CHAPTER III

HISTORY OF THE INDIAN COAL MINING
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Coal, the "Black diamond", was known to man from ancient times. What gave coal a world wide recognition were the use of coke for smelting iron in and around 1750. The introduction of Watt's steam engine and the introduction of gas lighting in 1807 - these two incidents had paved the way for the important recognition of coal. An engineer named Murdock first utilised the gas generated from coal in 1792, for illuminating his house.

There has been evidence that, in India, coal was being mined even before 1600 A.D., particularly, in Raniganj coalfield. The people of Midnapur used to come by the river Damodar with the boats loaded with salt and they sold it to the trader and they used to load the boat with coal on return journey and that very coal which they collected from Raniganj coalfield again they sold it to merchants. Thus the coal was then used as an item of business for a long time.
The Battle of Plasey marked the beginning of the economic ruin of Bengal and the Indian industries including the coal industry. The coal industry then existed in and around Kalipahari, Dishergarh and Barakar. The later half of the 18th century was one of the darkest periods in the eventful history of India and Bengal. When the East India Company assumed the Diwani in 1765 from the Puppet Nawab, Mir Kasim, the state of affairs in Bengal greatly deteriorated.

The East India Company's policy was mainly dominated by commercial interest along with the Company's trade, servant of the Company also carried on their private trades not in a very clean way. This resulted in a total breakdown of the political and economic structure of the Country. Along with other industries the coal industry which then existed in a miniature form was completely uprooted. But the Company needed coal for military purposes.

In the year 1774 two Englishmen Messers Suctionious Grant Heatley and John Summer claimed to have discovered certain coalmines in Panchet and Birbhum. Both of them were in the service of the East India Company. On the 11th of August 1774, they submitted an application to Warren Hastings for grant of lease/licence for working coalmines and selling coal in Bengal.
They were granted permission and began operating from October 1877.

The above coal-mining firm obtained the exclusive right for a period of 18 years to work and sell coal in Bengal. They had to pay royalty of one fifth of the value of all the coal raised by them to the Government. They also agreed to supply Government with ten thousand maunds of coal a year for a period of 5 years.

As early as in 1804, the existence of coal at Burdwan was also observed by the officers of a Regiment Machinery across the district. They communicated it to Col. Hardwick who was then in-charge of the ordinance work. He again observed that discovery of this coal promised no advantage for the use of blacksmiths in iron works. The Army Authorities of the East India Company also examined the Indian coal for their Company's requirement. They also expressed the negative verdict about Indian coal. Thus for this prejudice against the Indian coal, the then Governor General Lord Minto inclined to support this problem and the subject of India's coal mining dropped out of notice for sometime.

The abolition of East India Company's trading monopoly in 1813 had opened the way for rapid development of private Commercial enterprises.
In 1814 the Marquis of Hastings, Lord Moira, Governor General after Minto urged upon the military Board to ascertain the quality of the Indian Coal. They announced that a fully qualified person would be appointed to examine the Coal mines of India. For experimental purpose Chinakuri was suggested as a suitable site. Previous experiments was discarded owing to coal being obtained from near the surface.

First Coal Company:-
Mr. Jones with the help of government was enabled to work the seam discovered at Raniganj. He received an advance of Rs.40,000/-. In 1820 he came to a failure and could not repay the loans, Messers Alexander and Company, an agency house, paid the demand and took over the mining rights and became the owners of the colliery. Thus the Raniganj Mine was the first Indian Coalmines under European Supervision which was opened in 1820.

After 1820, other Coal mine under European management were opened in the Raniganj Coalfield in quick succession.

(1) In 1823 - Chinakuri Colliery
   - By Mr. Belt on site of Heatley's old workings

(2) In 1824 - Damulia Mine -
   By M/s Jessop and Co.

(3) In 1830 - Chanch
   By Mr. Hunfray
According to Thomas Bracken esq. by that time extensive mine workings were being carried out at Raniganj. The Raniganj coalfield was again briefly referred to by De la Beche, in his geological Manual 1833.

With the introduction of steam engines, the demand of coal increased and in 1831, again, an extensive mine workings were carried out at Raniganj.

