National Council for Cement and Building Materials

ENVIRONMENTAL MANAGEMENT PLAN FOR LIMESTONE MINES

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NCB TECHNOLOGY DIGEST

ENVIRONMENTAL MANAGEMENT PLAN FOR LIMESTONE MINES

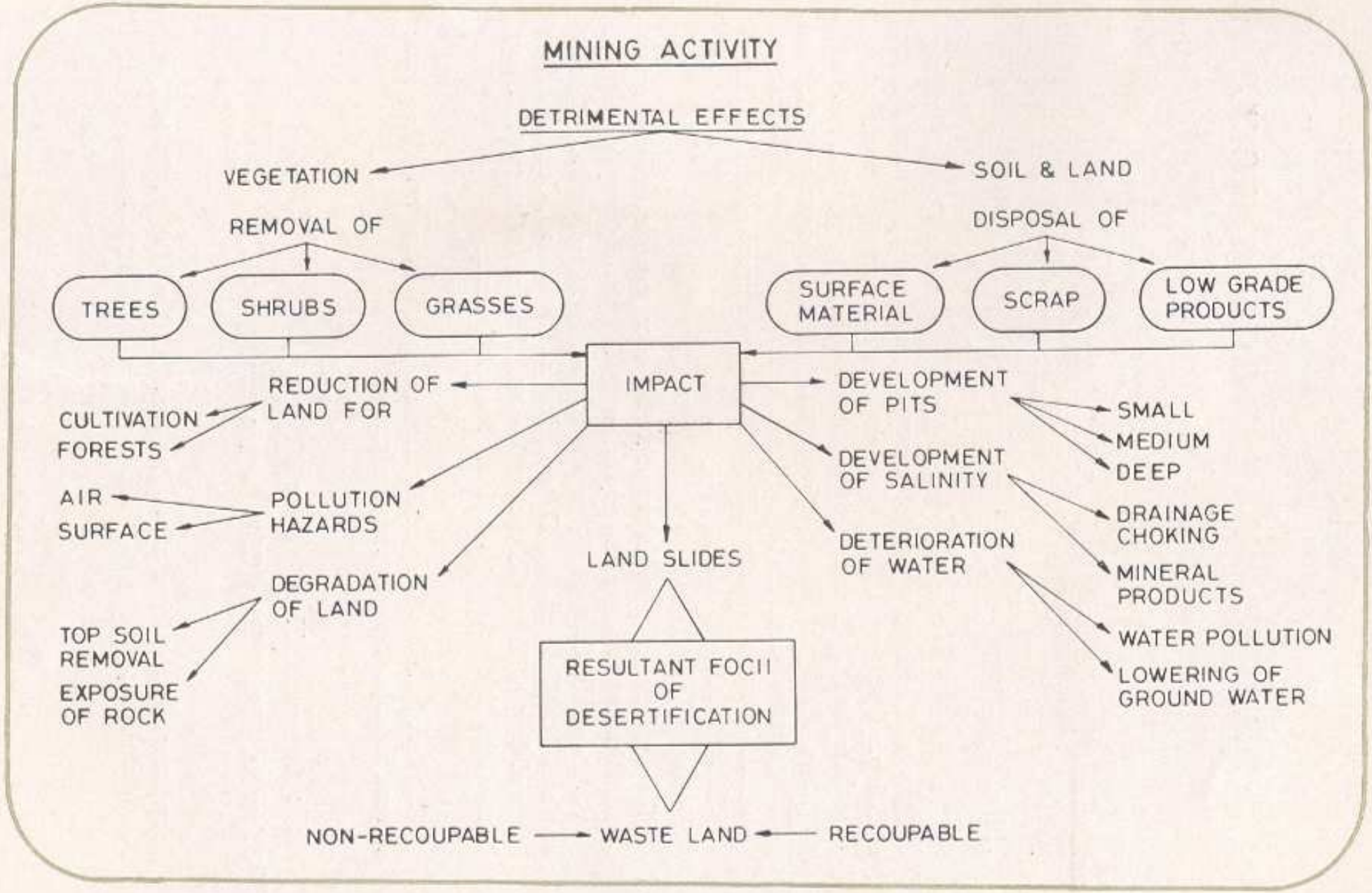
INTRODUCTION

Fast expansion of mineral industry, in general, and limestone mining in particular, has reflected an upsurge in environmental degradation. With growing concern for environmental protection, a beginning was made in 1981, to evaluate environmental impacts arising out of mining operations. Department of Environment, Govt of India, set up the Environmental Appraisal Committee to critically examine mining projects from environmental angle and recommend clearance or otherwise of the proposed mining projects. A detailed Environmental Management Plan (EMP) is a basic pre-requisite in this direction. This Technology Digest presents Environmental Management Plan for limestone mines, geared towards combating further damage to eco-systems.

