ROLE RIGMAROLE: MINER MINER.

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Small-scale mine owner
India

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Abstract

The topic of small-scale-mining is a little discussed subject in international circles. India is a well-known democracy; and very large. In India a prospective mine owner has to pass through many procedures which are strange and difficult enough to discourage any entrepreneur even before business starts.

In India all minerals are used for construction purposes and are known as Minor Minerals. Mining is done at the small-scale level; all remaining minerals used for industrial and other purposes are known as major minerals. The grant of permission for mining (lease) for major minerals is set and governed by the Central Government of India and that of the minor minerals by the respective state governments. These minor minerals include Natural Dimension Stones (marble, granite, sandstone, slates); quartzite; phyllites; and schists. Mining of these are done by the small-scale sector which is a unorganised sector of mining in India.

As an estimate out of total applications for the grant of minor minerals lease about 10 per cent are finalised and rest all are rejected or withdrawn at the some of the *just about* stages. After filling the application at the office of the mining authority, the applicant has to submit all information about the status of the land, mineral availability, natural and manmade features and forest boundaries. Then he has to convince the mining engineer, geologists, surveyors and draughts men in the mining department. Later he has to seek "No Object Certificates" (NOC) from the surveyors and other officials at the forest department. This is followed by NOC by the landowners, local village committees and various hierarchies of District Collector. If application survives through all this, the applicant has to seek NOC from the Pollution Board, prepare "Eco Friendly Mining Plan" and get it approved.

If he is successful to get all these things, he will get the lease of the area after a bit more of persuasion.

After all this he has to face the problems of approach roads, resistance of villagers and also of the illegal miners in the area (if any). Still last but largest problem arrives now. The mine owner has gone through all this rigmarole totally in the anticipation of a good deposit. Its now at this stage that he prospects the area. The mine owner spends a lot of money in the

hope of a good deposit, but it is not always a happy ending story. Only in less than 10% cases that the mine owner hits a very good deposit, in about 20-30 % cases the mine owner manages to survive themselves with meagre profits and working on the break evens. In all the remaining cases the mine owners quit the mining area after a year or two, depending on his the financial sustainability, with a huge loss and or big debts from the market.

The government does not provide any indemnity to the mine owners or any assistance in the process of setting up or starting the mines. It only works as an agency for the revenue generation, without bothering about the requirements, problems and the future of the industry.

This article attempts to draw the attention of the international community towards the darker side of good-looking small-scale mining in India.

Introduction

Mining and agriculture are the only two industries from which the mankind receives directly. Of these the mining fraternity has always been subjected to much criticism, world over. The mine owners are always blamed for the illegal working, child labour usage, underpayment to labourers, non compliance with the pollution and environmental norms etc. These all give an impact of a devilish character for the mine owners. Everybody is just disdains this class. The presented paper tries to look at one of the reverse aspect of this image. There are seldom any studies made from the mine owner's points of view. The presented paper tries to highlight the fact that mine owners are just other business persons from whom the society, the government, the environmentalist, the social activist and the academic organisations are demanding too much. The meaning of the term "Minor Miner" is often misinterpreted. It is not relating to the minor children, neither has it related to the manual workers in the mines. Minor miner is the class of mine owners (explained later) which are subjected to the harsh set of procedures for the operation of their mines. It glances in the condition, plight and working of mine owners who hold leases of minor minerals in the state of Rajasthan, India. Their role in the society and the rigmaroles they have to go through is tried to be presented in a very short form here.

About India, Rajasthan and Mining Scenario in Rajasthan

India is a vibrant country with enchantment of colours, cultures, peoples and everything which can be seen or imagined. India has the largest possible variety of everything. Be it the languages, culture, minerals, flora-fauna, climates, history, or you name it. It's also the only country in the world which has faced Flood, Draught, Tsunami, earthquake, war with neighbouring country, epidemic and increase of almost ten Crores (1 crore ~10 million) in population in just half decade of new millennium. On the other hand India is also one of the world's fastest growing economies, largest supplier of the technical experts as well as manual labour in the world, one of the world's largest producers of food grains, minerals, IT products and many other things. It has the world's second largest population, second highest peak as well as the second largest desert. The races found in India are amalgam of Aryans, Dravidians, Mongols, Oriental and many others.