M/s Alexander and Company eventually failed and then the Raniganj Mine with all its lands and buildings passed into the hands of Prince Dwarakanath Tagore (Grand Father of the Poet Rabindranath Tagore). Carr. Tagore and Company was formed with Prince Dwarakanath as the principal partner of his firm for running the Raniganj Mine in a big way. He wanted to expand his coal business and in 1837 his firm Carr. Tagore and Company purchased the Chinakuri Mines.

In 1837, Prince Dwarakanath Tagore went out of India. In the meantime Chanch, Nuchbad mines passed into the hands of M/s Gilmore, Hanmfray and Company. Prince Dwarakanath came back in 1842 with one George Thompson in his
company and found the affair of his firm in an unfortunate stagnation. In 1843 M/s Carr. Tagore and company and M/s Gilmore Hamfrey and Co. were amalgamated with a capital of Rs.11 lakhs. This company was registered in 1843 as a Joint Stock Company.

This joint stock company was named as the Bengal Coal Company Limited. The birth of the Bengal Coal Company on the very soil of Raniganj marked the first organised attempt on the part of certain European merchants, aided by an enterprising Indian, to utilise coal in this country.

It is interesting to note that a museum of Economic Geology was established in 1840 in Calcutta with the sanction of the Hon'ble Court of Directors and H. Piddington Esqr. of the Asiatic Society was placed in-charge of the collections. Experienced miners were sent out to India from England to import practical assistance in the opening and workings of the mines.

During the years 1845 and 1846, the Raniganj Coal field was first systematically mapped and reported upon. M.D.H. Williams, who had been attached to the Geological Survey of Great Britain and had been engaged in an examination of the South Wales Coalfield, was appointed to the Geological Survey or to the Honourable East India Company and was deputed to Bengal in 1845.
His report dated 7th December 1847, was not published till 1850 i.e., after his death. This report had been commented on in detail by Dr. Blanford.

In 1842, the annual demand of coal was assessed to be 40,000 tons as against capacity of collieries - all in the Raniganj coalfield at that time. The following figures are on record.

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal output (in tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1815-1823</td>
<td>400</td>
</tr>
<tr>
<td>1832</td>
<td>10,000 - 14,000</td>
</tr>
<tr>
<td>1839</td>
<td>36,000</td>
</tr>
<tr>
<td>1846</td>
<td>91,000</td>
</tr>
</tbody>
</table>

(3 years after the formation of B.C.L.) * 1

One great impetus to the development of the Coal industry came from the demand for coal for steam navigation. The inland steam transport depended on the supply of coal received in Calcutta from the Raniganj coalfield. In fact, boating facilities on the Damodar, sometimes on the Ajoy, especially during monsoon, regulated the early prospecting of coal in Raniganj belt. So navigation through such rivers caused interruption in the supply of coal to Calcutta. In the rainy season the transport cost always had a increasing tendency for the hazards of the river.

The first steam boat was imported from England in 1825 which, perhaps did not help movements to any considerable extent, but it is the anticipator of coal movement which served as an incentive to open up the second railway line in the country.

On the 18th February 1852, the first locomotive was witnessed starting near Byculla flats in Bombay. On 18th November 1852 the Company's Directors with some of their friends travelled in India's first railway train from Bombay to Thane covering a distance of 21 miles in 45 minutes and the formal inauguration ceremony was performed on 16th April, 1853. The first passenger train steamed out from Howrah to Hooghly a distance of 24 miles, started on 15th August 1854.

The opening up of second Railway lines between Howrah and Raniganj on Saturday 3 Feb, 1855, brought a remarkable change in the production of coal in the country in general and Raniganj field in particular. This Railway line was opened for serving mainly the coalfields in and around Raniganj. The opening up of railway lines began to relieve the collieries which were suffering from many transport difficulties and gave a fresh impetus to the coal industry to grow and a greater need for finding more coal sources was felt. The railways began to serve not only as a carrier but as a potential bulk consumer of coal. In 1855-56, railway sidings
were being installed at certain collieries in the Raniganj area and a coal depot was opened on the E.I.R. near Calcutta and Baidyabati. In 1858-60 Messers WT Blanford and W.L. Willson mapped the Raniganj geologically and established a standard clarification of the rock gray comprised in the lower Gondwana system. With this geological knowledge the Raniganj coalfield was extended upto Barakar and further development of the Raniganj field was assured. After the introduction of Railway line in 1855 the out turn of coal increased to 220,000 tons.

