

Environmental Impacts of Coal-Mines of Maharashtra State: A Study of Geography

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Research Article

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ABSTRACT

Coal has many important uses worldwide. The most significant uses of coal are in electricity generation, steel production, cement manufacturing and as a liquid fuel. Steam coal is also known as thermal coal. It is mainly used in power generation. Coal plays a vital role in electricity generation worldwide. Coal-fired power plants currently fuel 38% of global electricity and, in some countries; an even higher percentage. India is the third largest producer of coal in the world. Furthermore, non-coking coal reserves make up about 85% while coking coal reserves are the remaining 15%. The move broke the monopoly over commercial mining that state owned Coal India has enjoyed since nationalisation in 1973. Yavatmal, Chandrapur and Nagpur districts of Vidarbha in Maharashtra are famous for coal mines. Moving the land of Vidarbha, coal mines are being replaced. In the last ten years, this new district of Vidarbha has created new colonies and is being reformed. The coal mines have resulted in Environmental factors. Coalgamation affects the area of land, forests, humans, water and agriculture. The coal mines cause pollution in the environment. Vidarbha coal is a kind of bituminous coal Large quantities of thermal power plants have been created in the districts of Chandrapur and Nagpur, due to the large number of coal stocks in Vidarbha. The result of the coal mines is sustainable for Vidarbha. The coal mines and environment in the district are damaged.

INTRODUCTION

Coal is a major energy resource in India. Coal is used in the world to produce electricity. 76% of electricity in India is due to coal-based thermal power plants. Coal is a traditional energy source, which has been built on Earth before millions of years ago. It is estimated that India will provide coal to the centuries coming up. There is a coal mine in which coal stocks are found. Coal mining in India is in the possession of the Coal Ministry of the Government of India. Coal India Limited is a Government undertaking Company and it is situated in different directions of India. Yavatmal, Nagpur and Chandrapur district in Vidarbha, Maharashtra. These coalmines are headed by Western Coalfield Limited. Coal is excavated from the coal mines in Vidarbha region, Western Coal Field Limited. Increasing industrialization: Increasing coal mines cause environmental and social problems. If there is a coal mines in a district, then there is loss of adulthood and Environment. Coal mines in the area of coal reservoirs are influenced by influencing life. Due to the increasing impact of coal mining, the transfer of agricultural land to coal fields was in coal mining [1]. The environment is affected by various factors. Many problems are being generated by the use of coal and excessive use of coal for industrial purposes. The environment is affected by various factors. Many problems arising from the overuse of power generation and the use of coal for industrial production. India is a developing country and it is not possible to impose ban on coal in this country. It is necessary to limit the use of coal and use other resources as a substitute for coal, due to the expansion of coal mines in Chandrapur, Nagpur and Yavatmal districts in Vidarbha, it is necessary to study the consequences of environmental impact [2].

Maharashtra is an important state in India. The Maharashtra State is on the west side of India. In the Maharashtra state of Vidarbha, there is large number of coal reserves of Gondwana period. It is a charcoal container in Yavatmal, Nagpur and Chandrapur districts in the valley of the Wardha River and in the Valley of Kanhan River. The stock of coal is in the north east of Vidarbha in Maharashtra. This coal area is found between 200 North latitude to 210 north latitude and 780 east longitudes to 790 east longitudes [3]. The district of Vidarbha finds 5000 million tonnes of coal reserves. Vidarbha under Western Coalfields Limited, Indian Miniratna company, Wani North Area and Wani Area in Wani taluka, Chandrapur Area, Majri Area in Chandrapur district and Nagpur area and Umred area in Nagpur district. In Chandrapur district Chandrapur, Ballarpur, Warora , Majari, and Ghuggus have created coal mines. In Nagpur district, coal mines are found in Kamathi, Umred and Parasivani talukas. Due to the high quality coal found in Wani taluka in Yavatmal district, Wani city is called 'Black Diamond City'. Chandrapur city is called 'Black Gold City'. In this district of Vidarbha, coal is excavated from many open coal mines and underground coal mines.

