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Report No. 15238

PROJECT COMPLETION REPORT

INDIA

**JHARIA COKING COAL PROJECT
(LOAN 2498-IN)**

December 29, 1995

**Energy and Infrastructure Operations Division
Country Department II
South Asia Regional Office**

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CURRENCY EQUIVALENTS

(As of May 30, 1994)

Currency units	=	Rupees (Rs)
One Rupee	=	US\$ 0.316 (approx.)
One US Dollar	=	Rs 31.6

MEASURES AND EQUIVALENTS

1 Million cubic meters of gas	=	37 million cubic feet of gas
	=	6,500 barrels of oil
	=	890 mt of oil
	=	1,940 mt of (Indian) coal
1 British thermal unit (Btu)	=	0.252 kilocalories
1 m ³	=	cubic meter

ABBREVIATIONS AND ACRONYMS

BCCL	-	Bharat Coking Coal Ltd.
CCL	-	Central Coalfields Ltd.
CIL	-	Coal India Ltd.
GOI	-	Government of India
NCL	-	Northern Coalfields Ltd.
NHPC	-	National Hydro Power Corporation
NTPC	-	National Thermal Power Corporation
PAF	-	Project-affected family
PAP	-	Project-affected person
SAIL	-	Steel Authority of India Ltd.

FISCAL YEAR

April 1 - March 31

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THE WORLD BANK
Washington, D.C. 20433
U.S.A.

December 29, 1995

Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on India - Jharia Coking Coal Project (Loan 2498-IN)

Attached is the Project Completion Report on the India - Jharia Coking Coal Project (Loan 2498-IN, approved in FY85), prepared by the South Asia Regional Office, with Part II prepared by the implementing agency.

The project, which closed at the end of 1993, had two objectives: to increase the output and productivity of coking coal production, and to raise the quality of coking coal supplies to the steel industry. The US\$248 million loan consisted of two subcomponents: the first, was to develop an open cast mine to produce 2.5 million tons per year of raw (unwashed) coking coal; and, the second, to develop a highly mechanized underground mine, with its dedicated washery, to produce 3 million tons per year of raw coking coal. In addition, the project was designed to assist the implementing agency, Bharat Coking Coal Ltd. (BCCL)- - a subsidiary of Coal India Limited (CIL)- - in three important areas: underground mine operating practices, shaft sinking and transportation of stowing materials.

The first component ran into difficulties with resettlement of the families residing at the site of the open cast mine. By the end of 1993, only 160 families out of a total of 711 had been resettled. The remaining families demanded employment for all individuals above 18 years of age. While the company had provided employment for 247 project affected people in the first group, it could not accommodate such a large number, given its already overstuffed organization. The company, therefore, decided not to resettle the remaining families and to reduce the mining area. Consequently, production only reached 600,000 tons of raw coal in 1993.

In the underground mine, after the sinking of the first shaft it was discovered that the actual geology of the mine differed considerably from the initial assessment, because of the presence of dikes, faults and other anomalies. This precluded the large scale introduction of mechanized equipment, effectively destroying the mine's profitability. The component was canceled, leading to the cancellation of a large part of the loan. The studies related to shaft sinking, underground mine operating practices and transportation of stowing materials were completed, but the results can only be of use in future operations. With the partial cancellation of the open cast mine component, out of a loan of US\$248 million, only US\$55.3 million was disbursed. The reestimated ERR for the open cast mine is reported at 28.2 percent.

Based on the above, the project outcome is rated as unsatisfactory and its institutional development impact as modest. The sustainability of the reduced open cast mining operation is, however, rated as likely because of the existence of sufficient reserves, the operational capability of the company and the low cost of its operations. Bank performance is also rated as unsatisfactory

Lessons include the importance of careful Bank appraisal of the technical and geological aspects of mining projects and the risks of overreliance on Borrower's assessments of mining potential. In projects requiring substantial resettlement and land acquisition, the Bank needs to ensure that satisfactory plans to deal with families to be displaced are in place at an early stage.

The PCR is of satisfactory quality. An audit is planned.



Attachment

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PROJECT COMPLETION REPORT

INDIA

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(LOAN 2498-IN)TABLE OF CONTENTS

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PROJECT COMPLETION REPORT

INDIA

JHARIA COKING COAL PROJECT
LOAN 2498-IN

PREFACE

This is the Project Completion Report (PCR) for the Jharia Coking Coal Project in India, for which Loan 2498-IN in the amount of US\$248 million was approved on March 7, 1985. The loan was closed on December 31, 1993, one year behind schedule. US\$192.7 million of this loan have been canceled; US\$165.3 million, when a review of the geological conditions for the Pootkee-Bulliary Underground Mine component indicated that the original mine design could not be implemented and no other economically viable option could be found; US\$25.0 million, when a change in the layout of the BlockII Opencast Mine, caused by the inability of the implementing agency to satisfactorily resolve a dispute over compensation to land owners, led to a corresponding change in the list of required equipment; and US\$2.4 million, as a result of lower-than-projected equipment cost. The remainder of the loan was fully disbursed. The last disbursement was in July 1993.

The PCR was jointly prepared by the Energy Division of the India Country Department (Preface, Evaluation Summary, Part I and Part III) and the Borrower (Part II).

Preparation of this PCR was started during the Bank's final supervision mission of the project in January 1994, and is based, *inter alia*, on the Staff Appraisal Report; the Loan and Project Agreements; supervision reports; correspondence between the Bank and the Borrower; and internal Bank memoranda.

PROJECT COMPLETION REPORT

INDIA

JHARIA COKING COAL PROJECT PROJECT LOAN 2498-IN

EVALUATION SUMMARY

Objectives

The Jharia Coking Coal Project had two major objectives: One, to raise the output, recovery and productivity in the field of coking coal production through the development of (i) the Block II opencast coal mine, the first large scale opencast mine to be implemented by BCCL and (ii) the Pootkee-Bullinary mine, the largest underground mine, in terms of output (3 million tons per year), in India. And, two, to raise the quality of coking coal supplies to the steel industry through the development of a sector-wide action program to improve coking coal quality and by expanding the production of mines yielding high quality coking coal. Both, the output from the Pootkee-Bullinary mine and from the Block II opencast coal mine were to augment the supplies of high quality coking coal.

In addition, the project was designed to extend the Bank's assistance into three important areas: (i) underground mine operating practices (improved procedures for underground mining using highly mechanized equipment); (ii) shaft sinking (improved efficiency through better organization and more modern equipment); and (iii) transportation of stowing materials (study of alternative modes of transportation of sand for stowing).

Implementation experience

While the project was designed well, expectations with regard to the ability of the implementing agency to deal with difficult resettlement issues and the assessment of geotechnical conditions for highly mechanized underground mines were overly optimistic.

Implementation of the Block II Opencast Mine affected 711 families or 4266 persons (assuming a household consists on average of six persons). BCCL informed the Bank that it has up to now resettled 160 families (or 960 people). The company has built two resettlement sites, complete with infrastructure facilities and civic amenities, to house all project-affected people, and provided employment for 247 project affected people. At this point, a deadlock has been reached since the remaining 551 project-affected families (or 3306 people) refuse to vacate their houses on the project site unless BCCL offers employment to every person above 18. The mine area had to be re-designed to enable some mining to be done at a much-reduced annual tonnage, while deploying less equipment than was originally scheduled. In addition, mine operations have also been severely affected by major underground fires in the coal seam.

The Pootkee Bulliary underground mine had to be canceled altogether since it was found, on detailed examination, that geological conditions would allow the deployment of only a fraction of the scheduled fully-mechanized longwall equipment scheduled in the original design and that the resultant revised economic evaluation did not satisfy the minimum acceptance criteria of either the Government's Public Investment Board or the Bank.

Results

The original project objectives were not achieved. The Pootkee Bulliary underground mine component had to be canceled. The Block II opencast mine, due to land acquisition problems and underground mine fires, is currently producing only about a quarter of its design output tonnage; it is unlikely to ever produce more than a half of its design tonnage.

In retrospect, too much was taken for granted at appraisal, in respect of both the geological conditions at Pootkee Bulliary underground mine and the ability of the mining company to deal with the resettlement of project-affected people residing within the surface area of the Block II opencast mine.

A comparison of the actual financial (6.9%) and economic rates (38.6%) of return for the Block II Opencast Mine with the projections at appraisal shows a significant decline in the financial rate (12% at appraisal), but an improvement in the economic rate of return (28.2%). This result is due in part to the fact that only part of the projected efficiency gains were achieved and the divergence between economic prices of coal (based on imported Australian coal) and the prices BCCL realizes.

Sustainability

Based on BCCL's current projections the Opencast Block II mine will be operated for another 15 years, until 2009. Assuming the coal company continues to succeed in keeping the mine-fire, that currently affects operations, under control, the project is expected to continue to yield modest financial and satisfactory economic returns. While BCCL management insist that they will reach two million tons per annum in the following years, the Bank's engineer's opinion is that less than half of that annual tonnage will ever be achieved.

Findings and lessons learned

It is clear that too much optimism was expressed in the initial assessment of the ease of compensating, moving and resettling the population residing on the Block II opencast mine area. There are opinions expressed by both CIL and Bank staff that Bank involvement in coal mining projects in which major resettlement is necessary generates feelings among the potential oustees that they can obtain far better terms than could be expected otherwise. In both this, the Jharia project, and the Sonapur Bazari component of the Coal Mining and Coal Quality Improvement project (which is currently being implemented), land acquisition difficulties have resulted in crippling delays and a considerable increase in project costs. If at all possible, Bank financing of

similar projects should not be undertaken unless land acquisition has been entirely completed in advance.

In the case of Pootkee Bulliary underground mine too much confidence was placed in the Borrower's assessment of the mining potential at appraisal. It was only later, when an exhaustive examination was made by consultants in order to schedule the deployment of the six fully mechanized longwall mining units, that it became clear that opportunities existed for only one or two units at the most, thus destroying the viability of that component of the project and forcing cancellation of the major part (67%) of the loan.