The total annual production in 1859-60 was about 90,79,000 Maunds from the Coalmines spread over in 7 zones. The amount of Coal production of 7 zones are given below.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Coal production (annual) (in Maunds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>44,50,000</td>
</tr>
<tr>
<td>II</td>
<td>22,39,000</td>
</tr>
<tr>
<td>III</td>
<td>3,30,000</td>
</tr>
<tr>
<td>IV</td>
<td>6,20,000</td>
</tr>
<tr>
<td>V</td>
<td>3,70,000</td>
</tr>
<tr>
<td>VI</td>
<td>6,50,000</td>
</tr>
<tr>
<td>VII</td>
<td>4,20,000</td>
</tr>
<tr>
<td></td>
<td>Grand Total 99,79,000</td>
</tr>
</tbody>
</table>

* 2 Seminar on Planning and Reconstruction of Raniganj Coal Field, February, 1982.
* E.I.R. - East India Railway.
At that time Bengal Coal Company was the largest Coal Co. and Baboo Gobind Pandit was the closest rival. Baboo Govind Pandit was the Raja of Searsole. He was a reformer also and contributed to many community developments including the development of the G.T. Road from Raniganj point to Asansol.

The significant contribution of Indians in the early development of the Coal industry cannot be ignored although their collective importance was then slight. The contribution of Prince Dwarakanath Tagore was a very notable one. In 1859, for example, of the 17 Coal concerns 12 were Indians of which one, that of Gobind Pandit's. Another impetus to early Indian participation came from Mukunda Laik and Jadav Lal Banerjee, who were petty employees of the Bengal Coal Co. In 1878, they along with Harishchandra Mukherjee of Birbhum, formed a partnership firm, Messers Laik and Banerjee and began prospecting and opening of collieries specially in the Jharia field, besides Begunia and Barakar coalmines in the Raniganj field. Another notable Indian was N.C. Sirker, (N.C. Sirker and Sons,) who came to the field of production in a big way sometimes later.
The period 1850 to 1870 witnessed the floatation of large joint stock coal companies like the American firm of Messrs Apear and Co. and the Equitable Coal Company which disturbed the monopolistic position of Bengal Coal Company which it had so long been enjoying.

In 1873, the Coal industry was joined by two more entrants. Raniganj Coal Association, with Kilburns the Managing Agents and New Birbhum Coal Company which in turn had taken over the properties of one of the very first Coal entrepreneurs M/s Eraskin and Company. In 1878 Birds took over the Managing Agency of the Barakar Coal Company from Moe Allisters.

Meanwhile both the Jute industry of Bengal and the Cotton textile industry of Bombay had emerged in the industrial horizon of India. Bengal Iron and Steel Co. (BISCO) established their iron foundry near Kulti in 1874. Subsequently in 1891, the first paper mill - the Bengal Paper Mill went into production creating more potential markets for Coal.

The Bengal Chamber of Commerce which stemmed from Calcutta Chamber of Commerce interested itself in the development of the Coal industry in India and was urging
the extension of the railway system which in turn depended upon adequate supplies of coal. In the meantime, in 1879, the Railway had already begun to operate its own collieries. And then there was a vigorous protest against state trading in competition with private enterprise in coal which E.I.R.* authorities had begun to sell to the general public.

In 1890 Lord Cross proposed to the Government of India to introduce Mines Safety law in India. In 1891 the Government first proposed to apply the provisions of the Factories Act to coalmining. It led to the formation of a sub-committee of Bengal Chamber of Commerce. At a meeting of the Mines Sub-Committee, the Indian - Mining - Association (I.M.A.) was formed on 6th May, 1892 under the Chairmanship of G.M. Gray. It was the first trade association.

In 1885 the total output of coal crossed the million tonnes (1.3 million tonnes). But the Raniganj field alone was having 90 mines out of a total of 95 in India. It was since 1894 till 1900 that there had been a considerable expansion in the Raniganj field. And the Raniganj coalfield produced nearly 3 million tonnes of coal in the year 1900 out of a total Indian production of 6.1 million tonnes with the Jharia field as its closest rival.

* E.I.R. - East India Railway.
In the early years of the twentieth century Raniganj coalfield started losing its supremacy, so far maintained in yearly Coal production, to the already developing Jharia Coalfields. The Jharia Coalfields in the Damodar Valley is the most important Coalfield in the country - both in regard to its potentialities and development. Extraction of Coal by "pillar and stall" system was in vogue with varying degree of success. The following four are the most prominent Coal Companies till 1900.

