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# Development of Mineral Resources, Economics of Mining and Rural Employment Generation

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**Abstract:** Dr. B.P. Radhakrishna in his Anthology of Editorials (Memois 51, 61 and 81) had covered wide range of topics such as Geoscience, Mineral Exploration & Exploitation, Mining Industry, Science, Impending Water Crisis in Bengaluru city, Climate and Monsoon, Natural Disasters, Extra-terrestrial Phenomena, outstanding contributions of some eminent persons and important subjects like rural employment, sanitation, environment and human waste disposal. On these subjects he had listed our failures with analysis of what went wrong. In the following pages I have tried to summarize and highlight with occasional comments on mineral exploration, resources, reserves, mining environment, economics of mining and on policy matters related to Acts and Rules published in *JGSI*.

## INTRODUCTION

Some of the biggest controversies and corruption scandals of recent years in India have resolved around allocation of natural resources such as air, land, coal and iron ore. India's billionaires have made their money through natural resources. There is an urgent need for allocating natural resources in a manner that is honest, reasonable, transparent and in the long run beneficial to stake holders. Courts have devoted its valuable time in focusing on contemporary happenings especially their awful dimensions in allotment of leases, illegal mining, degradation of environment and corruptions. The illegalities identified by the courts in the allocation of mines are of two kinds: (i) ineligibility, under the law of State Government Enterprises, Joint Ventures and Private Companies to receive mines; (ii) Malafide exercise of power to allot mines to undeserving applicants. Granting of Mineral Concessions for major minerals is held in tight fists of governments. The State Governments have only powers on paper, the grant of license is within the close control of Central Government. Transactions are by no means transparent, as it is a closed system of State/Central governments and applicants, not open to discussion.

After the courts cancelled the allotted coal blocks, governments are now taking a call to decide which route is better, allotment or auction or tender cum auction. It is argued that mineral being finite non-renewable natural resource, auction is a better option. But auction of these key raw materials is bound to have an inflationary impact across the board be it agriculture, mining of major or minor minerals or service sector. So management of mineral blocks must be dealt in a different manner, keeping in mind the interest of the general public. Existing data, state-of-the-art technology prevents allocation or auction or tender cum auction of blocks until the resources are classified on ground into highest category UNFC code 111 to lowest category 334 under: (a) geological knowledge G1 to G4 (b) project feasibility F1 to F4 and (c) socio-economic viability E1 to E3. Based on the available data from different sources IBM has now classified the mineral resources into different categories of UNFC code (IBM Year Book 2010). These classified reserves and resources have to be identified on the ground in relation to the existing leases and those recommended to the state and central government for grant. This data has to be plotted on cadastral maps and put on website, to enable the government to take a decision on the mode of disposal of pending applications based on existing rules on a case to case basis in a transparent way and evolve a compromise formula where the applicants have gone to courts. Based on the break even cost, concepts, pre-feasibility or bankable study has to be undertaken by earth science professional bodies recognised under the Indian Act similar to the American Institute of Mineral Appraisers (AIMA) dedicated to the advancement of transparent appraisal of minerals to develop international valuation of standards as well as to certify individuals and offer training. These certified trading chains are acceptable to the bankers in assessing loan applications and funding of projects and listing in stock exchange for all demarketed mineral blocks by the Department of Mines and Geology for disposal by allotment, auction, auction-cum-tender or development under PPP model (Sawkar, 2014, MEAI seminar, p.151; Sawkar, 2013, v.82, p.725).

In the absence of clear answers to these questions and policy decisions of the central government based on court orders, the auctions for blocks should answer the following: (i) share of aggregate revenue from scientific sustainable mining regardless of cost; (ii) what is the premium the government is willing to fix to the investors under UNFC classified reserves and resources of different categories from 111 to 334 or will this figure be arbitrary to be decided by the government on a case to case basis from time to time or will there be a transparent mechanism based on

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measurable mineral index parameters; (iii) whether there will be a seamless transition from RP to PL and to ML and conditions for such transfers; (iv) How is the transparent cost of ore/minerals from production center to end user is determined.