There's no exaggeration in saying that India is a kaleidoscope of varieties. 2.1. About Rajasthan: Rajasthan is the largest state of the magic called India. The total span of Rajasthan is 3.42 Lakh sq. km and it has a population of around 56.47 million[1] (2001 Census). Rajasthan is mainly desert covered state, and this water scarcity is one of the major hindrances in the industrial development of the state. Main industries in Rajasthan are agriculture, mining, tourism, gem processing and textile industry. Rajasthan has a very colourful culture and a very rich history with lots of Rajas and lots of wars. In fact the word "Rajasthan" means the place of Rajas (kings).

Mining Scenario of Rajasthan

Rajasthan is museum of different of minerals. In Rajasthan 44 major and 23 minor minerals are being exploited. These include noble metals (gold and silver), base metals (lead, copper, zinc); semiprecious stone (garnet, emerald, corundum, aquamarine, crystal etc), industrial minerals (talc, feldspar, clays, asbestos, bentonite, barite, limestone, iron ore, wollastonite, calcite, dolomite, etc); fertilizer minerals (rock phosphate, gypsum); fuel minerals (lignite, natural gas); dimension stones (marble, granite, limestone, quartzite, slate, sandstone etc); besides these, construction materials like quartzite, sand, brick earth etc. Rajasthan stands 5th in contributing towards the national income of the huge country like India from the mining sector. Moreover, it stands first in the value of minor minerals produced by contributing 27% of the total value.[2] These details make it very clear that mining is very important for Rajasthan and Rajasthan is very important for mining in India.

Rajasthan produces about 67 minerals with sizeable reserves. The state is exporting these minerals in raw form as well as after value addition. The mining projects together with mineral based industries are growing fast in the recent past and are contributing an important role in the country's economy. Majority of mining activities of the state (viz. Grant of lease, cancellation of lease, collection of royalty, ensuring safe and eco-friendly mining etc.) are controlled by the State Department of Mines & Geology. This department administers central legislations (viz. MMDR Act, 1957 and MCR 1960) for major minerals and implement Rajasthan State Minor Mineral Concession Rules, 1986 for minor minerals.

Geological Setting of Rajasthan

General Geology

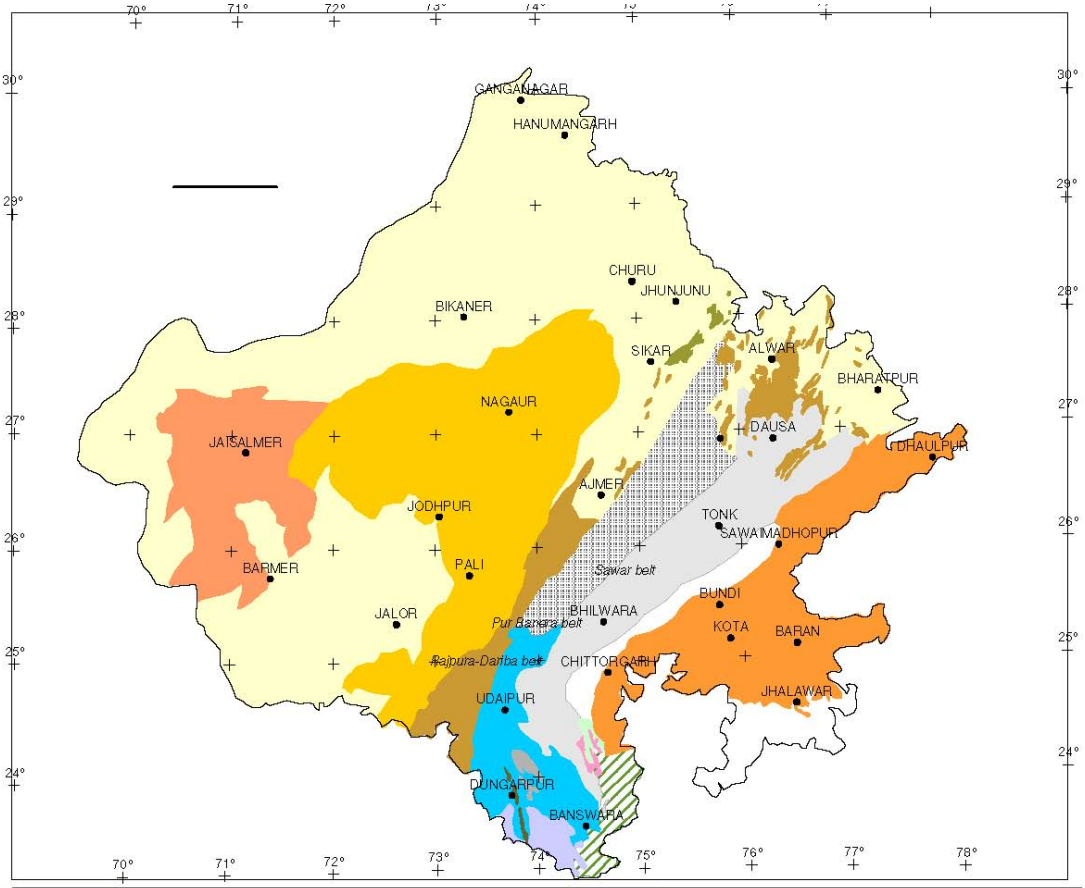
Geologically Rajasthan comprises rocks from oldest Archaean rocks to recent alluvium. The Aravalli hill range is made up of Precambrian rocks of Aravalli and Delhi Super group comprising the metamorphosed gneisses, schists, marble, quartzite, calc silicate and ultra basic and acidic intrusive rocks. The eastern and southeastern parts of the State are

