

CONCLUSION

ACCORDING to study of Physio-chemical parameter water of Tilakhera is slightly alkaline in nature. The water at the Tilakhera also did not exhibit any microbial contamination, perhaps due to its isolation from human and animal interferences, as also due to presence of alkaline (limestone) rocks. High quantity of ca, mg, hardness etc, indicate water is not potable purpose.

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