(1) The Bengal Coal Company
(2) The Equitable Coal Company
(3) The New Beerbhum Coal Company
(4) The Raniganj Coal Association

In 1944, at the end of the second World War, the Colliery Control order was promulgated by the Government of India in the interest of consumers.

To meet the growing demand of Coal for the Nizam's State Railway and the Madras and Southern Maharatha Railway, the collieries were purchased by the Singareni Collieries Company Limited (S.C.C.L.) in 1921.
In 1945 the Government of the Nizam of Hyderabad purchased all shares of the Company at London Stock Exchange and the collieries came under the ownership of the Indian Trust Fund of the then Nizam's Government. The Hyderabad Construction Company Limited was appointed as its managing agent. The Singareni Collieries Company Limited (S.C.C.L.) has thus the distinction of being the first Govt. owned Coal Company in India.

The Indian Mines Act, 1923 became applicable to the Mines of S.C.C.L. only in 1948 after the takeover operation of the State of Hyderabad by the Indian Government. The Company is now a joint undertaking of the Government of India and the State Government. The work force employed in S.C.C.L. was about 83000 in 1982. It is likely to increase to 91000 by the end of the VII plan period.

In December, 1945 the Indian Coalfields Committee, headed by K.C. Mahindra (Head of the Indian Supply Mission) was set up. This Committee put up a comprehensive report in September, 1946. It examined the Coal resources of India, history of Coalmining and the future growth of Coalmining industry.
The Mahindra Committee recommended that the good coking coal should only be used for iron and steel industry and made proposals for regulation of its use.

This Committee also opined that the private ownership of mineral rights in the permanently settled areas of Bengal/ Bihar had been responsible for harmful consequences and so the only solution was the State acquisition of mineral rights. Control on the production distribution and prices of Coal was first imposed in 1944 and a revised order was issued in December 1945.

In 1947, the new Government of India came in with a national mineral policy, which emphasised self-reliance in the key industrial sectors. This meant a strong measure of government control.

This is, in short, the background story of the coalmine in India before Independence.

The working party for the Coal Industry was formed in 1951. It included representatives of Coal industry, Labour and Government. According to that Committee the small and fragmented producing units should be amalgamated and recommended legislation to permit the Government to amalgamate such colliery units for the interest of the Country.
The Estimates Committee of the Lok Sabha (1954-55) took notice of the evidence submitted by different agencies. The Government officials strongly expressed their views on the status of the industry. The Committee came to conclusion that in the long run nationalisation of Coal industry is essential in the interest of industrial development.

According to this Estimate Committee "If nationalisation is postponed by 25 years and the industry is given a free hand, there will be little left at the end of the period for the country to take over; we will be left with a number of units which if not affected by underground fires, and other hazardous conditions, would be uneconomic to work." 

The Government again set up the Committee on Amalgamation of Collieries in November, 1955, with Balwantrai Mehta as Chairman to examine the problems of amalgamation of collieries in depth.

According to this Committee the safety and conservation of collieries should be reviewed by a statutory body and amalgamation of the various undertakings, wherever necessary should be made. However, non-contiguous collieries need not be amalgamated.

*3 Nationalisation Efforts - The Background and Takeover - Coal Mining In India A CPDIL Publication, New Delhi - November, 1994.
Any colliery not producing about 10,000 tonnes per month or had an area less than 100 acres, should be amalgamated with one or more collieries.

These recommendations were accepted by Government. But for some due consideration it was decided to postpone enactment of the legislation till the middle of the Second Five Year Plan.

The Industrial Policy Resolutions of 1948 and 1956 had laid down that the growth and development of all key sectors of economy like coal in the country had, necessarily, to be under the State protection. Also, the idea of a master plan for coal mining development was discussed variously in 1948, 1949 and 1950, and the Chief Mining Engineer, Railway Board had prepared a plan showing the actual and potential capacities of the different coalfields, simultaneously assessing the coal requirements of the country. The Second Five Year Plan document acted as a straight guideline for future action and the net effect was the launching of the National Coal Development Corporation Limited (N.C.D.C.) with a nucleus of 11 State-owned collieries. The N.C.D.C. was also given the task of expediting the development of the outlaying coalfields.
On the 5th of September, 1956 the National Coal Development Corporation (N.C.D.C.) entered the Coal arena, when 11 State - Railway Collieries located in three states and four coalfields were amalgamated.

