# The role of state mining enterprises in the Indian mineral industry — an overview

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Four decades of development experience in India's mineral sector underscore the size and central role that the *State Mineral Enterprises* (SME) have assumed in stimulating mineral development plans. The evolution of the public sector in the post-independence era reflects the nation's commitment in striving towards economic development and desired social change, bereft of any ideological slants. Even if the growth of the sector has been partly directed and developed without a conscious policy, it is worthwhile to trace the developments and analyse how the sector stands today and the roles that it has assumed. The evolution of the SMEs in Indian economy is a fascinating saga. From the conception of the captive mines of Bhadravati Steel Plant of the former Mysore Government to the collieries owned by the Railways, the discontinuous jump in the size and diversity of state mineral enterprises stem from the Industrial Policy Resolution of 1948, which has been the sheet anchor of the mixed economic system in India. Since then, and aided by the Industrial Policy Resolution of 1956, the development of state-owned enterprises has veritably been phenomenal.

The impressive breakthrough of Indian mineral economy has paralleled the development of SMEs. From an aggregate value of total mineral production of 500 million Indian rupees (MINR) around independence (1947), to well over 92 GINR in 1986, an increase of some 180 times over four decades. The percentage share of mining and quarrying in the gross domestic product at current prices was 3.1% during 1984-85. The role of the SMEs and their spectacular spread effects in mineral development over the past decades has been examined elsewhere (Ghose, 1983). In terms of quantity, the percentage share of the SMEs of the current mineral production is well over 97%.

Recent years have however witnessed a major shift in the government attitude towards SMEs, primarily because of the failure of the sector to generate investable surplus — and the poor rate of return on the invested capital has come under heavy fire. Most of the SMEs failed to meet the target of 10% profitability during the Sixth Plan (1980-85). This however need not be considered as an indictment and is probably being experienced in LDCs around the world (Ghose 1986). The performance of the SMEs in developing countries has become one of the top priorities of policy makers.

The paper will seek to present a conspectus of the evolution of SMEs in Indian economy, their extensive ramifications and their contributions. It will also seek to address the issues of performance evaluation of the sector and the problems implicit in any such exercise.

## Emergence of the public sector — the highlights

India is one of the pioneers among the developing countries to use the state enterprises as a major vehicle for social and economic transformation. The primary challenge facing the Indian planners at the time of the attainment of political independence was to break away from the classical characteristics of a stagnant, dualistic and colonial economy and to set in motion a self-sustaining growth process to achieve the twin objectives of self-reliance and redistributive justice. The instruments adopted for achieving a socialistic, planned economy speedily were the public sector enterprises operating within the framework of a mixed economy.

The Industrial Policy Resolution of 1948 demarcated clearly the sphere of ownership and management of the means of production between public and private sectors across major industrial segments of the national economy. Coal and lignite were identified as key industrial segments under the role of exclusive state responsibility to initiate and establish new units, while regulation by the state was envisaged for the mining of

major metallic and non-metallic minerals.

The Industrial Policy Resolution of 1956 reflected the urge of the national planners towards planned and rapid development of the minerals sector. The state, under the new imperative, assumed direct responsibility for a large sector of the mineral industry. The minerals were divided into three categories: the first category comprehends coal and lignite, mineral oils, mining of iron ore, manganese ore, chrome ore, gypsum, sulphur, gold and diamond, mining and processing of copper, lead, zinc, tin, molybdenum and wolfram and atomic minerals (Schedule A); the second category includes all other minerals except minor minerals which constitute the third category. Under this policy initiative, the public enterprises in the minerals sector have captured the "commanding heights" of the mineral economy.

Table 1 (in Appendix) presents the salient statistics of mineral production in India and the dominant share of SMEs.

The SMEs have indeed been an effective vehicle for mineral development in India as reflected in the success of the overall policy in achieving the following objectives:

(i) Meeting the target for burgeoning mineral demand.