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Essentially, the guidelines for EMP should integrate environmental protection measures with mineral exploration ensuring an economically viable and environmentally acceptable method of extracting limestone. EMP, as a rule delineates:

a) Mining Activity	—	a summary of the mining project
b) Environmental Setting	—	a detailed description of existing eco-system
c) Anticipated Environmental Impact	—	a study of ecological imbalance due to mining
d) Environmental Control Measures and Monitoring	—	action plan to implement safeguard and to monitor the controls


MINING ACTIVITY
DETRIMENTAL EFFECTS
VEGETATION
SOIL & LAND
REMOVAL OF
DISPOSAL OF
TREES
SHRUBS
GRASSES
SURFACE MATERIAL
SCRAP
LOW GRADE PRODUCTS
IMPACT
REDUCTION OF LAND FOR
CULTIVATION
FORESTS
DEVELOPMENT OF PITS
SMALL
MEDIUM
DEEP
DEVELOPMENT OF SALINITY
AIR
SURFACE
POLLUTION HAZARDS
DRAINAGE CHOKING
MINERAL PRODUCTS
DETERIORATION OF WATER
LAND SLIDES
DEGRADATION OF LAND
TOP SOIL REMOVAL
EXPOSURE OF ROCK
WATER POLLUTION
LOWERING OF GROUND WATER
RESULTANT FOCII OF DESERTIFICATION
NON-RECOUPABLE
WASTE LAND
RECOUPABLE

Mining Activity

The methods in surface mining of limestone are manual, semi-mechanised and mechanised. For the past decade, limestone mines have resorted to semi-mechanised and mechanised mining operations. Mechanisation of mines requires adequate precautionary steps to mitigate pollution and environmental degradation.

Environmental Setting

Environmental setting is broadly classified into three domains, namely, (i) physical, (ii) biological, and (iii) socio-economic. Mining projects impart significant impact on the physical environment. Impact on biological environment is often the indirect effect on changes in the quality of the physical environment while socio-economic environment is affected by changes in biological domains also. Hence, impact assessment studies logically involve:

- Establishment of base-level or background characteristics of environmental domains
- Collection and/or prediction of data for the altered characteristics of the various environmental domains, as altered by the mining activity
- Assessment of impact due to mining based on a comparison of base-line and post-mining characteristics.

Anticipated Environmental Impacts

Land—Land degradation is a common feature associated with mining. Irregulary dumped over burden immobilises a large area of land from use. Existing vegetation and forests are destroyed, making the area susceptible to drought. This stimulates erosion of soil, and affects temperature gradients and surface radiations.

Water—During in-pit mining, continuous pumping of ground water lowers water table in the vicinity. Siltation of water reservoir or blockage of water course by the waste dumps are common features in hilly terrains. There is, also at times, a disruption of drainage system due to mining activity.

Air—The discharge of particulate and/or gaseous matter during drilling, blasting and transportation pollutes the air.