The State collieries which N.C.D.C. inherited were being managed departmentally by the Government of India. With the emergence of the N.C.D.C. a new organisation was evolved, in order to correspond to the tremendous task and expectations facing it during the Third and subsequent Plan periods.

The mine planning activities of the N.C.D.C. which might appear rudimentary compared to the present day standards does credit to the Corporation in that, it has started mine planning as early as in 1958. The project reports prepared in those days, would seem to be rather sketchy in style and content - at least it so appears today, but the facts remains that those were the basis of the comprehensive Coal Planning.

N.C.D.C. as a name, had a very short spell of life. It afterwards merged in the total nationalised sector in the year 1974 and got organisationally assimilated in Central and Western Division of C.M.A.L. *

* C.M.A.L.- Coal Mines Authority Limited.
After the Third Plan, production increased and subsequently witnessed a decline. Inadequacy of wagons for transport and increased use of other fuels, particularly, oil in areas where coal could have served as well - all contributed to coal production stagnating to the level of around 70-million tonnes per year.

In the Fourth and Fifth Five Year Plans greater emphasis was given for the development of the iron and steel industry; so the question of conservation and scientific development of coal resources of the country including coking coal was a very important matter.

The coking coal mines, which were then operated by private ownership, managed those mines in a most unscientific and wasteful manner. An asset like coking coal needed an urgent attention, measures had to be taken immediately to stop wastage and further ruin. The manner of functioning coal mines was bound to result in serious damage to the mines and reserves. Therefore the coking coal mines were taken over for public management on the 16th October, 1971 for the purpose of protecting, conserving and promoting scientific developments of the resources of coking coal which is needed to meet the growing requirements of iron and steel industry.
National Coal Development (N.C.D.C.) was the major agency in the public sector as far as non-coking coal was concerned. Apart from N.C.D.C. and Singarani more than 70% of non-coking coal production of private sector come from Bengal-Bihar area, which contains superior grades of coal and has traditionally been the supplier of good quality coal to distant parts of the country. Private collieries in Bengal-Bihar area were generally organised in the form of small coal companies.

As far as planned development was concerned, the public sector was going ahead with major plans for opening new mines but private sector collieries were not coming forward with new investment. Even in the case of large companies, the investment from their own funds has been meagre. Major companies, such as Karamchand Thapur, Bird and Co., Bengal Coal (Andrew yule) and Shaw Walace hardly added a few errors to their equity in the entire period of a decade.

Non-coking collieries constitute an important sector of industrial employment in West Bengal. But the industry was in a woefully bad way. About 40 out of 232 working collieries were closed and quite a few large ones are on the verge of closure. Corrupt practices had led to the complete erosion of capital and reserves whatever little
working capital and collieries had been created by defaulting public dues. The collieries as a whole, owe about Rs.24 crores on account of Royalty to the State Government besides huge liabilities of Sales tax, Provident Fund, E S I (Employees' State Insurance) Income tax dues.

This miserable condition called for a drastic remedy.

Mohan Kumermangalam, the then Minister of Steel and Mines, the architect of coal nationalisation had given a vivid description of the coal industry in his book "Coal Industry in India ". According to his description in Jharia and Raniganj Coalfield, workers were cheated of their legitimate dues, slaughter of mine, lack of conservation and unscientific methods remained characteristic of large areas of the industry. " Lathials " or muscle men protected the interest of the mine-owner, corruption, forced labour, dubious and duplicate records, non-payment of full wages, extended hour of the shift, lack of safety and welfare, measures robbing of pillars in a haphazard manner etc., seemed to be the guiding principles of a large number of the private collieries.

The working conditions in private collieries were deplorable, characterised by ruthless exploitation of labour, non-implementation of wage Board Awards, and unwillingness to act upon labour laws.

The private employers indulged in a variety of malpractices in respect of labour. Illegal deduction from wages were common. Beside the avoidance of provident fund by manipulation of records, private collieries were guilty of default in depositing the provident fund dues with the Coal Mines Provident Fund organisation. So the workers did not have the job security or job benefits.