The current law does not make investment in industry (based on minerals) a necessary condition for grant of a ML. Steel industry points that investment in industry should be one of the main factor in the decision of the government to give preferntial rights to the industry in the allotment of resources. Mine Owners argue that mining is a risk industry and should be allowed to grow on stand alone basis. Out of the large number of prospects few will turn out to be economical and the profit made by the mine owners will be invested in identifying raw materials for other industries. Steel industry should concentrate on improving steel technology to reduce cost of steel and mine owners should adopt environmentally sustainable mining for supply of ore at reduced costs to the mineral based industries.

## DISCUSSION

Moddie (2002) states that British Rule was a graft on the earlier culture which tried to introduce and even force alien practice over the people of India. The centralized system of British Rule brought in middlemen, contractors and along with it corruption (Theka). Century old systems of local management of natural resources were allowed to decay and die. Minerals became overnight the property of the Government. People were deprived of the benefits of owning mineral-bearing areas and became paupers with no share in the mineral wealth, all the profits being siphoned off by Government in the form of taxes, profit by lease holders and hafta by local leaders. British rulers had no regard for the preservation of India's environment and destroyed virgin forests to own tea/ coffee estates and trade timber. After independence, the practice of expanding estates in virgin forest continue even today. Forest Department which had earlier destroyed virgin forest is now presiding over the environment ministry as guardian and protector of forest wealth. Bhargava and Chakraborti (2002) commenting on the permanent shortage of water, power and minerals points out corruption in all these sectors of our society have acted as major impediment to scientific and technological progress in the country. BPR (*JGSI*, v.61, pp.509-512) considered these actions as the root cause for the failure of all our rural economics development.

Mineral development ventures will no doubt need new skills and workers have to undergo a preliminary course of training imparted by experts invited with suitable practical experience. Such short-term training course would impart training in modern techniques in prospecting and exploitation. The trained persons could later form into groups of smaller companies similar to junior mining companies in Canada and take over the exploration of mineral blocks allotted to them by the Government under MMRD Act with a provision for transfer of lease. There is not even one example where Governments have allotted mineral blocks to technical experts under its discretion. The teaching staff of universities and earth science societies should be involved in this rural educative effort to train mineral prospectors who can be later employed by the junior mining companies. By so doing a considerable employment potential can be generated and a resource presently lying idle can be utilized. This proposal of Radhakrishna on small scale mining (2006) and water supply and sanitation in Indian context (2008) relates to skill development programs, the pet project of Prime Minister Narendra Modi in which Mr. Sarbanada Sonowal, Minister of State for skill development and entrepreneurships proposed to reach 624000 villages spread over 700 districts. Mining companies should identify villages in their area and develop traditional skills in mining, handicraft, water harvesting, agriculture, horticulture and animal husbandry to improve their standard of living by implementing total sanitation and supply of domestic water.

### Panchayats to be Empowered with Leasing and Collection of Revenue

The initiation of small-scale projects under the control of local Panchayats is an experiment worth trying in the selected minor mineral blocks. In the case of mineral resources, village community should have the right not only over the surface, but can also claim on the resource lying below the ground. Where large extents of land are acquired for mining purposes, it is not fair to pay only a nominal amount for surface rights and deny the village community a share in the wealth below ground being exploited. In all such cases, companies acquiring the land should pay the village community compensation commensurate with the percentage sale value of the mineral exploited instead of profit. When the land is acquired for mining from a private owner, he should get market value of land in cash and right share at par for the land value and one employment based on eligibility of the candidate. This formula should be applied prospectively to all blocks allotted or auctioned in future by amending rules under existing and proposed Acts.

### Recollection of Similar Working Schemes Initiated in Karnataka

Nearly forty-eight years ago (1966), an experiment was initiated by the Department of Mines and Geology in Karnataka. A new section of the Department was created solely for the development of Minor Minerals in all the districts of the State with specific instructions to prepare resources maps, identifying the occurrence of minerals like stone quarries, brick kilns and sand, used in construction industry in forest, gomal and private land holdings on cadastral maps (1:8000 or 1:4000 scale). New concessions were granted under minor mineral concession rules Karnataka (1969) on the basis of resources identified. The venture, which started in a small way, developed within a period of two to three years far beyond expectations and scaled newer heights where even multi-national companies with huge resource of capital and latest machinery came forward to organize the ornamental stone industry on a larger scale in Karnataka. Stona Exhibitions were initiated at Bangalore Palace grounds under the leadership of Mr. R. Veeramani, a pioneer in ornamental stone marketing to promote sales. An export demand was created and the income earned by way of royalty alone ran to several hundred crores, far in excess of the revenue earned on major minerals. But this ornamental

stone industry landed in difficulty because of the demand for allotment of share in the Company to influential local people and illegal quarrying in Ilakal village and scam in export of ornamental stones blocks. Karnataka Government resorted to auctioning of illegally mined dimension stones and blocks of areas where illegal quarrying was carried out. This type of illegal quarrying in Karnataka resulted in stunted growth of dimension stone industry in the State and discouraged scientific sustainable quarrying activities by licensed lease holder and encouraged illegal activities in private lands.