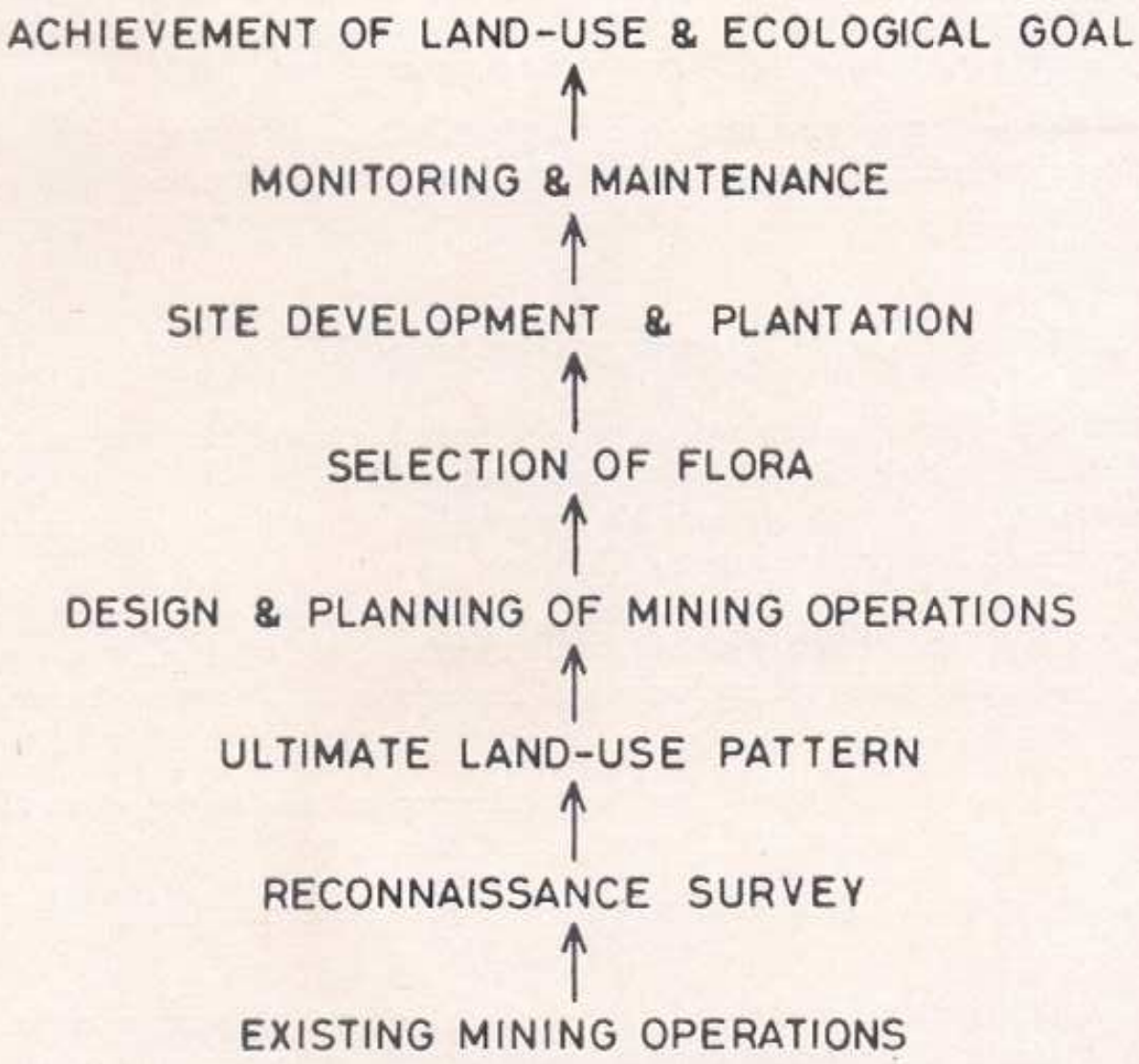
Ground Vibration and Fly Rocks—These cause major damage to both the pit configuration and structures in and around mining areas. Flying fragments may injure men and animals in and around the area of blast and cause serious damage to residential structures.

Noise—Mining machinery operation and blasting are the sources of noise pollution. Exposure to noise may interfere with speech-communication; cause annoyance and distraction and lead to reduced output and efficiency.

Environmental Control Measures and Monitoring

Control measures are a strategy for conservation and development of mines. They should satisfy the environmentalists, eco-activitists and at the same time allow economic exploitation of the legitimte mineral resources development activity. They are:

1) Land use planning should form an umbrella under which resources development and environmental management activity are planned and undertaken.
2) Mine planning should involve development of mineral deposits and restoration of land to former use and capability.
3) Haphazard dumping of wastes should be avoided to control blocking of water courses and land degradation.
4) To control excess run off water causing land and soil erosion; check dams, siltation tanks and toe walls should be constructed at the slope of the overburden dumps near nallahs/ streams. In course of time, the site of such check dams forms an ideal place for plantation.
5) The problem of fly rock, noise and ground vibrations can be solved by better blasting techniques, and through newer methods of size reduction in mines.
6) Where mining is done in close proximity of human habitation, the dump areas can be developed for parks and recreation centres. Besides, mined out areas may be used for water storage, which can be used to aid agricultural cropping.



RESTORATION OF MINED LAND

CONCLUSION

A good rehabilitation programme has twin objectives: (i) creating a land surface, stable to the erosive forces of water and wind, (ii) returning of mined land, for better use.

Careful study of existing systems, introduction of new methods and their implementation in the mines to create a harmonious atmosphere are effective steps for such environmental improvement. This can best be achieved by formulating and following an Environmental Management Plan. NCB, with its sophisticated infrastructure and advanced expertise in the field, renders assistance and advice in framing and executing such plans.

Prepared by : S/Shri A D Agnihotri, S Jana, Smt Vijaya Kalyani and and Dr N Hatwar

Edited by : Shri S S Kalra

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