



Ecosystem Properties and Mining with Special Reference to Slurry Waste Management

Environmental management is based on a scientific resource management and environmental planning in the proper prospective of long term sustained development programme, which would ensure rehabilitation operation and improvement works in mined areas. The cost benefit analysis for mining activities should view. The environmental control measures as an integral component of cost structure. Exploitation of mineral resources in fragile eco-system. Forest reserves and wild life areas and fertilize lands should be viewed within the overall frame work of environmental compatibility which supports various life cycle processes and provides several inputs for "The development and welfare of the society.

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Introduction :

Eco-system are self-sustaining, Once properly established, they need further support. There is a natural cycling of accumulated materials which maintains the growth of the plants and the other organisms which they contain. The second equally important property is that ecosystems have the capacity to develop, in nature, after disturbance, vegetation will gradually re-assert itself. It slowly develops over the passage of time. This process, known as plant succession, has given us all the vegetation that clothes the world today.

If we take these two properties of ecosystems together, we might presume that after mining disturbance there is no need to do anything. A self-sustaining vegetation cover will develop naturally. This is of course true, if we wait long enough. But the process of natural succession takes at least 100 years. The mining leave, behind special problems, such as bare rock faces or material contaminated with heavy dust on which natural succession will be much slower.

It is obvious that we must look at the particular treatments and management option by which appropriate, useful, vegetation can be established quickly and economically, do that a self sustaining ecosystem is produced.

The major damage is to soil and to vegetation. These must therefore be restored. Since plants cannot grow without a satisfactory soil, it is the soil to which we must pay attention first.

Slurry West :

The slurry waste generated from the mine is in the form of mud dust particularly in Makrana. Where we have seen the slurry are lying in the surrounding zone. Which creates the ecological imbalances in the region.

Mining operation specially in open cast mining generates a considerable amount of slurry depending upon the nature of marble. This is also considerable that at the time of mining land degradation obstruction of water regime and water pollution and land collapse is accrued. Disposal of over burden slurry waste is an important part of mining management by which the revegetation and proper land use can be restored.

Slurry management is important aspect which form air and water pollution control. The differences derives from the fact there are two pollutant in mining and processing system which are natural air and water and artificial vehicular transport in general air and flowing water carry pollutants

The bulk of slurry are deposited on land and disposal tends to be a local problem. Thus the principal solutions to slurry waste management lie in providing operational system that employ physical procedures rather than in regulations. Such handling along with reclamation and refuse as the slurry waste, management goal offers the ultimate solution.

Use of Slurry :

The marble entrepreneurs on the other hand leave the responsibility of tackling with slurry and residue on the government side. The research conducted so far has highlighted different opportunities of recycle as below:

- (1) As mineral fillers in various industries (plastic, rubber, paint, paper etc.)
- (2) In order to desulfurise the smoke of coal fueled powder plants.
- (3) In manufacture of cement
- (4) In order to acidity naturally basic soils.

In addition to above uses, research taken up by the Central Building Research Institute, Roorkee, reveals that more than 15 lakh tons of the slurry is obtained annually by the big marble-producing units alone in Rajasthan. A study has been made to utilise these powders obtained from different marble production units. The details of the same are as follows:

(I) As a source of building material : The experiments were carried out with powders, which in itself do not possess hydraulic properties, but when mixed with hydraulic cement or other cementations binders, the building material may be produced.

(II) Masonry cement : Masonry cement is obtained by intergrading the Portland cement and some siliceous argillaceous or calcareous powdery materials along with some other additives. The fineness of the ground mass is maintained around 5000 cm²/g. The marble dust obtained from some of the production units was also processed similarly. This masonry cement can be successfully used for masonry mortars etc. These cements are, however, not recommended for concrete and RCC works.

(III) Cellular concrete blocks : Cellular concrete is an air entrained lightweight concrete produced by autoclaving a set slurry consisting of Portland cement in some cases lime and siliceous and argillaceous material like flash, ground sand or sludge etc. The builders in India for multistory construction have used cellular concrete without autoclaving having a little high bulk density.

Unautoclaved cellular concrete with cement marble dust for Udaipur region and river sand with some air entraining agent possesses bulk density of 1240 kg/m³ and a 28 days of strength of 5.2 Map on normal curing. This may be useful material in framed structures and multistory houses.

