Journal of The Gujarat Research Society

ISSN: 0374-8588
Volume 21 Issue 10, October 2019

A Review of the Impact of Illegal Sand Mining on Environment

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ABSTRACT:*In the conservation of the environment, sand is an important mineral for our society, where this activity of sand and soil extraction is becoming an environmental problem as demand for sand rises in industry and construction. Considerable environmental harm can be attributed to mining and its related operations. In this article, we discuss the direct and indirect impacts on the ecosystem in Indian regions due to soil and sand mining. Water contamination is evident by the coloration of water that ranges from brownish to reddish orange in most rivers and streams in the mining zone.Some of the physicochemical and biological parameters that define the deterioration of water quality are low pH (between 2-3), high electrical conductivity, high concentration of ions of sulphate and iron and toxic heavy metals, low dissolved oxygen (DO) and high BOD. Acid mine discharge (AMD) pollution from mining and spoils, heavy metal leaching, organic enrichment, and sand particle silting are major causes of water quality degradation.*

KEYWORDS:*Mining, Water Quality, Acid Mine Drainage, Environmental Damage, Policy And Guidelines.*

INTRODUCTION

Sand is an important mineral in preserving the climate for our society, Buffer against heavy tidal waves and hurricanes, shelter for crustacean species and marine organisms, used in beach attractions for making concrete, filling roads, building sites, brick making, making glass, sandpaper, recycling, and in our tourism industry. Sand mining is the sand and gravel removal process where, as the demand for sand rises in manufacturing and construction, this activity becomes an environmental concern. Soil mining and land degradation have been inseparably linked in nearly every mineral bearing area. Unscientific mining has induced land erosion, followed by subsidence and consequential mine fires and water table destruction, leading to topographic disorder, significant ecological imbalance and harm to land use patterns in and around mining regions[1].

Mining is a major contributor to the national GDP (4%) occupied by mining (2nd)Thirty-six lakh hec. (0.11 percent) of the total land area (329 m ha) and job provisionGeneration (4%) for a nation of 1.1 million inhabitants. Soil mining and land degradation have been inseparably linked in nearly every mineral bearing area. India agrees that mining can have detrimental environmental and social effects unless properly supervised. In essence, mining is a destructive construction practice where at the altar of economy, biodiversity suffers.

ISSN: 0374-8588
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Scientific mining activities, followed by the environmentally sustainable restoration and regeneration of exploited wastelands and the judicious use of geological resources[2].

The underground geological resources (minerals) are, sadly, superimposed by aboveground biological resources in most regions of the planet (forests). This is more prevalent in India in particular. Mining activities therefore inevitably entail deforestation, degradation of forests and loss of biodiversity. The mining and refining of minerals and minerals also contributes to substantial contamination of the atmosphere. Nevertheless, humanity cannot afford to give up the underground geological resources that are fundamental raw materials for development.In mined soil areas, physicochemical parameters and concentration of heavy metals Pb2+, Zn2+, Ni2+, Co2+, As3+, Cu2+, Fe2+, Mn2+ and Sn2+ were analyzed and found that most parameters and concentration of metals surpass the permissible limit and concluded that ex-mining catchment has a high potential for contamination due to mining operations[3].

DRAINAGE OF ACID MINE- HAZARD TO WATER SUPPLIES

The potential for acid mine drainage is a key concern. The response will decide if the proposed mining project is suitable for the environment. If mined materials (such as open pit walls and underground mines, tailings, waste rock, and heap and dump leach materials) are excavated and exposed to oxygen and water, if iron sulfide minerals (especially pyrite or 'fools gold') are abundant, acid may form and there is an insufficient quantity of neutralizing material to be neutralized counteracting the formation of acid.

In Tamil Nadu, the Movement to Protect Water Resources-Tamil Nadu organized a State-level "public hearing" on the effects of sand mining in order to draw the government's attention to the severity of the issue and raise awareness of the risks involved (on river basins, streams, coastal areas and hill regions). The Campaign for the Conservation of Water Resources has documented 15 adverse effects of sand mining after intensive studies in different regions and contact with the affected citizens.These include groundwater depletion; reduced water supply for commercial, agricultural and drinking purposes; degradation of agricultural land; lack of jobs for farm workers; threats to livelihoods; abuses of human rights; and damage to roads and bridges. Victims' representatives from 13 of the 28 districts of the State presented proof of the environmental and livelihood harm caused in these districts.The river basins affected included those of Cheyyar, Araniyar and KosathalaiyarPalar and its tributaries (Kanchipuram and Thiruvallur districts); Cauvery (Karur district); Bhavani (Erode district); Vellar (Perambalur district); Vaigai (Madurai and Theni districts); and Thamiraparanii (Thamiraparani district); (Tirunelveli district). Victims of the Nagapattinam, Tuticorin, Ramanatha-puram and Kanyakumari coastal districts.

There has been a major rise in sand mining in Kerala since the following a boom in the construction industry at the beginning of the 1990s, and the operation reached alarming proportions in several areas, particularly in the southern and western regions of the State, after the sand mining court restrictions came into effect in neighboring Kerala in 1994.

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Likewise, the River Bharathapuzha has been a victim of indiscriminate sand mining in Kerala. Sand mining continues rapidly on the Bharathapuzha riverbed, despite various prohibitions and regulations.Water tables have fallen significantly and a land once renowned for its rich harvest of rice now faces water shortage. Groundwater levels have plummeted significantly in the villages and towns along the river and wells are almost perennially dry.

