A Vision for the Mineral Sector in Karnataka – *D. V. Pichamuthu (Email: davidpichamuthu@yahoo.co.in)*

Today the mineral sector in Karnataka is in the news and for all the wrong reasons. Mine operators are being blamed for everything which has gone wrong. How far is this true and who is to be blamed and for what reason is worth examination. Karnataka is one of the half a dozen mineral rich states of India. As far as mining is concerned, it has a hoary past. There are many ancient workings particularly of gold. Kolar Gold fields, unfortunately now closed, was famous all over the world and at one point of time boasted of the deepest mine workings in the world. Now Hutti Gold Mines is the only company in India producing primary gold. Karnataka has resources of gold, diamonds, platinum, chromite, manganese, limestone etc. apart from 11 billion tonnes of iron ore. Unfortunately, today all discussions are only about iron ore. Also the impression is being created that the mine operators are looting the resources and everybody including the government are the losers. It is worthwhile to examine this in depth.

The Historical Perspective

The Geological Department of the erstwhile Mysore State (now transformed into the Department of Mines and Geology) was set up in 1894, probably the first in the country. It was headed by such luminaries as R. Bruce Foote, with W.F. Smeeth, H.K. Slater, B. Jayaram, P. Sampath Iyengar, B. Rama Rao, C.S. Pichamuthu and B.P. Radhakrishna. Their reputation was not just national but spread internationally. Just to cite one example, the Kudremukh magnetite deposit was discovered by the aforesaid Sampath Iyengar. When Geophysical Survey, Atomic Minerals and even when Diamond Drilling Departments were set up by the Government of India, experienced technical persons were deputed to them by the Mysore Geological Department. B. Rama Rao was deputed to Bastar to advise on Mineral Resources. Exploration was the strength of this Department.

Apart from the Kolar Gold fields, there were a number of mines of manganese, chromite, felspar, clay and even gold which were being managed by the Department. To operate these mines in a more professional manner, Board of Mineral Development ***(BMD-1958)*** headed by B.P. Radhakrisha was set up and this entity was later on transformed into Mysore Minerals Limited (MML) in 1965. The Department was headed by extremely competent professionals and was primarily concerned with exploration for minerals. They also managed the extraction of minerals and guided the policy of the Government. In fact, P. Sampath Iyengar and C.S. Pichamuthu were the Directors, and at the same time the Professor of Geology of Central College (Mysore University) and reporting directly to the Minister-in-Charge! *Since last 25 years the department is directed by administrative officers who are frequently changed at the whims and fancies of the Government in power. Consequently the department has lost its scientific character and instead has become a revenue collecting agency. Administrators who took one decision while at Department took contrary decisions under the pressure of their seniors and political bosses.*

The Current Scenario

The Geological Survey of India carries out mineral exploration on a regional scale. The detailed exploration on the other hand has to be done by the State Geological Departments Mineral Exploration Corporation Ltd. (MECL) or private parties. But the Department of Mines and Geology has been reduced to a revenue collecting wing (collection of royalty) and transport permit issuing department. All expertise in mineral exploration has been lost and the performance is judged only on the basis of the amount of royalty they can collect.

Karnataka is a storehouse of minerals. You name it and it is there with the exception of fuel minerals. Confirmed reporting of occurrences (in many cases of mining) of gold, diamonds, platinum, nickel, base metals etc. are there but no new mine for these minerals have been opened in the last more than 30 years. These are all minerals in which India is deficient and foreign investment is ready to come in provided the environment is conducive. So where is the problem?

Identification of the problems

Converting the indicated and *inferred* resources to reserves is the primary necessity. Though resources are theoretically finite, they can be expanded exponentially by exploration and beneficiation. So exploration is the most critical activity for the future of the mineral industry.

