



## **MINING IN ODISHA: GROWTH VIS-A-VIS DESTRUCTION**

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**Abstract:** Odisha is blessed with an abundance of natural resources, including minerals, forests, marine life, and water. Odisha, One of the top producers of valuable minerals such as chromites, nickel ore, coal, bauxite, iron ore, and manganese in India. In addition, to facilitating a means of subsistence for the state's expanding tribal population, around 30 per cent of its land is covered with forests, which also serve as key rivers' water catchment areas, home to rich mineral deposits and biodiversity hotspots. This article aims to analyse the current growth of several extractive industry characteristics as well as the adverse effect caused by mining. Although this sector plays crucial role in economic prosperity, mean while the sector also contributes a significant proportion of various adverse effect largely on environment and livelihood. The article is based on secondary data that was taken from a variety of government papers, records, and prior pieces of works. To analyse the data and support the argument, the annual average growth rate and simple percentage share were employed. The study's findings show that mining output and value have increased over time. In Odisha, the GSV (gross state value added) of the mining industry has hardly grown and continues to trail behind that of the manufacturing sector. Additionally, it appears that the state's government exchequer has benefited greatly from the mining sector's strong performance (in terms of output, value, and income) and from its extensive use of mining operations. The employment numbers, however, are not substantial when compared to output, indicating that the locals in the mining region have not seen a considerable rise in income. In mining-prone areas, the effects of mining such as biodiversity loss, deforestation, loss of traditional livelihood and relocation, and land acquisition are more pronounced.

**Keywords:** mining, employment, destruction, Odisha, growth

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## INTRODUCTION

As heavy mining occurs in several areas of the state, Orissa's lungs are progressively getting smaller. According to a research released in June 2021, between 2010 and 2020, 18,500,000 trees were felled in Orissa, and over 57000 hectares of forest area were converted for non-forestry uses. Mining is the practice of removing valuable resources from the soil using essentially two methods: surface mining and underground mining. Mining may undeniably contribute to the economic growth of a region if it is carried out correctly, responsibly, and with consideration for the environment. India's economy and international trade are directly impacted by the mines in Orissa. Thanks to Orissa mines, steel production in India is anticipated to rise significantly by 2031, contributing around 2.1 percent to the nation's Gross Domestic Product (GDP), and it is anticipated to surpass three percent in the following ten years. In addition to iron and steel, other minerals from Orissa's mines have the potential to totally transform India's economy. But it's important to remember the other side of the story. Mining devastates the surrounding area, damages the forests, and contaminates lakes and rivers. Additionally, it results in "acid mine drainage," a sort of pollution that severely harms aquatic plants and animals by causing the sulphides created by mining to dissolve in precipitation. The dumping of mine waste might result in severe toxic metal water contamination in addition to acid mine drainage. If hazardous metals from mine waste, including arsenic and mercury, are dumped into surrounding waterways, they endanger both human and animal health. Excessive mining causes sinkholes, erosion, biodiversity loss, and groundwater, stream, and lake pollution, among other things. Due to an increase in air pollution caused by mining in Orissa, hundreds of people's healths have been negatively impacted.

Odisha is endowed with many natural resources including Minerals, forests, marine life, and water. One of India's top states for producing precious minerals including chromites, nickel ore, coal, bauxite, iron ore, and manganese is Odisha. An estimated 30 per cent of the state's territory is covered in woods, which also serve as habitat and a source of food for the state's growing tribal population and are home to abundant mineral resources and biodiversity hotspots. The purpose of this essay is to examine the existing state and probable future development of various extractive industry features. While doing so, the sector significantly contributes to a variety of negative effects on the environment and way of life. The article is based on secondary data that was taken from a variety of government papers, records, and prior

works. To analyse the data and support the point, the annual average growth rate and simple percentage share were employed. The study's findings show that mining output and value have increased over time. In Odisha, the GSVA of the mining industry has hardly grown and continues to trail behind that of the manufacturing sector. Additionally, it appears that the state's government exchequer has benefited greatly from the mining sector's strong performance (in terms of output, value, and income) and from its extensive use of mining operations. The employment numbers, however, are not substantial when compared to output, indicating that the locals in the mining region have not seen a large rise in income. In mining-prone areas, the effects of mining—such as biodiversity loss, deforestation, loss of traditional livelihood and relocation, and land acquisition are more pronounced.