PART I

PROJECT REVIEW FROM BANK PERSPECTIVE

Project Identity

Project Name: Jharia Coking Coal Project
Loan No. 2498-IN
RVP Unit: South Asia Region
Country: India
Sector: Energy
Subsector: Coal

Background

Coal is India's largest source of commercial energy. Almost 70% of annual coal output is used to generate electric power; the remaining 30% are consumed by a variety of industrial enterprises.

ORGANIZATION OF THE COAL INDUSTRY. Coal production is largely in the hands of seven coal companies, which operate in different geographical regions of the country. An eighth company is engaged in mine planing and design. Organizationally, these coal companies are subsidiaries of Coal India Ltd. (CIL), which was established after nationalization of the industry in the early 1970s as a holding company with the explicit purpose to manage the coal industry. CIL is fully owned by the central government. One of these subsidiary companies is Bharat Coking Coal Limited (BCCL), which is responsible for production from the Jharia coalfield, India's primary source of prime coking coal for the steel industry.

THE GOVERNMENT'S STRATEGY. After the steep increase of international oil prices in the 1970, the Indian Government established a working group to review India's energy policy. One of the main recommendations of this Working Group on Energy Policy was substitution of oil products with energy based on indigenous coal. This led to a massive shift of resources into the power sector. To facilitate this, the central government established the National Thermal Power Corporation (NTPC) and the National Hydro Power Corporation (NHPC); in parallel, the Government decided to nationalize the coal industry. This provided the coal industry with access to public resources which enabled it to finance the investments required to meet the rapidly growing demand for coal. The Government pursued a similar approach with regard to its steel industry. The Steel Authority of India Ltd. (SAIL) was established to control the production of steel in India and Bharat Coking Coal Ltd. (BCCL) to manage the core of the country's nationalized coking coal mines.

Immediately after nationalization of the coal mining industry in 1972 the Government's aim was to increase coal production as quickly as technically feasible. Little regard was given to efficiency and coal quality. By the early 1980s recognized the cost this strategy imposed on

the economy and took steps to improve the efficiency of mining operations and to raise coal quality. The Government then had the following aims for the industry:

- (a) the development of new, large-scale, highly mechanized mines to allow rapid expansion of production with due regard to safety and environmental protection and using increasingly efficient technologies and equipment;
- (b) the rehabilitation and mechanization of certain of mines producing prime coking coal in order to reduce the need for imports;
- (c) improvement in the availability and cost of coal to distant consumers by optimizing mine/consumer linkages, improving transportation systems and giving priority to the exploration and development of mines in southern India; and
- (d) the introduction of measures to improve the quality and consistency of coal supplies to consumers, reduce transportation requirements and improve the efficiency of thermal power units, steel plants, industrial boilers, etc.

THE BANK'S ASSISTANCE STRATEGY. The Bank's involvement in the Indian coal sector began with a loan for the Chasnulla mine (Coal Production Project, TO 287) in 1961. A major accident at this mine, killing 175 miners, led to a hiatus of almost two decades in the Bank's support for this sector. In the late 1970s the Bank decided to explore again the possibility of extending its support to the coal sector. A mission to review the coal sector visited India in 1980, and its report, India Coal Sector Report (Report 3601-IN), was issued in September 1982. The report endorsed Coal India's strategy to rely increasingly on highly mechanized large opencast mining operations to meet the expected increase in coal demand, and to raise the efficiency of underground mines through mechanization. The Bank's renewed involvement in the sector started with the Dudhichua Coal Project, which was designed to bring modern, state-of-the-art opencast mining technology to the Indian coal industry. In addition to improving mine design and operating practices, the project provided technical assistance for a review of coal transport and distribution from mines to power stations. Within a period two years the Board approved two more projects, the Jharia Coking Coal Project, which extended these efforts to the Jharia coalfield, India's largest resource of prime coking coal, and the Coal Mining Coal Quality Improvement Project, which did the same for mining operations in the Raniganj and Korba coalfields. With these three operations, the Bank had achieved the primary aim of its assistance to the coal sector, to assist Coal India Ltd. (CIL) in raising the efficiency of its opencast and underground mining operations in major coal producing areas through mechanization, improved mine design and better mining practices; and in implementing measures to improve the quality of coal produced.

Project objectives and description

PROJECT OBJECTIVES. The Jharia Coking Coal Project had two major objectives: One, to raise the output, recovery and productivity in the field of coking coal production through the development of

- (i) the Block II opencast coal mine, the first large scale opencast mine to be implemented by BCCL and
- (ii) the Pootkee-Bullliary mine, the largest underground mine, in terms of output (3 million tons per year), in India.

And, two, to raise the quality of coking coal supplies to the steel industry through the development of a sector-wide action program to improve coking coal quality and by expanding the production of mines yielding high quality coking coal. Both, the output from the Pootkee-Bullliary mine and from the Block II opencast coal mine were to augment the supplies of high quality coking coal.

In addition, the project was designed to extend the Bank's assistance into three important areas:

- underground mine operating practices (improved procedures for underground mining using highly mechanized equipment);
- shaft sinking (improved efficiency through better organization and more modern equipment); and
- transportation of stowing materials (study of alternative modes of transportation of sand for stowing).

PROJECT COMPONENTS. The project comprised the following components

- (a) **The development of the Block II opencast coking-coal mine** designed to produce 2.5 million tons of raw (unwashed) coking coal per year with an average ash content of 45% which, after washing, would yield 1,125,000 tons of coking coal with an ash content of 17%. The mine was designed to have a stripping ratio of 4.1 cubic meters of overburden to each ton of raw coal, a maximum mining depth of 220 meters and a 17 year production life. The new Madhuband coal washery, for which no financial support from the Bank was provided under this loan, was to be built on a nearby site, to process the production from Block II.
- (b) **The development of Pootkee-Bullliary mine**, which was designed to be the largest (in terms of annual coal output) mechanized underground mine in India, with a designed production rate of three million tons per year of raw (unwashed) coking coal similar in quality to that produced by the Block II mine. Two new mine-shafts were in the process of being sunk with Polish assistance, a dedicated **coal washery was to be constructed** and all necessary surface facilities and infrastructure were to be provided under this project.

Project design and organization

The Jharia project was designed to achieve its twin objectives, to improve the efficiency of opencast and underground mining and to raise the quality and quantity of coking coal in India

through the development of an opencast and an underground mine with an associated washery. The underlying assumption was that the technology and operating practices that would be introduced in these mines through this project would eventually be adopted by other mines.

The Jharia coalfield was chosen because of its reserves of high quality coking coal. The field, which is India's largest reserve of coking coal and its only indigenous source of 'prime' coking coal for the steel industry, has been intensively mined for well over a hundred years, originally using only manual labor in underground and primitive opencast mining. The project was intended to bring international state-of-the-art technology to both opencast and underground mines. Opencast mining productivity was to be improved by the introduction of large electric draglines and shovels, together with larger mining trucks and ancillary equipment. Underground mining production was to be increased by the introduction and use of fully mechanized, longwall mining equipment. Additional washing facilities were to be provided to process the coal produced and technical assistance would be provided.

The Bank's loan of US\$248 million financed about 35% of the total cost of the project of US\$696 million with foreign costs of US\$245 million and local costs of US\$451 million. Bank financing was limited to that required for the procurement of mining equipment for both mines, the coal washery at Pootkee Bulliary and some technical consultancy.

Given the objectives, the scope and scale of the project was appropriate, and so was the timing. India's coal companies were keen to gain access to state-of-the-art mining technology and operating practices. The decision to make three loans (each aimed at different beneficiary coal companies) with similar objectives in rather quick succession, takes into account that fact that these companies are fairly self-contained and operate at quite a distance from each other. Each of these loans supported projects that were tailored to the unique circumstances of the beneficiary coal companies. The aim of this lending strategy was to provide CIL's subsidiary coal companies with a 'heavy dose' of state-of-the-art technology transfer and to support institutional changes that would improve the efficiency of mining operations and the quality of coal to consumers.

The beneficiary of the loan was Bharat Coking Coal Limited (BCCL), an operating subsidiary of Coal India Limited (CIL). While BCCL was responsible for implementation of the project, CIL were responsible for the procurement of all the mobile equipment. Procurement of the fixed installations, i.e. coal washing plants, was to be the responsibility of BCCL.

Project implementation

LOAN EFFECTIVENESS AND PROJECT START-UP. The loan was approved on March 7, 1985 and signed on May 10, 1985. It became effective on August 8, 1985.

IMPLEMENTATION (BLOCK II OPENCAST MINE). The Block II Opencast Mine component of the project was scheduled to have attained its target production of 2.5 million tons per year (mtpy) during the year 1987/88, even though procurement of Bank-financed equipment would not have been completed before the end of 1989. Appraisal did not anticipate problems in the acquisition of the land necessary to allow both the opencast mining and the construction of

surface facilities for the underground mine and expected that solutions would not be difficult to find if problems were encountered. Construction of the externally financed washer nearby at Madhuband was scheduled to have been completed by April 1988 to coincide with the attainment of full coal output from the mine. Annual coal production at Block II has, at the date of this report, reached only 600,000 tons (less than 25% of the planned tonnage) and it is clear that construction of the Madhuband washery is still several years from completion. Coal is presently being washed at BCCL's Dugdha Washery.

LAND ACQUISITION AND RESETTLEMENT. Implementation of the project affected 711 families or 4266 persons (assuming a household consists on average of six persons). All of these families owned land, houses or both on the land required for the mine. No socio-economic survey had been prepared at the time of appraisal, and there is no record of the number of landless people that could have been affected by the project. However, BCCL will be asked to carry out such a survey to assess the remedial rehabilitation needs of all people affected by the project under the proposed Coal Sector Rehabilitation Project.