The extensive fires and collapses were the result of unscientific mining. Mine ventilation was poor, support inadequate, violation of mine safety laws were widespread. A dangerous situation had thus developed and the Govt. could no longer remain a passive spectator.

When the voluntary amalgamation of small collieries into larger units did not take place, and compulsory amalgamation of the collieries was found difficult, the only alternative left to the Govt. was the nationalisation of coking-coal mines. The coking coal mines were taken over for public management on the 16th October, 1971 with the object of reorganising and reconstructing the coking coal mines as well as coke oven plants for the purpose of protecting, conserving and promoting scientific development of the resources of coking coal needed to meet the growing requirements of iron and steel industry.
Even after taking over the management of coking coal mines by Government in October, 1971, the private owners of the non-coking coal mines were indulging more than ever, in unhealthy mining practices. In mid-January 1973, all the Trade Union centres joined together in organising a general strike of mine workers with the demand of nationalisation of all coal mines. Rational and co-ordinated development of coal industry, consistent with the principles of mineral conservation, has been the plea behind the nationalisation of Coal industry in many foreign countries as in U.K., France, East European countries. The take-over of the non-coking Coal mines was thus a response of the historical situation. The Coal mines ordinance 1973, (Taking over of Management) came into force from 30th January, 1973. It marks the end of an era of unhealthy and unscientific mining along with exploitation of labour and other malpractices. The rapidly growing demand for coal during the preceeding national five years plans, the heavy investments were inevitable in the coal sector. Considerable pressure was built up which ultimately resulted the decision of the Government to take over the entire coal industry.
Although nationalised sector in coal was also in existence in the form of S.C.C.L. and N.C.D.C., share of these early state-sector undertakings was only 26.3% at the time of nationalisation. The Government acted very timely and took over 214 coking coal mines in October, 1971 leading to the formation Bharat Coking Coal Limited (B.C.C.L.). This was followed by take over of over 700 mines in non-coking coal sector in January 1973. This Nationalisation Act was passed on the 17th May, 1973.

The Mines were nationalised and brought under the Management of the Coal Mines Authority Limited (C.M.A.L.). Later on, the C.M.A.L. and B.C.C.L. were merged and a holding company Coal India Limited was formed on the 1st November, 1975.

The organisational set up in the Coal industry can be assumed from the following table. This also mention the other State undertaking, namely, the Singarini Collieries Company Limited (S.C.C.L.) and three captive mines' organisation which together contribute about 10% of coal production in the country.
<table>
<thead>
<tr>
<th>Company</th>
<th>Subsidiary Company</th>
<th>Operational Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(b) Bharat Cooking Coal Limited (BCCL)</td>
<td>Mainly Jharia coalfield.</td>
</tr>
<tr>
<td></td>
<td>(c) Central Coalfield Limited (C.C.L.)</td>
<td>Coalfield of Bihar Orissa and Singrauli Coalfield.</td>
</tr>
<tr>
<td></td>
<td>(d) Western Coalfield Limited (W.C.L.)</td>
<td>Coalfield of M.P. and Maharashtra.</td>
</tr>
<tr>
<td></td>
<td>(e) Central Mine's Planning and Design Institute Limited</td>
<td>Planning Unit for Coal India Ltd., Godavari Valley Coalfield, Andhra Pradesh.</td>
</tr>
</tbody>
</table>
After nationalisation the smaller mines were organisationally combined into larger mine units on a rational basis. In place of 900 and odd small mines existing earlier, the number of mines functioning company-wise in the nationalised sector, were reduced to less than 330. The break-up was as follows:

<table>
<thead>
<tr>
<th>Company</th>
<th>No. of mine units</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEC</td>
<td>40</td>
</tr>
<tr>
<td>ECL</td>
<td>120</td>
</tr>
<tr>
<td>BCCL</td>
<td>85</td>
</tr>
<tr>
<td>CCL</td>
<td>53</td>
</tr>
<tr>
<td>WCL</td>
<td>65</td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td>Singareni Collieries</td>
<td>10</td>
</tr>
<tr>
<td>TISCO</td>
<td>6</td>
</tr>
<tr>
<td>IISCO</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>327</strong></td>
</tr>
</tbody>
</table>

The process of synthesis helped by coalfields studies and with formulation of master plans has been a continuous process to reach an optimum mine size.
The coal exploration programme was initiated by the middle of 1973. Within a decade's time, exploration techniques have advanced to a great extent. To expedite exploration work in coal industry, gradually, open hole drilling coupled with high revolution seismic reflection survey, geophysical logging etc. are being introduced to replace the practice of continuous core drilling. Modern seismic geophysical methods are being adopted in developing mines from underground workings itself.

