

CHAPTER 8

Coal Mining

Development of Eco Parks

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Introduction

India is the second largest producer of coal after China. There are two ways in which coal mining is done. The first being OC mining and the second is underground mining. Coal production is very important as most of the industries are directly linked to coal and produce various other substances. As mining is a temporary use of land, this land can be reused for the other purposes too. However, with coal mining there are various factors that harm the environment and are considered bad for the ecosystem. This chapter deals with the hazards of coal mining to the ecosystem and how the new concept of development of eco parks can help in controlling pollution. The chapter firstly deals with the pollution caused by or the hazards of coal mining. The chapter utilizes empirical data from the Coal India Limited (CIL) and its subsidiary (BCCL).

Air Pollution

The main sources of air pollution are movement of overburden (OB)/ coal by road, transfer points at crushers and loading/unloading operations in coal handling plants (CHP) besides drilling (Sharma, 2019). These operations generate suspended particulate matter (PM₁₀) and respirable particulate matter (PM_{2.5}). Some fugitive gaseous emissions such as carbon dioxide, carbon monoxide, sulphur dioxide (SO₂) and oxides of nitrogen are also caused by automotive, generators and blasting operations.

Shortcomings in Implementation of Air Pollution Control Measures

For mitigating air pollution, generation of dust is to be controlled at the source with necessary measures during drilling, loading, unloading, CHP transfer points and so on (Ward, 2019). Further, dust generation is to be minimized along coal/waste transportation roads and green belts are to be created around the source of dust. CIL prescribed (March 2014) guidelines for adherence so that air pollution can be mitigated. Audit visited (27 June 2018, 10 July 2018 and 17 July 2018) three mines and observed the shortcomings, as detailed further:

<i>S. No. Parameter</i>	<i>Mines where Parameters Violated</i>
1. Wetting of top surface of coal loaded trucks by sprinklers/ mist sprays	Kuya, DBOCP
2. Use of mechanical brooming/ industrial cleaner	Kuya, DBOCP
3. Wet drilling	Kuya, DBOCP
4. Drills fitted with dust extractor	DBOCP
5. Mechanically covered truck transportation	Kuya, DBOCP
6. Use of fixed sprinkler for dust suppression at railway siding	Kuya
7. Avenue plantation	Moonidih, Kuya (partially plantation done)

No reason for violation of the above parameters was found on record. BCCL continued mining activities without initiating remedial action.

Environmental clearance (EC) relating to clusters of mines of BCCL stipulated to conduct a source apportionment study and mineralogical composition study for Jharia Coalfield (JCF) to ascertain sources and extent of air pollution due to mining activities so that appropriate mitigating measures could be taken. It was observed that BCCL did not conduct these studies and hence the source and extent of pollutants generated due to mining activities could not be ascertained. This could undermine the mitigation plan for effective control of pollutants.

Deficiencies in Air Monitoring

The Central Pollution Control Board (CPCB) had notified National Ambient Air Quality Standards (NAAQS) in November 2009 with 12 identified pollutants and prescribed their maximum permissible limits in air (MINEO Consortium, 2000). It include five gaseous pollutants namely sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), carbon monoxide (CO) and ammonia (NH_3); two dust related parameters (PM_{10} and $\text{PM}_{2.5}$); three metals (lead, nickel and arsenic); and two organic pollutants (benzene and BaP-particulate). While granting EC to coal projects, the Ministry of Environment, Forest and Climate Change (MoEF&CC) stipulated that the prescribed limit of above pollutants should be monitored regularly and necessary mitigation measures be taken to restrict the pollutants up to their prescribed limits to avoid their adverse impact (International Institute for Environment and Development, 2002).

Further, NAAQS, 2009 extended discretion to industries, wherein, PM_{10} and $\text{PM}_{2.5}$ could be monitored either on an annual basis or on a 24 hours basis (Agarwal and Narain, 1991). In the case of monitoring on annual basis, annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week at uniform intervals was to be considered, while in the case of monitoring on 24 hours basis, the prescribed norms were to be complied with 98 per cent of the time in a year. However, the values could not exceed the limits on two consecutive days of monitoring.

