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Periodic Research

An Economic Analysis on Productivity of B.C.C.L.

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Abstract

In 1972 the coking coal industry in Indian economy was nationalized which ultimately formed Bharat Coking Coal Limited at Dhanbad. For the first time, a concentrated effort was put in the Industry for an integrated development of the mines and the worker's welfare was taken up after the formation of Bharat Coking Coal Limited. This study is highly essential because it is an "Economic Analysis" highlighting the performance of Bharat Coking Coal Limited since from 2001-02 to 2012-13. This research study is an attempt to high light the behavior of the Economic parameters of Bharat Coking Coal Limited, through which a clear picture can be achieved about the nature of performance of this public sector. Therefore, the fundamental objective of the study is to analyses the nature of the performance of different economic parameters analysis can be highlighted and future policies of the management can be formulated relating to Bharat Coking Coal Limited. In this study, time series data will be collected from 2001 to 2013. The data will be collected relating to production and productivity of Bharat Coking Coal Limite

After studying the trend of growth of each economic parameter, attempt will be made to study the nature of their relationship among these economic parameters. While studying the nature of Inter-dependence among the economic parameter, the Econometric Model will be fitted with the help of Co-relation, Analysis and Regression Analysis. Thus, with the help of econometric modeling, a complete economic analysis relating to the performance of Bharat Coking Coal Limited will be prepared through this research study.

Keyword: Economic Analysis, Public Sector, Economic Parameter, Corporate Level, Geological Importance, Monitor & Administer, Coal Reserve, Production & Productivity, Technology, Mechanization, Future Development, Action Mode

Introduction

Bharat Coking Coal Limited was incorporated in January 1972 to operate coking coal mines (214 nos) operating in Jharia and Raniganj coalfields taken over by the Govt. of India on 16th Oct. 1971 to ensure planned development of the coking coal resources in the country. After formed in 1971 pursuant to nationalization of mines in the country and become one of the subsidiaries of coal India limited w.e.f. 1st Nov. 1975. Since inception B.C.C.L. has been incurring losses. A revival plan for B.C.C.L. was submitted to BIFR. After constitution of BRPSE in 2004, in its 19th meeting BRPSE, inter-alia, directed that revival plan be vetted by an independent consultant M/s Credit Analysis and Research Ltd. CARE was accordingly appointed as consultant by B.C.C.L. Based on the appraisal report of the consultant, a modified revival package for B.C.C.L. was approved by the Board of Directors of B.C.C.L. and C.I.L. was submitted to BRPSE for consideration. After approval of BRPSE the revival proposal has been sent BIFR for further concurrence and the year 2005-2006 B.C.C.L. become again raised like a diamond. The profit earning bright from this period as Turn Around Basis.

BCCL one of the subsidiaries of Coal India ltd is the major coal production belt. It is the major producer in its mines in Mohuda area and Barakar area. Its collieries situate in district Dhanbad. The capital structure of BCCL is –

*Authorized share as on 31.03.2013 - 2500crore
*Subscribed share as on 31.03.2013 - 2118crore
*Paid-Up share as on 31.03.2013 - 2118crore

The balance due to Coal India ltd as on 31st March 2013 unsecured loan is nill as compared to previous balance of Rs.1983.30 crore.

Presently the mines of BCCL are spread over-

- Jharia Coalfield - 273 km^2
- Raniganj Coalfield - 32 km^2

BCCL are presently operating 63 coal mines under 12 administrative areas viz
(I) BAROARA AREA,(II) BLOCK II AREA
(III) GOVINDPUR AREA, (IV) KATRAS AREA
(V) SIJUA AREA, (VI) KUSUN DA AREA
(VII) P.B.PROJECT AREA, (VIII) KUSTORE AREA
(IX). BASTACOLA AREA, (X) LODNA AREA
(XI) EASTERN JHARIA,(XII) WESTERN JHARIA

In which no. of Underground Mines – 23, No. of Opencast Mines – 15, No. of Mixed Mines – 25 out of total 63 coal mines are producing 23 to 24 million tones per year at present, in which the contribution of underground production is nearly 5 to 6 million tones per year.

The company also runs 6 Coking Coal Washeries (18.6 Mty capacity are proposed work order for 2 already issued) and 2 Non Coking / NLW Coal Washeries.

In the financial year the company earned Net profit 822.36 crore on 31st March 2012 and 1709.06 crore on 31st March 2013 .Through the BCCL is not just one of the most profitable companies in the media industry but It is one of the most profitable companies in the country . The fact that the company is losing quite a bit on its News television and Internet operation and still value earning huge overall profit is an indicating how profitable its.