The marble slurry although powdery are not as fine as distempers, therefore the powder was grinded in ball mill/pot mill to make 95 percent of to pass through 63 micron sieve. Appropriate quantities of suitable pigments, extenders, water-soluble powdery binder and preservatives etc. were mixed with the marble powder and ground in the ceramic lined ball mill. The performance checked as per Indian Standards met all the general requirements for distempers and dry colour washes.

(IV) Facing tiles : Preliminary work on the facing tiles shows that cement based tiles in attractive colours can also be produced with this slurry.

Noise Pollution Management :

During my personal visit of near by villages. Through personal interviews and came to know about the hazardous effects of sound not only on man but on animal and birds also suffer. The following measures are suggested.

(i) Blasting should be on a particular time and in the particular DB units which should be affordable to the human beings.

(ii) Quantity of blasting material to be controlled.

(iii) More and more sprinkling of water can also reduce intensity of sound water.

(iv) Blasting should also be minimized and more and more cutting process should be adopted.

As per central pollution control board standards, the maximum allowable duration in hours per week for the workers in 94-95 dB noises 2-4 hours and in 97-101 dB noise is 0.5-2 hours. Therefore, to control any adverse effect due to noise following measures may be adopted:

(1) Proper disposal (on demarcated sites and barren land) of overburden and waste rocks.

(2) Use of low-waste generating mining technology (diamond wire saw or chain saw).

(3) Systematic development of mining pit for block mining.

(4) Provisions of all necessary infrastructure facilities (electricity, water, first aids, safety equipments.)

(5) Introduction of pollution control measure at various levels (specially for dust and noise).

(6) Environmental control through regular monitoring and assessment with a respect to change seen in surrounding land quality workers health surface and underground water, flora and fauna etc.

(7) Provision of pleasant surrounding and healthy working condition to reduce stress, monotony and dullness among workers, so that productivity and work efficiency may not be affected. Regular maintenance of mine machinery etc.

Air Pollution Management :

Air pollution is also a big problem in the area. It is not because of smoke or gasses coming from the plants; but mostly from the dust and noise. The above problems have already been discussed above. However, some specific measures for air pollution control may be taken up as below.

(i) A filter plant can be used to reduce the air pollution in the factories.

(ii) Green plants must be developed through plantation programme in the affected zones and around mines.

(iii) Main highway road transport must be shifted far from the factory and residential zone to avoid accidental cases. Pollution control rules and regulation must be applied strictly for the safe guard of public health of local's persons.

Intensive plantation has been done to control the dust formation tree plantation cover helps effectively as it sinks air pollutants. Moreover, trees also act as filters for air borne particles because of their large surface to volume ratio of foliage and rough surfaces of leaf and barks, control technique arrest all over the major air pollutants.

Water Pollution Management :

Water quality can be maintained physically and chemically near to the mining and processing areas. The mining project requires continuous supply of water for various purpose during mining and processing activities. The water treatment plants may be useful who will purify the water for drinking.

Water treatment plant can further help in this to reduce the water pollution. Recycled use of the some water can also

reduce the use and pollution of water. Thus the drainage system will have to be made more efficient so that water does not become stagnant.

Unplanned and gradual depending of mining activity generally influences the hydrogeological conditions, especially change in subsurface water flow system, reduction in recharge intensity, lowering of water table, drying of existing aquifers etc.

Conclusion :

Environmental management is based on a scientific resource management and environmental planning in the proper prospective of long term sustained development programme, which would ensure rehabilitation operation and improvement works in mined areas. The cost benefit analysis for mining activities should view. The environmental control measures as an integral component of cost structure. Exploitation of mineral resources in fragile eco-system. Forest reserves and wild life areas and fertilize lands should be viewed within the overall frame work of environmental compatibility which supports various life cycle processes and provides several inputs for "The development and welfare of the society.



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For Books :

(1) Name of Writer, "Name of Book", Publication, Place of Publication, Year of Publication, Page Number/numbers.

For Journals :

(2) Name of Writer, "Title of Article", Name of Journal, Volume, Issue, Page Numbers.

Web references :

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(7) गुजराती माध्यम के शोधपत्र हरेकृष्णा (Harekrishna), टेराफॉन्ट वरुण (Terafont Varun), टेराफॉन्ट आकाश (Terafont Aaksah) में टाईप करवाकर 'पेजमेकर 6.5' में भेजे जा सकते हैं।

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