Environmental Impact Assesment (EIA) of Gotan Limestone Mines, Village Borunda, Bilara, Jodhpur (Rajasthan)

Satyapal Jiterwal

Introduction

Environmental Impact assessment (EIA) is a tool that seeks to ensure sustainable development through the evaluation of those impacts arising from a major activity (policy, plan, program, or project) that are likely to have significant environmental effects. It is anticipatory, participatory, and systematic in nature and relies on multidisciplinary input (Glasson ET al.1994).

The phrase Environmental Impact Assessment comes from Sec. 102(2) of the National Environmental Policy Act (NEPA), 1969, USA. Some rudiments of EIA are implicit even in early examples of environmental legislation. Napoleon in 1910 issued a decree which divided noxious occupations into categories: those which must be far removed from habitations, those which may be permitted on the outskirts of towns, and those which can be tolerated even close to habitations, having regard to the importance of the work and the importance of the surrounding dwellings. Now the EIA has become a requirement in more than 100 countries (Canter1996). In many European countries, it came into vogue with the introduction of the concept of sustainable development after the World Commission of Environment in 1987. In India, though EIA came into existence around 1978-79, it was made mandatory only in 1994.

Till 1994, EIA clearance was the administrative requirement for big Projects undertaken by the Government or public sector undertakings. The Notification mandates a public hearing and environment itself), with further review by a committee of experts in certain cases. According to Schedule II of the notification, the EIA is expected to cover at least the following matters:

- Description of the proposed activities;
- Description of the base environmental and climatic conditions and potential affected environment including specific information necessary to identify and assess the environmental effect of the proposed activities
- Analysis of the land use and land use change, waste generation, water consumption (and the existing balance), power consumption etc. along with the social and health impacts (in terms of number of people displayed etc)
- Description of the practical activities as appropriate
- An assessment of the likely or potential environmental impacts of the proposed activity (like air pollution, noise generation) and the alternatives, including the direct or indirect, cumulative, short-term and long-term effects;
- A risk assessment report and disaster management plan to mitigate
- Adverse environmental impacts of proposed activity and assessment of those measures;
- An indication of the likely area to be affected by the proposed activity or its alternatives;
- A detailed environmental feasibility.

Objective

EIA was made mandatory in 1994 under the environmental protection Act of 1986 with the following four objectives:

- Predict environmental impact of projects;
- Find ways and means to reduce adverse impacts;
- Shape the projects to suit local environment;

Review of the Literature

There is a good deal of literature on EIA. Some of the important studies are referred in the review of literature by the author.

Tata Energy Research Institute (TERI) (2001) reports that energy consumption in industrial processes is one of the important areas where substantial reductions can be achieved. These include both efficient process and other demand-side management options.

Garg *et al.* (2003) estimates the future GHG and local pollutant emissions for India under various scenarios. The main insight is that GHG and local pollutant emissions from India, although connected, do not move in sync in future and have a disjoint under various scenarios.

The Government of India (2004) had submitted a comprehensive national GHGs inventory as part of it's first National Communication (NC) to the UNFCCC, For the base year 1994, the NC inventory reports total CO_2 equivalent emissions of 12,28,540 Gg, with per capita emissions of about 1.3 tonnes. The largest share of 61% in the national total was contributed by the energy sector, followed by the agriculture sector at 28%, industrial processes at 8%, and waste at 2%. Emissions from LULUCF are 1% of national emissions.

A report by Pembina Institute for Appropriate Development, (2004) discussed the CDM status & CDM methodology approval, market in various countries. As in India, it has significant potential for CDM-related project activities in the areas of energy, coal, industry, renewables, transport, and municipal solid waste. As the world's sixth largest emitter of CO_2, India's needs include energy efficient technologies to reduce GHG emissions, and to overcome the financial constraints associated with the adoption of cleaner technologies.

Haites (2004) estimated the market potential for the CDM based on the practical experience to date and development that could affect the demand for and supply of Certified Emission Reductions (CERs) from CDM projects. He assumed that the Kyoto Protocol does not enter into force, a market for CERs from CDM projects might still exist, but the market potential and price would differ from the estimates presented.

Pandey (2005) studied and reported that the developing countries are increasingly concerned about the growing pollution levels in cities. Because of the lack of reliable information on the nature and magnitude of emission /discharge from various industrial sources it is difficult for regulators to formulate cost – effective strategies for industrial pollution control.