At the corporate level, these mines and areas are monitored and administered by two Director i.e. Director (Technical) operation where as Director (Technical) Project and Planning is the Director-in-charge of all the Projects and Mines which would ultimately be devoted into projects as per reconstruction plan of Jharia Coalfield, the basic concept determining the future of this Coalfield, mining area. The Jharia Coalfield, the only, prime store house of coking coal property in India, is situated in the District of Dhanbad (Jharkhand) and is a part of famous Chotanagpur Plateau. The demarcation of boundary of Jharia Coalfield is slated by the beautiful rivers and mountains having religious and geological importance. The entire north is decided by Parasnath hill, having the historical Parasnath temple at its top. Damodar, one of the holy river referred in Vedas for the finy character is situated at the southern side of the coalfield. The Eastern side is determined by the river Barakar, which also separates the landed property between the stated Jharkhand and West Bengal. The River Jamunia is more or less the western boundary line of Jharia Coalfield as well as the District of Dhanbad and Bokaro. The other main operative areas of BCCL called Chanch Victoria starts from eastern side of the river Barakar, on area of Raniganj Coalfields in the District of Burdwan and are spread over about 32 sq.km. The Bhojudih washery is situated in Purulia district (West Bengal) at the South Bank of River Damodar. The Dugdha Washeries (Coking Coal and Non-Coking Coal) Damodar mines are situated Riven Jamunia, within the District of Bakaro in Jharkhand.

Coal Reserves

The coal inventory in India up a depth of 1200 meter as assessed by Geological Survey of India (GSI) in January 2012 on the basis of regional and detailed exploration carried out so far, stands at 253.30 Billion Tones (BT).

Table 1

Types-wise and category-wise Coal Reserves in India

Types of Coal	Proved	Indicated	Inferred	Total
Coking Coal	16.54	13.45	2.10	32.09
Non-Cocking Coal	78.86	106.21	35.20	220.27
Tertiary	0.47	0.11	0.37	0.95
Total	95.87	119.77	37.67	253.31

Table 2

Depth-wise and category-wise Coal Reserves in India

Depth(in m)	Proved	Indicated	Inferred	Total
0-300	73.75	66.63	14.38	154.76
300-600	6.74	41.41	17.52	65.67
0-600 (Jharia only)	13.71	0.50	0	14.21
600-1200	1.67	11.23	5.76	18.66
Total	95.87	119.77	37.66	253.3

Coal reserve of BCCL arise in Jharia Coalfield and Raniganj Coalfield , 13298.68 mt (0-600 depth) 4970.00 mt (600-1200 depth) totally 18268.68mt. : Total coal reserve of BCCL Depth wise , quality wise and coalfield wise is shown in table 3.

Table 3

Depth wise , quality wise and coalfield wise coal reserve of BCCL

Type of Coal	Depth in Meter				Total coal reserve of BCCL (Million tone)	
	0-600		600-1200			
	JCF	RCF	JCF	RCF	JCF	RCF
Prime Coking	4127.99	000	570.00	000	4697.99	000
Medium Coking	3400.70	310.87	2100.00	20.00	5500.70	321.87
Non-Coking	4761.87	706.25	1900.00	380.00	6661.87	1086.25
Sub total	12290.56	1008.12	4570.00	400.00	16860.56	1408.12

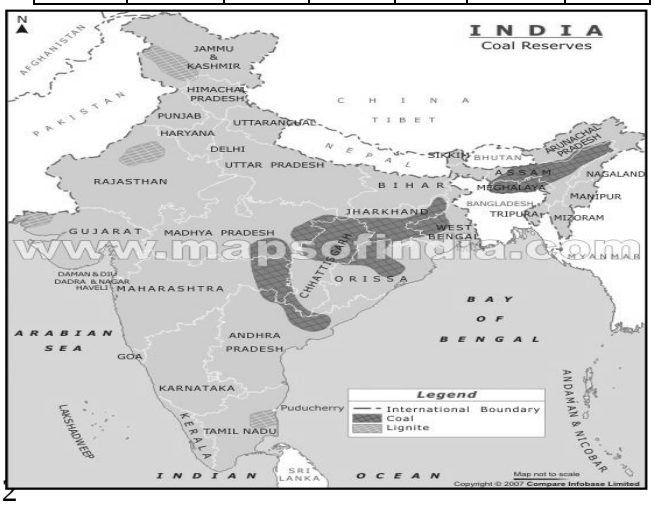


Table 4
Coal Production Plan of BCCL up to 2024-25(in MT)