For attracting investments in exploration, conducive conditions have to be created. Unfortunately, everything is being done to thwart this. Rule 63 (a) of

the Mineral Concession Rules, 1960 states that applications for reconnaissance permit, prospecting licence and mining lease have to be cleared in 6 months, 9 months and 12 months respectively. However, what we see is the government taking years to clear even reconnaissance permits. The Government of India has cleared the proposal of allowing 100% FDI in the exploration and mining of all minerals. It is also known that exploration is a high-risk activity requiring huge investments and the State Government has neither the funds nor the expertise to carry out these activities. But under the present circumstances, which multinational company will enter? The tragedy is that the sectors in which they are interested are exactly those which we are looking forward to i.e., gold, diamonds, nickel, platinum etc. *Government should take immediate steps of constituting an independent Authority as proposed by B.P. Radhakrishna.*

Much has been made of the canard that Karnataka will run out of iron ore in 20 years. Nothing can be farther from the truth. For this assumption, the reserves have been taken to be only 1164 million tonnes of haematite ore, conveniently ignoring the 9000 million tonnes of magnetite ore. Secondly, this view assumes that no exploration will take place and there will be no augmentation of resources. Exploration in depth and laterally has to be taken up and will yield dividends. Thirdly, the threshold value taken for estimation of resources has been lowered by the IBM to 45% from the current 55% iron (Fe) content. Further Banded Magnetite Quartzites (BMR) analysing 30% Iron which can be upgraded to +66% iron has to be assessed. This will increase the resources enormously. If these steps are taken, the resources will last for another 200 years. This view is reinforced by the fact that estimates published by the Indian Bureau of Mines show that iron ore resources between 1980 and 2005 (last officially published figures) show that the resources have gone up by 3000 million tonnes (all India) though about 1000 million tonnes have been extracted in this period. *As an example, Goa can be considered. Immediately after liberlisation in 1961, GSI had estimated that Goan iron ore resources might last for another 20 years (i.e. 1981). Since 1981, Goa might have exported more than 1000-1200 million tonnes of iron ore. Many miners have gone below sea level and iron ore is still being mined. There is no indication of exhaustion iron ore deposits in Goa.*

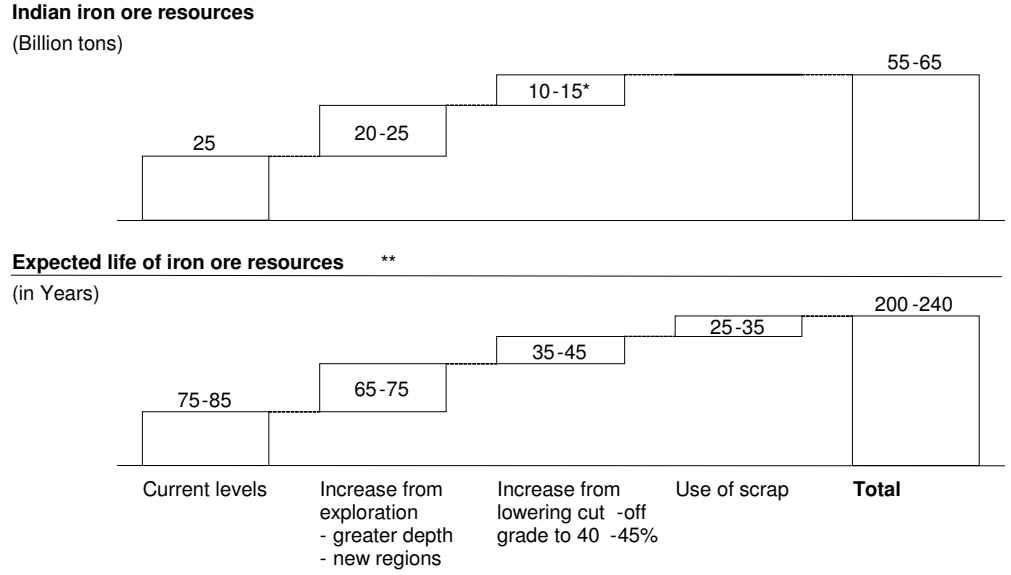
Levies and Taxes on Minerals under various Act and Rules

Permit fee: This is applicable to reconnaissance permits and is to be paid annually at the rates fixed by the State Government being not less than Rs.5/- and not more than Rs.20/- per sq km. Application for a reconnaissance permit is to be accompanied by a non-refundalbe fee a thte rate of Rs.5/- per sq km.