[1] http://www.jaipurplus.com/rajasthan/rajasthan.html

[2] Mehta, S.C. Growth of Mining Activity in Rajasthan, 1997

occupied by rocks of Vindhyan Super-group mainly forming a plateau of sandstone, shale and limestone. In the southern part Deccan trap formation of cretaceous age is exposed.

Map of Rajastan showing the geological formations.



	Quaternary		Rakhabdev Ultramafics
	Deccan trap		Aravali Supergroup
	Mesozoic and tertiary of Jaisalmer		Hindoli group
	Marwar Supergroup		Granites/granulites of Sandmata
	Vindhyan Supergroup		Bherach Granite
	Delhi Supergroup		Sandmata Complex
	Khetri Belt		Untala Gingala Granites
	Pur Banera, Rajpur-Dariba belt		Mangalwar Complex
	Lunavada Group		

Mineral Potentiality

The State is geologically so endowed that it becomes a repository of minerals. Rajasthan is fortunate enough to have a wide spectrum of mineral deposits. Different kind of major and minor minerals produced in the State, contribute annual revenue of more than $70 million. In India Rajasthan is the sole producer of garnet (gem variety), jasper and

wollastonite and nearly entire production of zinc (concentrate), calcite, asbestos and gypsum. Besides, out of total Indian production Rajasthan produces ball clay (40%), feldspar (70%), fluorite (graded) (59%), Kaolin (44%), lead concentrate (80%), ochre (72%), phosphorite (79%), silver (54%), steatite (85%), barytes (53%), copper (34%), quartzite (33%) and silica sand (21%).

Mineral Administration General Scenario-year		
Item	**1950-51**	**2002-2003**
No. of Minerals Produced a. Major Minerals b. Minor Minerals	15 6	35 21
No. of Mineral Concessions:		
a. Of Major Minerals b. Of Minor Minerals c. Quarry License(QL)	50 195 1200	1262 7841 16,070
Mineral Production (in Hundred thousand tonnes)	15.14	1312.10
Revenue from Minerals (in Hundred thousand Rs.)	48.02	44,937.57
Employment (No of persons per day)	32,250	478,043

The mining industry in India has been classified in two main categories viz. minor and major.

Major Minerals

Major Minerals are minerals like Agate, Asbestos, Barytes, Bauxite, Cadmium, Calcite, China Clay, Coal, Copper Lead, Manganese, Mica, Nickel, Rock Phosphate, Soapstone, Tungsten, Wollastonite and Zinc.[3]

Minor Minerals

The Minor Mineral as notified by Central Government in official gazette are Building Stone, Gravel, Ordinary Clay, Ordinary Sand, Brick Earth, Chips (ballast) and Powder making minerals, Diorite, Granite, Gravel, Limestone, Marble, Masonry stones, SandStone, Serpentine and other Decorative Stone.[4] Thus it can be considered that all building/construction related minerals in India are minor minerals. The mining of these are essentially done on the small-scale. The most popular/famous minor mineral of Rajasthan is marble. India is the largest producer of marble in the world and Rajasthan counts for more than 90% production of India.

[3] MMDR Act 1957, Second appended Schedule.

[4] RMMCR 1986, First appended Schedule.