Audit observed that although these norms came into effect from November 2009, BCCL started complying with them from September 2015 only. Moreover, ambient air quality was monitored on fortnightly basis which was required to be done twice a week at uniform intervals to complete 104 observations in a year as per NAAQS, 2009. NAAQS prescribed the maximum permissible level of PM₁₀ and PM_{2.5} concentration in industrial, residential, rural and other areas. Audit observed that the presence of PM₁₀ and PM_{2.5} in air exceeded the levels prescribed in NAAQS in two mines namely Dahibari–Basantimata OCP (DBOCP) and Moonidih UG during 2013–2014 to 2017–2018 as detailed further:

Pollutants	Maximum Permitted Level ($\mu\text{g}/\text{cum}$)	Range of Actual Levels Recorded ($\mu\text{g}/\text{cum}$)	No. of Occasions the Reading Exceeded the Specified Standards in the Mines	
			DBOCP	Moonidih UG
PM ₁₀	100	101 to 660.06	31	13
PM _{2.5}	60	60.5496 to 480	26	8

Source: CMPDIL monitoring report and data furnished by BCCL.

It was further observed that no action was initiated to analyse the reasons for the pollution in excess of prescribed limits for remedial action.

Non-installation of Continuous Ambient Air Quality Monitoring Station

As per the Consent to Establish (CTE) certificate issued (August, 2014) to Madhuban Washery and East Bassuriya OCP by the Jharkhand State Pollution Control Board (JSPCB), BCCL was required to install continuous ambient air quality monitoring station for online monitoring of ambient air quality with its connectivity to JSPCB server. However, BCCL had not complied with these directives so far.

Water Pollution

The major source of water pollution in coal mines is the suspended solids in the drainage system of mine water and storm water (Wathern,

1988). Effluent from washeries and coal preparation plants generally contain fine coal particles, suspended solids, washery medium, reagents and sometimes oil and grease. In heavy earth moving machineries (HEMM) and light vehicles workshops, the workshop floors mix oil and oily matters into water along with dirt that is being washed. Besides this the sewage from residential complexes contaminates water with mainly organic matter.

Shortcomings in Implementation of Water Pollution Mitigation Measures

Non-installation of effluent treatment plant: Water generated during the course of coal mining is contaminated and needs to be treated so that it can be recycled. EC stipulated for installation for effluent treatment plant (ETP) at Kuya, DBOCP and Moonidih mines.

It is observed that BCCL did not install ETPs at the workshops and CHPs of the above mentioned mines. Absence of ETP not only violated the stipulations contained in EC but also continuously exposed the ground water to contamination.

Non-installation of sewage treatment plant (STP): As per the decision (July 2015) of the Committee of Jharkhand Legislative Assembly on environment and pollution control, BCCL had to install sewage treatment plant (STP) at residential colonies of the BCCL to treat the waste water of residential colonies. Accordingly, four STPs were required to be installed in residential areas of Koyla Nagar, Jagjiwan Nagar, Karmik Nagar and Harina Bagan.

It is however observed that no STP has been installed in the above residential colonies till date exposing the soil and underground water to contamination (Ghose, 2004).

Deficiencies in Monitoring of Ground Water Level

As per the specific condition of EC, regular monitoring has to be done in respect of ground water level and quality by establishing a network of existing wells and construction of new piezometers. Further, monitoring for quantity of ground water should be carried out four times in a year.

As per Central Mine Planning and Design Institute's (CMPDI) report (21 March 2018) It was observed that ground water level in mines located under administrative block of Baghmara in Cluster V, administrative block of Dhanbad in Cluster VI and XI, and administrative block of Jharia in Cluster X showed a declining trend during 2013–2014 to 2016–2017.

However, BCCL did not install piezometers for monitoring ground water level and its quality, violating EC condition.

As per Central Ground Water Authority (CGWA) guidelines (16 November 2015), industries/infrastructure/mining projects in Dhanbad are required to obtain no objection certificate (NoC) to use ground water. However, again it was observed that BCCL continued using ground water for its mining operation without obtaining NoC from CGWA.

Treatment of Mine Water

EC condition stipulates that mine water must be treated before it is discharged into natural water course. The quality of water discharged is to be monitored at the outlet points and proper records are to be maintained (Singh, 2005).

It is observed that BCCL had discharged 328 million litres of mine water per day into natural water course during 2017–2018. Whereas BCCL mine water treatment plant had the capacity to treat 81.17 million litres of mine water per day. Thus, in absence of required water treatment capacity, 246.83 million litres per day (75.25%) of mine water was discharged into the natural water course without any treatment. It was also examined and observed from the reports of CMPDI regarding quality of water discharged at the outlet points in DBOCP during 2014–2015 to 2015–2016 that presence of total suspended solid (TSS) in the water was in the range of 138–142 mg/L against the permissible limit of 100 mg/L. BCCL did not initiate any action to increase the capacity of mine water treatment plant.

