



ORIGINAL ARTICLE

Rapid Environmental Impact Assessment Studies of Mining Activities in Chittorgarh District, Rajasthan

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ABSTRACT

Mining exerts pressure on environment at many stages i.e. exploration, extraction, processing, and post closer operations. Hence mining operations necessarily involves deforestation, habitat destruction and biodiversity erosion, change of landscape, displacement of human settlement, flora and fauna of the area, surface drainage, and change in air, water and soil quality. While for the purpose of development and economic upliftment of people, there is a need for establishment of industrial project, but these have to be environmentally friendly. Therefore it is essential to assess the impacts of mining on different environmental parameters, before starting the mining operations, so that abatement measures could be planned in advance for eco-friendly mining in the area. Environmental impact assessment (EIA) is a systematic process that examines the environmental consequences of development action like mining, transport, river valley. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensures that these impacts are taken into account during the project design.

Keyword: Mining, EIA, Chittorgarh

INTRODUCTION:

Mining activities and waste product produces a significant impact on surrounding environmental-ranging from localized surface water and ground water contamination to damaging effect of airborne pollutants on the regional ecosystem. The main objectives of this study were to evaluate (estimate) the possible environmental impacts that might generate from mining industries as a rapid growth industrial sector in Chittorgarh. . DOE (1989) describe the environmental assessment as technique and a process by which information about the environment effect of a project is collected both by developer and other sources and taken into account by the planning authority in forming their judgment on whether the development should go ahead. The study assesses through simple preliminary EIA for the major effective impacts of wastewater and solid waste disposal strategies adopted in marble manufactures along other environmental norms. Environment Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for proposed projects. It aims predicting environmental impacts at an early stage of project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision makers. By using EIA, both environmental and economic benefits can be achieved. The environmental damage caused by mining was accepted by society because of the economic benefits that derived from mineral extraction. (Nelson, 2007).

STUDY AREA

The industrialization of Rajasthan slowly began in 1960s. Chittorgarh district is located south east of Rajasthan state. Chittorgarh District Area is 10,856 Square Km (3.17% of the Rajasthan State). Chittorgarh city lies between 23° 32' and 25° 13' north latitudes and between 74° 12' and 75° 49' east longitudes. The major mineral mining lease area of Chittorgarh is 4368.572 Hector and production is 11221720 tons and miner mineral mining lease area is 251.399 hector and production is 5190756 tons.

MATERIAL AND METHOD

The environmental impacts from the proposed mining activity on different environmental parameters viz. air, water, noise, soil, land use pattern, conditions has been assessed through rapid Environmental Impact Assessment (EIA) studies. On the basis of a quick assessment of the environment condition at all the mine

site and the nature of the adjoining area, it has been found that the area lying within mining lease areas forming cluster as its centre was considered to be the core zone of 500 meter where fugitive emission of the mining activity can have an impact on physical and biological environment. Area within 3 to 5 Km from mine boundary was considered to be the intermediate zone, where some impact may be observed. Area within 5 to 10 Km was considered as buffer zone, where only sight impact may be observed occasionally.

The detailed survey by random sampling methods was conducted in Chittorgarh district different location during study period of Nov. 2012 to Jan. 2013.

RESULT AND DISCUSSION

BASELINE ENVIRONMENTAL DATA: Environment baseline studies have been conducted during the winter season Nov. 2012 to Jan. 2013 in respect of micrometeorology, air quality, ambient noise levels, biological environment (flora & fauna), water quality, soil quality & socio-economics in the core and buffer zone of 10 km radius.

Ambient Air Quality: To know the ambient air quality at a larger distance i.e. in the buffer zone of 10 Km. radius, air quality survey has been conducted at different location.

As compared to the rural areas the SPM is higher at the mine site. The gaseous pollutants (SO₂, NO_x and CO) are anticipated (expected) by, excavator, dumpers, dozer, compressor and other transport vehicles. By proper mitigation measures via better maintenance and efficient operation & utilization will keep pollution under control. The generation of dust is anticipated from various mining activities i.e. dozing, drilling, blasting, loading, haulage and other transport activities related to mining. These will increase SPM/RPM in the area if no mitigative measures are taken. Dust suppressive, green belt & efficient operation will keep it in under control.

Noise environment: Noise often defines as unwanted sound, interferes with speech communication, and causes annoyance (irritate), distracts from work, disturb sleep, thus deteriorating quality of human environment. Noise monitoring in the study area at different location shows that the noise level is very high at mine site and very less in location of surrounding area. The highest noise level recorded at mining site.

Water Quality: The quality of water was studied by collecting water sample from different location. The, Total Hardness of CaCO₃, TDS and chlorides sulphate, calcium, magnesium values of water sample are crossed the permissible limit. It is due to extremely suspended mineral matter. The above values of different characteristics of water produce cathartic effect, Allergy, stomach related diseases, stone diseases etc.

Soil environment: The, pH, Temperature, Nitrogen, Phosphorus, Potassium content are not suitable for permissible fertile limit and Organic matter was present in very low concentration. Due to above value and unbalancing of nutrients, resulting in to loss of soil cover, loss of vegetation and deterioration of the land quality in study area and hence soil degradation is directly related to crop production. By proper mitigation measures, the impact on the soil environment of the study area due to the mining activities can be controlled / minimized.

Land use pattern: The land use pattern of the area will change due to mining in form of voids and dumps. Absence of scientific approach for waste recycling through land application may result in degradation of surrounding land. However, controlled recycling through land application, as suggested in environmental management plan, will result in improved land use pattern, vegetation and aesthetic quality of surrounding landscape. There may not be any adverse impact on existing vegetation due to the project activity, when proper mitigating measures and or proper reclamation measures are adopted.

Table 1 Environmental Baseline Data (Nov. 2012 to Jan. 2013)

S.No.	Parameters	Details
A.	Ambient Air Quality	
1	SPM ($\mu\text{g}/\text{m}^3$)	495-516
2	Particulate matter	83-88.5
3	Sulphur dioxide(SO₂)	7.6-8.5
4	Oxide of nitrogen (NO_x)	23-27
B.	Noise Level in dB	
5	At Day time	44.5- 64.5
6	At Night time	43.5- 53.7
C.	Water Quality	
7	Total hardness(CaCO₃) Mg/L	660-730
8	TDS Mg/l	2689-2795

9	Mg mg/l	96-105
10	Cl mg/l	1074-1152
D.	Soil Quality	
11	pH	7.35-8.98
12	Potassium (Kg/Hect.)	.0723-.0883%
13	Nitrogen (Kg/Hect.)	1.020-1.024%
14	Phosphorus (Kg/Hect.)	.0088-.0093%

CONCLUSION

The baseline of air, water, soil and noise levels are found across the permissible limits. Results of the study show that mining activities have significant effects on the environment. Although mining activities should be organized by terms of sustainable development, mining activities have been executed illegally. These mining activities have led to the severe degradation of the fragile local environment on the Plateau due to the lack of adequate management and planning, as well as poor operating experience and waste management (Lin et al., 2007).

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