(ii) Creation of an infrastructure for economic development.

(iii) Development of backward regions and creation of employment opportunities.

(iv) Extensive forward and backward linkages in the economy.

(v) Betterment of the socio-economic conditions of the workforce.

(vi) Investment of risk capital in exploration and major mining ventures which would not have been otherwise possible.

(vii) Assisting the development of small-scale and ancillary industries.

(viii) Attaining commanding heights in the economy.

While the Industrial Policy Resolution spearheaded a purposive thrust of public sector growth, the means dimension has been through entrepreneurial substitution, entrepreneurial support and managerial substitution. The setting up of the Mining and Allied Machinery Corporation, represents a decisive thrust towards entrepreneurial substitution, while Coal India Limited or Hindustan Copper Limited represent an attempt towards a contrived monopoly in a strategic sector. Even in the canalisation of products, such as the export of minerals, entrepreneurial support is provided through such organisations as Minerals and Metals Trading Corporation Limited or the Mica Trading Corporation Limited. According to Section 617 of the Indian Companies Act 1976, a Government Company is that in which not less than 51% of the paid-up share capital is held by the Central Government or any State Government or Governments or partly by the Central Government and partly by one or more State Governments.

Judged by this criterion, there are currently some 60 state mining enterprises in India involved in the production of minerals and metals, manufacture of mining machinery and explosives and for trading and marketing of minerals.

If one surveys the current industrial scene, the motives dimension of the SMEs spans over a wide range, from ownership of natural monopoly to that of contrived monopoly, from development of equity, growth and self-reliance to conservation of productive capital and preservation of employment.

## The achievements

The quantum jump in India's mineral production and a wide range of fall-outs in socio-economic benefits stem from the economic precepts contained in the Industrial Policy Resolutions. This has culminated in a vastly developed SME structure, in almost all sectors of the mineral economy from exploration to exploitation, from manufacturing to canalisation of exports. The inroads of the SMEs into the economy is reflected in the fact that currently the minerals sector contributes to over 3.3% of GDP; it has also subserved effectively the nation's commitment towards self-reliance, going its own way without the intervention of multinationals.

The spectacular increase in mineral exploration effort has been made possible entirely through state owned organisations, especially with the establishment of the *Mineral Exploration Corporation Ltd* (MECL) in 1972. Over the years, the MECL, the Geological Survey of India and exploration wings of the SMEs have launched a massive exploration effort leading to major discoveries and bridging the time gap between the discovery of a mineral prospect and their eventual exploitation.

Table 2 (in Appendix) shows the augmented national mineral resource inventory between 1950 and 1984, which makes evident the inputs in exploration and high success ratio achieved by state-owned agencies. In the Seventh Plan period (1985-90), some 4.4 million metres of drilling is planned by the SMEs. Amongst the notable achievements of the state owned agencies in their exploration efforts are:

- Discovery and detailed proving of vast bauxite deposits in the states of Andhra Pradesh and Orissa.
- Locating the single largest lead-zinc deposit of Rampura-Aguscha in Rajasthan.
- Identifying the phosphorite deposits in Rajasthan and Uttar Pradesh.
- Discovery and detailed proving of the copper deposit at Malanjkhand in Madhya Pradesh.
- Evaluation of a large 2 Gt iron ore deposit at Chiria in the State of Bihar.

During the Sixth Plan, the state owned MECL executed some 9.5 million metres of drilling, some 50 km of exploratory mining and prepared 92 final geological reports of mining prospects on a contractual basis. The organisation has also contributed to the optimisation of the exploration effort in the country, the introduction of new technologies in drilling and is currently exploring the possibility of undertaking projects on a contractual basis in the international market. Overall, the sizable inputs of state owned organizations have had a marked impact on India's mineral inventory and detailed proving of deposits for exploitation.