As far as the Jharia Coking Coal Project is concerned, BCCL informed the Bank that it has up to now resettled 160 families (or 960 people). BCCL has built two resettlement sites, complete with infrastructure facilities and civic amenities, to house all project-affected people, and provided employment for 247 project affected people. At this point, a deadlock has been reached since the remaining 551 project-affected families (or 3306 people) refuse to vacate their houses on the project site unless BCCL offers employment to every person above 18. Making such an offer would put a heavy financial burden on an already financially poorly performing project and company. BCCL has a significant overstaffing problem. Considering that jobs with the coal industry pay about 8-10 times the minimum wage and are very secure, further additions to BCCL's payroll over and above the company's needs would just add to its losses.

Within the surface area of the mine, seemingly insoluble land acquisition problems, caused by the continued refusal of landowners and tenants to vacate their land and properties, have caused considerable fragmentation of the planned mining areas and have necessitated major redesign of the mine itself.

Clearly, one of the more important lessons to be learnt from the implementation of this component is that land acquisition and resettlement issues need to be resolved before the Bank commits itself to support a project. At a minimum, a rehabilitation action plan reflecting the agreements reached with project-affected people needs to be available before the Bank becomes involved in a project. At the time this project was appraised, BCCL could point out to the Bank that effective mechanisms (in form of CIL's resettlement and rehabilitation policy and the various legal provisions under which land is acquired in India) were in place to successfully complete land acquisition and resettlement for this project. The rather successful experience with land acquisition and resettlement under the Dudhichua Coal Project gave the Bank little reason to doubt the effectiveness of BCCL's approach to land acquisition. In retrospect, it is easy to see that landowners and other project-affected people gained through the Bank's involvement in the project additional leverage to press their demand for employment with BCCL. (Earnings in the coal industry are about 8-10 times the minimum wage, and most project-affected people prefer this to any other form of compensation).

IMPLEMENTATION (POOTKEE BULLIARY UNDERGROUND MINE). The mine shafts for the underground mine at Pootkee Bulliary were sunk and constructed with Polish technical assistance. During 1989, British Mining Consultants Ltd. carried out a detailed examination of the engineering geology in order to design and schedule the deployment of the proposed mining equipment. They found that the geological conditions which were believed at the date of appraisal to exist and that were essential for the deployment of the six fully mechanized longwall units planned for the mine did not, in fact, exist. Far in excess of that which had been anticipated were the multiple geological faulting and large zones of thermally-degraded coal (*jhama*). These conditions made it impracticable to deploy more than one (or at most, two) of the six proposed longwall units, thus severely reducing the annual production capability and effectively destroying the mine's profitability. Further feasibility studies carried out by BCCL and the Central Mine Planning and Design Institute (CMPDI), CILs planning subsidiary, failed to come up with a revised project proposal that would yield financial and economic rates of return acceptable to the India's Public Investment Board or the Bank.

As a consequence, US\$165.3 million of the Bank loan, which was allocated to the development of the Pootkee Bulliary Mine component were canceled in November 1989, which, when added to the above-mentioned US\$25 million at Block II, reduced the loan by a total of US\$190.3 million to US\$57.7 million. Despite the foregoing, BCCL have continued working at the mine and it is presently credited with producing coal at the rate of about 250,000 tons per year.

PROCUREMENT. By prior agreement with the Bank, procurement was carried out by a special cell previously created for the Northern Coalfields' Dudhichua project within the Coal India Ltd. headquarters in Calcutta and not by the beneficiary, BCCL. Mobile mining equipment was procured by ICB under Bank guidelines. BCCL staff were to have procured the Pootkee Bulliary coal washery but, in the event, there was no requirement for them to be involved as it was no longer required in the wake of the cancellation of the Pootkee Bulliary component of the loan. Such problems as were encountered in the procurement of goods in the two components of this project (and in other CIL Bank-financed projects) were caused primarily by shortcomings in the CIL Notice of Invitation to Tender (NIT) and differences between that and the Bank's recommended Sample Bidding Document. In addition, recurring problems were caused by inappropriate and insufficiently precise equipment specifications. Coal India has also been reluctant to impose penalties for non-observance of contract conditions when this would involve state-owned suppliers. Combined with the 15% preference allowed, during evaluation, to domestic manufacturers this situation has resulted in contract awards to companies which have consistently responded with delayed (and even incomplete) supply and inferior quality goods being supplied without effective penalty. Recent problems quoted by BCCL staff involved spare-parts for the Bank-financed mining equipment taking as long as two years to procure.

Both in this project and in the earlier Dudhichua project it was found that the prices for some of the mobile mining equipment which had been assumed in the appraisal were far in excess of those achieved in practice. It is believed that the prior (and still continuing) CIL practice of negotiating prices for equipment after initial bidding results in artificially high prices being bid in the first instance, since bidders are always assured of a second chance to

negotiate their prices downwards and obtain an order. Bidders were quick to realize the Bank's ICB rules and accordingly priced their bids at more realistic and competitive levels.

Project cost and financing

PROJECT COSTS. At the time of appraisal, the project was estimated to cost US\$696 million, which consisted of US\$271.5 million for the Block II Opencast Mine and US\$424.5 million for the Pootkee-Bulluary Underground Mine. After cancellation of the support for the Pootkee-Bulluary Underground Mine and cancellation of US\$25 million of project savings (BCCL's decision not to procure two walking draglines) under the Block II Opencast Mine the project cost dropped to US\$190.7 million. Correspondingly, the original financing requirements of US\$696 million declined to US\$196.1 million based on the cost estimates after the cancellations.

At the time the project closed actual expenditures (US\$127.8) amounted to only about 65% of projected financing requirements. As with the Dudhichua Coal Project, expenditures for locally procured items had been underestimated at the time of appraisal, mainly because a larger share of the contracts than anticipated at appraisal were awarded to Indian suppliers and the ICB process drastically reduced the cost of imported items.

DISBURSEMENTS. From the original loan of US\$248 million only US\$55.3 million (equivalent to 22.3%) were disbursed. This was due to the cancellation, in November 1989, of US\$25.0 million, for the non-procurement of two walking draglines for Block II opencast mine, and US\$165.3 million due to the effective abandonment of the Pootkee Bulluary underground mine component. Of the remaining US\$57.7 million, US\$2.4 million was canceled as unused at loan closing.

Project results

ATTAINMENT OF PROJECT OBJECTIVES. The original project objectives were not achieved. The Pootkee Bulluary underground mine component had to be canceled when adverse mining conditions, sufficiently bad to prevent deployment of the state-of-the-art equipment which had been designed into the mine, were found to exist. The Block II opencast mine, due primarily to virtually insuperable land acquisition problems and, secondarily, to the underground mine fires, is currently producing only about a quarter of its design output tonnage and is unlikely ever to produce more than a half of its design tonnage. In consequence, the objective of introducing high volume output of prime coking coal from a large-scale underground mine was lost and the demonstration of the effectiveness of modern opencast mining techniques could not be shown, due to difficulties which were beyond the capacity of the mining company to overcome.

CAUSES OF THE VARIANCES BETWEEN PLANNED AND ACTUAL RESULTS. In the circumstances, little or no positive impact could have been achieved in the area. In retrospect, too much was taken for granted at appraisal, in respect of both the geological conditions at Pootkee Bulluary underground mine and the ability of the mining company to deal with the

resettlement of project-affected people residing within the surface area of the Block II opencast mine.

FINANCIAL AND ECONOMIC RATES OF RETURN. In light of the cancellation of the Pootkee-Bulluary Underground Mine component, only the financial and economic rates of return for the Block II Opencast Mine were estimated. A comparison of the actual financial (6.9%) and economic rates (38.6%) of return with the projections at appraisal shows a significant decline in the financial rate (12% at appraisal), but an improvement in the economic rate of return (28.2%). This result is due in part to the fact that only part of the projected efficiency gains were achieved and the divergence between economic prices of coal (based on imported Australian coal) and the prices BCCL realizes.

Project Sustainability

Based on BCCL's current projections the Opencast Block II mine will be operated for another 15 years, until 2009. Assuming the coal company continues to succeed in keeping the mine-fire, that currently affects operations, under control, the project is expected to continue to yield modest financial and satisfactory economic returns. (See financial and economic cost/benefit streams in Part III). In addition to controlling the mine fire, the continued commercial viability of the opencast mine depends on whether CIL will continue to be able to pass increase in wages for miners on to consumers through price increases. This was the practice in the past. The Government has indicated that it will abolish price controls on coal.

In order to be in a better position to deal with high economic, environmental and social cost of mine fires, BCCL is receiving technical assistance under a credit approved in December 1992. The Government has sought the Bank's assistance in identifying experts that could work with BCCL to find ways to extinguish or at least contain these fires. The fire that hampers operations in the Opencast Block II mine will benefit from these efforts.

Critical for the continued success of the project will be the outcome of BCCL's efforts to resettle the people that up to now have refused to move to the resettlement site in the expectation of eventually getting jobs with the coal company. Under the proposed Coal Sector Rehabilitation Project, which currently under preparation, the resettlement and compensation issues will be revisited; if BCCL's resettlement and compensation actions are found to be deficient in one way or another, a remedial action plan will be prepared.

Bank Performance

The clear positive potential of Dudhichua, the previous Bank-financed, Indian coal mining project, was probably a factor in leading Bank staff to an over-optimism regarding the implementation of this project. In retrospect, the assumptions made by the Central Mine Planning and Design Institute (CMPDI), the planning subsidiary of Coal India Ltd., regarding the technical merits of the Pootkee Bulluary underground mine were based on inadequate investigation. The further investigation carried out by consultants during project implementation, which was supposed only to define the optimum deployment of the proposed

state-of-the-art fully mechanized longwall equipment, instead revealed that technically acceptable conditions for deployment of more than one or two of the six units proposed was not possible. Revised financial analyses showed rates of return unacceptable to either the Indian Public Investment Board or to the Bank. That component was therefore canceled. In addition, assumptions regarding the resettlement of the population residing within the area of the proposed Block II opencast mine were probably influenced by the ease of resettlement experienced at Dudhichua. The assumptions were proved erroneous; at loan closure only 22% of the potential oustees had been resettled. The latter experience has underlined the need for the Bank to more closely examine future project assumptions regarding land acquisition and resettlement issues.