**Mineral Industry and Rural Development**

In recent years, the Government of India is enthusiastically pushing through schemes of rural development and employment generation. The minor minerals rules could be extended and grant of short term license permitted with the additional provision that the Panchayat becomes a partner in the scheme to the extent of land within the panchayat limits. The land will be valued in proportion to the mineral wealth below the ground. Being the land-owner, the farmer also becomes a part of the venture and will get annual return out of the profits earned by the panchayats. In the recent FIMI Mining Mazama September 2014, President FIMI stated that mining is taxed very heavily. To this Hon'ble Minister and also Secretary, Mines replied that in spite of this heavy tax, mine owners make profit and there is no equitable distribution of profit for the benefit of local people.

The panchayat will work out an annual budget of receipts and expenditure to be approved at the annual general meeting and start operating within its framework. A Mining and Small Mineral Industries Bureau for group of villages should be constituted with experts which will act as a facilitator in establishing contacts, in securing quarrying/mining leases, environmental clearances and permits from government agencies, and in promoting the development of the rural mining industry by supply of water, power, land and infrastructure. Collection of float iron ore, alluvial gold, alluvial diamond, stone quarrying, brick and pottery making, supplying broken aggregate for road making and railway ballast, sand collection and many other similar small-scale operations can come into existence in most parts of rural India, creating fresh avenues of employment to technically trained men, assuring a fair amount of return on the land as well as labour. In the present set up in the country, every organization (government or private) is concerned with grabbing the land and its resources and throwing the land owner out to fend for himself denying him any share in the profits in the enterprise. This can be better controlled by the government under Panchayat Management rather than Centralized System of Management at the District, State and Central Government capitals.

**Cement Industry and its Effect on the Rural Poor**

The cement industry can be cited as an example of the exploitation of the rural poor. In Andhra Pradesh and Karnataka a large number of cement factories have come into existence in recent years, producing millions of tonnes of cement. Raw materials required are mostly limestone, little amounts of clay, sand etc. Large companies employ heavy machinery for mining, material handling eliminating the labor component. The industry wants land for constructing its factories, and for mining millions and millions of tonnes of limestone. A large quantity of water badly needed by the community is diverted to the use of the industry. The welfare of the human resources living on the land should be their concern. Industry makes huge profits from the enterprise and invests money in putting up magnificent mansions in cities while the poor farmer, once owner of the land which provided the limestone does not get anything. According to existing laws the land-owner has no right over the mineral that lies below surface. Water required by him for his daily needs is also drawn by the industry and in its place dirty and highly polluted water is discharged, ruining the only source of fresh water available to him. Hardly any amount is spent in improving the conditions of the poor living on the land which is providing all the wealth and are reduced to a pitiable condition living on doles from government. There is something seriously wrong with existing laws which deny the village community, land-owner a share of the runaway profit the industry is making, with all the money being diverted to the growth of cities. Deprived of his land and water, denied employment in the industry, the villager is forced to migrate to the cities and slave under deplorable conditions. To him, the mineral industry has not brought any benefits. It stands to reason that a good part of the money earned by the mining industry should be reinvested in the region which provides the resource. Karnataka is the leading state having 30% of the total limestone resources of India. Most of the resources are within the private land holdings. Many new large cement and lime based industries can be established particularly in Hyderabad, Karnataka and Bijapur Districts. A rail link passing through the Centre of limestone resources linking it to Port has a great potential for investment, sustainable development of lime based industries and employment generation.

