

Environmental Impact Assessment (EIA) Study of Non-Metal Mines: A Critical Review

Pramod Kumar & Kumar Nikhil

Abstract— Environmental Impact Assessment is a study of the effect of a proposed mining project, plan or program on the environment. Mining has a great impact on flora, fauna and environmental component i.e. air, water and soil which will decrease our ecosystem. But mining wisely has greater impact on our country economy and helpful in socio-economic development of the region. This paper briefly highlights on issues related with Environmental Impact Assessment (EIA) of non-metal minerals mining at national and international level.

Index Terms- EIA, Flora, Fauna, Non-metals, Minerals.

I. INTRODUCTION

Minerals are natural resources which are finite and renewable. Minerals are valuable inputs for diverse industrial activity also natural endowment of minerals increases the potential wealth of a country but their distribution varies across the world [1].

Environmental impact assessment is an objective analysis of the probable changes in the physical, bio-physical, and socio-economic characteristics of the environment from a proposed project. The prediction and evaluation of the environmental consequence enables the planners to plan better so as to avoid irreparable damage to environment and to ensure sustainable development [2]. .

Non-metal minerals such as limestone, dolomites etc. are having huge use in present society but on the other hand they are giving ill effect on the environment.

Here EIA is applicable which restricts the health hazardous causing during the process of non-metallic minerals. For the restriction of non metal mining effect, EIA were established in 1970 by the enactment of the national environmental policy act (NEPA) in the USA [3].

The Environmental Impact Assessment (EIA) process, which originated in the United States in the late 1960s and early 1970s, has been adopted extensively in the rest of the world. The U.S. model and that of other developed countries share basic principles and reflects commonly agreed-upon approaches to similar problems. While EIAs in developing countries are based on the same set of principles, their implementation often falls considerably short of international standards. They frequently suffer from insufficient consideration of impacts, alternatives, and public participation. In the worst case, they are not conducted at all [4]

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Pramod Kumar, Interim Trainee at EMG, CSIR-CIMFR, Dhanbad, Jharkhand, India (April, 2014-July, 2014) & student of M.Sc. Environmental Science, A.N.College, Patna, Bihar, India.

Dr.Kumar Nikhil, Principal Scientist, EMG, CSIR-CIMFR, Barwa Road, Dhanbad-826015, Jharkhand, India.

II. ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

The EIA process has several important purposes. It is first and foremost a decision-making aid to prevent projects with strongly negative environmental impacts from going forward. The emphasis in EIAs, in contrast with other mechanisms for environmental protection such as a cost-effectiveness analysis, is on a systematic, holistic, and multidisciplinary assessment of the potential impacts of specific projects on the environment [4].

EIA is a systematic process that examines the environmental consequences of the development action in advance. The emphasis of an environmental impact assessment is on Prevention and therefore, is more proactive than reactive in nature. The EIA process involves a number of steps-

- a. Screening
- b. Scoping and consideration of alternatives
- c. Baseline data collection
- d. Impact prediction
- e. Assessment of alternatives
- f. Delineation of mitigation measures and environmental impact assessment
- g. Public hearing
- h. Environment management plan
- i. Decision-making and monitoring the clearances condition [6].

The role of EIA formally recognized at the Earth summit held at Rio conference in 1992. Principle 17 of the Rio declaration states that "EIA as a national instrument shall be undertaken for the proposed activities that are likely to have significant adverse impact on the environment and subject to a decision of a competent national authorities". In India many of the development projects till as recently as the 1980s were implemented with very little. The environmental issues began receiving attention when a national committee on environmental planning and coordination was set-up under the 4th five years plan (1969-1978).

A major legislative measures for the purpose of environmental clearance was in 1994 when specific notification was under section 3 and rule 5 of the environmental protection Act, 1986 called the "Environment Impact Assessment Notification 1994"[5].

EIA is an important procedure for insure that the likely effects of new development on the environment are fully understood and taken into account before the development is allowed to go ahead [7].

III. RULES AND REGULATION

1. The mines and minerals development and regulation (MMDR) Act, 1957, and the mines Act, 1952, together with the rules and regulation framed under them, constitute the basic laws governing the mining sector in India. The relevant roles in force under the MMDR Act are the mineral concession Rules, 1960, and the mineral conservation and development Rules, 1988. The health and safety of the workers is governed by the mines Rule, 1955, created under the jurisdiction of the mines Act, 1952, [8].