Objectives

The main objective of this research study is to study the coal mines in Vidarbha, study the impact of coal mines on the environment and to study the coal mining pollution.

MATERIALS AND METHODS

The study of information collection and research methodology is based on Primary and secondary sources of information. The primary information is collected from various coal fields in Vidarbha. Coal mining in the coal field has been monitored to study the impact of environment and human settlement [4]. Some information is collected through interviews and observations. Secondary information collected for the magazine is from Western Coalfield

Limited's Wani Area, Wani North Area, Chandrapur Area Ballarpur Area, Majri Area, Nagpur Area and Umred Area. Information is also obtained from Nagpur, Chandrapur and Yavatmal District Collector office, Gram Panchayat office and other government offices. Information has been collected from some of the most important sites on the basis of computer support. Through field monitoring and statistical method, it is used in an inspection way to analyze information collected. The computer has been taken to analyze the statistical data, which has created various tables and graphs [5].

Analysis

According to the analysis, coal is extracted from several coal mines of Western Coalfield Limited according to the coal field in Yavatmal, Nagpur and Chandrapur districts.

There are two coal fields in Wani taluka and Wani North area in Wani taluka in Yavatmal district. In this, under Wani Area, 1) Kolgaon (OC) (2) Mungoli (OC) (3) Niuljai (OC) are coal mines. Under Wani North Area (1) Bhandewada (UG) (2) Ghonsa (OC) (3) Kolarpimpri (OC) (4) Junad (OC) coal blocks come [6].

Under Ballarpur area

1) Ballarpur (OC and UG) 2) Saasti(UG and OC) 3) Pauni(OC) are coal mines.

Under Chandrapur area

1) Durgapur (UG and OC) 2) Padampur (OC) 3) Nandgaon (UG) 4) Mana (UG) 5) Bhatadi (OC) are coal mines.

Under Majri area

1)Majri (OC and UG)2) Yekona (OC) are coal mines.Nagpur district has two coal blocks in the Nagpur area and Umred area. Under the Nagpur region,

1) Adasa (UG)2) Patansavangi (UG) 3) Savner (UG) 4) Sillevera (UG) 5) Bhanegaon (OC)

6) Gondegaon (OC) 7) Kamathi (OC) Shingori (OC) are coal mines.

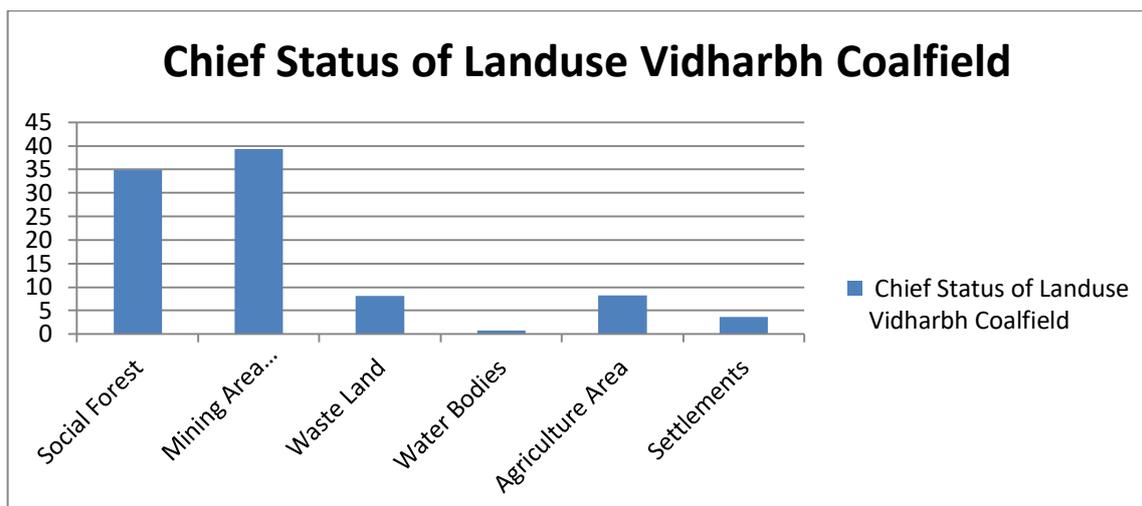
Under Umred area

1) Murpur (UG) 2)Makardhokada (OC) 3) Umred (OC) are coal mines.