While bauxite mining in India dates back to 1908, the development of the industry had to await expansion of alumina refining and smelting plants during the 1940s. Since then, with the entry of SMEs and particularly of *Bharat Aluminium Company Limited* (BALCO) in 1965 and the *National Aluminium Company Limited* (NALCO) in 1981 a major structural transformation has been underway and expansion has been substantial. The production of aluminium metal has increased from a mere 5 kt in 1950 to about 264 kt in 1985-86; with the going on stream of NALCO in 1987 — one of the largest bauxite-aluminium complexes in Asia — the total installed capacity will reach some 580 kt/y. The creation of the gigantic NALCO complex with an investment of nearly 24 GINR has elevated the nation to the status of an exporter in aluminium. There has been a major and decisive effort on the part of the state to launch the SMEs to meet the ever-growing needs of this versatile metal. From conception to production, the NALCO has been the epitome of a highly efficient and fully-modernised bauxite mining activity and has to its credit several "high-tech" applications including the installation of a cable belt conveyor with multiple curves over a distance of 14.6 km.

Yet another success story of a high-performer amongst the SMEs in India has been that of the Neyveli Lignite Corporation. Set up in 1956, the Neyveli Lignite Complex has over the past decade made a significant contribution to meeting the energy needs of South India and has evinced dynamic growth. This is the first mine in the country where giant-sized Bucket Wheel Excavators and continuous transportation systems were used for continuous mining with unique application tackling the most intractable overburden formations vis-a-vis diggability, and meeting the challenge of managing the problems of groundwater with a difficult confined aquifer. Technological breakthroughs apart, the NLC has also been a high performer vis-a-vis capacity utilisation. In 1985-86, the thermal power station achieved a plant load factor of 75% against the national average of 52.4%; the capacity utilisation for the mines and thermal power stations has been over 115%. The SME has also evinced excellent financial performance. Of the authorised capital of 1 140 INR crores (1 crore=10 million), investment in the Corporation up to December 1986 was 967.3 crores and during 1985-86 the Corporation made a net profit of 546 MINR. Currently, the capacity of the first mine is being expanded to 10.5 Mt/y and of the second mine to 4.7 Mt, while a third mine with a capacity of 11 Mt/y is being planned.

There are examples galore of specific achievements of SMEs in India. The following is a summary of those achievements.

### Production performance

Most SMEs have exhibited high capacity utilisation vis-a-vis targets set, despite serious constraints of power availability throughout India.

### Technology upgradation

Majority of the SMEs have been the harbingers of high technology in an essentially low technology mining arena in India. Introduction of bulk mining methods in Hindustan Copper Limited, conception and planning of giant surface mines of Coal India Limited, the island of high technology for iron ore mining at Kudremukh and many others attest to the efforts of SMEs in technology transfer and diffusion.

### Environment and ecology

The inevitable degradation of the environment, especially in such fragile environments as in Kudremukh or Singhbhum, has been kept in view in major mine development programmes being executed by the SMEs, who have discharged their obligations through appropriate environmental control measures. The responsible corporate attitude towards environmental care and management policy espoused by the SMEs is worthy of being emulated. Most of the non-coal projects have planned excellent facilities for tailings disposal according to best available technology and pollution control has been included as a key area in all new projects. Measures for soil conservation and afforestation have been implemented. The Neyveli Lignite Corporation, in the coal sector, has undertaken a massive programme of afforestation and appropriate measures for environmental control.

### Development of ancillary industries

The SMEs have given a purposeful thrust towards the mandate of promoting ancillary units, service units and small-scale industries and the falls-outs in terms of economic and industrial growth have been impressive.

### Regional development and the government's 20 point programme

The SMEs have by and large fulfilled their societal obligations and concerted efforts have been made to raise the weaker sections of the society in the neighbourhood, improving the infrastructural base of the mining belt, im-

proved welfare measures, including health and education.