During supervision, Bharat Coking Coal Ltd. (BCCL) were allowed as much freedom to vary the equipment configuration as they requested. In addition, the difficulty of obtaining timely spare-parts for the Bank-financed mining equipment led to allowing BCCL to obtain larger packages of spare-parts when they became available together with what CIL terms 'float-assemblies', i.e. complete spare diesel engines, complete spare transmission assemblies, etc., to ensure the availability of mining equipment under adverse maintenance conditions.

Additional lessons to be learned from the implementation of the Jharia Coking Coal Project include:

- the need for standard bidding documents, in order to minimize the possibility of disputes and misprocurement (CIL has agreed to use standard bidding documents under the forthcoming Coal Sector Rehabilitation Project);
- the desirability of providing CIL with frequent and timely advice on procurement issues, in order to avoid lengthy procurement-related implementation delays (CIL has agreed to use the services of an expatriate company specializing in procurement for the preparation of the technical specifications of bid documents and the evaluation of bids under the forthcoming Coal Sector Rehabilitation Project); and
- the need to consider in the estimation of project cost that procurement under ICB will reduce the cost of items procured under this method by about 30%.

Borrower Performance

The beneficiaries of the project, CIL and BCCL, performed well, bearing in mind the difficulties under which they are operating. They were generally responsive to recommendations from the Bank, and made every effort to comply with covenants.

Project Relationships

The relationships between CIL/BCCL and the Bank have been consistently good throughout the project. The frank and open discussions which took place during supervision

missions resulted in satisfactory solutions in spite of differences in viewpoints which occurred from time to time; they helped Bank staff to understand better and appreciate the environment and constraints under which CIL's and BCCL's management are operating; and they provided an opportunity to convey to CIL and BCCL the rationale for the positions taken by the Bank.

Consulting Services

Only two consultant companies were involved in the project, ILF, to carry out a study of transporting sand for stowing purposes in the now-canceled Pootkee Bulliary mine, and British Mining Consultants Ltd., to design the deployment and use of longwall mining equipment in the same mine. Both companies performed satisfactorily.

Project Documentation and Data

The Bank's documentation proved invaluable to the project, although much of the equipment procurement listings had to be modified due to cancellations and variations brought about by physical circumstances. Experience in writing this PCR has shown clearly that preparation for a PCR should begin at appraisal or soon afterwards, when data specifically destined for use in the PCR should be required to be included by Borrowers in their regular reports to the Bank. A quarterly report pro-forma should be decided upon at completion of the appraisal report and included in that report for the benefit of Borrower and Bank.

PART II

PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

Preface

During early 1980s CIL sought the World Bank assistance for Jharia Coking Coal Project owned by one of its subsidiaries Bharat Coking Coal Ltd. (BCCL), the major producer of prime coking coal in India. The objective of the loan was to increase the output and to improve the recovery and productivity in the field of coking coal production through development of a large scale opencast mine in Block II and development of a large highly mechanized underground mine in Pootkee-Bullliary. It also envisaged to raise the quality of coking coal supply to the steel plant by construction of washeries linked to these projects. The Bank's loan of US\$248 million (30% of the estimated total cost of the project) was limited to the procurement of mining equipment for both the mines and coal washery at Pootkee-Bullliary and also for some technical assistance.

Project Implementation

Block II. During the implementation of the project two major difficulties were encountered. The problem of land acquisition and resettlement became serious as the inhabitants insisted on employment of each eligible project affected adult person. As BCCL is having surplus manpower it could absorb such people only in phases depending on the requirement and other financial constraints. This has put a heavy financial burden on BCCL which has significantly overstaffing as well as financial problem. As a result around 500 project affected families are yet to vacate their houses on the project site. After considering all associated problems certain area of the mine-take has been excluded from mining activities for the time being. The willing people are being gradually resettled in properly developed resettlement sites which have provisions of modern amenities.

The project also faced another unforeseen problem. While implementing it was found that the extent of fire affected area was more extensive than earlier envisaged. Naturally certain advance action was required to deal with the fire before the mining could be extended to those areas.

Due to these problems the implementation was delayed and the project was closed one year behind schedule. Action are in hand to resettle the project affected people as soon as feasible and also to improve the output to the optimum level under the given situation.

Pootkee-Bullliary. The mine shafts at Pootkee-Bullliary was constructed with the assistance of Polish experts. During the exploitation underground it was experienced that there was wide variation between the pre-project geological assessment and the actual. Most of the mine take was very adversely affected by dikes, faults, burning of seams, etc. Large scale

introduction of mechanized longwall was not feasible. British Mining Consultants were engaged to carry out a detailed study and CMPDI and BCCL also made the reassessment of the geomining conditions. It was concluded that large scale mechanized mining methods could not be introduced though earlier envisaged. With other alternative mining technique the targeted production of 3 mtpy also could not be achieved. After making a tailed techno-economic reassessment it was concluded that with this modifications the mine operations became economically unviable. As a consequence, US\$165.3 million of the Bank loan was canceled in November 1989. However, BCCL is continuing with the modified mining method and at present producing around 0.3 mtpy

Comments on Part I

The analysis made by the Bank under Part I is quite comprehensive and has covered all important aspects. We generally agree with the conclusion made by the Bank.

Cancellation of Part of the Loan

As already said above, the Jharia Coking Coal has two components out of which Pootkee-Bulliary underground mine and the Pootkee washery had to be canceled. As a consequence the Bank loan of US\$165.3 million in respect of Pootkee-Bulliary underground project including the washery was canceled. Due to the change in mine area and mine plan in Block II the equipment requirement was scaled down. Further, while finalizing the purchase of opencast equipment for Block II following ICB procedures it was found that the quoted price was on the lower side than the price estimated earlier. As a result amount of US\$25 million was not required and hence was surrendered. The overall position is given in the table below:

Component-wise allocation of loan in US\$ million

	<u>Original</u>	<u>Canceled</u>	<u>Revised</u>
Block II Opencast Mine	80.7	25.0	55.7
Pootkee-Bulliary U/G including Washery	165.3	165.3	
Technical Assistance	2.0	-	-
Totals	248.0	190.0	57.7

Environmental issues

Block II. This opencast project is very much adversely affected by the mine fire in old opencast workings. Moreover the old underground workings within the mine take have also been extensively affected by mine fire. Thus the combustion products have posed serious environmental problems. It is gratifying to note that the project has persistently dealt with this problem to a very great extent and the major fires are now under control by adopting effective fire control measures. A fire control project has also been approved by World Bank (Jharia Mine Fire Control Technical Assistance Project, Cr. 2450-IN) for financing and this

study will also help the project to deal with the fire remove effectively. The land reclamation is also taking place in a systematic manner as the fires are dealt with in proper sequence. It is anticipated that the project will be able to deal with the fire effectively and one of the very serious environmental problems will be dealt with. Afforestation has been done on a large scale and all the rehabilitation sites and the infrastructure sites are now adequately protected by plantation. An organization with experienced engineers has been set up to deal with the problem of fire and other environmental issues. Proper monitoring system has been introduced. However, the problem being of very serious nature it will require more intensive action to keep all these adverse affects under control.

Resettlement and rehabilitation of project affected people

Resettlement and rehabilitation issues have been dealt with adequately in the report of the Bank and we agree with the same. Though the problem is very serious in this particular project but with consistent efforts made by the project it is expected that major part of the problem will be resolved. With the new R&R policy of the CIL and by setting up a proper organization for implementation and monitoring it is expected that such problem could be resolved in time in other projects.

Procurement Procedures

For procurement of equipment for Bank financed projects, "Notices Inviting Tenders" (NIT) of CIL were prepared normally on the basis of Bank's sample bidding document. Bid documents were issued to the prospective bidders only after obtaining World Bank's 'no objection'. Any changes/modifications in the bidding documents also had the World Bank's approval. CIL followed the Bank's procedure for pre-review (Contracts valuing above US\$3 million) and post review (contracts valuing within US\$3 million) of the cases by the World Bank.

For procurement under World Bank loan CIL has benefited much. Indian suppliers also could quote lower price (about 40-50%) because, as per the policy of GOI such purchases fall under "deemed export" category. Under such category, manufacturers are not to pay custom duty for the import content of the goods and get back excise duty for indigenous component.

All the procedures introduced by the Bank are followed strictly. CIL did not hesitate in imposing penalty on the defaulting suppliers even if they are state owned like Heavy Engineering Corporation (HEC) or Bharat Earth Movers Limited (BEML). CIL has already recovered 10% penalty from HEC for delayed supply of dragline for Dudhichua project. CIL has also not faced any interference from the Ministerial levels of Government of India in procurement activities and payments.

Comments on Part III

Report is in order.

Bank Performance

Both the projects were of difficult nature as they encountered unforeseen problems. In dealing with these problems highly professional Bank's appraisal missions were of great assistance to the project.

Borrower's Performance

Coal India Limited generally agrees with the assessment made by the Bank.

Lessons Learned

By implementing a project of this size faced with mining, technical, social problems, with active guidance and consistent monitoring by the Bank officials, the project has benefited in the following areas:

- a) Project planning and monitoring,
- b) design and engineering of equipment and construction,
- c) effective bidding procedures,
- d) environment management., and
- e) resettlement and rehabilitation of project affected people.