EC condition stipulated that discharged mine water must be gainfully utilized for industrial and domestic purpose. Audit observed that during 2017–2018, 46 per cent of mine water of BCCL was discharged

into natural water course without utilization. As per the Memorandum of Understanding (MoU) (October 2017) entered between CIL and Government of Jharkhand, BCCL was required to supply approximately 30 million gallons surplus mine water per day to Government of Jharkhand. However, no further development has taken place for supply of surplus mine water to Government of Jharkhand till date.

Land Management

Mining involves government forest land and non-forest land, and tenancy or private land for its development as well as operational activities. During exploration, land degradation due to change in land use takes place. An external dump is created to accommodate OB removed to extract coal and it is continued till internal dumping or backfilling commences.

The process of land management includes topsoil management, technical reclamation of external OB dump, internal dump/backfilled area, management of void left after completion of extraction and plantation, that is, biological reclamation of technically reclaimed dumps. (Biswas and Agarwal, 1992).

Improper Management of Topsoil

Topsoil is the upper and outer most layer of soil, usually the top 5 centimetres (cm) to 20 cm. It has the highest concentration of organic matter and microorganisms wherein most of the earth's biological soil activity occurs. It takes approximately 1,000 years for one inch of topsoil deposit to be formed. This soil requires to be removed for OC mining of coal. Given the time taken to generate and the importance of topsoil, MoEF&CC stipulated that topsoil be stacked at earmarked specific sites with adequate measures to preserve and be used as top layer for reclamation of mined-out areas. A record of topsoil indicating the area of stacking along with the date was to be maintained and topsoil was to be stacked in such a way so as to facilitate its issue on first-come-first-go basis. Regulation 108 of Coal Mines Regulation 2017 also stipulated that topsoil be stacked in a separate place.

It was observed that records of topsoil indicating the quantity and areas of stacking were not maintained in Kuya and Dahibari–Basantimata mines, which is indicative of ineffective management of top soil.

Improper OB Management

Overburden is required to be managed properly to prevent pollution of air, water, land and sliding of land during rainy season. Guidelines for Preparation of Mine Closure Plan 2009 stipulate that measures are to be implemented for reclamation and rehabilitation of mined-out land. Reclamation of the mined-out land is carried out through backfilling of OB. Audit observed that as on 31 March 2018 despite availability of fully mined-out land, BCCL dumped OB in the partially mined-out areas as detailed further:

<i>Mines</i>	<i>Mined-out Area Available (ha)</i>	<i>Total Backfilled in Mined-out Area (ha)</i>	<i>Mined-out Area Available for Backfilling (ha)</i>	<i>Backfilling in Partially Mined-out Area (ha) in Place of Mined-out Area</i>
Sijua Area (Mudidih and Kankanee Mines)	122.44	76.26	46.18	20.72
Kusunda Area (Godhur and Kusunda Mines)	108.5	97.4	11.1	33

OB backfilled in the partially mined-out areas is again required to be shifted before extraction of coal lying under the partially mined-out areas. Thus, backfilling of OB in partially mined-out area in place of totally mined-out area would result in unnecessary re-handling of OB causing additional cost of re-handling of OB and delay in reclamation of mined-out areas.

Specific condition of EC of the Cluster XVI (a group of mines) stipulated that no OB was to be dumped near water bodies and rivers,

and a safety barrier of a minimum 60 meter width was to be maintained along the water/nalas to avoid the contamination the water/nalas.

We saw that in DBOCP, OB was dumped along the banks of Khudia River without maintaining the minimum distance, and hence it spilled continuously into the river. Further, garland drainage and embankment of suitable dimension with stone pitching were not provided to prevent spillage of OB into the river, thereby resulting in contamination of the river water.

Deficiencies in Plantation Surrounding the Coal Mines of BCCL

Biological reclamation by way of broadcast seeding of grass seeds and plantation/afforestation is to be undertaken for stabilization of OB dumps against erosion or minimization of soil erosion and best utilization of land. Tree plantation is to be taken up on external OB dumps and backfilled/internal dump areas including terraced slope, vacant land and avenue plantation as a mitigation measure. Tree plantation is one of the cost effective remedial measures to mitigate air and noise pollution. As per CIL Environmental Guidelines, it was decided to develop heterogeneous mix of forest with local species so that the survival rate remained high and evergreen. These species of trees were to have combined properties like medicinal, timber-yielding and fruit-bearing. However, it was observed that though BCCL is meeting the year-wise target of biological reclamation, no records were produced showing the species of trees used for plantation in each area. Further, no mechanism to monitor and ensure survival of the existing plantation was found on record.