Chandrapur district

There are three coal fields of WCL in Chandrapur district. Ballarpur Area, Chandrapur Area, and Majri.

Figure 1. The total land deployment in Vidarbha coal mining areas. Note: (■) Chief status of Landuse Vidharbh Coalfield



Shows that the total land deployment in Vidarbha coal mining area was studied in the following areas: Yavatmal, Nagpur and Chandpur districts under Western Coalfield Limited. Top 10 coal mines are 39.32 Sq.KM. The total area covered by the kilometer is 41.39% of the total land use area [7]. The area under the social forest is 34.89 square kilometers and 36.72% area. The area of fallow land is 8.10 square kilometers and is 8.35%. The area of water bodies in the coal mining area is 0.81 square kilometers and the area of water bodies are 0.85%.

The area under agriculture in the coal mining area is 8.22% square kilometers out of 8.65% area. The area under human colonization is 3.67 square kilometers out of 3.86% area. In Vidarbha, the number one area in the total land use in the coal mining area is 41.39%, which is covered by coal mining. The area under the second land utilization area is below the social forest, which is 36.72%. Since Padmapur, Durgapur, Umred, Majari and Ghuggus are the main colonial areas, the area of agriculture is very negligible. The third largest area is 8.65% under agriculture. With coal being the largest land occupation, the major impact of coal mining is on forests, agriculture and on humans [8].

A study shows that bituminous coal is found in Yavatmal, Chandrapur and Nagpur districts in Vidarbha. The bituminous type of coal is found in 50 to 75 percent of the coal. Coal grading in Yavatmal, Nagpur and Chandrapur districts of Vidarbha is between G8 and G 11. The coal field in Vidarbha is monitored in three ways before coal mining. 1) Pre Operational Phase - In the present scenario, the land area in the coal fields. Look at the condition of human colonization. Look at the local ecosystem. These three components are essential for the production of mines.

Operational phase is overburden dumps are created by destroying the surface of the open coal mine while producing coal from the coal mine. The coal is removed by blasting the groundwater while excavating the coal in the underground coal mine [9].

Post-Operational phase is the coal is removed from the open coal mine, the pier is formed and the surface is unusable.

Coal mines produced in the coal fields of Yavatmal, Chandrapur and Nagpur districts in Vidarbha have a serious impact on the environment. Due to the increase and expansion of coal mines, the impact of coal mines on environmental aesthetics has been shown to be real [10].

Land Degradation in the Coalfield area of Yavatmal, Chandrapur and Nagpur districts of Vidarbha, large land is used in coal mining. About 15 sq km in Yavatmal district, 20 sq km in Chandrapur district and 20 sq in Nagpur district. The kilometer of land has been used for coal mining. The open caste coal mines are high in this district. The underground coal mine is low. Open coal mines have created a large hill-like overburden dump in the mining area.

Artificial hills have been created in the coal field. This is causing land degradation and soil erosion in the mine area (Table 1).

Table 1. Overburden Dumping and Height of OB in Coalfields.

Coalfield area	No.of Overburden dump	Height of OB dump (min .and max.)
Wani area	9	30 Meter to 65 Meter
Wani north area	10	40meter to 60 Meter
Nagpur area	8	30 meter to 60 Meter
Under area	4	25 meter to 65 meter
Chandrapur area	8	30 meter to 65 meter
Ballarpur area	6	25 meter to 50 meter
Majri area	4	20 meter to 55 meter

Source-western coalfield India

Overburden dump is causing landslide. The slopes and soil in this layer are obstructed by traffic coming to the main road and are at risk of major accidents. There are landslides in the Wani and Chandrapur areas. Human colonies near the coal mines have also been found in the wrecks and the Chandrapur area. Open coal mines are creating surface mines and creating large wells.