Prospecting fee: This is applicable to prospecting licences and is payable in advance at the rates fixed by the State Government being not less that Rs.0.50 and not more than Rs.5/- per hectare. Application fee for prospecting licence is to be paid as per Schedule – II of MMDR Act 1957 and is payable at Rs.50/- for the first square km. And to Rs.10/- for each additional sq.km:

Fees in connection with mining lease: Application fee for a mining lease is Rs.500. In addition, a deposit of Rs.1000/- is required to be made to meet preliminary expenses in connection with the grant.

Fig.1



* Equivalent Fe grade for the low grade material
** Assumptions: Constant steel production levels of 200 million tons per year from 2020; 1.6 tons of iron ore per ton of steel
Source: FIMI

Iron ore in India will last another 200 years as shown in Fig.1.

Surface rent: This is payable at a rate not exceeding the land revenue, as may be specified by the State Government and may vary from state to state. The rate of surface rent in West Bengal is Rs.45/- per acre per annum whereas it is Rs.2 per acre in Madhya Pradesh. In Maharashtra, the rate varies in villages from 1 paisa to 2 paisa per sq m of non-agricultural area (NAA) used for mining and 20 paise per sq m in municipal areas.

Security deposit: This deposit for the observance of terms and conditions is required to be made before execution of the reconnaissance permit/prospecting licence/ mining lease at the rate of Rs.20/- per sq. km for a reconnaissance permit, Rs.500 per sq km for a prospecting licence and Rs. 10,000/- for a mining lease.

Dead rent: The rates of dead rent are as specified in the Third Schedule to the MMDR as given hereunder:

Illegal Mining

The Chief Minister of Karnataka has stated publicly that illegal mining is rampant in the State. The Honourable Lokayukta has also opined the same in his report which the Central Empowered Committee has accepted in toto. However, the matter becomes serious when the mine lessees who have to register themselves under the Sales Tax Act are accused of indulging in the same among many other things purchasing iron ore from unregistered dealers (URD's). This accusation bears further scrutiny.

Lessees have obtained clearances from the IBM and the MoEF for a certain level of production. Only if they exceed this production, would they need to purchase ore from URD's and if they do so, all they will save is the royalty of Rs.100/- or so, which is a small percentage of the total sales value. This illegal ore will have to run the gamut of various check-posts of sales tax, police, forest etc. This does strain one's imaginations. Actually, the illegal trade is run with the active connivance of the politico-bureaucratic nexus along with the police and forest officials. Otherwise, how can this illegal ore get through the dozen or so check-posts between the mine and the ports? It is our considered opinion that the bogey of illegal mining has been laid at the door of mine lessees to divert attention from the real culprits ***who are mainly traders and end users.*** If anyone is found guilty of illegal mining, ***and transport of ore*** nobody should stand in the way of action being taken under the statute.

Working beyond Sanctioned Mining Leases

Many mining leases have been sanctioned in the 1950s. At that time survey was done by Chain and Compass method to fix lease boundaries. These boundaries remain to date. Now satellite pictures are taken and superimposed over the earlier sketches and any deviations are labelled as encroachments. Even the National Mineral Development Corporation, a Central Navaratna PSU was one of the accused. It is instructive to note that joint survey was conducted by the Department of Mines & Geology, IBM and Survey of India in 7 cases and in all 7 cases no deviations were found. On 6th May 2011, the Supreme Court has directed that 99 mines will be re-surveyed by a joint team and will be re-opened only if no irregularities are found.

Exports of Iron Ore

Exports have been banned by the Karnataka Government under the specious plea that this step will curb illegal mining. While the illegal mafia will continue to thrive under the politico-bureaucratic nexus, only legitimate trading will be affected. As we have seen earlier, neither should exports be banned under the plea that we would run out of iron ore as this is far from the truth nor legal miners be stopped from expor-ting iron ore. Secondly and more importantly, it seemed to have escaped the attention of the powers that be, that what is exported is material that is not required by the domestic industry.