The SMEs' efforts for the development of the hinterland and the protection of employment can best be illustrated by the example of *Pyrites, Phosphates and Chemicals Limited* (PPCL) which operates a pyrite mine in the remote and relatively undeveloped Rohtas District of Bihar State. Following the stoppage of the use of acid-grade pyrites by the sole consumer Fertilizer Corporation of India at Sindri, the PPCL authorities initiated a major measure to rehabilitate the project and avert lay-offs and closure. A project has been undertaken to set up a single superphosphate plant of 625 t/day capacity with imported raw materials besides a 240 t/day sulphuric acid plant. The integrated facilities at Amjhore will comprise an expanded pyrite mine, a beneficiation plant for upgrading the run-off-mine grade pyrites to concentrate containing 38% sulphur and roasting of pyrite concentrates for production of sulphuric acid. The project includes many proven and not so proven technologies, including the use of photometric-ore sorting and fluidised bed roasting.

SMEs have also had a creditable record in export earnings, and measures for safety and human resource development. It would appear therefore that state intervention in the mineral development process has spawned wide and far-reaching effects on the economy and the SMEs represent today a major instrument in the pursuit of sectoral objectives. We can now examine some of the apparent "failures" of the SMEs in terms of enterprise performance.

## The failures

On the bleaker side, the failure of the SMEs to generate investible surpluses as well as the poor rate of return on invested capital have in the past five years given rise to serious concern. Despite administered prices and operation in near-monopoly situation, there is increasing demand that the "enterprise dimension" of the SMEs should deserve closer scrutiny. While they are providers of infrastructure, they should also be financially viable and they need to earn profits to grow and fulfil their objectives. The sub-optimal performance of the SMEs, and of public sector enterprises in general, has imposed severe strains in the national plan and budget, calling for massive transfer of resources from the government budget to SMEs, not only for new investment but also to cover working capital needs or current deficits. Additionally, the SMEs (at least some of them) have shown deficiencies concerning under-utilisation of production capacity and productivity, and promotion of indigenous self-reliance through research and development efforts.

While the problems of the evaluation of performance are many and varied, and will be discussed later, one can examine performance using the yardstick of financial profitability. Table 3 (in Appendix) shows the operating results of selected SMEs for the past five years covering some of the giants like Coal India Limited and its subsidiaries as well as small SMEs such as Sikkim Mining Corporation. It is evident that, barring a few bright stars, the overall performance of the SMEs has fallen short of the commercial yardstick. While a whole host of reasons could be adduced to explain away the results, including acute power crisis, non-availability of essential inputs and problems of industrial relations, there is no doubt that there are a few sick SMEs too. Major criticism of the state-owned enterprises has been made recently by the Union Minister for Energy who authored an article on "The Millstone of Public Sector" (Sathe, 1986). The article brought out the significant causes of failure, such as high labour-intensiveness, which "arise from a misplaced concept of socialism which equates over-employed, inefficient and unaccountable public sector with socialism". While the criticisms are somewhat sweeping, it is undeniable that the performance of the SMEs, despite their commanding heights, leave much to be desired.

In the area of productivity again, performance has been none too satisfactory. Even though labour productivity is at best a partial measure, one can review the productivity figures of Coal India Limited in Table 4 (in Appendix). Despite massive inputs of capital of nearly 60 GINR, and serious efforts made in introducing new technology, productivity has by and large stagnated.

The objective of preservation of employment in public enterprises emerges as an obvious cause of set-back in managerial efficiency. Apart from productivity, there have been major time overruns in implementing projects, adversely affecting their viability (Ghose and Chowdhury, 1987).