**Mineral Pronouncements to be followed by Positive Executive Action**

The new mineral policy extended a red carpet and welcomed outsiders to bring new capital and technology but when they came, delayed granting mining leases to them without which no significant advance in mineral development could be effected. Many investors have got disillusioned by inordinate delay, backed out and closed their regional offices in India. The insensitivity of our administrative machinery is proverbial. How to make the administrative machinery move is the biggest task facing the Statesmen. The way out of this impasse is to create for ourselves and to our progeny a better future, depends on our ability to reform and transform our colonially inherited administration consciousness of being masters of the people into true servants of people as Prime Minister Modi expressed in his address on 15$^{th}$ August 2014 from Red Fort.

The mineral industry cannot make much headway unless the policies of granting mineral concessions are quickened. The current enormous and heart-breaking delays will eventually spell disaster and ruin the industry which should have brought prosperity

to the entire neighborhoods. The mineral wealth in the country has brought great prosperity not here at the local level but elsewhere as it has denied benefits to the local people. It is most unfortunate that our leaders, occupying high positions have given least thought to mineral development; their vision apparently does not extend to what lies below ground.

**Policy Matters**

Radhakrishna (2003, *JGSI*, v.61, p.511) states that both nationally and internationally community-based natural resource management systems alone will lead the nations of the world towards a durable peace and development. NGO's such as Sundarlal Bahuguna in Garhwal, Anil Agarwal and Sunita Narain in Delhi, Rajendra Singh in Rajasthan, Balakrishna Hazare in Maharashtra, Meda Patkar in Gujarat, Arundhati Roy in Kerala and Hiremat in Karnataka are fighting against the evil forces at work, official apathy and malfeasance to enlist judicial intervention through public litigation petitions. We are fortunate the Courts of India have struck down the mines allocations, sent several officials and politicians to jails for these wrong doings of public officials in connivance with political bosses. Recent examples are from Karnataka, Jharkhand and Tamil Nadu states and these examples stand as warning bells for such wrong doings. In the present system of centralized administration, sometime honest senior officers are also punished for not applying their mind in passing orders. Moddie (2002) states that there have been delays in judgment's by courts mainly due to introduction of British Judiciary system with its emphasis on "Evidence", which brought with it the evil of "cooked evidence (supported by Vakils or Lawyers). In recent disproportionate assets case against a politician that lasted 18 years in the endless process of gathering and shifting evidence has culminated to send out a tough message to the political class that Indian Courts are willing and able to act in corruption cases concerning them.

S.A. Iyer (Sep 28, 2014–India Times) commenting on the New Coal Policy, following the Supreme Court striking down 214 coal blocks allocation since 1993, calling it writ against corruption and Modi's slogan "Minimum Government, Maximum Governance" comparing the coal production in Australia and India suggested to De-Nationalize Coal, auction all future coal blocks and allow all winners to produce associated gas (Methane) as well as coal, by creating a level playing ground between the public undertakings and private investors.

A.K. Monappa, (DH, 3rd Oct.2014) HGML Managing Director has proposed taking up gold mining outside India. Instead of diverting the HGML capital to mine gold outside India, it is more desirable to utilize the capital of HGML, NMDC, HCL & MECL to develop 337 tonnes of gold resources classified under UNFC STD code 111 to 334 which will generate employment in rural areas. As per the Annual Report for the financial year 2013 of Ministry of Mines, Government of India, India globally ranks No.3 in terms of Coal and Chromite, No.4 in terms of Iron ore, No.5 in terms of Bauxite and No.6 in terms of Manganese ore resources, yet India imports these materials. Just as Gandhiji started revolution in India by urging the masses to burn British clothes wear Kadhi and boycott British goods, we earth scientists and miners too, advocate clearly with regard to use of our own natural resources instead of importing. The current share of mineral production in GDP is less than 2% and as per the plan document, it is projected at 4%. Reserve Bank of India has highlighted the current account deficit due to importing of minerals (Sawkar, *JGSI,* v.82 p.452). Make in India Policy of Prime Minister Modi should be followed to produce steel, cement, gold and other manufactured goods from our own raw materials. In respect of water which is a primary requirement for the sustenance of all living beings, man, animal, or plants there is no equitable distribution. Sugarcane growers have a hay-day in getting more water and better price but the farmers growing ordinary food grains will be starved of water and sustainable price for their produce. Growing sugarcane and exporting sugar means in effect permitting export of large quantities of water from the regions affected by water crisis is a suicidal policy (Radhakrishna, 2009, v.73, p.599-605). Development of water, mineral, forest and air resources should lead to economic freedom and transparent, equitable distribution of wealth.