Air Quality

Dust particles are the biggest air quality problem with mining (Ghose and Majee, In 2000). A health risk may be vast quantities of dust concentrations, exacerbating respiratory problems such as asthma and irritating the lungs and bronchial passages. However, before their health is impaired, people inevitably experience a lack of environmental comfort due to dust deposits or dust accumulation. Dust deposition is measured with deposition gauges and recorded in dust fallout units of g/m2 per month. Pre-mining activitythe normal measures against which limits are set are background concentrations and total quantities of deposited dust.With mechanical high volume air samples, dust concentrations are tracked and limits are set on average and peak hourly values.

Noise and Vibration

Noise can be a concern as mines usually run 24 hours a day and sound levels can fluctuate widely. Surface mines primarily produce noise from excavation and transport overloads, while ventilation fans, surface facilities and product transport are the key sources of noise from underground mines. Generally, noise levels must be regulated so that when neighboring landholders choose to relax or sleep, they represent the strictest standards during night hours. In order to prevent damage to building structures and inconvenience to individuals living in the city, blast preparation must also restrict ground vibration[4]. There are considerably lower vibration limits set for environmental amenities than for structural damage. Without structural damage, industrial structures can also withstand up to 50-mm/s ground vibrations. Average noise sensitivity is adopted for transport noise. It is also important to allow noise enhancement caused by atmospheric thermal reversals at night in many parts of the world.

Water Quality

Via contamination with dissolved and suspended materials, mines can affect surface runoff and groundwater quality. Sediment or suspended solids are probably the most prevalent surface water contaminant. The beds of receiving streams may be smothered by mud, impacting fish and benthic species[5]. Rain water may be polluted from process plants, workshops and vehicle wash-down pads, in addition to runoff from overload sites and stocks. Drainage from sulphur or sulphidic ores oxidization is highly acidic and can contain heavy metals dissolved. These are toxic to marine life and affect the ecosystem in the region. Mine developers need to know how flooding can be treated by their facilities. Any distance from shafts or open pits, which can make nearby wells or groundwater bores run dry, mines, can

de-water groundwater aquifers. Mine designers must also protect against the release of water polluted chemically or radiologically.

Quality of the Soil

The largest effect of mining on the soil resources of nations is by far due toOpencast mining, which has a very high potential for soil quality degradation relative to underground activities. Topsoil is an important component in coal mining areas for land reclamation (Kundu and Ghose, 1994)[6]. The topsoil is very badly contaminated if, at the outset, it is not mined separately in order to replace the area for proper reclamation. This is especially important because of the shortage of coalfield topsoil. Therefore, for later use, it is important to save topsoil in a way that protects the primary root medium from pollution and erosion, and therefore from productivity. However, Sendlein et al (1983) indicates that systemic practice of handling and storage will protect topsoil's physical and chemical characteristics while in storage and even after redistribution into the regraded area[7].

CONCLUSION

Weak governance and rampant corruption make illicit mining simpler. Exhaustion of water supplies. The socio-economic importance of mining activities is frequently ignored, and its economic and social benefits need to be secured. Owing to inadequate resource management, the climate is negatively impacted by soil and sand extraction. In order to reduce the negative impacts, the method of preparing an EMP report for clearance by the Government of India prior to the implementation of the mining project was a positive move.Caution should be exercised by the government when it comes to leasing out the riverbed for mining operations and also clearly demarcate zones and track mining through an effective institutional framework. It is important to create a high-level lobbying committee to implement laws in an effective and impartial manner and take decisive measures for an environmental solution.

REFERENCES

[1] M. K. Ghose, “The data mining perspective of the indian mineral industry,” in *Data Mining and Management*, 2010.

[2] S. S. Chauhan, “Mining, Development and Environment: A Case Study of Bijolia Mining Area in Rajasthan, India,” *Journal of Human Ecology*, 2010, doi: 10.1080/09709274.2010.11906299.

[3] M. A. Ashraf, M. J. Maah, and I. Bin Yusoff, “Study of Water Quality and Heavy Metals in Soil & Water of Ex-Mining Area Bestari Jaya , Peninsular Malaysia,” *International Journal of Basic & Applied Sciences*, 2010.

[4] P. S. Pitchaiah, “Impacts of Sand Mining on Environment–A Review,” *International Journal of Geoinformatics and Geological Science*, 2017, doi: 10.14445/23939206/ijggs-v4i1p101.

[5] M. Naveen Saviour, “ENVIRONMENTAL IMPACT OF SOIL AND SAND

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Volume 21 Issue 10, October 2019

MINING:\nA REVIEW," *International Journal of Science, Environment*, 2012.

[6] N. K. Kundu and M. K. Ghose, "Shelf life of stock-piled topsoil of an opencast coal mine," *Environmental Conservation*, 1997, doi: 10.1017/S0376892997000064.

[7] A. T. Lima, K. Mitchell, D. W. O'Connell, J. Verhoeven, and P. Van Cappellen, "The legacy of surface mining: Remediation, restoration, reclamation and rehabilitation," *Environmental Science and Policy*, 2016, doi: 10.1016/j.envsci.2016.07.011.