## Evaluation of SME performance – unresolved issues

The Industrial Policy Resolution of 1956 suggested that the public sector should be judged by "total results". The problems of evaluation of the total results however are complex, as the SMEs pursue a number of objectives simultaneously and a single measure of performance is difficult to specify. Performance per se can be defined in terms of success in achieving stated objectives, and in principle the process of performance evaluation would follow a step by step procedure of identifying the objectives set for the SME, constructing performance indicators to measure the degree of attainment of these objectives, and measuring the aggregate performance (Kirkpatrick et al, 1985). There are many imponderables, however, as the objectives are seldom stated clearly or unambiguously. Even if a set of objectives can be identified, it will be difficult to devise a satisfactory procedure

for multiple-goals performance assessment. While measures of economic efficiency are often used pragmatically, this is by no means straightforward or rational, as in all public sectors, as an instrument for implementing public policy: social welfare costs are to be borne and these create problems in the accounting framework. Whereas the SME is expected to carry out some "non-communal" objectives, the benefits are difficult to quantify. It seems inescapable therefore that monetary performance in terms of financial profitability has to be supplemented and the performance criteria could include, inter alia, financial performance, productivity and cost reduction, technical dynamism and effectiveness of project implementation.

Realizing the critical role assigned to the public sector in the mobilisation of resources in the Seventh Plan, the government of India set up in 1984 a high level committee headed by Arjun Sengupta to review and suggest policies for improving the performance of public enterprises.

The report of the committee made two major recommendations. One related to the performance of a chief executive of a public enterprise who should be evaluated on the basis of an agreed set of clear targets. The second recommendation related to the need for development of an appropriate information system capable of monitoring public enterprise performance in terms of these targets. The committee also suggested three criteria to evaluate the financial performance of public enterprises.

The Arjun Sengupta Committee report has inevitably faced some measure of criticism, but some of its basic recommendations are in the process of being implemented (Trivedi, 1987). It is worthwhile to note that for SMEs, an initiative had been taken early in 1983 to establish a covenant of performance aims and financial targets to which both sides stood committed — the SMEs for achieving the financial and production targets and the government for rendering all necessary support to them for fulfilling the tasks. The Department of Mines had also institutionalised an "early warning" management information system whereby the physical as well as financial performance of each SME was reviewed at the end of every month and each quarter vis-a-vis the targets. The provision of managerial incentives linked to performance had also been identified (Department of Mines, 1984).

The current debate in India on the performance of public enterprises is a reflection of the urgent imperative of a new role for the enterprises where the state would wish its structure more viable and cost-effective so that it does not act as a drag on the rest of the economy and is able to generate investible internal surplus. In the face of the severe global resource crunch, it is imperative that the latent inflationary tendencies of the economy be contained within reasonable bounds. In the new environment, the government expects the private sector as well as the public sector to be more efficient and competitive.

The new role of generating and releasing investible resources for economic development assigned to the public enterprises are highlighted in the Seventh Plan document which states that "only in the measure that the public sector generated investible surpluses can it play its indispensable social role providing an adequate infrastructural base for the economy, being a vehicle for the introduction and absorption of new technology in crucial sectors of the economy and for achieving balanced regional growth".

Accountability in the context of a well-defined performance criteria is thus being increasingly projected for the SMEs. This has invariably raised the issues of the degree of autonomy enjoyed by the state enterprises, their organisational structure and relation with the government, the system of performance evaluation and accountability. The interface between the government and the enterprise vis-a-vis strategic issues like commitment of resources choice and direction of business, appointment of top management team and their tenure and the interface between the government as share holders and owners with the enterprise is creating serious problems of implementation. The definition of parameters against which the performance of an enterprise is to be judged becomes vital. The state enterprises are expected to sign a sort of "memorandum of understanding" with the government agreeing to work towards stated objectives and committing themselves to achieve the targets set, as has already been done for some SMEs.