Product Mix and Fines Requirements: 56% of iron ore production comes out as fines and 44% as big boulders which have to be sized to: 10-30 mm for blast furnaces, 6-18 mm for sponge iron plants. In final analysis 65-70% of the total iron ore production lands as fines either after sizing or handling. *The current production of* lumps is 67.80 MT and Fines 158.20 MT. Total Production is 226.00 MT. Generation of fines is more in Goa and Karnataka where ore is friable. Ultimate ratio of lumps to fines in Goa and Karnataka may work out 20:80.

SAIL and TISCO use fines produced from their captive mines. Total fines requirements of other plants do not exceed 30 MT. These plants procure fines from non-captive standalone mines, including NMDC. *Fines requirements of Steel Mills in India is given in Table 1.*

Fines produced/generated are surplus. To supply domestic industry sized lumps (calibrated lump ore), fines have to be evacuated from the mines. Since domestic demand is not adequate, only outlet is export. In the absence of an attractive export market a large proportion of iron ore produced will be wasted. Operations of several independent iron ore producers will become unviable and they will be forced to shut down. Secondary sector steel units predominantly supplied by these miners will also be forced to close. All the sponge iron plants take only lumps. Many other steel plants too do not have sintering facilities and hence consumes only lumps or pellets. Therefore, there is no market for fines and the only outlet is the Chinese market. Therefore, if export is banned, the fines will only pile up in the mines causing environmental hazards. Finally, when the stocks build up, mine production will be affected and may even come to a standstill. *Grade wise iron ore export from India is given in Table 2.*

Table 1

Organization	Production Capacity (MT)	Fines used after sintering/pelle-tisation (%)	Plant designed to use pellet/ fines (%)
SAIL	15	72	
TISCO	7	70	
RINL	3.6	75	80
Essar Steel	4.6	70	100
JSW	5.5	100	100
Ispat Industries	2.6	66	
Total	38.3		

Table 2

Quantity in Million Tonnes

	64% Fe and above			Between 64-62% Fe			Below 62%Fe					
	Lumps	Fines	Total	Lumps	Fines	Total	Lumps	Fines	Total	Total (Lumps)	Total (Fines)	Total
2004-05	7.77	12.2	19.97	2.99	19.33	22.32	2.78	33.07	35.85	13.54	64.6	78.14
	39	61	100	13	87	100	8	92	100	17	83	100
2005-06	5.47	12.6	18.07	4.02	20.99	25.01	4.79	41.4	46.19	14.28	74.99	89.27
	30	70	100	16	84	100	10	90	100	16	84	100
2006-07	3.06	10.46	13.52	5.09	26.01	31.1	7.15	42.02	49.17	15.3	78.49	93.79
	23	77	100	16	84	100	15	85	100	16	84	100
2007-08 (P)	4.86	7.29	12.15	4.47	20.82	25.29	5.54	61.29	66.83	14.87	89.4	104.27
	40	60	100	18	82	100	8	92	100	14	86	100
2008-09 (P)	2.93	6.54	9.47	3.77	23.27	27.04	7	62.36	69.36	13.7	92.17	105.87
	31	69	100	14	86	100	10	90	100	13	87	100
2009-10 (P) (April-Dec. 09)										7.10	69.44	76.54
										9	91	100

Source: MMTC, GMOEA, KIOCL, Private Exporters

Note: 1. Concentrate and Pellets are included in Fines and Lumps respectively; 2. Private Exporters - grade wise quantity has been taken on estimation basis. P: Provisional

Road Map for the Future

In the rules it is laid down that if a mine has not been worked for 2 years, the lease is determined and this fact is notified in the Gazette. Then applications have to be called from interested parties. The actual situation is that the Government does not take any action for years. With the mine lying idle, illegal miners are attracted. There is complete lack of transparency and objectivity in processing applications for mineral concessions. Everything should be put on the website of the Department of Mines as is done in countries like Canada. Information should not be hoarded but disseminated freely and widely. The other flaw in the system is the small size of leases. For massive deposits like iron ore, leases should be at least 200-250 hectares. The reason is that since each lease has to leave a 7.5 meters barrier, 15 meters of reserves width is lost at each boundary between 2 leases. Due to the need for benching, the barrier increases with depth. Therefore, greater the number of leases, more the reserves that are sterilised which is a national loss. Small leases do not lend themselves to scientific mining or to good environmental management practices. Lessees of small mines will certainly lack the wherewithal to invest in exploration.