The state government reported record revenue of over 13,200 crores during the 2020–21 fiscal years, mostly due to mining earnings, according to a story in *The Times of India*. The government had included mining as one of the key services when the lockdown was put into place, recognising the significance of the industry. Therefore, responsible mining is the only workable answer in an area where mining has great significance. Following environmental regulations might safeguard Orissa's scarce surviving biodiversity.

Mineral products and mines are placed a top position in contemporary world where this sector helps to create employment and uplift the economic development of an economy. Mineral extraction is most perilous process for human life and other habitats on the earth. The impact of mineral extraction can be positive and negative, direct and indirect impact on social, economic and health for living beings especially mine workers. There are some rules and regulations have been formed by the government of India through DGMS (Directorate of General of Mines Safety) mining act-1952. The mining law and guidelines are being articulated mostly for the mining affected peoples benefit. The frequently affected people by the hazardous process of mining can claim the sufficient benefits for their livelihood security, smooth and healthy life.

## **LITERATURE REVIEW**

Developing countries like India can generate employment due to abundant labour by mining industry rather the developed countries where the process more mechanize and capital intensive. The mineral sector provides employment, tax revenue and other benefits to the public as well as government. The abundant

natural resources can contribute a large part to the development through mineral industries and related other sectors. The infrastructural development is also an achievement by the mining industrialization. Most of the natural resources are available in forest tribal area which is remote villages and the infrastructure such as rail, road, power, township, schools and air field's facilities are given by the industries. For instance, the copper abundant countries such as Congo, Chile and Peru have improved the infrastructural development by mining industries (Daniel No. Lapedas, Encyclopedia of Energy, Hill Book Company, 1976, page 1383). The economy of a region, culture, all over society across the globe have affected by the mining activities.

There are mainly five capital assets such as human capital, natural capital, physical capital, financial capital and social capital which are help to improve the economic development in an economy. Human capital plays a vital role to develop the economy through health, education and skills. Etc. natural capital includes land, water; air and forest also have the contribution to the growth of an economy. There are several empirical evidence found that natural capital crowds out the human capital which is a big factor to slower down the economic development and growth of nation (World Bank, 2011; James, 2015). The reason behind the economic crisis in mineral rich countries is lower public expenditure on human capital (education and skills, health) rather choose to hire skilled and educated outside laborers (Esham et al, 2005). The expenditure on human capital is not significant which pull down the mineral rich countries from development. at the same time, the countries like Finland and Norway have their expenditure more on human capital which helps them to overcome the problem of resource e curse satisfactorily(Holden, 2013; Shao and Yang, 2014).

There is a huge amount of revenue and foreign exchange reserves have been contributed by the mining industries to the process of economic development in a nation (Hilson, 2002; Roopnarine, 2006; Mishra, 2009). It can be applied to India; the mining sector has contributed a significant share after the policy changes and proper monitoring system in 1980s. More numbers of private enterprises were entered into the sector and became more vibrant after the economic reform, 1991 in India. There has been a greater change in policy in a global prospect through globalization in 1991 to attract more F D I into mining sector for the growth and development. The economic reform has not only facilitated development and growth but also strengthen the mining sector with better employment opportunities and other benefits. The changes

in policies have brought economic strength to both rich and poor. For instance, capitalists can earn more profit by investment and it generates employment for the local poor people. The employment opportunities in mining sector are facilitating more income to the poor and strengthen their standard of living. Moreover, the mining activities and industrialization creates market and business opportunities to other non-mining worker or local residents which brings the outmigration down (Black, McKinnish & Sanders, 2005). The social sector is also strengthening by mining activities through the development in infrastructure, health, education and roads for the local people in mines area (Das, 2005).

Odisha has a huge mineral resources deposit which attracts domestic as well as international investors to invest in extractive sector. Importantly, after economic reform, 1991, (LPG) most of the MNCs from outside are investing which makes mineral destination hub to a poor state like Odisha. There is a positive as well as negative impact of mineral resource abundance in the state. In one hand, the mineral resource deposit facilitates the economic growth development and infrastructural development and employment opportunities. Paradoxically, although the natural resources, forest and tribal living in a parallel geographical area, it creates conflict due to environment and livelihood threat from mineral extraction.