Production data of main minerals from Rajasthan in the year 2002-03 in 000 tonnes					
Major Minerals				Minor Minerals	
Mineral	**Production**	**Mineral**	**Production**	**Mineral**	**Production**
Copper	701.773	Magnesite	92.000	Bentonite	80.831
Iron ore	17.860	Mica	658.000	Brick Earth	8831.191
Lead Concentrate	55.806	Ochres	731.271	Chert	0.588
Lead Zinc (ROM)	3029.220	Pyrophyllite	8.939	Chips Powder	196.096
Silver [in Kg]	36923.349	Quartz	192.295	Fuller's Earth	30.600
Gold [in Kg]	114.158	Rock Phosphate	1408.941	Granite	207.548
Zinc Concentrate	486.027	Selenite	18.601	Kankar-Bajri (Gravel)	22383.220
Asbestos	9.149	Silica Sand	581.996	Limestone (Burning)	3676.995
Ball Clay	792.850	Siliceous Earth	1.608	Limestone (Dimensional)	3387.312
Barytes	0.500	Soapstone	576.875	Marble	6150.755
Calcite	120.718	Vermiculite	85.000	Masonry Stone	41918.820
China Clay	287.384	Wollastonite	176.856	Mill Stone	2.827
Dolomite	293.538	Lignite	473.639	Murram (Ochre)	772.900
Feldspar	137.356	Manganese	2.728	Patti Katla (masonary slabs)	316.430
Fire Clay	1.173			Quartzite	5.595
Fluorite	5.352			Rhyolite	506.963
Garnet (Abrasive & Crude)	457.513			Salt Petre	0.321
Garnet (Gem)	381.000 Kg.			Sandstone	5727.033
Gypsum	2800.777			Serpentine	703.273
Jasper	4.483			Shale	0.930
Limestone	23384.069			Slate Stone	6.965

Mining Lease of Minor Minerals

The Jurisdiction

The jurisdiction of giving the lease for mining is with the central and state governments in India. For the grant of the lease of major minerals and their supervision thereafter is done by the central government through the state government. On the other hand this whole process for the minor minerals is formulated and executed by the respective State Governments.

The grant of lease of minor minerals

This is the stage which opens up the Pandora's Box. It all starts when a prospective miner wants to get a lease for the mining of a minor mineral in the state of Rajasthan. The first step in this process is the search and selection of the mineral deposit. The most typical aspect of the minor mineral mining in India is that it is done by the small and the unorganised sector. The entrepreneurs involved in the minor mining are generally not mining professionals nor can they afford to employ any professional person. Generally there are two types of willing minor miners. One category is that who owns a land expected to have some mineral deposit. Second category is that who discovers the mineral deposit. The grant of minor minerals in the state of Rajasthan is done as per "Rajasthan Minor Mineral Concession Rules", the rules and procedures for all Minor Minerals are same except few added steps for marble and granite.

For all Minor minerals

After identifying an area vis a vis a mineral for which he wants to take a lease, a prospective miner/lessee has to apply in a prescribed format to the Mining Engineer (State Government official) of the area. This application has a non-refundable application fee, some declarations in stamped papers, maps and the cadastral details of the area applied. Often the cadastral details of the area are not very clear and create a lot of ambiguity. These details are submitted in the Department of Mines and Geology (DMG), they scrutinize whether the area applied for is already not been granted to or applied by somebody else. The applicant is also required to get the land rights from the land owner at this stage. After this stage the application is sent for the clearance from the Department of Forest. This department checks if the land applied falls under or in the periphery of any reserved, protected or existing forest. It also checks whether the area does not fall under any kind of wildlife sanctuary or national park*. The irony at this stage is that, all the hillocks in the state of Rajasthan are demarcated as protected/reserved forest. Moreover, most of the remaining hillocks are identified in the recent past few years as Aravali (one of world's oldest mountain range), hence an object of historical importance.

It is a bitter fact that many areas being demarcated as the forest by the government for the compliance of the norms set by international organisations do not even contain a single strand of grass. The forest department evaluates after ascertaining the status of the area as maintained in their records and on the basis of the reports from the ranger and surveyor the forest officer may issue an NOC or may reject it. The applicant has to pursue his cause personally at each level. So if the application survives even this hurdle, it is now sent for the examination by Geologists of DMG for the availability of the minerals being applied. Geologists make their report on the basis of the available data and just one physical survey of the area. The positive report of the geologist is necessary for the furtherance of the application.