PART III

STATISTICAL INFORMATION

A. Related Bank loans

<u>Loan Number</u> <u>Project Title</u>	<u>Year of</u> <u>Approval</u>	<u>Purpose of Project</u>	<u>Status</u>	<u>Comments</u>
Dudhichua Coal Project, Loan 2393-IN	1985	To continue the transfer of technology for highly mechanized opencast mines	Completed March 31, 1993	See Project Completion Report for this project
Coal Mining and Coal Quality Improvement Project, Loan 2796-IN	1987	To continue the transfer of technology for highly mechanized opencast mines. The project focused on a mine in the Korba coalfield (belonging to Southeastern Coalfields Ltd.) and a mine in the Raniganj coalfield belonging to (Eastern Coalfields Ltd.)	Under implementation.	
NTPC Power Generation Project, Loan 3632-IN	1993	The project comprises: a) Generation of Capacity Addition; b) Private sector component (joint venture operations); and c) Environmental strengthening and resettlement and rehabilitation	Under implementation.	The project is located in the Singrauli coalfield, and uses coal from the Dudhichua coal mine

B. Project Timetable

	<u>Date Planned</u>	<u>Date Revised</u>	<u>Date Actual</u>
Identification	September 1982		October 1982
Preparation			
Appraisal	January 1983	March 1983	September 1984
Loan Negotiations		January 1985	January 1985
Board Approval		March 1985	March 7, 1985
Loan Signing			May 10, 1985
Loan Effectiveness			August 8, 1985
Loan Closing Date			March 31, 1992
First Extension of the Closing Date			December 31, 1992
Completion			April 30, 1992

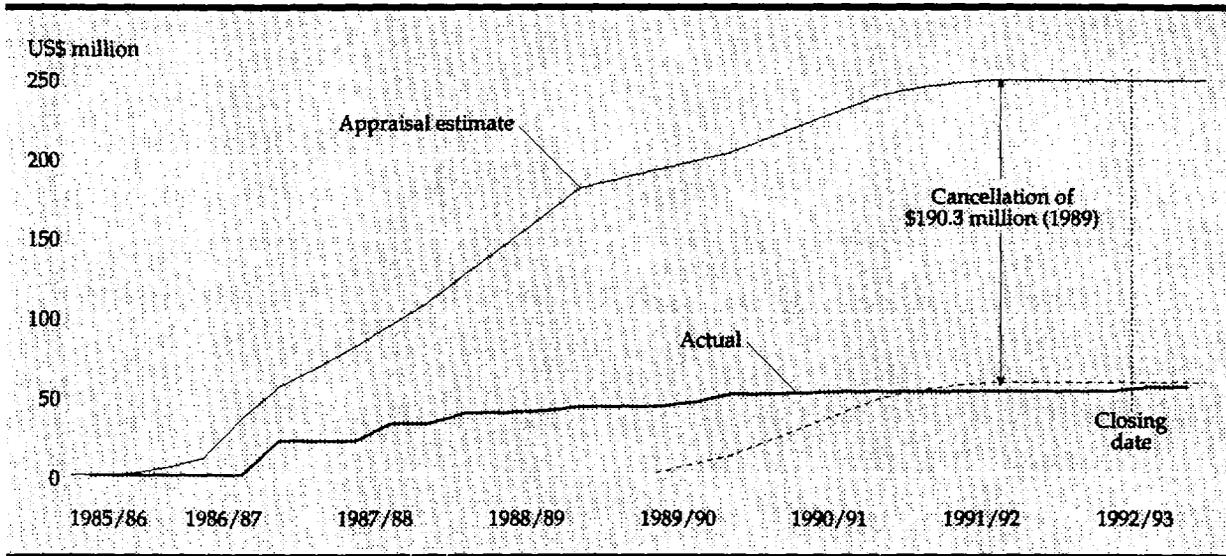
COMMENTS. Almost two years elapsed between the time the project had been identified and the date of effectiveness. While this may somewhat exceed the time required for the preparation of similar projects, it has to be kept in mind that this was the Bank's first project with a new implementing agency, Bharat Coking Coal Ltd.

C. Disbursements

Cumulative Estimated and Actual Disbursements

	<i>US\$ Million</i>								
	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	
Appraisal Estimate	0.6	55.2	108.8	180.0	202.4	238.6	248.0	248.0	
Actual	0.0	21.4	32.6	42.8	50.8	52.4	52.6	55.3	
Actual as % of Estimate	0.0	38.8	30.0	23.8	25.1	22.0	21.2	22.3	

Date of Final Disbursement: April 29, 1993



Follow-on Project

Name: Coal Mining and Coal Quality Improvement Project

Loan No.: 2796-IN

Loan amount: US\$340 million equivalent

Date of Board approval: April 21, 1987

D. Project Implementation

Block II Opencast Mine

Pootkee Bulliary
Underground Mine

Projections at Appraisal (on an annual basis)

<u>Year</u>	<u>Overburden Removal (million m³)</u>	<u>Raw Coal Production (million tons)</u>	<u>Washed (million tons)</u>	<u>Raw Coal Production (million tons)</u>	<u>Washed (million tons)</u>
1984/85	1.40	.20	0.09	0.01	0.003
1985/86	1.40	.40	0.18	0.13	0.13
1986/87	2.85	1.50	0.68	0.26	0.18
1987/88	5.95	2.50	1.13	0.37	0.20
1988/89	9.50	2.50	1.13	0.40	0.20
1989/90	9.50	2.50	1.13	0.41	0.35
1990/91	9.50	2.50	1.13	0.70	0.97
1991/92	9.50	2.50	1.13	1.94	1.22
1992/93	9.50	2.50	1.13	2.460	1.45
1993/94	9.50	2.50	1.13	2.942	1.45
1994/95	9.50	2.50	1.13	2.92	1.45
1995/96	9.50	2.50	1.13	3.00	1.45

Actual Achievements (on an annual basis)

1984/85	0.51	0.04	NIL	0.07	NIL
1985/86	0.82	0.14	NIL	0.06	NIL
1986/87	1.90	0.44	NIL	0.02	NIL
1987/88	2.96	0.80	NIL	0.04	NIL
1988/89	4.87	1.02	NIL	0.04	NIL
1989/90	5.10	1.22	NIL	0.11	NIL
1990/91	5.23	0.93	NIL	0.22	NIL
1991/92	5.11	0.61	NIL	0.26	NIL
1992/93	5.44	0.66	NIL	0.29	NIL

E. Project costs and financing

	Project Cost					
	<i>Rs million</i>					
	<u>Estimated Cost</u>			<u>Actual Cost</u>		
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
Equipment and spares	77.3	138.1	215.5	71.3	34.3	105.6
Land and civil works	47.7	2.5	50.2	5.5	0.0	5.5
Engineering and Training	5.7	0.0	5.7	0.0	0.0	0.0
Preoperating Expenses	9.0	0.7	9.7	10.2	0.0	10.2
Washery	76.2	31.8	108.0	0.0	0.0	0.0
Furniture, Vehicles, etc.	0.0	0.0	0.0	0.3	0.0	0.3
Technical assistance	0.0	2.0	2.0	0.0	1.4	1.4
Duties and taxes	94.5	0.0	94.5	0.0	0.0	0.0
Base cost	310.4	175.1	485.5	87.3	35.7	123.0
Physical contingencies	24.2	10.4	34.7	0.0	0.0	0.0
Price escalation	100.2	58.1	158.3	0.0	0.0	0.0
Installed cost	434.9	243.6	678.4	87.3	35.7	123.0
Working capital	10.4	1.2	11.6	4.8	0.0	4.8
Project cost	445.3	244.7	690.0	92.1	35.7	127.8
Interest during construction	6.0	0.0	6.0	0.0	0.0	0.0
Front-end fee						
Total financing required	451.3	244.7	696.0	92.1	35.7	127.8

Notes: 'Actual cost' include duties, taxes and price escalation under the respective categories of expenditures. 'Interest during construction' is included in 'pre-operating expenditures'.

Project Financing Plan

US\$ million

	<u>Original</u>	<u>Revised</u>	<u>Actual</u>
A. Equity	348.0	98.0	63.9
Government of India	215.8	N.A.	N.A.
CIL cash generation	132.2	N.A.	N.A.
B. Long-term debt	348.0	98.0	63.9
IBRD	248.0	57.7	55.3
Government of India	85.8	26.1	2.5
ODA	14.2	14.2	6.1
Total financing	696.0	196.1	127.8

Note: The revised projection was made after Coal India had decided to cancel US\$190.3 million of the Bank loan.

Allocation of the Bank Loan

US\$ million

<u>Category</u>	<u>Original</u>		<u>Revised</u>		<u>Actual</u>	
	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>
Mining Equipment	169.5	68.4	50.0	86.6	54.5	98.5
Washery	60.8	24.5	0.0	0.0	0.0	0.0
Technical assistance	2.0	0.8	2.0	3.5	0.8	1.5
Front-end fee	0.0	0.0	0.0	0.0	0.0	0.0
Unallocated	15.7	6.3	5.7	9.9	0.0	0.0
Total	248.0	100.0	57.7	100.0	55.3	100.0

Note: The revised projection was made after Coal India had decided to cancel US\$190.3 million of the Bank loan.

F. Project Results

1. Economic impact

Operating Costs

Rs per ton

	<u>Projection</u>		<u>Actuals</u>
	<u>1984/85 terms</u>		
	<u>84/85</u>	<u>89/90</u>	<u>89/90</u>
Wages	94.7	76.5	89.8
Stores	27.8	28.3	28.5
Power	11.1	11.2	13.4
Other operating expenses	20.4	18.8	27.0
Operating costs	154.0	134.8	158.7
Depreciation	17.3	21.9	18.8
Interest	16.5	19.9	14.3
Total Production Cost	187.8	176.6	191.8

Economic Cost /Benefit Streams

Rs million 1983/84 terms

<u>Fiscal Year</u>	<u>Production</u>	<u>Capital</u> <u>cost</u>	<u>Operating</u> <u>cost</u>	<u>Working</u> <u>capital</u>	<u>Net sales</u> <u>revenues</u>	<u>Net flows</u>
1984/85	0.04	190.4	5.6		16.6	-179.4
1985/86	0.14	98.6	29.5		58.8	-69.3
1986/87	0.44	280.2	40.2	3.6	180.1	-143.8
1987/88	0.80	306.0	61.8	7.2	330.8	-44.2
1988/89	1.02	-40.1	99.3	12.5	422.3	350.6
1989/90	1.22	161.7	112.1	4.3	505.1	227.0
1990/91	0.93	58.9	60.4	-17.2	383.4	281.4
1991/92	0.61	30.3	49.3	-3.7	253.8	177.9
1992/93	0.66	66.7	48.4	-0.3	273.7	158.9
1993/94	0.87	7.2	71.6	7.7	360.2	273.7
1994/95	2.00	64.3	149.7	26.0	828.0	588.0
1995/96	2.50	64.9	172.6	7.6	1035.0	789.9
1996/97	2.50	19.7	172.6		1035.0	842.7
1997/98	2.50	50.8	172.6		1035.0	811.6
1998/99	2.50	10.7	172.6		1035.0	851.7
1999/00	2.50	19.0	172.6		1035.0	843.4
2000/01	2.50	15.2	172.6		1035.0	847.2
2001/02	2.50	-236.2	172.6	-47.7	1035.0	1146.4

Economic rate of return: 38.55%

Notes: The financial cost streams (see the following table) have been converted into economic cost streams using the following conversion factors: Indigenous capital goods: 0.8; indigenous capital goods with import content: 0.84; revenue expenses: 0.72; Australian coal was used to compute the economic border price for coal.