Due to a variety of anthropogenic activities, such as wood extraction, industrialisation, agricultural expansion, mining, and urbanisation, the world's forest cover has been undergoing substantial and unprecedented changes (Geist and Lambin, 2002; Reddy et al., 2013; Kim et al., 2014; Maus et al., 2020). Mining is one of the main contributors to forest cover loss (FCL) in developing nations with tropical climates (Emiru et al., 2018; Thonfeld et al., 2020). Several factors, including mining operations, population pressure, migration rates, unemployment rates, a lack of property rights, and agricultural and infrastructural development, affect FCL in tropical regions (Seymour and Harris, 2019; Edwards and Laurance, 2015). Given that this state on India's east coast is one of the wealthiest in terms of mineral reserves and contributes considerably to both the states and the country's Gross Domestic Product, the significance of mining in Odisha State is well recognised. The output of minerals and the number of personnel engaged in mining operations are trending upward, according to recent production figures (Hota and Behera, 2015; Ranjan, 2019).

In the part of Odisha State that is rich in mineral resources, mining operations are substantial contributors to the deterioration of the forest. The

forest cover makes up 21.67 per cent of India's total land area (Forest Survey of India, 2019), although it has lately been harmed by the country's raising desire for expanded agriculture and greater mineral output. The study is essential because of the proximity of mineral resources and forest inhabitants in the 33.15 per cent of Odisha State's land that is covered in forest. The degradation of the forest due to mining has made the mineral-rich regions susceptible. This is because extractive agencies have been established there (Dutta et al., 2015). As a result of such mining activities, mineral resource-rich zones in this region have seen a significant shift in their forest cover. . Additionally, with 34.3 per cent of the nation's total mineral output in 2017–2018, this area occupies a key position in the production of minerals (Government of Odisha, 2020).

In terms of mineral resources, Odisha State is one of the richest states in India. Mines in this region are situated in rural regions where locals mostly make their living via agriculture and related work. Although mining in this area has a negative impact on the ecosystem and forest cover, it can benefit the tribal inhabitants in Odisha State financially (Temper and Martinez-Alier, 2013).

Tribes in the area are now agitated and engaged in a protection campaign as a result of the mining operations (Basu and Nayak, 2011). The main coal reserves in the Indian state of Odisha are found in densely wooded areas close to native communities (CSE, 2008), and the mining exploitation has forced several people to leave their homes. Hota and Behera (2016) claim that during the 1970s, the mining industry has switched significantly from underground to open-pit mining, which has resulted in this significant displacement. Conflicts between the local population, indigenous tribes, and mining have arisen in Odisha State as a result of the relocation, which has made the local population unhappy and jeopardised their livelihoods. Due to this, several indigenous people and landless farmers have been forced to relocate to neighboring settlements in. Conflicts between the local population, indigenous tribes, and mining have arisen in Odisha State as a result of the relocation, which has made the local population unhappy and jeopardised their livelihoods. As a result, several landless farmers and indigenous people have been forced to relocate to surrounding settlements in search of employment, for instance, in the construction industry, mining, or refineries (Patil et al., 2020). The remaining portion of the hamlet is not in the coal region; hence its residents are not qualified for long-term employment in the mines or refineries (Hota and Behera, 2015).

The paper is based on secondary data. To analyse the data and enhance the case, the simple percentage and annual growth rate have been used. The

paper attempts to analyse the present growth of mining sector compared with past. Additionally, it also tries to discuss different mining led destruction in local mining areas.