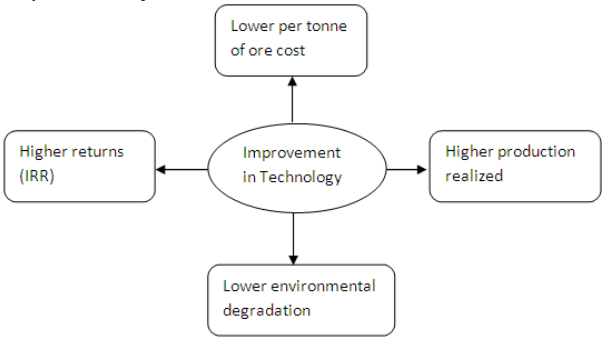
5 year Plan	Opencast	Underground	Total
X – Plan (06-07)	19.8	11	34.5
XI – Plan (11-12)	26	10	36
XII – Plan (16-17)	27	13	40
XIII – Plan (21-22)	29	16	45
XIV – Plan (24-25)	32	17	49

Production and Productivity

Production and Productivity play a vital role in any production unit. Presently in India about 85% of the national coal production is obtained from opencast and rest from underground. Bharat coking coal Limited in the present crossroad is in the process of transformation from a phase of mostly manual production system to a mechanized system. Obviously production plays an important consideration. Opencast mining has already achieved a respective position of productivity in some of the mechanized mines, but underground mines are yet to reach that stage.

The thrust of the new economic policy of the country is towards creating a more competitive environment for improving the system's productivity and efficiency. The competitiveness implies:-

- Production of goods and services based on new technology.
- Enhancing the economic health of the organization through improved man productivity, machine productivity as well as capital investment productivity.



Coal produced from opencast or underground may be coking and non-coking depending upon its property. We describe here the nature of trend of production of all type of coal produced by BCCL.

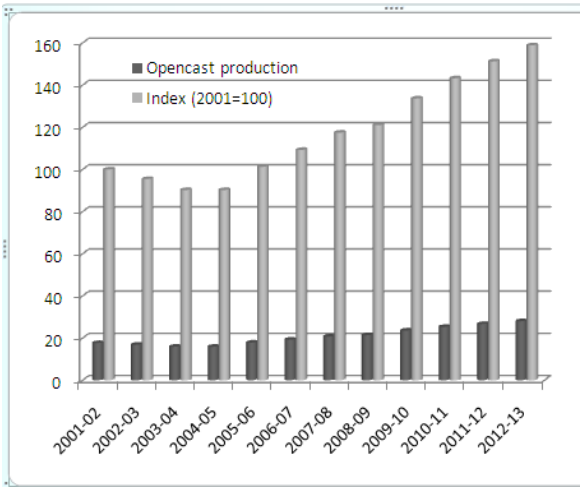
Opencast mining dominates the coal production due to number of favorable factors like economic viability, better safety, higher conservation of coal, ease in mass reduction, higher productivity, low gestation period etc. In view of above favorable Factors, modern trend of management is to increase production from opencast projects.

During sub period 2001-02 to 2012-13 performance of open cast mines improved significantly. Even through forced to work with higher depth and stripping ratio, only with the help of opencast mining, we have been able to achieve higher production with higher productivity. Also with opencast mining there is scope to maintain growth of OMS by introducing higher capacity equipment.

Production of Coal from Opencast Mines: Total production of coal from opencast mines from the year 2001-02 to 2012-13 is shown in table 5.

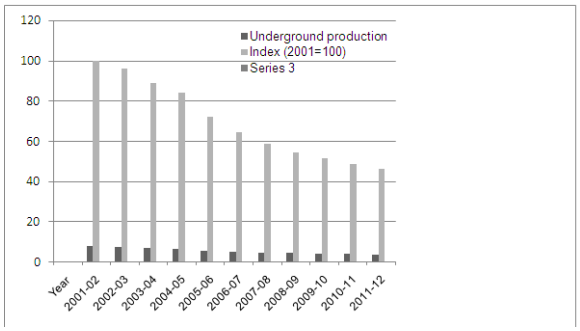
From table 5, it is clear that production in opencast mines had always an increasing trend.