New EIA Notification dated 14th September 2006 (2006), Ministry of Environment and Forest, GoI, New Delhi ,issued the Notification for Process of the Environmental Clearance for New/expansion project .The Central Government hereby directs that on and from the date of its publication the required construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to this notification entailing capacity addition with change in process and or technology shall be undertaken in any part of India only after the prior environmental clearance from the Central

Government or as the case may be, by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of section 3 of the said Act, in accordance with the procedure specified.

Taylor, International Energy Agency (IEA) (2006), presented an IEA paper "Energy Efficiency and CO_2 Emissions from the Global Cement Industry". Country specific energy efficiency data suggests that global cement production consumes, on average, between 4 and 5 GJ per tonne of cement today. The industry uses 8 -10 EJ of final energy annually, while process emissions account for two-thirds of CO_2 emissions from the sector.

The recent IEA publication "Energy Technology Perspectives 2006", presents a groundbreaking review of technologies across all sectors, which includes projections of global CO_2 emissions for 2050 under baseline (assuming no new energy and CO_2 policies) and global CO_2 emission stabilization scenarios.

World Business Council for Sustainable Development (2007) described that the Cement Sustainability Initiative (CSI) is a global effort by 18 major cement producers who believe there is a strong business case for the pursuit of sustainable development.

Mining project being site specific project will also have to obtain separate site clear from the Environment as specified in the EIA notification (Singh, 2008)

Nandi (2009) states that mining is a hazards occupation in which workers are exposed to adverse condition. Hypertension, Diabetes and musculoskeletal morbidity are found common diseases among mines.

Herald, 2011 Forest department for made it clear that clearness for several mines operation at around wildlife sanctuaries would be cancelled once the panel comes cut with proper marking of coo-sensitive areas (English report)

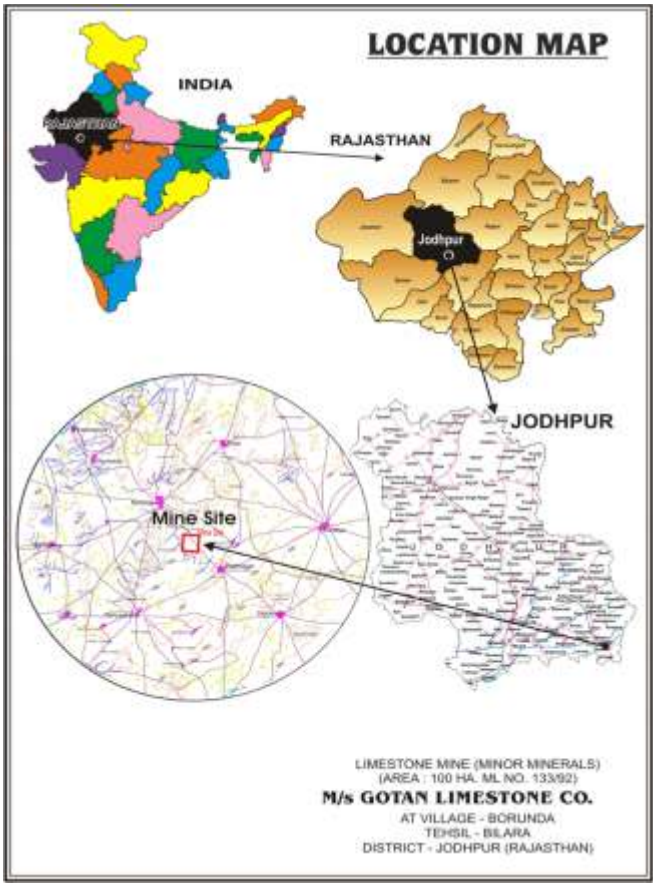
Location of the Study Area

The study area is situated about 2.25 km away from village Borunda in North-West direction. The study area is approx. 79 km away from Jodhpur and is well connected by tar road. There is regular private bus service from Jodhpur which is well known & well connected place by Rail & Bus services. The details about the size, location of the study area are given below **(Table 1)**.