2. Environmental legislation has to cover many areas, including comprehensive environmental impacts analysis to ensure that projects that are ecologically destructive are not allowed, identification of 'no-go' areas, effective forest and wildlife acts to protect biodiversity, and regulations governing mine closure and mine restoration. There are five main environmental Acts that impact the mining industry in India:

- The water (prevention and control of pollution) Act, 1974 (amendment in 1988).
- The Air (prevention and control of pollution) Act, 1981 (amendment in 1988).
- The Environment (protection) Act, 1986.
- The Forest (conservation) Act, 1980 (amendment in 1988).
- The Wildlife (protection) Act, 1972 (amendment in 1991) [9].

IV. METHODOLOGY

There is theoretical agreement that EIA methodologies are important and are gradually becoming an integral part of environmental planning and major development projects. Followings are the major reasons to conduct EIA.

- Improve environmental management.
- Good governance
- Economics
- Donor requirements.
- Sustainable development. [10].

The brief methodology is being discussed below:

Air Environment

- Collection of surface meteorological data like wind speed, wind direction, relative humidity, rainfall, ambient temperature etc.
- Design of ambient air quality monitoring network.
- Measurement of 24 hourly average background concentrations of SPM, RSPM (size < 10µm), SO₂, PM_{2.5}, PM₁₀, NO_x and hydrocarbon.

Noise Environment

- Establishing existing status of noise levels in residential, commercial, industrial areas and silence zones within the core and buffer zone.

Land Environment

- Collection and assessment of representative soil samples within the study area for soil pollution study.
- Assessment of productivity and fertility of soil found within the study area.

Water Environment

- Collection of surface, waste, ground and drinking water resources for determining quality in the study area
- Assessment of biotic environment for water in terms of phytoplankton/zooplankton (enumeration, indices and distribution).

Biological Environment

- Collection of data on flora and fauna including rare and endangered Species within the core and buffer zone.
- Collation of information on wildlife sanctuaries / reserve forest and corridor if any in the vicinity of the project area.
- Assessment of species diversity, density, abundance etc., in the study region.

Socio-economic Environment

- Collection of baseline data including demographic details, such as households, population, literacy, employment pattern, general health, tribal, transport, communication & welfare facilities such as hospitals, educational institutions, project awareness amongst the public, infrastructure facilities, economic resources, cultural and aesthetic attributes etc. as per the requirements under MoEF.

Anticipated Environmental Impacts

- Identification of Environmental Impacts associated with exploratory drilling.
- Prediction of adverse impacts due to activities related to proposed exploratory drilling through modelling or advance mathematical tools.
- Quantification of assessment of adverse impacts due to the proposed activity on air, land, water, biological and on human interests.[11]

V. CONSTRAINTS

- Lack of standards for measuring the quality of environmental impact assessment reports.
- Possibilities of lack of complete monitoring and compliance of E.C. conditions. No cross check system to validate the monitoring.
- Availability of reliable base line secondary environmental data base of that area.
- Lack of sufficient technical trained manpower for environmental impact assessment study process.
- Lack of standard procedures for technical evaluation for mitigation measures taken[12].

VI. FUTURE SCOPE

Environmental impact assessment is having a very useful practice in upcoming future because the developing countries are progressive towards a harmful and less health supportive future. The life sustaining measures are mostly required which can only be recovered by environmental impact assessment. As per the results of researchers the assessment is cumulating in the production of this report, the environmental statements (ES). It is the identification and evaluation of all significant, direct and indirect effects of the proposed development, during both construction and

operation, on the environment[13]. As it was introduced in 1994, where it was relied on institutional framework that has a strong supportive legislative, administrative and procedural setup[14]. The new EIA notification 2006 and amendments to follow are projective steps that have been taken to launch only sustainable and carefully planned projects in the country. The new notification has certain drawbacks which are and will be addressed by bringing necessary amendment from time to time [5].

VII. CONCLUSION

Environmental Impact Assessments study should lead to development decisions informed by knowledge of the range of potential environmental and social impacts—direct, indirect, interactive and cumulative. In order to save our ecosystem it is very necessary to a well planned mining. Thus EIA plays a vital role in these situations. It tells how to exploit the natural components for human with wisely, thus EIA has a great impact on a country development. It has been recognized that India is well in adapting legal provisions, which are very essential for further strengthening of the EIA process. Moreover, EIA process posses a basic structure including screening, scoping, comprehensive study, progress report, review, public participation, decision and follow up measures. Thus further recommend project level EIA needs and immediate attention but efforts should also be targeted to include environmental conservation concerns at policy and planning level. Such initiatives could help in filling up the gaps and coordination between various government authorities involved in planning and execution of the non-metal mines in our country.

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