Closed Mines

Mineral deposits being exhaustible, once the process of economical extraction of mine is complete, there is a need for its closure (Bagchi and Gupta, 1990). Planning for mine closure is necessary and is to be done systematically so as to ensure safety, post-closure monitoring, control of safety hazards, decommissioning of infrastructures, closure of entries to the mine, management of final voids, reclamation of forest/vegetation and financial aspects involving closure costs.

Mineral Conservation and Development Rules, 1988 (MCDR), stipulate that the owner of mine shall not abandon a mine without prior permission in writing and without obtaining a certificate from the regional controller of mines or the officer authorized by the state government in this behalf to the effect that protective reclamation and rehabilitation work have been carried out in accordance with the final mine closure plan. For financial assurance of mine closure expenses, BCCL was to open an escrow account with a scheduled bank with the Coal Controller Organization (CCO) and deposit money at prescribed rates. Up to 80 per cent of the total amount deposited including interest accrued in the escrow account or the expenditure incurred towards progressive mine closure in the past five years, whichever is less, could be claimed from CCO by BCCL for reimbursement of expenditure on mine closure activities.

Production above Environmental Norms

The Environmental Clearance (EC) and the Forest Clearance (FC) issued by MoEF&CC permits the maximum quantum of coal to be extracted from the mines after compliance of various measures specified in this regard.

Penalty due to Excess Production of Coal Violating EC

The production of coal beyond the quantity specified in EC attracts penalty at the rate of 100 per cent of the price of the illegally or unlawfully mined mineral under Section 21(5) of the MMDR Act, 1957.

Operation of Mines/Washeries without EC, CTE and CTO

Environmental Impact Assessment (EIA) notification 2006 of MoEF&CC stipulates that every project has to get EC to control the adverse impact of coal mining. Further, Water (Prevention and Control of Pollution) Act, 1974 and Section 31A of Air (Prevention and Control of Pollution) Act, 1981 require that every project should obtain CTE for establishment of a new unit or expansion/modernization of any existing unit from SPCB. After obtaining CTE, the

project requires to obtain Consent to Operate (CTO) before commencing commercial production for a specific period, which needs to be renewed periodically.

Change in Mining Technology

General condition of EC provides the details of mining technology to be used for coal extraction (Saxena et al. 2000). In case a project proponent (PP) intends to use a different mining technology other than what is stated in EC, then PP must obtain a modified EC from MoEF&CC. Scrutiny of ECs obtained for Basantimata underground mines, Dohari underground mines, Gopalichak underground mines and Gaslitand underground mines revealed that management were required to use bord and pillar method for mining of coal. Audit however observed that these mines were operated as OC mines using dumper and shovel combination. Change in mining technology without taking prior permission from MoEF&CC tantamount to violation of the General EC conditions.

Jharia Mine Fire

Mining areas in JCF within the leasehold land of BCCL are faced with problems of fire and subsidence due to the century-old history of mining in this coalfield. Fire in JCF was first reported in 1916. Issues relating to pervasive mine fire include health and well-being of the persons living around the fire areas in terms of air and water pollution, subsidence, threat to infrastructures such railway lines, roads, buildings and rivers have been major concerns from time to time (WHO, 1946). To deal with the problems of fire, subsidence and rehabilitation, CMPDIL prepared (March 1999) Jharia Master Plan (JMP) which was approved (April 1999) by BCCL Board. The JMP was revised in 2004, 2006 and 2008 and finally it was approved by the Government of India in 2009 wherein a time frame of 10 years was allowed for dealing with the fire.

As per JMP, 67 places under JCF are under fire which requires mitigation measure for its extinguishment and for controlling the adverse

environmental impact due to fire. JMP recommended conventional method as well as other method for controlling or extinguishing the fire. Conventional methods included total excavation of fire, isolation by trenching, blind flushing, surface sealing, isolation by underground stopping, quenching and cooling, cooling by water curtain, flooding and natural burnout. Other methods included inert gas injection, chemical treatment, burnout control, modified bulk filling (water/slurry and pneumatic) and underground coal gasification.