## Concluding remarks

The SMEs in the Indian economy have assumed a pivotal position with the dominant share of mineral production; the net contributions have also been many and varied with impressive achievements on several counts. Their size, inevitable political interface and lack of clear-cut guidelines for accountability have raised major problems of evaluation of their performance on "total results". Of late, the SMEs have come under increasing public scrutiny; their critical role in the mobilisation of resources for a propulsive thrust in the national economy for the current and future plans call for a major focus of interest. As new challenges and opportunities present themselves, the SMEs will grow bigger and more diversified with greater spread-effect impacts. The current debate on their performance will hopefully lead to some course corrections and appropriate means and measures can be marshalled and put to work so that the SMEs can be more productive. The interface with the government has to be carefully defined so that they have the flexibility to operate within clear-cut guidelines and continue to fulfil their obligations to the nation in terms of

quantitative targets of production and productivity, investible surplus and social responsibilities.

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**Table 1**
**Mineral production in India and share of state mining enterprises**

| Mineral | | Production(kt) | | | % Share Public & Private | | |
|---|---|---|---|---|---|---|---|
| | | 1983 | 1985 | 1986 | 1983 | 1985 | 1986 |
| | India | 710 | 925 | 595 | — | — | — |
| Apatite & Phospgorite | Public | 707 | 921 | 592 | 99.48 | 99.57 | 99.50 |
| - | Private | 3 | 4 | 3 | 42 | .43 | .50 |
| - | India | 24 768 | 29 450 | 25 515 | — | — | — |
| Asbestos | Public | 1 025 | 2 471 | 2 191 | 4.14 | 8.39 | 8.59 |
| - | Private | 23 743 | 26 979 | 2 3324 | 95.86 | 91.61 | 91.41 |
| - | India | 312 | 575 | 350 | — | — | — |
| Barytes | Public | 196 | 114 | 113 | 62.82 | 19.83 | 32.29 |
| - | Private | 116 | 461 | 237 | 37.18 | 80.17 | 67.71 |
| - | India | 103 | 2 268 | 2 345 | — | — | — |
| Bauxite | Public | 10 | 616 | 619 | .97 | 27.16 | 26.40 |
| - | Private | 93 | 1 652 | 1 726 | 99.03 | 72.84 | 73.60 |
| - | India | 364 | 576 | 638 | — | — | — |
| Chromite | Public | 161 | 300 | 358 | 44.23 | 52.91 | 56.11 |
| - | Private | 203 | 276 | 280 | 55.77 | 47.09 | 43.89 |
| - | India | 3 301 | 4 200 | 4 388 | — | — | — |
| CopperOre | Public | 3 301 | 4 200 | 4 388 | 100 | 100 | 100 |
| - | Private | — | — | — | — | — | — |
| - | India | — | 16 271c | 1 610 | — | — | — |
| Diamond | Public | — | 16 171c | 1 610 | — | 100 | 100 |
| - | Private | — | — | — | — | — | — |
| - | India | 2 184 | 2 236 | 2 138 | — | — | — |
| Dolomite | Public | 961 | 764 | 739 | 44 | 34.17 | 34.57 |
| - | Private | 1 233 | 1 472 | 1 399 | 66 | 65.83 | 65.43 |
| - | India | 666 | 697 | 586 | — | — | — |
| Fireclay | Public | 47 | 53 | 59 | 7.06 | 7.60 | 10.07 |
| - | Private | 619 | 644 | 527 | 92.94 | 92.40 | 89.93 |
| - | India | — | 4 163 | 6 503 | — | — | — |
| Fluorite | Public | — | 2 940 | 4 190 | — | 70.62 | 64.43 |
| - | Private | — | 1 223 | 2 313 | — | 29.38 | 35.57 |
| - | India | 470kg | 452kg | 423 | — | — | — |
| Gold | Public | 470kg | 452kg | 423 | 100 | 100 | 100 |
| - | Private | — | — | — | — | — | — |
| - | India | 972 | 1 289 | 1 599 | — | — | — |
| Gypsum | Public | 855 | 1 149 | 1 429 | 87.96 | 89.14 | 89.37 |
| - | Private | 117 | 140 | 170 | 12.04 | 10.86 | 10.63 |
| - | India | 38 412 | 44 186 | 47 352 | — | — | — |
| Iron Ore | Public | 18 822 | 21 185 | 23 635 | 49 | 47.95 | 49.91 |
| - | Private | 19 590 | 23 001 | 23 717 | 51 | 52.05 | 50.09 |