2. Financial impact

Financial Cost /Benefit Streams

Rs million 1983/84 terms

<u>Fiscal Year</u>	<u>Production</u>	<u>Capital cost</u>	<u>Operating cost</u>	<u>Working capital</u>	<u>Net sales revenues</u>	<u>Net flows</u>
1984/85	0.04	224.0	7.8		7.0	-224.8
1985/86	0.14	116.0	40.9		24.0	-132.9
1986/87	0.44	329.6	55.8	5.0	81.5	-308.9
1987/88	0.80	359.9	85.9	10.0	147.2	-308.7
1988/89	1.02	-47.1	137.9	17.3	205.4	97.4
1989/90	1.22	190.2	155.7	6.0	229.8	-122.1
1990/91	0.93	69.2	83.9	-24.0	162.5	33.4
1991/92	0.63	35.6	68.5	-5.1	116.4	17.4
1992/93	0.61	78.5	67.2	-0.4	129.6	-15.6
1993/94	0.66	8.5	99.4	10.7	175.7	57.0
1994/95	0.87	80.4	207.9	36.1	414.0	89.6
1995/96	2.00	81.1	239.7	10.6	517.5	186.1
1996/97	2.50	24.7	239.7		517.5	253.1
1997/98	2.50	63.5	239.7		517.5	214.3
1998/99	2.50	13.4	239.7		517.5	264.4
1999/00	2.50	23.8	239.7		517.5	254.0
2000/01	2.50	19.0	239.7		517.5	258.8
2001/02	2.50	-295.3	239.7	-66.3	517.5	639.3

Financial rate of return: 6.91%

Comparison of economic and financial rates of return

	<u>Projections at appraisal</u>	<u>Current projections</u>
<u>Jharia Block II</u>		
Economic rate of return	28.2	38.6
Financial rate of return	12.0	6.9

The following table shows a comparison of projected and actual trends of Indian coal prices:

Average coal prices in India, 1984/85 to 1989/90

Rs per ton

<u>Indian fiscal year</u>	<u>Projections</u> ^{a/}	<u>Actual</u>
1984/85	192.2	188.2
1985/86	212.8	190.9
1986/87	230.9	202.8
1987/88	250.5	215.0
1988/89	271.8	252.3
1989/90	294.9	273.7
1990/91	320.0	268.2
1991/92	345.0	306.9
1992/93	366.0	362.9

Notes: a/ coal price projections at the time of appraisal.

3. Social impact

LAND ACQUISITION AND RESETTLEMENT. Implementation of the project affected 711 families or 4266 persons (assuming a household consists on average of six persons). All of these families owned land, houses or both on the land required for the mine. No socio-economic survey had been prepared at the time of appraisal, and there is no record of the number of landless people that could have been affected by the project. However, BCCL will be asked to carry out such a survey to assess the remedial rehabilitation needs of all people affected by the project under the proposed Coal Sector Rehabilitation Project.

As far as the Jharia Coking Coal Project is concerned, BCCL informed the Bank that it has up to now resettled 160 families (or 960 people). BCCL has built two resettlement sites, complete with infrastructure facilities and civic amenities, to house all project-affected people, and provided employment for 247 project affected people. At this point, a deadlock has been reached since the remaining 551 project-affected families (or 3306 people) refuse to vacate their houses on the project site unless BCCL offers employment to every person above 18. Making such an offer would put a heavy financial burden on an already financially poorly performing project and company. BCCL has a significant overstaffing problem. Considering that jobs with the coal industry pay about 8-10 times the minimum wage and are very secure, further additions to BCCL's payroll over and above the company's needs would just add to its losses.

Within the surface area of the mine, seemingly insoluble land acquisition problems, caused by the continued refusal of landowners and tenants to vacate their land and properties, have caused considerable fragmentation of the planned mining areas and have necessitated major redesign of the mine itself.

Clearly, one of the more important lessons to be learnt from the implementation of this component is that land acquisition and resettlement issues need to be resolved before the Bank commits itself to support a project. At a minimum, a rehabilitation action plan reflecting the

agreements reached with project-affected people needs to be available before the Bank becomes involved in a project. At the time this project was appraised, BCCL could point out to the Bank that effective mechanisms (in form of CIL's resettlement and rehabilitation policy and the various legal provisions under which land is acquired in India) were in place to successfully complete land acquisition and resettlement for this project. The rather successful experience with land acquisition and resettlement under the Dudhichua Coal Project gave the Bank little reason to doubt the effectiveness of BCCL's approach to land acquisition. In retrospect, it is easy to see that landowners and other project-affected people gained through the Bank's involvement in the project additional leverage to press their demand for employment with BCCL. (Earnings in the coal industry are about 8-10 times the minimum wage, and most project-affected people prefer this to any other form of compensation). Thus, CIL's decision to seek the Bank's support for this component before concluding the land acquisition and resettlement process was a significant, if not the major factor behind the implementation delays and unsatisfactory results of this project component. (This was again borne out under one of the project components of a follow-up project, the Coal Mining and Coal Quality Improvement Project. Under this project the development of the Sonapur-Bazari opencast mine was delayed by more than six years due to land acquisition problems).

4. Studies

As part of the project the following studies had been prepared:

<u>Study</u>	<u>Purpose as Defined at Appraisal</u>	<u>Status</u>	<u>Impact of study</u>
Shaft Sinking	To assist CIL and BCCL in particular, to improve the design, engineering and implementation of shafts 500-600 m deep	Completed	The shaft sinking and armouring operations have been conducted with assistance and guidance of KOPEX, Poland. The manpower at the project has been trained and the experiences have been documented for future reference
Management Practices in Moonidih Mine and Planning, design and management of fully mechanized, Pootkee Bulliary Mine	To assist CIL group to improve the operational efficiency of fully mechanized underground mines, with particular reference to the Pootkee Bulliary and Moonidih mines in the Jharia coalfield	Completed	Further geological design of Pootkee Bulliary was carried out based on which the project was redesigned
Alternative modes of transporting sand to Jharia coalfield from Maithan and Durgapur	To determine the most economic and technically feasible mode of transporting sand to be used for stowing in Jharia coalfield	Completed	The cost benefit analysis of various modes of transport was researched and this study will help in investment decisions as and when the need arises
Study of disposal project Mahduband Washery	To assess environmental impact and plan for dumping rejects from the washery	Incomplete	The study area for dumping was not identified; the washery project was not completed

G.Status of Covenants

Agreement	Section	Description of Covenants	Status
LA	2.02(b)	GOI to maintain special account in dollars	Complied
LA	3.01(b)	GOI relending to CIL under terms acceptable to the Bank (not less than 13.25%; repayment 15 years, including 5 years grace period	Complied
LA	3.05	Borrower will initiate, by June 30 1986, a shaft sinking study: exchange views with the Bank and implement study recommendations	Complied
LA	3.06	Borrower shall issue all necessary approvals for carrying out Pootkee Bulliary washery	Complied
LA	3.07 Amended	Audit: special accounts (due within 6 months of fiscal year end)	Complied
LA	4.01	Borrower shall periodically review coal prices to ensure CIL financial viability and progressive mobilization of financial resources to cover an increasing part of coal sector capital expenditure	Complied
PA	2.02	CIL to onlend to BCCL under financial agreement	Complied
PA	2.07	CIL/BCCL to ensure project accords due regards to ecological/environmental safety standards	Complied
PA	2.08	BCCL to submit schedules for housing and services by June 30/December 31 1988 and carry out that schedule	Complied
PA	2.09	BCCL to provide training report for part B(iii) of projects on July 1, annually	Complied
PA	2.11	BCCL to take actions to secure all land for project	Complied: land acquisition problems persist
PA	2.12	BCCL to complete implementation manuals	Complied
PA	2.13	BCCL to carry out further geotechnical testing on Block II	Complied
PA	2.14	BCCL to review studies with Bank and implement findings	Complied
PA	3.03	CIL/BCCL to take out insurance in amounts consistent with appropriate practice	Complied
PA	4.02	Audit: CIL and BCCL (due within nine months for CIL and six months for BCCL)	Complied
PA	4.03	CIL to ensure consolidated internal cash generation is at least 1.3 times debt service requirements. CIL/subsidiaries not to incur debt if debt/equity ratio exceeds 60/40. CIL/subsidiaries maintain a ratio of current assets/liabilities of not less than 1.2	Complied

H. Use of Bank resources

<u>Stage of Project Cycle</u>	<u>Month /Year</u>	<u>Number of Persons</u>	<u>Days in Field</u>	<u>Specialization Represented</u>	<u>Performance Rating status/b</u>	<u>Type of Problems</u>
Through appraisal						
Appraisal through Board approval						
Board approval through effectiveness						
Supervision 1	Oct 85	3	11	Economist Engineer Consultant	2	Slow progress. Pootkee Bulliary 9 months behind schedule
Supervision 2	Feb 86	3	19	Economist Engineer Financial Analyst	2	
Supervision 3	Aug 86	2	10	Engineers (2)	2	Slippage on sand and stowing and in main shaft sinking activities Land acquisition and procurement delays
Supervision 4	Dec 86	2	12	Engineers (2)	2	
Supervision 5	May 87	4	13	Economist Engineer Procurement Financial Analyst	2	
Supervision 6	Oct 87	5	21	Economist Engineers (2) Financial Analyst Consultant	2	
Supervision 7	Jun 88	4	22	Economist Engineers (2) Financial Analyst	2	