Exploration: One of the factors that will lead to a major crisis in the future is the lack of exploration. India produces 3 tonnes of gold and imported 930 tonnes in 2010 at a cost of 35 billion dollars. One would have thought that the Government would go all out to encourage exploration for gold. What one sees, however, is that clearance of applications taking several years contrary to what is laid down in the Mineral Concession Rules. Since it is a high risk high cost activity, the Government must attract FDI. However, there is no urgency in clearing applications. No new mine has come up in the last 30 years or so. We do not produce a single tonne of nickel or platinum group of elements which are strategically important. No meaningful exploration has been planned for iron ore but we hear of grandiose plans to produce steel. The intention of the Government is to hand over already identified mineral resources to steel manufacturing companies. This will only result in depleting the resources. Instead, exploration should be encouraged to enhance the resources and the steel companies should pay market-determined prices for iron ore. Exploration is a very important but a thoroughly neglected activity. The very future of industry and in a way the country is at stake.

Exploration and mining: These are two different activities. Most of the exploration expenditure in the world and particularly in the mineral-rich countries like Canada, Australia, Brazil, US, Russia, Mexico, etc., is done by private companies. Most of these companies are known as *junior exploration companies*. The exploration work is extremely risky: if during aerial survey, 1000 anomalies are observed, it may be that only 100 anomalies are worth ground prospecting and it may again be that only one out of these 100 turns out to be worth economic exploitation. The Governments do not therefore prefer to spend the tax payers' money on exploration because it does not want the tax payers' money to be invested in risky ventures like exploration. The entire exploration is done by what is popularly known as *junior exploration companies*. They draw on venture capital to finance their exploration activities. The exploration risk being as high as 1:100, these exploration companies then sell their discovery to the mining companies whose job is only to mine. While selling their explored area, these junior exploration companies not only recover their past losses, if any, but also to provide for their future exploration expenditure. Exploration details of top 10 countries *where money was spent,*

and opportunities lost by India are given in Table 3.

Private Sector to be at par with Public Sector: If the Government decides to go for private investment, then the Government has to treat private sector at par with the public sector. There are cases where private sector has done reconnaissance in areas which happened to be near the areas where public sector is operating. In such cases, reconnaissance permits (RPs) were not converted into prospecting licence (PL). In other cases, where private sector applied for prospecting licence (PL) first and public sector applied subsequently, public sector got priority. This is a discouragement to the private sector investment. The Centre should therefore intervene to provide in the MMDR Act for seamless transfer from reconnaissance permits (RP) to prospecting licence (PL) and prospecting licence (PL) to mining lease (ML) and ensure the security of tenure to cover the risk involved in exploration. Further, an entrepreneur

Table 3

A. Exploration details of Top 10 Countries

S. No.	Country	2007		2008		2009		2010	
		US$ billion	%age	US$ billion	%age	US$ billion	%age	US$ billion	%age
1	Canada	1.8981	19	2.394	19	1.17	16	2.02	18
2	Australia	1.1988	12	1.764	14	0.95	13	1.25	11
3	U.S.	0.6993	7	0.882	7	0.44	6	0.79	8
4	Russia	0.5994	6	0.63	5	0.36	5	0.41	4
5	Mexico	0.5994	6	0.756	6	0.36	5	0.63	6
6	Peru	0.4995	5	0.63	5	0.51	7	0.79	7
7	Chile	0.3996	4	0.504	4	0.36	5	0.50	5
8	South Africa	0.3996	4	0.378	3	0.23	3	0.00	-
9	China	0.2997	3	0.378	3	0.29	4	0.41	4
10	Brazil	0.2997	3	0.378	3	0.23	3	0.30	3
11	Argentina	-	-	-	-	-	-	0.30	3
12	Other countries	3.0969	31	3.906	31	2.42	33	3.28	31
	Total	**9.99**	**100**	**12.6**	**100**	**7.32**	**100**	**10.68**	**100**