Radhakrishna and Curtis (1999 in Gold in India) have pointed out that mining is a combination of highly technical operation, in which man puts his mental and physical abilities and knowledge against nature, major decisions require technical support of persons with adequate qualification, training and experience in geology, mining, metallurgy, environment and finance at the Board level. They pointed out that since 1956 when Hutti Gold Mines Company was transferred to Karnataka till 1999 it has had 19 Chairman and 145 changes of Directors. They pointed out that appointment of Board of Directors for brief periods without direct knowledge of imperatives which accompany any mining operations does considerable harm to the company's long term interest. In the Management of Central Government Public Sector Undertakings there is still a continuity of technical support at the Board level but it is lacking in State level Undertakings. While it is a prerogative of the government to change Chairman and Chief Executives, there should be a continuity of Administrative and Technical directors at the board level. The suggestion of BPR that an IAS officer appointed as CEO when transferred should continue in Board to defend the project proposals initiated by him, is invariably opposed by political bosses who change the CEO or new CEO himself opposes it. Only one exception was to continue Chief Executive of Hutti Gold Mines for a period of 5 years during which time major decisions for expansion of the Hutti Gold Mines was taken up to reduce the fixed cost component of labour/wages by increasing the production with available labours. The present ongoing capital investment on deep shaft sinking will progressively convert 533.13 tonnes of resources (*JGSI,* v.76, Sept 2010, p.210) into reserves and will lead to increased production of 7 tonnes of gold per annum and lower the fixed cost. This is possible if there is continuity of CEO at Board level supported by technical directions. But the discontinuity in Management of MML/HGML at the Board level and other State Government Companies has made them less efficient when compared to private sector mineral based companies which have continuity of thinking and implementation.

The best suggestion of BPR & LCC to pay 10% of pay to employees of HGML in the form of gold or as share capital of HGML is also not implemented and they were wondering as to why Labour Unions have not taken up this suggestion seriously. The CEDB in the year 1968 suggested location of steel plants site at Goonda based on the captive mining of Ramandurg iron ore deposit, but the Dutt committtee decided Toranagallu from the point of optimum utilization of large number of iron ore mines, availability of land and infrastructure. Swaran Singh, Hon'ble Minister for Mines in the year 1961 while deciding on location of steel plants stated that captive iron ore mining is not the main crieteria to establish the steel plant (B. Mahabaleswar, Reminiscences, 2013, p.171).

B.P. Radhakrishna (1990, v.36, pp.59-61) states that Government has now disorganized and commercialized the entire old MGD area leaving very little to DMG with no scope for expansion. Administrative officers taking decisions on technical matters, same administrative officers reviewing the performance and senior administrative officers passing the judgments and getting it approved by Ministers is not the correct transparent procedure of administration particularly in the allotment of mining leases. State Government should ensure that the person to be appointed as the head of scientific department is an experienced scientist well versed in his subject and with an established reputation. He should have a good advisory council to outline broad policies to advise the Government on all important matters of geology, mining, metallurgy, environment and finance.

M.J. Akbar (ToI, 2 Nov., 2014) writing on India's public planners state that public sector once in charge of economy, after glory, fell into a grip of stagnocrats that protected the interests of a class, made the partners of politician who converted shattering doctrine into a vote machine. 1990's privatisation was a band-aid to prevent fatality and Dr. Singh asking planning commission to restrospect was too late. Prime Minister Modi's proposal to replace planning commission to enable private sector to become the prime engine of development should not mean exclusivity. India needs an honest business environment, not crony capitalism. The success of private sector lies in the harvest of small businesses and multiplicity of new ideas, born in unknown minds, each with its fertile space in vast and varied garden. The body to replace planning commission should utilize information technology to sift the useful idea from the maverick weed. Akbar's analysis is more correct and applicable to mineral industry.