In addition to these, one more step for the plight of applicants has been added from past few years. He has to now arrange for the approval from the 'Ministry of Environment and Forest' (MOEF), New Delhi. The Ministry ascertains the implications and repercussions

on the forest and environment of mining in this area. The studies and decisions are made by a committee which is mainly consisted of persons from judiciary, some self acclaimed environmentalists and the forest officials. This has become one of the most difficult obstacles in getting the mining lease in the state of Rajasthan. The number applications got approved in the past few years could be counted on fingers. If the applicant and his application survives thorough all these procedures the lease is sanctioned in favour of the applicant. But this is not the final phase. After sanction the applicant is required to submit required fees and buy some government bonds and securities. This fee is generally a big amount calculated on the basis of the extent and minerals of the area applied. After the submission of the fees the application is sent to the land revenue authority *

In a recent event all the mining activities in the vicinity of Sariska Wild Life Sanctuary were closed as it is supposed to be a tiger sanctuary. Many mines even as old as 70 years were also closed by the Supreme Court orders. In a census of tigers conducted in April-May 2005 it was found that the sanctuary does not contain even a single tiger. Studies suspect that all have been killed by poachers and sold to the oriental markets. While everybody was concentrating on the impact of mining being done few kilometers away, poachers within the sanctuary were somehow neglected. of state government i.e the concerned district Collector. The collector's office forwards this application to the Tehsil (sub district) officer of that particular area, which after his noting passes it to the Patawari (block officer). He is the officer in charge of few villages. Patawari is the officer at the site and he surveys and measures the area by himself. The Patawaris don't have any modern measuring or direction instruments. They measure the area with the help of metered chains and take a rough estimation of the direction. The mine owner indubitably has to face the hostility of the villagers at this stage. Mainly, because land owners being poor fellows, are afraid of loosing their land. Even if the area is a government land there are always some illegal occupants in there.

The land in the mineral rich areas is generally occupied by the local dwellers for agriculture, cattle grazing, and storing, illegal mining etc purposes. Moreover, everybody has a tendency to encroach the land which belongs to nobody. So the applicant has to compensate or promise to compensate these encroachers. The Patawari if convinced gives his report, but he has also to seek the approval of the village committee (Punchayat). This is a committee existing in every village of rural India. It's consisted of 5 village elders (called Punch) and sufficient number of members depending on the size of the village (the members are elected by the villagers and Punch and Surpunch are elected by the members among themselves). A meeting of Panchayat has to be called, which should have minimum quorum. Polling is done for the decision of whether to permit the applicant for the mining work in the area. The fact behind the scenes is that the applicant has to approach each and every member of the Panchayat and convince or satisfy him. After all these procedures the Panchayat may issue a NOC for mining in the area. They forward their letter to the Patawari. The Patawri makes necessary noting and issues his own NOC before forwarding it to the Tehsil officer. The Tehsil officer studies the whole row of events and if satisfied issues his NOC and forwards the application to the District Collector. At this stage the collector office can easily issue their NOC but they require the

copies of NOC from the forest office and MOEF also, before issuing their NOC. The collector offices in India are big offices with a lot of works under their jurisdiction. The applicant has to pursue his application for fast disposal and getting the NOC from the Collector. Once the Collector issues the NOC the applicant has to prepare the Eco-friendly mining plan as per Environment Protection and Eco-Friendly laws to concerned Assistant Mining Engineer/Mining Engineer. This mining plan would be different and in addition to the mining plan/mining scheme as required under law.[5] At this stage the applicant has to get an NOC from the State Pollution Board also, stating the limits and measures to be taken for the air, water and noise pollution. After this an agreement is made between the applicant and the government.

In case of government land the applicant has to get the area registered at the Tehsil office. The registration fee is the 20% of the cost of land as per the government evaluation. After registration of land the applicant becomes a lessee or a miner. Now he can start doing the mining work. The dead rend on the mines starts accruing from the date of registration.

For marble and granite

Looking at the importance and the failure ratios in these two minerals, government has changed the procedure of granting lease of marble and granite. In a virgin area an applicant has to take a Prospecting License (PL) before taking a mining lease. This is a temporary license for three years in which the lessee is permitted to only examine the availability of the required mineral in the area. This has been a mandatory step for leasing of major minerals and has been introduced to marble and granite too. During the PL the licensee is not permitted to do the commercial mining in area. Though a PL holder has the right of getting lease in the area being prospected by him a PL is applied in a prescribed format. For a PL a larger area can also be applied. Applicant has to produce the maps along with the cadastral details of the area. Here, it is not necessary to produce the land rights of the land owner, but an NOC from the land owner is to be produced which is equally difficult. Besides this the NOC from the collector's office is also to be attained. The process for which remains the same as stated above. If the area applied is larger than 50 hectares than an NOC from the MOEF is also required. If the applicant is able to do all these jobs he may get the PL from the DMG.