Year	Opencast production	Index (2001=100)
2001-02	17.66	100
2002-03	16.86	95.47
2003-04	15.94	90.26
2004-05	15.94	90.26
2005-06	17.89	101.30
2006-07	19.30	109.29
2007-08	20.75	117.50
2008-09	21.38	121.06
2009-10	23.61	133.69
2010-11	25.30	143.26
2011-12	26.72	151.30
2012-13	28.06	158.89



From table 6, it is clear that production in Underground mines had always an decreasing trend.

Year	Underground production	Index (2001=100)
2001-02	7.59	100
2002-03	7.29	96.04
2003-04	6.74	88.80
2004-05	6.38	84.06
2005-06	5.47	72.07
2006-07	4.90	64.56
2007-08	4.46	58.76
2008-09	4.13	54.41
2009-10	3.90	51.38
2010-11	3.69	48.62
2011-12	3.48	45.85
2012-13	3.15	41.50



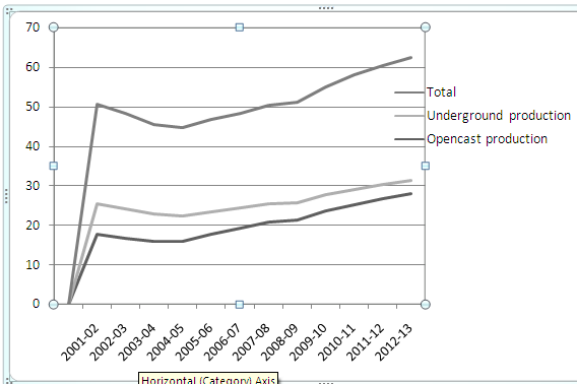
It is clear from the table 5 that the trend of production of underground mines is going down. The valid reason for the poor show of underground mines may as follows:

1. BCCL is still carrying the burdens inherited from the pre-nationalized Indiscriminate mining.
2. There have been restrictions on account of possible subsidence effects and shortage of stowing materials forcing to develop more than depillar.
3. The average depth of working has increased and so has the complexity from continuous, multiple thick seams.
4. Many of the mines in Jharia and Raniganj fields are now forced to work small distance patches with extensive old working around

A detailed study of the underground mines in BCCL would reveal that in majority of the mines with B & P method of mining, the salaries and wages component work out to be 60% or even more with continually escalating EMS. Despite the sale price being lower than that the BCCL.

Table 7:
Total production of coal

Year	Opencast production	Underground production	Total	Index (2001=100)
2001-02	17.66	7.59	25.25	100
2002-03	16.86	7.29	24.15	95.64
2003-04	15.94	6.74	22.68	89.82
2004-05	15.94	6.38	22.32	88.40
2005-06	17.89	5.47	23.36	92.51
2006-07	19.30	4.90	24.20	95.84
2007-08	20.75	4.46	25.21	99.84
2008-09	21.38	4.13	25.51	101.03
2009-10	23.61	3.90	27.51	108.95
2010-11	25.30	3.69	28.99	114.81
2011-12	26.72	3.48	30.20	119.60
2012-13	28.06	3.15	31.21	123.60



The total production of coal of BCCL with respect to year is shown in Table 6. To achieve the target production, BCCL has not only expended the opencast mines, but stress has also given to improve the production from under- ground mines. For this, intermediate technology like Side Discharge Loaders (SDLs) and Load Haul Dumpers (LHDs) have been introduced in BCCL mines for getting coal depillaring area and development area. The purpose of introducing these machines was to quicken the face operation and also to dispense with human presence at front as the immediate face is more prone to the danger of roof fall accidents. Cole production and productivity in underground mines has either stagnated or declined despite significant investments aimed at improving the productivity and the safe working conditions in these mines.

BCCL currently operates about 48 underground producing mines (including 25 mixed), traditionally employing B & P method since nationalization. The under- ground production has been declining continuously over a period time. B &P method with semi mechanized technology such as SDL/LHD loading onto coal tubs is being practiced 48 producing underground mines of BCCL.

The growth of production and productivity in opencast mines has been quite good; this has been possible primarily because of a strategy of developing large opencast mines.

Equipment Technology

BCCL have deployed 1022 $HEMM_S$. The detail is given below in Table 7.

Equipment	Number of equipment
Dragline	2
Shovel	125
Dumper	563
Dozer	157
Drill	175
Total	**1022**

Multi Skill Concept

I. The development of multi skill concept will help in reduction of man hour expose at the place of work and thus automatically cater for improvement in safety. This may be introduced in conventional development and depillaring operations apart from long wall working. The workman should be trained for all types of works they will expected to do. It may be necessary to redesign ate and enlarge the existing job content to suit new technology.