## DISCUSSION

**Table 1: Annual growth of employment in mining**

<i>year</i>	<i>No. of employment</i>	<i>Annual growth of employment(percent)</i>
2000-01	52937	-
2001-02	45135	-14.73
2002-03	44167	-2.14
2003-04	43743	-0.95
2004-05	49837	13.93
2005-06	55764	11.89
2006-07	47376	-15.04
2007-08	49176	3.79
2008-09	44167	-10.18
2009-10	43705	-1.04
2010-11	51877	18.69
2011-12	48263	-6.96
2012-13	59417	23.11
2013-14	47370	-20.27
2014-15	47370	0
2015-16	49086	3.62
2016-17	52405	6.76
2017-18	55,940	6.74
2018-19	58,600	4.75
2019-20	59,636	1.76
CAGR		0.60

*Source:* Directorate of Mines, Odisha

Tribal people and other groups receive work from mining and quarrying. The number of workers who were directly employed in various mining activities between 2004 and 2005 is shown in Table above. Because this industry has increasingly used labor-saving and capital-intensive manufacturing processes and technology over time, there have been several years with negative growth. However, by the end of 2010–2011, employment had reached 51,877, an increase of 18.7 per cent over 2009–2010. The mining industry is not favourable from an equity standpoint for reducing poverty by creating jobs.

**Table 2: Annual Growth rate of mining revenue**

<i>Year</i>	<i>Mining revenue (Rs. In crore)</i>	<i>Annual Growth rate (%)</i>
2000-01	360.31	-
2001-02	378.31	4.99
2002-03	443.53	17.23
2003-04	550.76	24.17
2004-05	670.51	21.74
2005-06	805.00	20.05
2006-07	936.55	16.34
2007-08	1126.09	20.23
2008-09	1380.59	22.60
2009-10	2020.72	46.36
2010-11	3330.47	64.81
2011-12	4586.65	37.71
2012-13	5679.35	23.82
2013-14	5519.58	-2.81
2014-15	5310.09	-3.79
2015-16	5797.79	9.184
2016-17	4925.66	-15.04
2017-18	6130.97	24.47
2018-19	10479.18	70.92
2019-20	11019.86	5.159
2020-21	13918.20	26.30
CAGR		19.01

*Source:* Directorate of Mines, Odisha

Mining also generates revenues for the government at both the central and state levels. For the state government, minerals generate (i) statutory revenues from royalties, rent etc, (ii) profits and interest income received from public enterprises functioning in the sector. As Odisha is a mineral rich state, it contributes substantial amount of revenues for the State government. The production, dispatch of minerals, and collection of mineral revenue in Odisha from 2016-17 to 2020-21 is presented in Table In 2020-21, it is estimated that State collected INR 13,918 crore from minerals. The State's total revenue receipts in 2020-21 as per revised estimates were INR 1, 07,200 crore. This makes mineral revenues 13 per cent of total revenue receipts. This reflects the importance of mineral revenues to the State Government fiscal management and the resources available for development expenditure.



It can be noticed from table, that there was a substantial jump in 2018-19 in mineral revenues. This was primarily a consequence of the 2015 and 2016 amendments of the Mines and Minerals (Development and Regulation) Act which led to revision in royalties and collections for the District Mineral Fund.

Mineral revenues have played an important role in State and allowed fiscal space to undertake developmental intervention. Post June 2022, GST compensation cess may be discontinued. As per 2021-22 Budget Estimates, 124 GST compensation cess constituted nearly 10 per cent of revenue receipts. Considering expected impact on state finances, mineral revenues are one of the potential non-tax revenue sources that could mitigate the fiscal impact. As per the estimates available up to December 2021, total mineral revenue in 2021-22 was INR 32,485 crore. This is a substantial jump in mineral revenues which allows the state to direct spending in development sector. However, infrastructural capability to handle further cargo movements as well as other associated facilities may come on the way to harness the sector on a short time. Environment, inter-generational equity and non-replenishable nature of the sector are other important considerations.

**Table 3: Percentage change in mining revenue to total revenue**

<i>Year</i>	<i>Mining revenue (Rs. In crore)</i>	<i>Total Revenue receipt (Rs. In crore)</i>	<i>% of revenue in mining to total revenue receipt</i>
2000-01	360.31	6902.02	5.22
2001-02	378.31	7047.98	5.36
2002-03	443.53	8438.76	5.25
2003-04	550.76	9440.24	5.83
2004-05	670.51	11850.19	5.65
2005-06	805.00	14084.71	5.71
2006-07	936.55	18032.62	5.19
2007-08	1126.09	21967.19	5.12
2008-09	1380.59	24610.01	5.60
2009-10	2020.72	26430.21	7.64
2010-11	3330.47	33276.15	10.00
2011-12	4586.65	40267.02	11.39
2012-13	5679.35	43936.91	12.92
2013-14	5519.58	48946.85	11.27
2014-15	5310.09	56997.88	9.31
2015-16	5797.79	68941.44	8.40
2016-17	4925.66	742993.9	0.66
2017-18	6130.97	852042.9	0.71
2018-19	10479.18	995461.2	1.05