After this the licensee has to do the prospecting work to search out the availability of the minerals in the area. The prospecting can be done by ground survey of whole area with the help of geologists, geophysical survey of the suspected areas, followed by core drilling in areas in where geophysical survey gave good results. The licensee has to arrange all these examinations from his own resources; government does not provide assistance of any kind in this survey work. The lessee has to also face the hostility of the local villagers while prospecting, as they are afraid of losing their land or the lands on which they have illegal hold. Moreover, if the licensee is able to spot a good deposit of

[5] www.dmg-raj.com; website of "Department of Mines and Geology", Government of Rajasthan.

mineral in this area, he has purchase the land. In such cases the landowner demand highly appreciated prices as now they are aware that the piece of land contains the mineral deposit.

On the other hand if licensee does not find any viable deposit then he has to simply forget all his labour and expenses. Once the prospecting is complete the licensee has to identify a plot of 4 hectares on which he wants the Mining Lease. The government delineates the whole area and allots the required four hectare plot to the applicant by the process as stated in the above section for the mining lease of minor minerals. Rest of the area is either auctioned by the government or is left available for the mining lease of that mineral for other applicants. The PL only assures that the applicant will get one plot of 4 hectares in that area on the preferential basis, but he has to undergo the same rigmarole as is applicable for the Mining Lease of all the other minor minerals in the state of Rajasthan. Some of the rules which a minor miner of the state have to follow are given in the list below:

- The Mines Act 1952.
- The Mines Rules 1955.
- The Mines & Minerals (Development and Regulation) Act 1957.
- The Forest (Conservation) Act 1980.
- The Forest (Conservation) Rules 1981.
- Rajasthan Minor Mineral Concession Rules (RMMCR) 1986 (Applicable for Minor Minerals of Rajasthan).
- Mineral Conservation and Development Rules 1988
- Mineral Policy 1994 (promulgated by State of Rajasthan in July 1994).
- The Granite Conservation and Development Rules 1999.
- Granite conservation and development Rules 1999 (promulgated by Government of India in June 1999).
- Marble Policy 2002 (promulgated by State of Rajasthan in March 2002).
- Granite Policy 2002 (promulgated by State of Rajasthan in March 2002).
- Marble conservation and development Rules 2002 (promulgated by Government of India in May 2002)

Mining Minor Minerals

Once the applicant gets the mining lease with all the formalities completed, he thinks that he has done most of his job. There is nothing between him and the riches. But the reality is really very hard and bitter. The fact is that it's only now that that they have become miners. The success ratio of mining in the minor minerals in the state of Rajasthan is less than 10%. The first and the foremost problem faced by the mine owner is the approach to the mining area. There are seldom any roads to the mining areas and even if there are, these are unraveled and not suitable for the mining equipments and the traffic of trucks. So the mine owner has to first make arrange for the approach roads to the mining area. In many other states of India the state government takes this as its own responsibility. In making of the roads the mine owner instead of getting any assistance from the villagers has to face resistance from them. The making of the roads is a costly affair and a big

amount of miner's capital is generally spent on this. Some times two or more mine owners club together their efforts for the common cause.

The small-scale mining technologies used for different mineral in the different parts of world have developed in there own indigenous ways. At present the mining technology used for most of the minor minerals, except for the dimension stone, involves use of locally developed explosives like ammonium nitrate and many a times gelatine too. The rocks loosened by blasting are then excavated with the help of manual labour or with the help of earth movers. Generally the minor minerals do not require much after processing; only the grading of the minerals is to be done and the product is saleable. The mining technologies of the dimension stones are highly advanced and very different from what explained above. Miners in Rajasthan are using most modern technology for dimension stones mining; these technologies have also been modified and adjusted according to locally developed methods.

The preliminary mining goes simultaneous to approach road construction. In the primary stage of mining the biggest work is the removal of the overburden. This could range anything from 0 to up to 20 meters in depth. At this stage no income is earned from the mining and all the expenses are to be made from the miners own capital. Generally the mine owners don't use the modern techniques like core drilling or geophysical surveys for ascertaining the depth, exact location and dip of the deposit. This mainly because these procedures are expensive and miners assume that they would rather extract big part of over burden with that amount. So the mine owners keep on working on the removal of overburden in ambiguity and uncertainty for long periods which sometimes stretches many years. Many mine owners have booked bankruptcy in past few decades during the development stage of mines.