**Table 1 con'd**
**Mineral production in India and share of state mining enterprises**

| Mineral | | Production(kt) | | | % Share Public & Private | | |
|---|---|---|---|---|---|---|---|
| | | 1983 | 1985 | 1986 | 1983 | 1985 | 1986 |
| - | India | 541 | 758 | 705 | — | — | — |
| Kaolin | Public | 29 | 39 | 19 | 5.36 | 5.15 | 2.70 |
| - | Private | 519 | 719 | 686 | 94.64 | 94.85 | 97.30 |
| - | India | 39810 | 30574 | 31261 | — | — | — |
| Kyanite | Public | 23453 | 16441 | 21242 | 58.91 | 53.77 | 67.95 |
| | Private | 16357 | 14133 | 10019 | 41.09 | 46.23 | 32.50 |
| Lead & Zinc | India | 974 | 1487 | 1489 | — | — | — |
| Concentrates | Public | 974 | 1487 | 1489 | 100 | 100 | 100 |
| - | Private | — | — | — | — | — | — |
| - | India | 37253 | 48385 | 51650 | — | — | — |
| Limestone | Public | 8568 | 9545 | 8866 | 23 | 19.73 | 17.17 |
| - | Private | 28685 | 38840 | 42784 | 77 | 80.27 | 82.83 |
| - | India | 450 | 421 | 430 | — | — | — |
| Magnesite | Public | 263 | 240 | 275 | 58.44 | 57.01 | 63.95 |
| - | Private | 187 | 181 | 155 | 41.56 | 42.99 | 36.05 |
| | India | 1311 | 1259 | 1272 | — | — | — |
| Manganese Ore | Public | 616 | 648 | 670 | 46.99 | 51.47 | 52.67 |
| - | Private | 695 | 611 | 602 | 53.01 | 48.53 | 47.33 |
| - | India | 7512 | 4875 | 4753 | — | — | — |
| Mica | Public | 52 | 53 | 342 | .69 | 1.09 | 7.20 |
| - | Private | 7460 | 4822 | 4411 | 99.31 | 98.91 | 92.80 |
| - | India | — | 987 | 922 | — | — | — |
| Silica Sand | Public | — | 10 | 23 | — | 1.01 | 2.49 |
| - | Private | — | 977 | 899 | — | 98.99 | 97.51 |
| - | India | 9304 | 17123 | 14059 | — | — | — |
| Sillimanite | Public | 6475 | 16098 | 13404 | 69.59 | 94.01 | 95.34 |
| - | Private | 2829 | 1025 | 655 | 30.41 | 5.99 | 4.66 |
| - | India | 281 | 345 | 350 | — | — | — |
| Steatite | Public | — | — | — | — | — | — |
| - | Private | 281 | 345 | 350 | 100 | 100 | 100 |
| - | India | 134.8 | 149.2 | 166.8 | — | — | — |
| Coal | Public | 131.8 | 145.6 | 163.0 | 97.8 | 97.6 | 97.7 |
| - | Private | 3.0 | 3.6 | 3.8 | 2.2 | 2.4 | 2.3 |
| - | India | 6.7 | 7.8 | 7.9 | — | — | — |
| Lignite | Public | 6.7 | 7.8 | 7.9 | 100 | 100 | 100 |
| - | Private | — | — | — | — | — | — |