<i>Year</i>	<i>Mining revenue (Rs. In crore)</i>	<i>Total Revenue receipt (Rs. In crore)</i>	<i>% of revenue in mining to total revenue receipt</i>
2019-20	11019.86	1015677	1.08
2020-21	13918.20	1095594	1.27
CAGR	19.01%		27.29%

The above table indicates that the importance of mining activities in Orissa during 2001-2011 in terms of revenue collections, percentage contribution of mining to Gross State Domestic Product and percentage of revenue from mining to total revenue and growth rate total production of minerals and value of production which have shown an upward trend. Total revenue collection from mining receipt to total revenue trend has been increased up to 2012-13, but afterwards a declining trend has been seen till now.

**Table 4: Annual growth rate of mineral production**

<i>Year</i>	<i>Production(in lakh tons)</i>	<i>Values (Rs. In crores)</i>	<i>Annual growth of production(percent)</i>
2000-01	689.24	2776.15	-
2001-02	749.81	2910.47	8.78
2002-03	873.62	3694.17	16.51
2003-04	1080.00	3877.75	23.62
2004-05	1270.48	6130.93	17.63
2005-06	1396.78	6604.41	9.94
2006-07	1614.45	7629.63	15.58
2007-08	1784.23	10627.05	10.51
2008-09	1889.55	15122.90	5.90
2009-10	1988.40	15317.10	5.23
2010-11	1995.46	28286.87	0.35
2011-12	1852.20	30204.38	-7.17
2012-13	1866.80	34994.55	0.78
2013-14	2017.57	54511.87	8.07
2014-15	1919.24	54861.11	-4.87
2015-16	2396.47	41535.57	24.86
2016-17	2594.31	41280.01	8.25
2017-18	2689.89	38437.71	3.68
2018-19	2914.33	47849.12	8.34
2019-20	3109.16	38478.75	6.68
2020-21	2927	26576.1	-5.85
CAGR			7.50

Source: Directorate of Mines, Odisha

The annual growth of mineral production is increasing over period of time. The above table indicates that the importance of mining activities in Orissa during 2000-2021 in terms of growth rate total production of minerals and value of production which have shown an upward trend. Since it is increased from 2000 but in 2020, there is a negative growth due to covid-19 pandemic. The production has declined 3109 lakh tons in 2019-20 to 2927 lakh tons in 2020-21. However, there is an increasing trend from 2000 to 2019-20.

**Table 5: Value of exports and dispatched in Odisha**

<i>Year</i>	<i>Dispatched (in million tonnes)</i>	<i>Value of export(INR Lakh)</i>
2000-01	61.77	453.82
2001-02	69.6	538.79
2002-03	77.957	642.20
2003-04	97.64	1186.53
2004-05	109.83	1171.8
2005-06	124.22	9161.2
2006-07	145.15	6085.42
2007-08	160.08	7088.06
2008-09	168.6	6900.06
2009-10	175.5	5740.14
2010-11	180.27	9836.84
2011-12	171.95	9259.48
2012-13	173.55	2427.57
2013-14	226.35	3546.78
2014-15	193.19	705.79
2015-16	241.6	539.44
2016-17	264.85	1261.40
2017-18	287.8	8,117.91
2018-19	310.81	9483.26
2019-20	313.16	14627.10
2020-21	320.43	-
CAGR (%)	8.15	18.96

Source: Directorate of Export Promotion and Marketing, Odisha

As an intermediate good, the traditional and ever-expanding newer uses of aluminium are wide ranging – from food packaging to aircrafts and defense equipment. Odisha is the preferred location for aluminium production because of the State's position as the largest producer in India of Bauxite, the main raw material, as also comfortable power availability. Key players in Aluminium

production are operating in the State. Private sector players are taking the leading role.