This trend is more often in the dimension stones like marble, granite, limestone, slate, sandstone, etc as there are many parameters for the saleable product like colour, sizes, flawlessness etc. In the minor minerals like masonry stone, gravel, sand etc the lessee does not faces this problem because the mineral is generally available right from the top and he has to just mine it and sell it. Moreover, these minerals have a big market in the developing economies like India.

The overburden removal work also requires a lot of use of blasting. Though the blasting is done by the experts employed by the miner and the accidents reported due to blasting are very rare, but it sure alarms the local dwellers. The mine owner has to convince them that the blasting is not going to harm them. The safe keeping of explosives is another big problem. For that purpose the miner has to get an explosives license and it is as difficult as getting a mining lease. No provisions are provided with the mining lease for the safe keeping of the explosives. If some explosives are found at mines without a license it counts to serious criminal offence which may ruin the whole life of a lessee. So the miners generally buy some small quantities of explosives for weekly consumption and keep the stuff at some hidden places. For the smooth working conditions and evading the daily frictions with villagers, mine owners generally employ these villagers in the mines.

Though they are unskilled labourer for the mining work but sometimes it becomes necessary.

Huge investment is yet another big problem. Mine owner has also to procure heavy earthmoving machines. Many skilled unskilled labourers are employed and a huge quantity of fuel is consumed. Mining has not been identified as an industry by the State Government. This being a heavy investment industry with a lot of risk factor involved none of the government organisations or the banks are willing to give loans to the miners in India. Even if they give against some collateral securities then they do not consider the mines lease as a security. So the mine owner has to arrange for his own sources of funds, or he takes loan from the local financial organisations at a very high rate of interests.

These entire sums up to the fact that most of the mine owners which start mining for minor minerals, don't get the minerals or they don't get the quality which could be marketed in the market or that the quantity produced is so small that he could not meet out the expenses incurred in the mining. In some cases he has to leave the mining areas due to constant resistance from the villagers and the government authorities. The situation continues for few years depending on the financial capacities and the Patience of the minor miner. After that, the mine has to be closed for good and the miner has to book heavy losses. Many a times the mine owner sells out his lease to someone else at a very low price and same story is repeated. But in some interesting cases the new mine owner hits the good mineral deposit and starts minting money, as the overburden has already been removed by previous miner(s). There are many examples of this kind in the field of marble and granite deposits from all over the world.

Product Marketing

If the mine owner hits a mineral deposit he has to concentrate on the marketing of the mineral. This being a small-scale operation is much unorganised. The mine owner contacts the traders of the respective minerals and invites them to the mines to see the product quality. If the trader agrees to buy the mineral the mine owner has to send the material to the traders place. The traders generally exploit this situation. Being very new the mine owner does not has many buyers for his product, so he sells the material at very cheap prices as well as at some undefined credit periods. Similar to all other minerals, the upper layer of the product is of weathered and inferior quality. This is the most testing time for the mine owner. This small entrepreneur has invested a huge amount on one venture and the end product is of not so good quality. Most of the miners quit the area at this stage. They start trying to sell off the lease at this stage rather than selling the product thereof.

Environmental Aspects

Mining is condoned at a large scale for its environmental hazards. Of course mining changes the topography and demography of the area. Such negative aspects are attached to each and every industry anywhere in the world. Though this does not mean that mining is no culprit but the benefits from the industry are much more than the damages caused by it.

The biggest environmental hazard by this industry is the disposal of the overburden. This causes the removal of top soil from area under mining and covering of equal area with the dump. The government has suggested in this regard the safekeeping of topsoil and covering the dump with it for the plantation purposes.

Other anti environmental deeds done by mining is the change of topography of the area. Deep pits are made and dumps are created by their sides. Similar to most of the mining, in minor mining also only 50% of the material is used and rest is discarded as waste. This is a serious problem, environmental organisations and NGO's suggest refilling of pits with the waste, and replenishing top soil on it once the mine is abandoned. Interestingly in the draught ridden state like Rajasthan many abandoned mines are serving the purpose of important water reservoirs.

Other pollutions caused by the minor mining activities like dust and noxious gases are negligible. The government is taking heavy revenues from the mine-owners in the form of royalty and dead rent. It should take the initiative to do the suggested remedial measures from its own side rather than leaving it on the mine owner who has already abandoned the mines, which itself is a major financial and psychological failure.