Water impacts

The valley of the Wardha River in Vidarbha is famous for the river valley and the Kanhan river basin for coal mining. The highest number of coal mines has been created in the valley of the Wardha river. Yavatmal, Chandrapur district shows the formation of a coal mine on the banks of the river Wardha.

Coal mines have been created in Nagpur, Kamthi along the banks of the Kanhan River. The area of water bodies in Vidarbha is around 1.5 square kilometers around the coal mines. The coal mines Kamthi, Majari, Ghugus, Niljai are large by extension and the Wardha river and Kanhan river are used for the coal mines.

Coal mining is created along the banks of the river because of the need for water for coal mining. Coal mining has been affected due to the formation of coal mines along the banks of the Wardha and Kanhan rivers. Coal mines have obstructed the character of the river Wardha in the Wani and Chandrapur coal fields (Table 2).

Table 2. Toxic trace elements of coalfields.

Sr. No.	Elements	Wani coalfields	Chandrapur coalfields	Nagpur coalfields
1	Fe	5.43-13.50	4.38-13.30	5.16-14.98
2	Mn	0.138-0.500	0.130-0.498	0.150-0.901
3	Pb	0.139-5.91	0.136-0.589	0.130-0.718
4	Cd	0.028-0.067	0.28-0.67	0.21-0.61
5	Cu	0.289-0.490	0.289-0.480	0.302-0.631
6	Zn	1.36-1.57	1.32-1.52	0.823-1.009

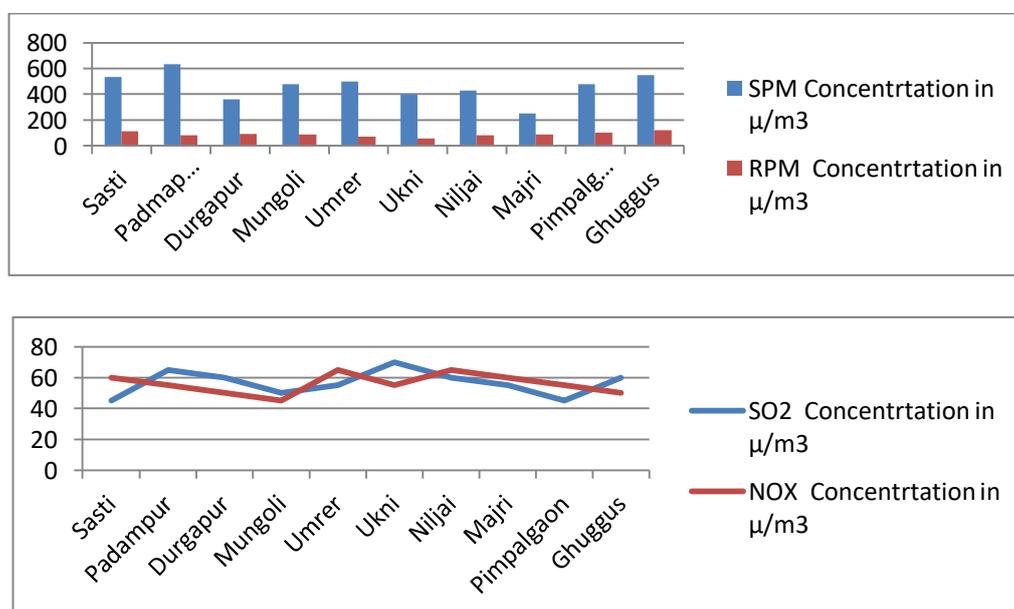
Coal mining water is also released into the river. The release of coal mine water into Wardha and Kanhan rivers has increased the pollution of the river. Hazardous pollutants like lead, zinc, arsenic, and cadmium are found in coal mine water in Chandrapur, Wani, Nagpur coal fields in Vidarbha.

Greases and oils are found in the water due to the release of mineral water into the river. In the Chandrapur forest area, underground coal mines, oil and grease are found poisonous, they are dying in the ground with rain water and the fish in the river have also been affected. The river Wardha and the Kanhan river are polluted with water.

