# ECO-FRIENDLY MINING AND LOW GRADE (WASTE MINERAL) UTILIZATION REQUIRED FOR RISING OUR NATION AND REVENUE CREATION

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***Abstract:*** *Mining and Mineral play a very vital role for development of our nation and revenue generation, but the current scenario of mining and mineral industries required attention and awareness for Eco friendly mining practices and low grade waste mineral utilization in different industries. In this paper we are study the eco friendly mining practices and low grade minerals their physical and chemical properties accordingly utilization in different industries and also developed new products.*

***Keywords:*** *Mining, Mineral, Waste, Grade, Products, Revenue, Eco-friendly.*

## 1. INTRODUCTION:

Minerals are valuable natural resources being finite and non-renewable. They constitute the vital raw materials for many basic industries and are a major resource for development. The history of mineral extraction in India dates back to the days of the Harappan civilization. The wide availability of the minerals in the form of abundant rich reserves made it very conducive for the growth and development of the mining sector in India. The country is endowed with huge resources of many metallic and non-metallic minerals. Mining sector is an important segment of the Indian economy. Since independence, there has been a pronounced growth in the mineral production both in terms of quantity and value. India produces as many as 87 minerals, which includes 4 fuel, 10 metallic, 47 non-metallic, 3 atomic and 23 minor minerals (including building and other materials).

Indian mining industry is characterized by a large number of small operational mines. The number of mines which reported mineral production [excluding minor minerals, petroleum (crude), natural gas and atomic minerals] in India was 2076 in 2011-12 as against 2355 in the previous year. Out of 2076 reporting mines, 354 were located in Andhra Pradesh followed by Gujarat (308), Rajasthan (241), Madhya Pradesh (225), Karnataka (180), Tamil Nadu (156), Odisha (119), Jharkhand (106), Chhattisgarh (99), Maharashtra (86) and Goa (70). These 11 States together accounted for 93.64% of total number of mines in the country in the year 2011- 12.

Now time for continuously growth of our nation its required attention and awareness for Eco-Friendly mining practices and also utilized the low grade mineral for developed new products in different mineral based industries.

## 2. OBJECTIVE OF STUDY:

In this research paper main objectives are under:

- First our nation so it's our first duty for Proper Systematic Mining, Proper Mineral Utilization the mineral wealth. And also developed the low grade and over burden utilization in different mineral based industries for developed our nation and revenue creation.
- The Procreate Awareness and attention for Mining Leases owner (Lessee) about Mining and Mineral.
- Some ideas and view for Government to launched Strict Provisions, rules and regulation for low grade mineral utilization and also proper maintain and monitoring, sampling of low grade mineral on mine site area.
- For Procreate knowledge of low grade mineral utilization for Research Scientist and Technical persons.
- Some views and ideas for developed State government some centre's where share some technical knowledge and skill centre where formed the new mineral based products formed by low grade minerals.
- Procreate attraction and knowledge for Mining and Mineral regarding information for new comers student and Scientist.
- For Generate and Increase maximum mineral based revenue rate of our Nation.
- Some ideas which Developed Job opportunities in Mining and Mineral based industries.

## 3. MOSTLY PROBLEMS AND ISSUES :-

- Low grade Mineral not stack separately and for lacking of technical knowledge mix with overburden.

- Top soil not stack separately which cause after mine closure plantation in not proper manner. The high grade éléments of top soil which is necccessary for survive plants and growth of plantation which is totally absent or low concentration.
- Not Systematic and Advanced mine development which caused complete excavation is not possible and mineral wealth is destroyed.
- Not Separately stack maintain grade wise mineral as per the Physical and Chemical properties on mine site.
- The Geological ore modeling is not conducted.
- Systematically and timely sampling is required for understand the grade of mineral and variation of grading.
- Absent of Advanced mine development software like Minex, Arc GIS, Surfer, GIS etc.
- Lacking of Techincal knowledge of lesse.
- Absence of Technical persons on mine site area.
- Requirement of detailed Research & Development in Mineral.

**4. METHOD:**

The technical literatures and as per our technical knowledge used for this research paper for developed the revenue creation of our nation and also developed and proper utilization of mineral wealth.

**5. ECO-FRIENDLY MINING:**

The degradation of environment in the mining areas has affected the public life by way of air pollution, land degradation, forest degradation and retreating water table etc. Government is aware of these and taken measures to improve the various aspects of environment degradation by implementing strict conditions for every lease holder. The Mining Engineers and lessees are compelled to adhere with the rules and follow the Eco-Friendly Mining in the State.

There are sufficient existing provisions in various laws to take care of measures required to protect environment in mining areas. Some of the provisions are being highlighted as under: -

Minor Mineral Concession Rule, 1986:- Rule 18 (7), Rule 18 (8a), Rule 18 (8b) (iii), Rule 18 (8b) (iv).
M.C.D.R., 1988: Rule 31, 32, 33 and Rule 34.
Granite Conservation and Development Rules:-Rule 29, 30, 31 and 32.
Marble Development Conservation Rules, 2002:-Rule 22, 25, 26, 27, and Rule 28.
Marble Policy, 2002: - Provision 16(2) (iii), Provision 16(2) (iv), Provision 16(2) (v) and provision 16(2) (vii).

These provisions should be followed strictly by all the leaseholders otherwise action will be initiated against defaulting leaseholders as per rules.