However, the following deficiencies/shortfalls are present in the implementation of JMP.

Delays in Implementation of Fire Dealing Activities

In the JMP to deal with fire, 67 fire places under JCF were grouped into 45 fire projects. A timeline of 10 years was earmarked to extinguish fire in these 45 fire projects. Audit observed that even after completion of nine years from approval of JMP, fire dealing activities could be started only in 25 fire projects. In other 20 fire projects, no firefighting activities had been undertaken so far. Delay in implementation of JMP not only resulted in spreading of fire around the JCF but also endangered the lives of the people residing in and around the fire area. Also, it has had an adverse impact on environment.

Rehabilitation of Affected Population from Endangered Areas

JMP recommended rehabilitation of affected families by constructing 79,159 quarters which included 25,000 quarters for families of BCCL employees and 54,159 quarters for outsiders. These houses were to be constructed in identified non-coal bearing places within a period of 10 years. Construction of quarters for the BCCL employees was to be carried out by BCCL and the same for the outsiders was to be carried out by the Jharia Rehabilitation and Development Authority (JRDA).

As per the data, only 6,668 quarters for families of BCCL employees and 4,352 quarters for outsiders were constructed till date (August 2018). Further, only 3,361 families of BCCL employees and 2,122

families of outsiders had been shifted into the newly constructed quarters in non-coal bearing area as detailed further:

<i>Target for Quarter Construction (in Numbers)</i>							
<i>Quarters Target</i>		<i>Quarters Built</i>		<i>Shortfall</i>		<i>Shortfall in (%)</i>	
<i>BCCL</i>	<i>Outsiders</i>	<i>BCCL</i>	<i>Outsiders</i>	<i>BCCL</i>	<i>Outsiders</i>	<i>BCCL</i>	<i>Outsiders</i>
25,000	54,159	6,668	4,352	18,332	49,807	73.32	91.96

<i>Quarter Built and Occupied (in Numbers)</i>							
<i>Quarters Built</i>		<i>Quarters Occupied</i>		<i>Shortfall</i>		<i>Shortfall in (%)</i>	
<i>BCCL</i>	<i>Outsiders</i>	<i>BCCL</i>	<i>Outsiders</i>	<i>BCCL</i>	<i>Outsiders</i>	<i>BCCL</i>	<i>Outsiders</i>
6,668	4,352	3,361	2,122	3,307	2,230	49.60	51.24

Non-shifting of the families from fire-affected areas exposed the inhabitants to the risk of subsidence and other environmental hazards.

Diversion of Stretch of National Highway 32 between Putki and Godhur

JMP recommended diversion of stretch of National Highway 32 between Putki and Godhur, passing over coal bearing fire-affected area. In November 2009, BCCL and Government of Jharkhand decided that the fire-affected stretch would be handed over to BCCL on lease basis to excavate coal from the entire fire-affected area. After excavation of coal, the stretch was required to be handed over to Government of Jharkhand. To deal with NH traffic passing through this stretch In the meantime, it was decided to develop an alternate route at par with NH standards as a short-term measure. BCCL was required to bear the cost of developing the alternate route. The proposal was concurred in July 2010 and accordingly BCCL deposited (February 2012) Rs. 198.5 million with the JRDA, Dhanbad.

Non-assessment of Quantum of Underground Fire

In JCF fire exists on surface as well as below the ground. BCCL assessed expansion of mine fire on the surface from time to time

through the National Remote Sensing Centre (NRSC), Hyderabad. In 2014, the NRSC reported that the quantum of surface fire covered an area of 2.18 sq. km which expanded to 3.28 sq. km in 2018 due to opening of underground fire by excavation method.

As the surface fire further expanded over 1.10 sq. km in last four years, likelihood of further spreading of the existing underground fire cannot be ruled out. No records were produced regarding initiatives taken by BCCL for assessment of the quantum of underground fire.

Hazardous Substance Management

The hazardous substance management includes management and handling of hazardous wastes, bio-medical wastes, batteries and e-waste. Hazardous wastes in coal mines include used/spent oil and wastes/residue containing oil arising out of the process of industrial operation using mineral/synthetic oil as lubricant in hydraulic systems or other applications, chemical sludge from waste water treatment, and oil and grease skimming residue resulting from the process of purification of air, water and waste water. E-waste is waste generated out of damaged electrical/electronic products (Bose and Singh, 1989). Hazardous Wastes (Management, Handling and Transboundary Movement) Rule, 2008, was applicable to the company till March 2016. In April 2016, Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016 (Rules), were issued in supersession of 2008 Rules. These Rules defined hazardous waste as any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances. Handling, generation, collection, storage, packaging and transportation of used oil required authorization from the JSPCB, in accordance with Clauses 5 and 6 of the above Rules.