<u>Stage of Project Cycle</u>	<u>Month /Year</u>	<u>Number of Persons</u>	<u>Days in Field</u>	<u>Specialization Represented</u>	<u>Performance Rating status/b</u>	<u>Type of Problems</u>
Supervision 8	Jan 89	1	14	Engineer	2	Land Acquisition delays Non compliance with financial covenants
Supervision 9	Aug 89	5	15	Economist Engineers (2) Financial Analyst Consultant	1	
Supervision 10	Feb 90	5	30	Economist Engineers (2) Financial Analyst Project Officer	1	
Supervision 11	Aug 90	3	22	Economist Engineers (2)	1	
Supervision 12	Feb 91	3	14	Economist Engineers (2)	1	
Supervision 13	Oct 91	4	16	Economist Engineers (2) Operations Analyst	1	
Supervision 14	Jul 92	4	18	Economist Engineers (2) Operations Analyst	1	
Supervision 15	Mar 93	3	16	Engineers (2) Operations Analyst	1	Land acquisition Equipment stoppages (erratic power supply) Spontaneous combustion of mine face

COMMENTS. Overall, the scope and intensity of supervision seemed to be adequate, in particular in light of the considerable amount of technical assistance. Management at the subsidiary level and the project site were interested in the comments made by Bank supervision missions and receptive to their recommendations.

Annex 1.1 COAL INDIA LIMITED: INCOME STATEMENTS

COAL INDIA LIMITED

INCOME STATEMENT 80/81-92/93

Rs million

	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93
Coal production (million tons)													
Underground production	61	63	61	61	61	60	60	59	61	60	57	57	58
Open pit production	40	46	54	60	70	74	85	100	110	119	133	147	153
Total production	101	109	115	121	131	134	145	159	171	179	190	204	211
Saleable production	94	102	110	116	126	129	139	154	165	171	184	200	207
Oms (ton): ug	1	1	1	1	1	1	1	1	1	1	1	1	1
Oc	2	2	2	2	2	2	2	3	3	3	3	4	4
Total	1	1	1	1	1	1	1	1	1	1	1	1	1
Ems (rs)	50	55	59	79	85	91	107	108	140	146	154	171	202
Revenues													
Average price(rs/ton)	121	138	156	160	188	191	203	215	252	274	268	307	363
Sales revenues	11,313	14,018	17,064	18,624	23,636	24,564	28,176	33,033	41,595	46,868	49,360	61,357	75,122
Contribution to cpra	0	0	428	-428	0	484	298	-598	-366	0	0	0	416
Total revenues	11,313	14,018	16,636	19,051	23,636	24,079	27,878	33,632	41,961	46,868	49,360	61,357	74,706
Production costs													
Salaries & wages	6,860	7,650	8,542	11,708	12,620	13,320	15,497	15,976	20,610	21,208	22,253	24,788	29,008
Overhead	537	589	753	940	887	1,083	1,347	1,536	1,722	2,208	2,544	2,826	3,653
Stores	1,524	2,056	2,602	3,015	3,336	3,800	4,419	4,998	5,705	6,738	7,739	9,302	11,076
Power	541	747	968	1,187	1,437	1,705	2,087	2,360	2,734	3,167	3,707	4,433	5,284
Transportation	293	404	462	452	503	511	803	1,405	1,048	1,323	1,123	1,577	2,120
Other costs	429	681	871	1,043	1,359	2,461	2,190	2,510	3,230	2,863	3,824	4,679	5,506
Total operating costs	10,183	12,127	14,198	18,344	20,141	22,879	26,342	28,785	35,050	37,505	41,189	47,604	56,646
Depreciation	735	991	1,344	1,716	2,070	2,500	2,935	3,489	4,014	4,429	5,364	6,274	7,264
Interest	623	805	1,110	1,324	1,733	2,158	1,501	2,921	2,600	3,402	4,467	5,331	6,841
Total production costs	11,540	13,922	16,652	21,384	23,944	27,537	30,778	35,195	41,664	45,337	51,019	59,210	70,752
Production cost/ton (rs)	123	137	152	184	191	214	222	229	253	265	277	296	342
Other income	-59	-43	-42	-136	-526	-629	-455	-708	-539	-762	-650	-265	-620
Cmpdi profit before tax	3	4	5	12	10	16	12	14	24	24	21	21	25
Tax on cmpdi profit			1	2	3		4	5	4	6	5	5	6
Cmpdi profit after tax	3	4	5	10	7	16	8	10	20	18	16	17	19
Profit from s.Yard/dcc				31	44	28	26	11	18	8	-243	-233	-447
Profit before tax	-284	56	-53	-2,427	-781	-4,042	-3,317	-2,247	-199	801	-2,532	1,671	2,913
Tax	0	0	5	2	3	0	4	14	38	41	5	5	6
Net income	-284	56	-58	-2,429	-783	-4,042	-3,321	-2,260	-236	760	-2,536	1,666	2,907

COAL INDIA LIMITED
BALANCE SHEETS 80/81-92/93

Rs million

	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93
Assets:													
Cash & bank	773	727	1,075	2,352	1,218	1,187	1,417	1,424	1,617	2,299	2,917	1,463	1,866
Coal stock	2,518	2,918	3,605	4,179	5,242	4,702	5,302	5,805	8,042	8,923	10,215	14,281	16,911
Stores & spares	1,571	2,247	2,821	3,425	3,764	4,030	4,413	4,748	5,062	5,713	6,582	6,953	7,556
Sundry debtors	1,340	1,768	2,224	3,758	3,731	3,950	4,608	7,227	9,885	14,419	14,338	13,903	20,845
Others	305	519	658	789	1,250	1,386	3,501	3,828	3,750	4,328	5,664	6,478	7,017
Total cur.Assets	6,507	8,179	10,383	14,502	15,205	15,255	19,241	23,032	28,356	35,682	39,716	43,078	54,195
Gross fixed assets	12,393	15,390	20,862	26,144	32,103	40,378	47,011	55,034	64,340	75,069	89,172	104,238	119,024
Less acc. Depreciation	4,213	5,328	6,992	8,724	11,275	14,087	16,612	20,199	24,259	29,005	34,806	41,247	48,539
Net fixed assets	8,179	10,062	13,870	17,419	20,828	26,292	30,399	34,835	40,081	46,064	54,366	62,991	70,486
Capital w.I.P.	2,455	4,115	5,114	6,720	7,866	8,341	11,796	14,437	18,242	21,338	21,245	23,731	27,019
Loans & advances	5,497	4,679	5,431	7,147	7,913	7,363	6,690	6,031	5,846	7,184	10,079	8,859	10,229
Total assets	22,639	27,035	34,798	45,788	51,811	57,250	68,126	78,334	92,525	110,268	125,406	138,659	161,929
Liabilities:													
Sundry creditors	4,004	4,594	5,152	7,998	4,324	3,670	3,816	3,631	3,094	3,449	3,637	4,246	5,089
Statutory liabilities	574	726	571	867	790	1,003	1,335	1,971	2,273	5,173	6,012	6,846	9,639
Other current lia.	3,200	831	1,241	1,211	5,157	6,862	11,346	11,141	16,481	16,078	19,021	21,601	28,034
S.T.Debts	418	632	830	1,767	1,340	851	2,243	2,254	2,679	4,360	4,550	5,669	9,318
Total current lia.	8,196	6,784	7,794	11,844	11,611	12,386	18,741	18,997	24,526	29,060	33,221	38,362	52,079
Ltd : govt. Cil	10,780	13,196	15,636	19,457	21,737	25,284	27,156	31,160	33,462	40,382	46,687	49,093	51,554
Other liabilities	1,261	1,573	1,825	2,954	3,430	3,883	3,476	6,631	7,094	8,117	10,431	11,597	14,769
Total liabilities	20,237	21,552	25,255	34,255	36,778	41,553	49,373	56,788	65,082	77,559	90,339	99,052	118,402
Share holders' equity:													
Paid in capital	9,862	12,869	16,913	21,299	25,567	30,123	35,595	41,203	47,642	52,239	57,133	60,008	60,979
Retained earnings	-7,460	-7,386	-7,370	-9,765	-10,534	-14,426	-16,842	-19,657	-20,199	-19,529	-22,066	-20,401	-17,452
Total Share holders'equity	2,402	5,483	9,542	11,534	15,033	15,697	18,753	21,546	27,443	32,709	35,067	39,607	43,527
Total liabilities	22,639	27,035	34,798	45,788	51,811	57,250	68,126	78,334	92,525	110,268	125,406	138,659	161,929