The export of minerals from Odisha has been increased over the period of time. Demands for minerals have been increasing all over the world which fuel to the export trends up in mineral rich state Odisha. In 2000-01, there was only 253 INR lakhs of export which increased to 14627 INR lakhs in 2019-20. In these 20 years of gap mining sector export has remarkably upward trend. The economic reform of LPG policy is playing a vital role for the increased export line.

**Table 6: Aluminium Production in Odisha**

<i>Name of company</i>	<i>Up to 2020</i>	<i>Up to 2021</i>
NALCO	3.06	3.43
BALCO	4.26	4.37
Hindalco	9.13	9.68
Vedanta	10.13	12.52
total	26.58	30

*Source:* Monthly Summary Report, Ministry of Mines, December 2021

To promote downstream and ancillary industries, NALCO has committed 50,000 tonnes of hot metal to the Aluminium Park at Angul, which has been established in Joint Venture (JV) mode with IDCO. More recently, the Vedanta group has also partnered with IDCO in 2021 to set up another Aluminium Park at Jharsuguda to which it has committed to supply 3 lakh mt. of aluminium. The major facilitation measure in the mining subsector, which also incorporates improved governance, is the i3MS. Steel & Mines Department has implemented the IT based mineral administration through a software application named Integrated Mines and Mineral Management System (i3MS) to bring in more transparency in the mineral transactions in the State and to ensure proper monitoring and supervision of the same. This technology intervention caters to the 'Ease of Doing Business' in mining sector and helps monitoring various activities for extraction to consumption of the minerals at the end-use industries. The system also facilitates online vehicle tracking, issues of e-permit and regular surveillance. Steps are also being taken to adopt Drone Technology, Webcasting methodology for further improving the system of i3MS.

## **MINING LED DESTRUCTION**

According to a research, Odisha is the fourth most polluted country in the world. Due to the extensive extraction of mineral resources from a dozen open cast mines in the region over a period of 70 years, this significant amount of deterioration has occurred. In 2007, the Blacksmith Institute of the US named the resource-rich Sukinda valley in Odisha as the fourth most polluted region in the world. The state pollution control board aggressively disputed the findings as greatly inflated, but they nonetheless managed to spark a productive discussion on environmental challenges in the area.

### **Ecological damage**

According to the Lokayukta Report, illegal mining has caused significant ecological damage. In the Bellary region, certain species of animals have vanished, including the sloth bear. The local medicinal plants no longer flourish. In the mining region, the entire rainfall system has been altered. According to reports, the land surrounding the mining area is completely devoid of vegetation and has no agricultural activities related traffic accidents, road damage, and fatalities. Road safety has been negatively influenced by a lack of adequate regulation in the mining and transportation of iron.

### **One instance of Odisha “Sukinda” mining region**

About 97 per cent of the nation's deposits of chromite ore, a key ingredient in the creation of stainless steel, leather, and alloys, are located in the valley in the Jajpur district of Odisha. The complete devastation of Sukinda's terrain has been caused by the intensive extraction of mineral resources from a dozen open cast mines in the region over a period of 70 years. The area's water has been severely poisoned, the soil is tainted with poisonous materials, the trees are on the verge of extinction, and the farms have been left in ruins. Locals claim that although half the mines are currently closed, harm has already been done, primarily as a result of workers' inappropriate dumping of waste in river water.

People within a 20-kilometer radius of the mines, according to local resident of Sukinda, a local who once worked at a mine that was shut down in 2002, have no option but to consume poisonous water and breathe in chrome dust. Every household in the valley has members who are afflicted with diabetes, gastroenteritis, and skin conditions. At least two cancer sufferers reside in every community nearby mining area. One local named Nayak started farming on his four acres of land after losing his mining job, but the yield is still poor

since the soil has been damaged. In addition to the 60,000 people living in the seven gram panchayats of Sukinda, the effects of mining have also directly impacted more than 40,000 people in five additional gram panchayats in the neighboring Dhenkanal district.