Deficiencies in Management of Hazardous Waste

In accordance with the Rules, authorization was to be obtained for handling the hazardous waste. Kuya mines and Bhojudih Coal

Washery handled the hazardous waste without obtaining the authorization from the JSPCB. DBOCP, Putki Balihari and Moonidih UG mines handled the hazardous waste without obtaining authorization from JSPCB till July 2017. Hazardous waste collected, received, treated, transported, stock and disposed of by BCCL in the above mentioned mines and washeries during 2013–2017 (July 2017) is detailed further:

S. No.	Mine/ Washery	Burnt Oil (in kl)	Used Cotton Waste (in kg)	Lead Acid Automobile Batteries (in nos)	Lead Acid Cap Lamp Batteries (in nos)	Metal Scrap (in kg)
1.	Kuya ¹	21.355	1,211	39	-	29,950
2.	PB Project	1,460	-	-	-	-
3.	Moonidih	1.8	60	NA	NA	NA
4.	Bhojudih Washery	655	-	43	NA	Estimated 80 Ton

Note: For the period of 2013-2018.

Handling of waste without proper authorization is a pointer to deficient monitoring.

Under clause 23 of Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, BCCL was to obtain insurance cover as contemplated under Section 4 of the Public Liability Insurance Act, 1991, as a safeguard against liability for damages caused to the environment to third party due to improper handling and management of hazardous and other wastes.

Corporate Social Responsibility

Mining of coal has adverse impact on the ecosystem and biodiversity in and around the areas where the mines are in operation. Therefore, projects should be designed on the principle of sustainable development with due consideration for environment, conservation, safety, quality and aspirations of the community around it. Expenditure on corporate

social responsibility (CSR) is required for activities relating to protect and safeguard environment, and to maintain ecological balance.

Shortfall in CSR expenses

In accordance with specific condition of EC granted by the MoEF&CC, five rupees per tonne of coal produced was to be earmarked for activities under CSR. The amount was to be spent for community development under CSR activities.

There was a shortfall in CSR expenses actually incurred by BCCL by Rs. 38.24 crores as compared to the amount mandated by the MoEF&CC during the year 2014–2015 to 2017–2018 as detailed further

<i>Year</i>	<i>CSR Expenditure to Be Incurred as Mandated by the MOEFandCC (in Crore)</i>	<i>Actual CSR Expenses (in Crore)</i>	<i>(+) Excess (-) Shortfall (2) – (3)</i>	<i>Percentage of (4) to (2)</i>
1	2	3	4	5
2014–2015	17.26	14.33	(-) 2.93	16.98
2015–2016	17.93	3.26	(-) 14.67	81.82
2016–2017	18.52	11.45	(-) 7.07	38.18
2017–2018	16.31	2.74	(-) 13.57	83.20
Total	70.02	31.78	(-) 38.24	54.61

No reasons were found on record for shortfall in actual expenses.

Conclusion

You can't start with imbalance and end with peace, be that in your own body, in an ecosystem or between a government and its people. What we need to strive for is not perfection, but balance

—Ani DiFranco

Sustainable development aims at the creation of sustainable improvements of the quality of life for all people and this should be the

principle goal of development policy. As far as the development of eco parks to safeguard the ecosystem is concerned, firm steps are required to be taken to bridge the gap between regulations and its proper implementation. Although in this regard, there have been successful examples of mining land being reclaimed and restored into sustainable structures like eco parks. Development of eco-restoration site at Gokul Park, Lodna Area has become a major tourist attraction. Jhunkundar closed OC mine has been converted into a beautiful lake which is acting as rain water harvesting structure and helping in recharging the ground water level. Pisciculture by local villages is done here. The site has been restored to a natural ecosystem. MoEF&CC through its EC conditions directed companies to have well-laid down system of reporting of non-compliances/violations of environmental norms to ensure proper checks and balances.¹

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¹ During 2013–14, against CSR expenditure of Rs. 16.31 crores as mandated by MoEF&CC, BCCCL actually spent an amount of Rs. 20.00 crores.

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