Note: While no authentic figures, it is estimated that the entire expenditure on exploration in India does not exceed US$ 5 million

B. Where the money was spent (US$ billion)

Commodity	2006	2007	2008	2009	2010
Gold	3.21 (45%)	4.10 (41%)	4.914 (39%)	3.51 (48%)	5.71 (51%)
Base Metals (copper, lead/zinc, nickel)	2.28 (32%)	3.60 (36%)	5.04 (40%)	2.64 (36%)	3.70 (33%)
Diamond	0.86 12%)	1.00 (10%)	1.008 (8%)	0.36 (5%)	0.34 (3%)
PGM (platinum group of metals)	0.21 (3%)	0.30 (3%)	0.378 (3%)	0.15 (2%)	0.11 (1%)
Other Minerals	0.57 (8%)	1.00 (10%)	1.26 (10%)	0.66 (9%)	1.34 (12%)
Total	**7.13 (100%)**	**9.99 (100%)**	**12.6 (100%)**	**7.32 (100%)**	**11.2 (100%)**

Source: Metals Economic Group, Canada

C. Opportunities lost by India

Reserves	INDIA		AUSTRALIA	
	1980	2005	1980	2005
Iron Ore (hematite) (million tonnes)	11470	13763	15000	40000
Diamond (million carat)	Majhgawan	2.6 (Majhgawan)	0	230
Gold (metric tonnes)	56.1	326.7	400	6000
Coal (billion tonnes)	111 (inferred)	246 (inferred)	29(Proved)	42 (Proved)
Bauxite (million tonne)	2489	2636	3000	8700

should have freedom to transfer his reconnaissance permit (RP), prospecting licence (PL) and mining lease (ML).

Value Addition: The concept of value addition has been misconstrued in India. Every activity in mining has or creates value. The expertise of a resource company (miner) is to explore geologically with the latest state-of-the-art technology, find the mineral resource beneath the earth, create value by extracting it (as below the earth, it is a waste and has no value) and make it a marketable product to meet the requirements of different consumers. It is the job of next discipline (metallurgist) to add value to value created by the resource company, e.g. iron ore, by making steel. To further add value to steel is the expertise of another industry which converts steel into white goods like refrigerators, utensils, automobiles, etc. The chain of value addition thus goes on.

Captive Mines: Despite rich mineral potential, the country has not been able to exploit its full potential. This is mainly because the concessions of most of the abundant minerals like limestone, bauxite and iron ore have been given to cement, aluminium and steel plants. The areas granted to them are far in excess of their requirements and are thus an indirect state subsidy to these industries from which domestic consumers do not get any benefit. Moreover, the first casualty of this policy is total lack of exploration activity and scientific development of mineral resources. Tata Steel and Steel Authority of India are sitting on vast resources but have not reported any increase in resources. On the other hand, National Mineral Development Corporation has reported additional resources of 611 million tonnes at its mines in Chattisgarh.

It seems to have escaped the notice of the authorities that iron ore is only one of the factors of production. Today, coke constitutes a higher percentage of cost of production than iron ore per tonne of steel. Besides, the water requirement per tonne of steel is 4 to 5 tonnes. 5.5 tonnes of material (both inward and outward) will have to be moved for producing a tonne of steel but there is no simultaneous plan to augment the infrastructure. Coke has to be imported entirely but are our ports and connected rail network geared for this need? Further, there is no specific provision in the MMDR Act for the grant of captive leases.

Infrastructure: This is another thoroughly neglected area. A particular cause of worry is the Lokayukta recommending that the production of minerals should be controlled to suit the present abysmal infrastructure. India is planning to achieve a 9% growth in GDP for 2011-2012 and take it up further to double digits. This cannot be achieved without a quantum growth in mineral output. To cater to this requirement, roads and railways have to be developed but we do not see any meaningful activity from the Karnataka Government in this decision.

Conclusions

If we have to progress, the Government has to stop apportioning blame and forge a true partnership with the industry. The Fedeeration of Indian Mineral Industries is more than willing to play its part.