For implementing the provisions of various laws related with Environment Protection and Eco-Friendly mining in an effective manner, every mining lease holder is required to prepare and submit Eco-Friendly mining plan to concerned Assistant Mining Engineer/Mining Engineer. Eco-friendly mining plan would be different and in addition to the mining plan/mining scheme as required under law.

**6. GUIDELINES FOR ECO-FRIENDLY MINING:**

Whenever the lessees dig out the available top soil they may store it separately in such a manner that it could be utilized for stabilizing of dumps created by depositing over burden, by intensive plantation.

For minerals like Gypsum, brick earth etc. where mining is done for very shallow depth (1m to 5m), waste & overburden generated during mining operations, must be refilled. After levelling, top soil collected must be spread over it and suitable plantations should be done.

All lease holders should check the water channels in their mining lease areas and clear/clean them before the rains start. Water should flow in its natural path and there should be no obstruction created by way of unplanned mining activities.

If some diversion of water channels becomes necessary due to availability of mineral in lease area at a particular location only, new drains following the contours be constructed by lessees, so that water flows un-obstructed to main water bodies/ponds / tanks/natural reservoirs.

The over burden should not be dumped in such a manner that it flows with water in the nearby tanks, reservoirs and ponds etc. The leaseholders should dump the over burden in such a manner that it does not gets washed away to the nearby water tanks and lakes etc. during the rainy season.

All mining lease holders/quarry license holders are requested to plant a specific number of trees based on their area of lease so that they survive for longer time to come. It has to be ensured here that the mine owners should report the achievement of the target of tree plantation by way of giving number of plants that survive and not by the number of plants planted by them.

The lessees of major and minor minerals having areas more than 5.00 hectares shall develop thick afforestation zone on the boundary of lease in at least 10 meter strip. This can be achieved in steps and exact plan

should be submitted to ME/AME. The plan must contain year wise afforestation programme including site and nature of plantation. It shall also be duty of lessee to maintain growth of these plants and survival rate should not be less than 80%. Proper protection of these plantations is also to be ensured by the lessee.
The norms for plantation for each lease holder /quarry license holder would be as under: -

| S.No. | Category | Norms |
|---|---|---|
| 1. | Major Mineral lessee | 5 plants/ hect. Or part / year |
| 2. | Marble, Serpentine and granite leases and Q.L. | 20 plants / hect. Or part / year |
| 3. | Other minor mineral leases and Q.L. | 10 plants / hect. Or part / year |
| 4. | Q.L. of minerals other than Marble and Granite having area less than 1.00 hectare. | 5 plant / Q.L. / year |

In all leases that are located adjacent to forest areas, a safe distance as provided in the rules should be left by leaseholders between the actual mining area and the forest boundary. The lessees of such leases should plant a specific number of trees to create a green buffer zone between the mining area and the forest. Such lessees may also construct loose stone/Pakka stone wall showing their working boundaries between the forest and the lease so that there is no possibility of even unintentionally movement towards the forest areas.

Whenever mining reaches to the water table, the leaseholder should dig a separate well in the lease area itself in which water from the mining pit is disposed with the objective of recharging the water table. By doing so there would be no wastage of ground water due to mining operations close to the water table.
Water pollution and air pollution clearances, wherever required are duly obtained by the lessees from the State Pollution Control Board.

The lessees should prepare "eco-friendly mining plan" including the action plan on above issues for their mining area and submit it to the concerned ME/AME for approval.

**7. LOW GRADE MINERAL (WASTE MINERAL) UTILISATION:-**

Low grade mineral (Waste Mineral) it's not a waste and it's also a very useful as per their physical and chemical properties and it can be used in different industries and also developed new products.

Some low grade Minerals examples and their special characteristics shown below with help of knowledge also developed some other low grade Mon-Metallic & Metallic Mineral utilization and developed products.

**(A) Clay (Kaolin):-** Clay is hydrous aluminum silicate. The High Grade Clay is used mostly for manufacturing of floor tiles, wall tiles, Insulator, ceramic wash basin manufacturing and other ceramic products.

For above industries clay some special physical and chemical properties is required like Fired colour, Shrinkage, Water absorption, Strength, Viscosity plasticity, etc.

So other than above clay which is not shown the special characteristic and properties of above mentioned called low grade clay (Less aluminum Contain).

So now time for attention and awareness for utilization of low grade clay and develop new products some examples mentioned below.

- The reddish and yellowish colour clay which is high concentration of iron and Titanium and not utilized in manufacturing of ceramics tiles product it can be used for manufacturing of red colour/ red oxide in Paint Industries.
- Manufacturing of clay bricks.
- Manufacturing of Ceramics Cast & Moulds.
- Manufacturing of building solution related products like Cracks fillers.
- Manufacturing of beauty and cosmetic related products.
- Home decorative products etc.
- Clay Modelling, Crafting & Clay toys where can be used the low grade clay.

**(B) Marble: -** The current scenario of marble slurry is very big issue, but this marble slurry also been utilized.

- Manufacturing of bricks.
- Also utilized as calcite.
- Slurry has been also used in Paint industry.
- Manufacturing of decorative man made stones.
- Flooring.

- Building solution related products like fillers.
- Manufacturing of marble polishing related products.
- Manufacturing of soft abrasives.
- Manufacturing of decorative products.

**9. CONCLUSION:**

In this paper we found with the help of R & D, Technical knowledge, Ideas, views, we utilized the low grade mineral in different mineral based industries and developed new products, if we carried proper and systematic Eco friendly mining practices the mine life is increases and also generate maximum mineral revenue which help to rising our nation in world wide.

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