II. While formulating the programmed for mechanization of mines, utilization and gainful deployment of existing manpower would be taken into consideration.
III. Engagement of Sunday/Holiday should be regulated by fixing norms for deployment of manpower on Sunday/Holiday for mine maintenance, safety etc.
IV. Quality Circle Concept is to be initiated and adopted soon. Some workshop/Seminar are being arranged and this will lead to educate people.

Steps to be taken for Achieving above Improvement

Actions to be taken for attaining the level of performance in respect of underground mines are indicated below:

(a) Face Mechanization/Eliminating Basket Loading: A number of districts have to be taken up for through provision of scrapers, chain conveyors, side discharge mechanization loaders and load haul dumpers. Some of the SDL's are working in Bera, Simlabehal, Begunia etc. and LHD's are working in Jealgora, Hurriladih etc. Scrappers are working in East Katras and Murulidih 20/21 pits. Chain conveyors for direct shoveling there on are in Phularitand and Dahibari. Action to be taken in this regard is summarized below:
(i) Scraper hoist in conjunction with scrapper chain conveyor at various mines.
(ii) Introduction of SDL's in conjunction with scrapper chain conveyors.
(iii) Introduction of LHD's
(iv) Introduction of scrapper chain conveyors for direct shoveling there on
(b) Improvement in Loaders Output per Man shift: Action to be taken for improvement of loaders OMS are as under:
(i) Removing the transport bottlenecks
(ii) Providing the required numbers of coal tubs.
(iii) Improving ventilation to the required extent.
(iv) Rationalization and leveling of loaders strength.
(v) Identification of bare minimum requirement of materials.
(vi) Making a time bound programmed for the development activities.
(c) Injection of New Technology: Successful trials have been taken up with blasting
Gallery method. These techniques are conducive to high OMS and their wider application ultimately would bring about significant improvement in the long term perspective. Action to be taken for improvement in system capacity utilization in opencast mines is indicated below:

(i) Critical Study of Low OM Opencast Mines:
A critical study has to be undertaken in opencast mines with low OMS. Action is to be taken to remove the deficiencies identified in the study. Some studies are being carried out also.

(ii) **Target Setting Commensurate with Capacity:**
Based on in depth study of capacity vis-à-vis constraints realistic target for coal and over burden has to be set up and actual performance against this is to be monitored intensively.

(iii) **IED Study for Identification of Bottlenecks*:***
IED studies have to be initiated in selected opencast mines to identify nherent weakness in the system leading to low utilization which ultimately effect OMS. Studies have already been carried out in GOCP, KOCP, Block-II areas etc.

(iv) Action Teams:
Action teams are to be constituted in mines/areas from among the machine operators, maintenance personnel and supervisors and they are being imparted job oriented training for improvement in work performance and work technique.hey would form a nucleus in each mine/area and would disseminate the Knowledge gained by them among the broad spectrum of workmen.

Focus for Future Development

Future development should focus on gaining overall control of the situation and put BCCL in an "Action Mode" building on the positive features of the personnel and environment profiles. The following need special attention.

a) Clarity Roles and Modify Delegation: Take all steps like clarifying roles, introducing participative forum, empowering local group to take initiative for action etc. to promote team work at all levels. Form special empowered group to clear back log of employee grievance. Take a close look at the systems and review the staff performance in personnel to seek improvement.
b) Promote Officers: Impart proper training to promote officers and ensure that they are transferred from their original nexus. Bring HRD and training department under one General Manager. Improve the quality of staff through proper incentive for attracting talent. Make a training plan relevant to needs. Give emphasis to supervisory development, promote officers development, content for skills for team work, inputs for improved work culture.
c) Integrated HRD and Training: Training function should be strengthened by attracting available internal talent through proper incentives and brought under a unitary command covering HRD and training. Development of promote officers should receive greater attention in training efforts in team of both professional and general management competence. Technical trainees should spend full six months in the training division. Introduce cross functional training.
d) Technological Bottlenecks – Crash Programmed Implement a crash programmed of clearing technological bottlenecks and improving facilitations for safety and ventilation.

Conclusion

BCCL under the present circumstances need progressive and innovative management to achieve productivity increase with human resource management technology that goes beyond any incentives. Productivity of coal mines is vital in achieving the growth of the industry. In fact low production of coal has been a setback in growth of in industry all along. This might be due to too much

dependence of manual system of mining, late realization of advantages of e-governance in production/ administration/ marketing etc. Mining method (Advance Safety System & Equipment) as there are very much related in the process of enhancing production in BCCL.

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