## CONCLUSIONS

Radhakrishna (April 1992) while writing on (Wrong Priorities) suggested creation of Gold Authority of India similar to ONGC with Special Financial and Administrative Powers, solely for exploration of gold occurring in different parts of India. Sawkar (Sept. 2010) based on capital cost, breakeven cost of mining, price of gold, indicated that Gold Mining Industry can become an engine of change in many rural areas where gold deposits are located and suggested constitution of Karnataka Gold Authority fully empowered to take decisions with a view to stepping up production of gold in Karnataka. Sawkar (Nov. 2013) has suggested creation of Kappatgudda Development Authority empowering the local Panchayat to consider and recommend land use pattern for storage of water, development of ground water zones, cultivation of medicinal plants, development of gold mines and wind power. Development of Gadag Gold Project will be precursor for development of 58 tonnes of gold per annum from 7 centres of production, to generate more than one lakh direct employment.

Pichamuthu (Sept. 2011, p.258) writing on Mineral policy stated that amendments to the MMRD Act in 1994 and 1999, which was further re-inforced by the NMP 2008 have been sought to be reversed in the proposed MMRD Act. He suggested that proposal should include disposal of R.P. PL & ML applications within the time frame of 6, 9 & 12 months respectively, in a transparent way with a clause of seamless migration from RP/LAPL to PL to ML. He further suggested that government should pay attention to infrastructure particularly ports and railways and treat investors, entrepreneurs, mine operator's, local people as partners in development and create task force to implement the suggestions. Pichamuthu in his 'A vision for the Mineral Sector' gives a historical perspective of Mysore Geology Department and concludes that the market determines the production of steel and not the proximity to the iron ore deposits. He also suggests that government should forge a true friendship with the mining industry.

The Government of Karnataka under the direction of Hon'ble Supreme Court has now approved the establishment of the "Karnataka Mining Environment Restoration Corporation (KMERC)" under the Companies Act to implement the comprehensive environment plan for mining impact zone (CEPMIZ) through a special purpose vehicle (SPV) funds (Govt-order no.C1- 121-MMM2014 BAN dated 21-6-2014). Considering this development is restricted to only three districts (Bellary, Chitradurga and Tumkur) Sawkar (Aug. 2014 p.248) suggested that there is a need to bring in further changes in mineral policy, so that transparency in allocation of all mineral resources, to optimize revenue, generate employment, to increase GDP with societal concerns, to preserve environment and avoid unscientific illegal mining. He has suggested that the Department of Mines & Geology (DMG) at the State Government level should be strengthened to manage and administer the mineral resources. To operate mines in Karnataka in a more professional manner, B.P. Radhakrishna and Curtis (1994, p.1) writing on the new mineral policy suggested forming an autonomous commission fully empowered to take appropriate decisions and draw up programmes both for short term and long term for the developing mineral industries in the state as was done under Govt.order No. C & d. 60-67 – Geo 108-53-2 dated 6th April 1954 for exploring the possibilities of improving the mining industry in the Mysore State. The DMG by outsourcing the work through commission should obtain all statutory clearences for ML, PL and RP blocks and prepare model concession agreement (MCA) for development of different category of mines for transparent method of allocating of mining blocks.

Venugopal (2014, p.23) commenting on 63,935 applications

pending in different states from few years to decades writes that the problem of mining industry can be solved only if the state/ central governments create mining zones through special legislation and create special purpose vehicle for fast track statutory clearances.

While land is classified as forest, revenue, gomal and private, there is no land classified as mineral bearing land. State Government should declare mineral bearing land for scientific development of mineral resources. Once this is notified, any other agency which wants to take up other than mineral development should seek permission from the Directorate of Mines & Geology (Sawkar, 2014, p.248).

Recently Earth Science Associations from different parts of India have formed a "Federation of Indian Geoscience Association" (FIGA) with a mandate to promote and advance Earth science in all its branches. FIGA members should break the system and suggest transparent method of allocating natural resources for society at large in a transparent way and suggest development of different branches of sciences to achieve international standards.

It is high time the country and those responsible for its governance take note of these basic facts. In the present practice of mining, the rich will continue to get richer and the poor, poorer, creating a lot of unrest in every part of the country. This is an example of iron ore mining particularly in Karnataka. In the euphoria of economic boom and galloping trade indices, the steep economic gradients being generated between the urban-rich and rural poor is glossed over. Mineral Industry has a good potential for rationally distributing wealth if proper policies are followed. **Great statesmanship on the part of government to appoint autonomous commission suggested by Radhakrishna (2003) and intelligent leadership at the local level is called for to see that mineral development benefits the largest number of people.**

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