**Table 2**
**Evolution of national mineral resource inventory for important minerals (in kt)**

| Minerals | 1960 | 1970 | 1980 | Current position |
|---|---|---|---|---|
| Coal | 41 000 | 74 000 | 112 000 | 159 299 |
| Lignite | 2 000 | 2 268 | 2 100(+) | 3 300 |
| Bauxite | 74 | 227 | 2 489 | 2 653 |
| Chromite | 5 | 14 | 111 | 135 |
| Copper ore | 33 | 243 | 455 | 566 |
| (metal) | (0.30) | (3.2) | (5.7) | (6.29) |
| Ironore | 6400 | 10 200 | 17 600 | 17 600 |
| Lead Zinc | 9 | 107 | 350 | 358 |
| (Lead metal/Zinc metal) | (0.13/0.31) | (2.2/3.7) | (4.6/12.2) | |
| Manganese ore | 100 | 80 | 117 | 135 |
| Nickel ore | — | 15 | 160 | 160 |
| Berytes | 0.7 | 7 | 73 | 74 |
| Dolomite | 301 | 1 778 | 5 086 | 5 086 |
| Fireclay | 7 | 316 | 359 | 359 |
| Gypsum | 966 | 1 190 | 1 205 | 1 249 |
| Ilmenite and rutile | 356 | 133 | 69(-) | ? |
| Kaynite | 1.2 | 3.8 | 3.0 | 3.0 |
| Limestone | NA | 50 000 | 63 000 | 73 199 |
| Magnesite | 104 | 524 | 211 | 239 |
| Phosphorite (including apatite) | 9 | 60 | 139 | 187 |
| Sillimanite | 0.3 | 0.3 | 12 | 17 |
| Steatite | Na | 8 | 15 | 58.2 |

**Table 3**
**Financial performance of SMEs**

| Name Of Undertaking | Net profit (+)/Loss(-), (in MINR) | | | |
|---|---|---|---|---|
| | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
| Hindustan Zinc Ltd (1966) * | (-)101.4 | (+)20.0 | (+)12.7 | (+)3.7 |
| Hindustan Copper Ltd (1967) | (-)296.3 | (+)2.7 | (-)32.65 | (-)277 |
| Mineral Exploration Corporation Ltd (1972) | (-)35.5 | (-)7.3 | (+)11.4 | (+)8.5 |
| Sikkim Mining Corporation(1960) | (-)1.56 | (-)0.54 | (+)0.18 | (+)0.50 |
| Bharat Gold Mines Ltd (1972) | (-)27.3 | (-)54.9 | (-)120 | (-)176.9 |
| Bharat Aluminium Co. Ltd (1965) | (-)528.4 | (-)3 13.0 | (-)773.7 | (-)147.5 |
| Coal India Ltd (1975) ** | (-)58.4 | (-)2 438.3 | (-)770.8 | (-)4 041.8 |

* Year of incorporation.
** Accounting data relates to Overall Coal India Limited excluding Central Mine Planning and Design Institute Ltd.

**Table 4**
**Productivity trends in coal industry**

| | Overall output per manshift (tonnes) | Output per manshift in underground mines (tonnes) | Output per manshift in opencast mines (tonnes) |
|---|---|---|---|
| 1974-75 | 0.58 | 0.54 | 0.76 |
| 1975-76 | 0.66 | 0.60 | 0.90 |
| 1976-77 | 0.67 | 0.61 | 0.82 |
| 1977-78 | 0.68 | 0.60 | 1.05 |
| 1978-79 | 0.67 | 0.57 | 1.13 |
| 1979-80 | 0.68 | 0.55 | 1.26 |
| 1980-81 | 0.72 | 0.54 | 1.51 |
| 1981-82 | 0.77 | 0.55 | 1.81 |
| 1982-83 | 0.79 | 0.52 | 1.99 |
| 1983-84 | 0.82 | 0.53 | 1.97 |
| 1984-85 | 0.87 | 0.53 | 2.10 |
| 1985-86 | 0.91 | 0.53 | 2.20 |

**Note:**
The data relate to revenue mines of Coal India Limited.
**Source:**
*Operational Statistics*, 1974-75/1984-85, Coal India Ltd.