Air pollution

Coal is the main electric source. In the coal field, open coal mines appear to be affecting the environment. There is a high percentage of opencast coal mines in Wani and Chandrapur coal area in Vidarbha. Open coal mining is directly related to atmospheric ventilation. Therefore, ash and coal are mixed with coal ash in the coal mine. Much poisonous air mixes and pollutes the air due to the fire in the mine. The ongoing process in the coal mine pollutes the atmosphere. Pollution in coal mines is high in winter.

Figure 2. Air pollution occurs in the atmosphere of wani. Note: (■) SPM Concentration in μ/m^3 ; (■) RPM Concentration in μ/m^3 ; (—) SO_2 Concentration in μ/m^3 ; (—) NOX Concentration in μ/m^3



Air pollution occurs in the atmosphere of Wani, Chandrapur, Nagpur area in Vidarbha, in the atmosphere like coal Sulfur dioxide Nitrogen oxide Suspended Particulate Matter (SPM) and Respirable Particulate Matter (RPM) carbon monoxide. In Vidarbha coal field, the atmosphere is found to be polluted from ten to fifteen square kilometers. The proportion of SPM and RPM in Vidarbha coal area is higher than the permissible limit of Central Pollution Control Board. This has affected human health, and people living in coal area colonies have been diagnosed with various respiratory illnesses.

Noise pollution

Noise pollution in the coal mines is recognized as a threat to human health. The drilling and blasting of open and underground coal mines in Vidarbha coal field produces a great deal of noise. Drilling and blasting begins in the coal mine overnight (Table 3).

Table 3. Noise pollution of Coalfields.

Coalfield area	Underground coalmines	Opencast coalmines
Wani	80 DB to 170 DB	70 DB to 155 DB
Chandrapur	80 DB to 165 DB	75 DB to 160 DB
Nagpur	70 DB to 168 DB	80 DB to 150 DB

Sources-coal mining & planning survey

This results in noise pollution that affects the surrounding human colonies. Coal mines in Wani, Chandrapur and Nagpur area in Vidarbha have been created at human settlement ^[11].

Coal mining uses drilling and blasting to break ground layers. Blasting creates noise in the surrounding area and spreads far and wide. Likewise, the volume of heavy machines used in coal mining is loud. This noise causes many problems. Blasting is more widely used in underground coal mines. In Chandrapur Nagpur area. There are many underground coal mines. Since there is a lot of drilling and blasting going on there, certain assumptions have been formed.

DISCUSSION

Mining in coal mining has led to an increase in suspended particulate matter SPM and respiratory particulate matter RPM in atmospheric air .The levels of sulfur dioxide and nitrogen oxide are increasing in the air. Air is polluted in the coal field, causing human respiratory and various diseases. Drilling and blasting in coal mines are causing noise pollution. Coal area in Yavatmal, Chandrapur and Nagpur districts of Vidarbha is destroying environmental beauty by affecting environmental factors.

While studying some coal mines in Chandrapur and Nagpur districts, their volume is on average 170 decibels. The volume of open coal mines is on average 155 to 160 decibels. The noise in the coal mines has far reaching implications. The underground coal mines are also blocked at night. This makes it difficult for the residents of the colonized area to fall asleep. Noise pollution has a serious impact on humanity. People in the region are suffering from hearing and mental illness.

CONCLUSION

Conclusions of this study, which is that the coal mine under Western Coalfield Limited in Vidarbha is found to be expanding and expanding. The environmental impacts of coal mining are very serious. Coal mining in the coal fields of Yavatmal, Chandrapur and Nagpur districts has transformed a large amount of land into a coal mine. Due to the open coal mines, the surface has been mined and a significant breach has been formed.

Overburden dumping has been created near the coal mine. Overburden dumping landslides can cause major accidents in this area. Land degradation and soil erosion are occurring in Wani, Nagpur and Chandrapur coal fields. Coal mines in Vidarbha have been affected by the flow of the river due to the construction of the river Wardha and Kanhan. The waters of the Wardha and Kanhan rivers are polluted and the river water is mixing chemicals with many coal mines.

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