The various environmental rules and regulations which the lessee has to comply with during the tenure of mining lease are:

- To store top soil removed in a way to place it above the overburden removed for the purpose of intensive plantation.
- Taking proper care of the water channels and if required, directing them to main water bodies/ponds.
- 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 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 program 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.
- 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.
- Proper implementation of the norms set by the Director General, Mines Safety.
- 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
3	Other minor mineral leases and Quarry Licenses	10 plants / hect. Or part / year 4
4	Q.L. of minerals other than Marble and Granite having area less than 1.00 hectare	5 plant / Q.L. / yea

Besides these horrendous set of uncertainties and expectations, the lessees have to run the show in constant vagueness about the future of their leases. For example in the February 2005, taking strong exception to the continuance of illegal mining in the eco-sensitive Aravali Hills in Rajasthan, the Supreme Court has stayed all mining licences granted after December 12, 2002 in the state issuing notice to the state government, a bench comprising Justice YK Sabharwal, Justice Arijit Pasayat and Justice SH Kapadia said "all mining leases granted or renewed after the impugned date would stand cancelled and mining has to be stopped with immediate effect".[6]

Impact of this industry on the society

This is one of the important issues to know how much the society is getting from this sector of mining and vice versa.

Generation of Employment

This is one of the biggest contributions of the industry from the socio-economic point of view. Today the minor mining industry in the state employs more than 2 million persons in the various sectors of the industry like mining and processing and many more are getting their employment indirectly from this industry like transporters, mechanics / workshop owners, masons (for laying and fixing of stones), artisans etc. In Rajasthan the overall industrial development is not much and the major portion of the population depends on the agriculture which in turn is very poor due to water scarcity and high dependency on monsoon. In such conditions the contribution of minor mining is important and vital for in-situ employment generation.

Revenue Generation

The revenue generation from the industry is in the form of royalty on mineral dispatched, excise, sales tax and surcharge on finished products and taxation on machines and various incomes. The industry is generating huge revenue for the state in the form of

[6] Press Trust of India, New Delhi, April 10, 2005 50 years of marble development in Rajasthan, Rajasthan Mineral Bulletin, Oct – Dec 2000.

mineral royalty. As per the available data mining in the state generates a revenue of more than Rs.300 crores per annum (approx. $ 70 million).[7]

Earning of Foreign Exchange

The industry generates huge amounts of foreign exchange from the exports of natural dimension stones. These exports are the largest Forex earners for the state for past few years. Geologically Rajasthan is a unique place in world where all the main types of natural stones viz. granite, marble, limestone, sandstone slate, quartzite are produced simultaneously.

Rural Development

There has been tremendous exodus from the villages in past few decades. This is further facilitated by the fact that educated and more competent persons get chance in the cities and migrate from villages, leaving behind only mediocrity. Further due to lack of infrastructure facilities such as road, rail -head, port or dry port and air terminal facilities, electricity, houses, school, availability of market and unwillingness of experts to stay in rural areas, it is difficult to start industries in the rural sector, despite of some incentives and subsidies given by the government. The mining is absolutely resource controlled and the resources are only in rural sectors. Even if there is a mineral deposit present in the urban sector, it cannot be mined due to demographic reasons. Hence, the development of mining is synonymous to development of rural sector. It is evident from the fact that most of the villages situated near the mining fields have progressed and have become the hub of other business activities.

Development of Allied Industries

With the development of mining industry several allied and related industries of the minor minerals are also developed in the state of Rajasthan in the past few years. The main development of the allied industries is due to the development of marble industry in the state. These allied and related industries are marble slab processing, mineral powder industry, natural stones article industry, machine manufacturing, cutting tools industry, polishing abrasives industry, transport industry, tourism industry and construction industry.

Conclusion

All these give an impact that the government and the society are in an anti mining spree. The small-scale mining is more a victim of this for the reasons that it is small, unorganized, and scattered.

It is assumed that in the economy like that of India, small-scale mining is very important for the society. Government has to realize this fact. The in-situ generation of employment, generation of government revenues and generation of foreign exchange are

[7] Goyal, Gagan. Viability of marble industry of Rajasthan, conference souvenier, Marmo Macchini 2003.

some of the most important benefits from this industry. Mining in itself is a very difficult industry; government should make some plans for the benefit of the miners and proper development of the industry.

If the current state of affairs continues for few more years, the minor mining will slip out of the small and artisanal miners and will go to the big mining groups, which will generate more revenues with heavy mechanisation but lesser employment. A sustainable eco friendly mining strategy should also be worked out which is non harassing and easily adaptable by the small mine owners.