Computerisation of geological data has also been introduced for summarisation and processing of enormous information. Exploration programme is not confined only to the limit of planning and opening of a new mine project. It is being extended to keep continuous watch on geological incidences in a developing mine, specially in relation to logging of shafts, mapping of underground geological features to ensure more accurate projection of data for further development work in coal mines.

One of the most significant achievement has been the emergence of the Central Mines Planning and Design Institute. This Institute is likely to be expanded by creating additional centres of activity, namely Detailed Design and Construction Wing for washaries and also additional Regional Institute for better distribution of the planning work load.
After nationalisation, development of number of big underground mines have been taken up and shaft sinking for mine interior accelerated. The overall productivity has also gone up. In open cast mines productivity rise has been even sharper. A sharp improvement in Mine's safety can be seen after nationalisation. The safety standards planned for achievement in 1985 have already been achieved. Inadequacy of the salary structure has been largely removed.

Quality-wise, coal of Raniganj measures are mainly high volatile medium to non-coking types and provide major bulk of superior quality Coal in the country. This formation contains excellent semi-coking coal in Raniganj Coalfield.

Good quality non-coking coals are essential for manufacture of paper, cement, fertilizer, synthetic, oil etc. A recent estimate of good quality non-coking coals with low sulphur content reveals a reserve in coalfields of Damodar, Koel and Sone-Mahanadi Valleys. Out of this coal reserves the major bulk (65%) is lying only in Raniganj Coalfield in the easternmost part of Damodar Valley Coalfield.

The State-owned Eastern Coalfields Limited (ECL) drew up a programme to raise over 20,000,000 tonnes of coal in 1979/80 to meet the country's growing demand.
True, there is an uncertainty in future projections and there is always a difference between the projected demand and the actual materialisation. Still, it is essential to have projections in future, because it indicates the trend of the development which is required.

The working group on energy policy and the Department of Science and Technology are the two sources from whom we can get the projected demand of energy consumption in 2000 A.D. There is not much of difference between the figures arrived at by the Coal India and the report of the working group of energy policy. For the making of our future demand project the energy G.D.P. elasticity is a very important factor, GDP elasticity for this country is very high compared to advanced countries.

The following Table will show the energy GDP elasticity of India as well as different countries in the world.
### Energy G.D.P. Elasticities in selected Countries.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>France</td>
<td>0.76</td>
</tr>
<tr>
<td>Germany</td>
<td>0.73</td>
</tr>
<tr>
<td>U.K.</td>
<td>0.42</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>0.81</td>
</tr>
<tr>
<td>U.S.S.R.</td>
<td>0.84</td>
</tr>
<tr>
<td>India</td>
<td>1.8</td>
</tr>
</tbody>
</table>

The main reason for high energy G.D.P. elasticity in India is inefficient fuel utilisation. Another reason is that, in India, the ratio of coal to other forms of energy is very high compared to other countries and coal conversion is always inefficient. So it is a very important need in our country to increase the efficiency of fuel utilisation.

In implementing a programme to raise coal production the Indian Government has sought assistance from the United Kingdom, France, Poland and West Germany. The Government has already signed agreement with the Soviet Union and Poland. Denomen colliery of Raniganj coalfield area is now going to be fully mechanised with the help of Poland.

Under the agreement with the Soviet Union, Soviet engineers will assist the Indian Coal industry with design and survey work, supply mining equipment and materials and also arrange for the training of Indian personnel in the Soviet Union. The engineers of the U.S.S.R. are now giving assistance to the development of Jhanjra coalmine in the Raniganj coalfield area.

The Government expanded and strengthened the existing agencies and institutes and started a chain of national laboratories, the most prominent being the Central Fuel Research Institute, National Metallurgical Laboratory etc. The underlying idea was to investigate all aspects of the mineral industry and formulate policies and guidelines for their rapid development. The implementation of the project has also to be accelerated.

In short, we can say the coal industry is now aspiring for new light and new move. More emphasis should be given on the development of human resources by improving of skills and training.