COAL INDIA LIMITED
FUND FLOW STATEMENT 80/81-92/93

Rs million

	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	90/91	92/93
Sources:													
Income before cpra	-284	56	370	-2,856	-783	-3,558	-3,023	-2,859	-603	760	-2,536	1,666	3,323
Cpra	0	0	-428	428	0	-484	-298	598	366	0	0	0	-416
Depreciation	692	1,115	1,664	1,732	2,551	2,811	2,525	3,587	4,060	4,747	5,800	6,441	7,292
Ltd interest	623	805	1,110	1,324	1,733	2,158	1,501	2,921	2,600	3,402	4,467	5,331	6,841
Gross i.C.G.	1,031	1,976	2,716	628	3,501	927	705	4,248	6,423	8,909	7,731	13,438	17,040
New equity capital	1,831	3,007	4,044	4,386	4,268	4,556	5,472	5,608	6,438	4,597	4,895	2,874	971
L.T.Loan	2,638	2,745	3,380	3,950	3,550	3,835	4,451	4,309	4,197	8,550	6,909	2,406	4,547
Increase in other liabilities	710	311	253	1,128	476	454	-407	3,154	464	1,023	2,314	1,166	3,172
Total sources	6,209	8,039	10,392	10,092	11,795	9,772	10,220	17,319	17,521	23,079	21,849	19,885	25,730
Applications:													
Investment	2,889	4,658	6,470	6,888	7,105	8,751	10,088	10,664	13,111	13,826	14,009	17,552	18,075
Debt service:													
Principal payment	0	888	939	313	1,086	289	2,578	305	1,895	1,630	603	0	2,086
Interest payment	21	708	956	368	1,590	2,128	3,501	365	3,993	3,997	3,422	5,095	3,461
Decrease in other lia.													
Inc. In w.Capital	3,299	1,785	2,026	2,523	2,015	-1,395	-5,947	5,986	-1,478	3,627	3,815	-2,763	2,108
Total applications:	6,209	8,039	10,392	10,092	11,795	9,772	10,220	17,319	17,521	23,079	21,849	19,885	25,730
Ratios:													
Current ratio	0.79	1.21	1.33	1.22	1.31	1.23	1.03	1.21	1.16	1.23	1.20	1.12	1.04
Debt to equity ratio	0.82	0.71	0.62	0.63	0.59	0.62	0.59	0.59	0.55	0.55	0.57	0.55	0.54
Debt service coverage ratio	1.00	1.26	1.41	0.26	1.08	0.23	0.15	0.78	0.96	1.19	0.90	1.47	1.79

Annex 2.1 BHARAT COKING COAL LIMITED

BHARAT COKING COAL LIMITED

INCOME STATEMENT 80/81-92/93

Rs million

	<u>80/81</u>	<u>81/82</u>	<u>82/83</u>	<u>83/84</u>	<u>84/85</u>	<u>85/86</u>	<u>86/87</u>	<u>87/88</u>	<u>88/89</u>	<u>89/90</u>	<u>90/91</u>	<u>91/92</u>	<u>92/93</u>
Coal production (million tons)													
Underground production	15	16	15	14	13	13	14	14	14	15	13	12	12
Open pit production	6	7	9	8	9	8	10	11	12	12	14	15	16
Total production	21	23	24	22	22	21	24	25	26	27	27	27	28
Saleable production	20	21	23	20	20	20	22	24	25	25	25	26	27
Oms (ton): ug	0	1	0	0	0	0	0	0	1	0	0	0	0
Oc	1	2	3	2	1	2	2	2	2	2	2	2	2
Total	1	1	1	1	1	1	1	1	1	1	1	1	1
Ems (rs)	51	56	59	79	88	98	107	110	144	150	154	176	205
Revenues													
Average price(rs/ton)	129	145	164	151	178	206	216	225	265	277	279	302	393
Sales revenues	2,582	3,075	3,732	3,034	3,653	4,085	4,792	5,358	6,616	6,994	7,111	7,827	10,696
Contribution to cpra	0	0	-412	-213	-1,494	-1,101	-1,290	-1,718	-2,511	-3,339	-2,413	-3,320	-2,964
Total revenues	2,582	3,075	4,144	3,247	5,147	5,186	6,082	7,076	9,127	10,333	9,524	11,147	13,660
Production costs													
Salaries & wages	1,792	1,926	2,128	2,884	3,203	3,420	3,699	3,932	5,120	5,149	5,257	6,025	6,835
Overhead	170	183	223	237	252	286	353	420	424	585	538	699	830
Stores	336	472	578	547	583	648	682	803	872	909	931	1,190	1,426
Power	171	240	309	353	482	522	544	570	574	601	667	732	832
Transportation	131	165	168	119	115	152	203	231	261	336	238	287	385
Other costs	128	203	284	202	287	374	483	506	434	329	590	349	726
Total operating costs	2,727	3,188	3,691	4,342	4,923	5,402	5,964	6,462	7,684	7,910	8,221	9,282	11,035
Depreciation	140	183	264	320	413	409	503	610	746	772	906	1,006	1,187
Interest	133	219	288	389	424	533	279	710	553	696	1,009	1,188	1,656
Total production costs	3,000	3,591	4,242	5,051	5,760	6,344	6,746	7,782	8,983	9,377	10,135	11,475	13,878
Production cost/ton (rs)	150	169	187	251	281	320	304	326	359	371	398	443	511
Other income	-33	22	62	-115	-288	-437	-212	-414	-195	-442	-351	-152	-521
Profit before tax	-451	-494	-36	-1,919	-901	-1,594	-877	-1,120	-52	513	-963	-481	-738
Tax	0	0	0	0	0	0	0	0	0	0	0	0	0
Net income	-451	-494	-36	-1,919	-901	-1,594	-877	-1,120	-52	513	-963	-481	-738

BHARAT COKING COAL LIMITED

BALANCE SHEETS 80/81-92/93

Rs million

	<u>80/81</u>	<u>81/82</u>	<u>82/83</u>	<u>83/84</u>	<u>84/85</u>	<u>85/86</u>	<u>86/87</u>	<u>87/88</u>	<u>88/89</u>	<u>89/90</u>	<u>90/91</u>	<u>91/92</u>	<u>92/93</u>
Assets:													
Cash & bank	270	179	79	131	215	149	303	335	301	276	206	101	364
Coal stock	879	980	1,236	836	918	888	1,451	1,650	1,999	2,691	3,621	4,106	4,854
Stores & spares	344	445	469	647	680	782	767	792	852	965	999	998	1,102
Sundry debtors	365	419	615	1,226	1,072	1,071	779	1,184	2,139	2,832	2,730	2,795	3,970
Others	4	5	4	7	330	198	178	161	33	61	137	205	509
Total cur.Assets	1,862	2,028	2,403	2,846	3,215	3,087	3,478	4,123	5,384	6,826	7,693	8,205	10,799
Gross fixed assets	2,633	3,353	4,765	5,822	7,305	8,574	9,691	11,304	12,393	14,067	15,808	17,436	20,148
Less acc. Depreciation	769	1,008	1,356	1,751	2,497	3,016	3,465	4,027	4,821	5,679	6,696	7,794	8,995
Net fixed assets	1,865	2,345	3,409	4,071	4,809	5,558	6,226	7,277	7,572	8,388	9,112	9,642	11,152
Capital w.I.P.	1,435	1,651	1,286	1,576	1,391	1,663	2,559	3,086	4,040	4,586	4,882	5,613	5,180
Loans & advances	880	1,060	1,619	2,479	2,534	2,696	2,390	1,844	1,746	1,834	2,109	1,976	1,965
Total assets	6,042	7,084	8,717	10,972	11,948	13,004	14,653	16,330	18,742	21,633	23,795	25,434	29,096
Liabilities:													
Sundry creditors	1,054	1,162	1,496	2,380	1,326	1,379	1,054	1,053	919	804	795	1,054	1,341
Statutory liabilities	134	249	172	135	48	211	283	622	644	1,604	1,464	1,076	1,270
Other current lia.	486	316	137	406	1,504	1,233	2,390	2,311	3,363	2,942	3,738	4,429	6,217
S.T.Debts	209	359	420	277	292	249	373	187	152	179	310	194	464
Total current lia.	1,883	2,085	2,224	3,198	3,170	3,071	4,100	4,173	5,078	5,530	6,307	6,752	9,292
Ltd : govt.													
Cil	5,425	6,756	6,389	9,580	11,481	13,172	13,121	15,946	15,399	15,980	17,358	18,294	20,156
Other liabilities													
Total liabilities	7,308	8,842	8,613	12,778	14,651	16,244	17,220	20,119	20,477	21,510	23,665	25,045	29,447
Share holders' equity:													
Paid in capital	1,657	1,658	3,500	3,500	3,500	4,500	6,044	6,044	8,150	9,500	10,476	11,220	11,220
Retained earnings	-2,923	-3,415	-3,397	-5,306	-6,203	-7,739	-8,612	-9,834	-9,886	-9,377	-10,346	-10,831	-11,571
Total s.H.equity	-1,266	-1,758	104	-1,806	-2,703	-3,239	-2,568	-3,790	-1,735	123	130	389	-351
Total liabilities	6,042	7,084	8,717	10,972	11,948	13,004	14,653	16,330	18,742	21,633	23,795	25,434	29,096

BHARAT COKING COAL LIMITED
FUND FLOW STATEMENT 80/81-92/93

Rs million

	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93
Sources:													
Income before cpra	-451	-494	-449	-2,132	-2,395	-2,695	-2,166	-2,838	-2,562	-2,826	-3,375	-3,801	-3,703
Cpra	0	0	412	213	1,494	1,101	1,290	1,718	2,511	3,339	2,413	3,320	2,964
Depreciation	201	239	348	396	746	519	449	562	794	857	1,018	1,098	1,201
Ltd interest	99	184	244	356	394	500	264	658	513	694	1,009	1,064	1,682
Gross i.C.G.	-151	-70	556	-1,168	238	-574	-164	100	1,255	2,065	1,064	1,681	2,145
New equity capital	1,000	1	1,842	0	0	1,000	1,544	0	2,106	1,350	976	744	0
L.T.Loan	482	1,331	-367	3,191	1,901	1,691	-52	2,825	-548	581	1,378	936	1,862
Total sources	1,331	1,262	2,030	2,023	2,139	2,117	1,329	2,926	2,814	3,995	3,418	3,360	4,007
Applications:													
Investment	527	935	1,047	1,347	1,299	1,541	2,014	2,140	2,043	2,220	2,038	2,358	2,279
Debt service:													
Principal payment													
Interest payment													
Decrease in other lia.													
Inc. In w.Capital	804	327	984	677	840	576	-685	786	771	1,776	1,380	1,002	1,728
Total applications:	1,331	1,262	2,030	2,023	2,139	2,117	1,329	2,926	2,814	3,995	3,418	3,360	4,007
Ratios:													
Current ratio	0.99	0.97	1.08	0.89	1.01	1.01	0.85	0.99	1.06	1.23	1.22	1.22	1.16

IMAGING

Report No: 15238
Type: PCR