The second-largest river in Odisha, the Brahmani, which flows through the Sukinda valley, is the most polluted in the state as a result of excessive hexavalent chromium exposure, which has increased the danger of cancer-causing carcinogenic compounds for the 26 lakh river-dependent residents. Studies have shown that chromite-related disorders are to blame for more than 80% of fatalities in extensively mined regions. Despite claiming that the Blacksmith Institute report was much overstated, the state pollution control board's own research likewise revealed significant amounts of hexavalent chromium in surface water. The state pollution control board's report stating that the PH and hexavalent chromium levels after treatment were within the limits specified under the Environment (Protection) Rules was not accepted by the Orissa high court when it heard a writ suit in May of last year. After hearing a writ petition in May of last year, the Orissa high court requested that the central pollution control board conduct an independent investigation into Sukinda's pollution because it was unsatisfied with the state pollution control board's report that the pH and hexavalent chromium levels were within the limits set by the Environment (Protection) Rules, 1986. The central board issued its findings in October of last year, noting that mining for chromite had increased hexavalent chromium contamination and recommending the formation of a partnership with representatives from all miners operating in the valley to take corrective action. Ranjan Panda, a well-known environmentalist and water campaigner, questions the effectiveness of the collaboration and claims that local officials cannot escape accountability since without their complicity, mine owners would not have been able to contaminate the region with impunity. Despite the fact that an independent evaluation was completed in response to the high court's intervention, according to Panda, it is unlikely to alleviate the dangerous levels of pollution.

### **Instances of destruction**

The problems of the local residents of mining area have gotten worse due to the frequent disposal of processed rocks, mineral-rich boulders left over from mining that cause air pollution by making the region dusty.

Our village is frequently covered with dust from the dumping sites, which hinders individuals from going about their daily lives outside of their

houses. Trucks from the mining firms have wrecked the roads leading to our community.

### **Air pollution (Pollution related to transportation of mineral loaded vehicle)**

In reality, the constant movement of mining trucks has seriously damaged several of the roads going to nearby settlements. These hundreds of cars frequently make a beeline for the landfill, endangering notably the movement of kids, the elderly, and others who have trouble walking on the roads with potholes. Monsoon season brings much harsher circumstances.

### **Water pollution**

Another difficulty people encounter is finding safe drinking water. Orange-colored ponds, which are mining and post-mining effluents, are scattered around the landscape. According to Odisha environmentalist S.N. Patro, poisonous orange denotes high concentrations of iron, chromite, and other heavy metals that are frequently diluted with the water bodies in mining sites. The water quality of six streams of the Gandhamardan Iron Mines in Sukati, Keonjhar district, was assessed in a 2017 research. The analysis came to the conclusion that the water was suitable for irrigation but unfit for home use based on 14 factors. It also blamed human activities like mining for the poor quality of the water.

### **Health Hazard**

A different study by Lipsa Dash from Sambalpur University and Vijayeta Priyadarshi from the Government Women's College in Keonjhar also highlights the prevalence of respiratory illnesses, water-borne illnesses, eye and joint problems among the populace of Kumunda panchayat in the Banspal block of the district, which can be viewed as a result of the mining.

According to the CSE research, mining cannot be environmentally beneficial or sustainable because, first, all ore bodies are limited and non-renewable, and second, even the best-managed mines create "environmental imprints." However, it also acknowledges the necessity of mining and minerals. Chandra Bhushan is added "Whether mining should be done or not is not the question. Instead, it concerns how it ought to be carried out. It entails making sure mining is done in a way that is both ecologically and socially acceptable.

### **CONCLUSION**

The much-discussed problems with illegal mining have not improved the economy in Odisha. The unforeseen profits from the mining operations in

Odisha have seriously distorted the system. Allegations of widespread corruption are said to have reduced the amount of money coming into the state exchequer. The income that could have been used to strengthen the social sector instead went to a select few members of society, resulting in inequality. The extraction, transit, trade, and end-user points should all be subject to a reliable system of checks and balances. Information and communication technology (IC&T) tools can be used to enable an effective control and regulation over mining activities. The mining area's private sector should be given control over the construction of its infrastructure. Mineral resources are known to be limited. The right balance between exploitation and augmentation should be struck while keeping in mind the needs of the various industries.

## **POLICY SUGGESTIONS**

### **Sustainable development other than mining**

Industrial and infrastructure growth propelled a country's economy to a developed world. Growth and development are becoming targets through fast industrialisation or structural change. Conversely, the area's increasing industrialisation and growth are causing significant environmental pollution. Without question, we need to develop, but now is the moment to promote sustainable development, which would be more environmentally friendly than development driven by destruction.

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