Table 1: Salient Features of Study Area

S. No.	Particulars	Details
A.	**Location**	
	Village	Borunda
	Tehsil	Bilara
	District	Jodhpur
	State	Rajasthan
	Latitude	26º26' 27.5" – 26º27' N
	Longitude	73º49' 12.9" – 73º49' 57.4" E
	Toposheet No.	45 F/15
	Nearest Village	Borunda (2 25 km in NW direction)

	Nearest City	Jodhpur (approx. 79 km away from the mine site)
	Nearest Railway Station	Kharia Khangar Railway Station (23 km in NW)
	Nearest National Highway	NH – 112 (approx. 31 km in SW)
	Nearest Airport	Jodhpur (approx. 79 km away from the mine site)
B.	**Study Area**	
	Mining Study Area	100.00 Ha
	Proposed Area for plantation	37.40 ha.(Including backfilled area)
	Topography	Flat
	General ground level	320 mRL
	Elevation Range in the area	320 mRL- 324 mRL
	Water Table	230 mRL (90 mbgl) – 240 mRL (80 mbgl)



Environmental Impact Assessment of Study Area

1. Assessment of Environmental Impacts due Mining Activity

2. Impact On Soil And Land Use

2.1 Impact on Soil 2.2 Landscape and Land Use pattern 2.3 Aesthetic Environment

2.4 Impact of change of land use particularly agriculture land and gaucher / grazing land

3. Impact On Air Quality

3.1 Gaseous Pollution 3.2 Suspended Particulate Matter

4. Impact Of Noise

4.1 Noise and Vibration Problems

5. Impact On Water Environment

5.1 Impact on Ground Water 5.2 Impact on Surface Water

6. Impact On Biological Environment

6.1 Impact on Flora 6.2 Impact on Fauna

7. Impact On Local Transport Infrastructure

8. Socio-Economic Environment

9. Occupational Health Impact

9.1 Exposure to Dust 9.2 Noise and Vibration Exposure 9.3 Physical hazards

Environmental Management of Study Area

Environmental Management Plan of this limestone mine detail the environmental quality control measures which are proposed in the project scheme to achieve for production of 15,00,000 TPA of limestone by complying with the stipulated standard limits specified by State Pollution Control Board and CPCB. Environmental Management Plan, which is to be implemented in the project is detailed under the following heads:

- Air Pollution Control • Noise Mitigation • Water Management
- Solid Waste Management • Greenbelt Development
- Implementation of EMP and Monitoring Programme

1. EMP For Soil and Land use Pattern:

2. EMP For Aesthetic Environment

3. Impact on agriculture land and gaucher/grazing land

4. Prevention and Control of Air Pollution

4.1 Dust Pollution

- During drilling operations •During blasting operation
- During loading operation • During Transport operation
- Plantation work carried out • Monitoring of air pollution

4.2 Prevention and control of Gaseous Pollution

5. Noise Abatement and Control

5.1 Vibration Abatement 5.2 Ground Vibration due to Blasting

6. Water Management

6.1 Surface Water Management 6.2 Ground Water Management

6.3 Waste Water Management 6.4Water Conservation measures:

7. EMP For Biological Environment

7.1 Green Belt Development

8. Measures for Minimizing Impact on Flora

9. Measures for Minimizing Impact on Fauna

10. Socio-Economic Environment

10.1 Education

- Assistance in construction and repairing of schools.
- Promotion of education programmes
- Promotion of Adult Education programme

10.2 Water

- Repairing of wells and hand pumps.
- Support for water harvesting schemes.
- Awareness programmes on safe drinking water.

10.3 Health

- Periodic medical check-up of employees as well as residents of adjoining villages.
- Preventive medical care and educational facilities for rural population shall be promoted.
- Awareness to improve health and hygiene standards.

10.4 Employment avenues

10.5 Others

- Supplementing Govt. efforts in health monitoring camps, social welfare and various awareness programmes among the rural population.
- Assisting social forestry programme.

11. Industrial Hygiene, Occupational Hazards And Safety

The working conditions in the mines are governed by the enactments of the Director General of Mines Safety (DGMS) and Indian Bureau of Mines (IBM). As per the guidelines of the Mines Act, the management will take all necessary precautions. Normal sanitary facilities will be provided within the lease area. The management will carry out periodic health check up of workers.

Occupational hazards involved in mines are related to dust pollution, noise pollution, blasting and injuries from moving belt conveyors, equipment, fall from high places. DGMS has given necessary guidelines for safety against these occupational hazards. The management will strictly follow these guidelines.

All necessary first aid and medical facilities will be provided to the workers. The mine will be well equipped with proper fire protection and fire fighting equipment. All operators and mechanics will be trained to handle fire-fighting equipments. Further all the necessary protective equipments such as helmets, safety goggles, earplug, earmuff, etc. will be provided to persons working in risky areas.

Conclusion

After investigation of the study area and above Management plan it is concluded that the project is not likely to cause any significant adverse impact on the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area would also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released due to mining.

Senior Research Fellow

Department of Geography, University of Rajasthan, Jaipur

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