Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

The Environmental Degradation of Chhattisgarh: - A Case Study of Central Level Challenges

[1]Alankrit Singh, [2]Afsha Anjum, [3]Shiksha Shreshtha, [4]Paluck Sharma, [5]Kaustubh Kunal Thakur
[1,2,3,4,5]Student of Faculty of Law
[1,2,3,4,5]Kalinga University, New Raipur, Chhattisgarh
[1]alankrit947@gmail.com, [2]afshaanjum172002@gmail.com, [3]Shiksha272002@gmail.com

ABSTRACT

This study examines environmental challenges in Chhattisgarh, focusing on the effects of industrial expansion, deforestation (due to mining), thermal power plants pollution and pollution on local ecosystems and communities. One of the main environmental issues with coal-based thermal power plants is the contaminating of the air and fly ash. In Chhattisgarh, the adverse consequences of thermal power stations are crucial and include airborne pollutants, contamination of the environment, and contamination of water from flying ash. Ash from coal disposal problems have been associated to the production of leachate, or which represents a serious risk because it includes toxic substances. Perhaps the most significant industries in the territory of Chhattisgarh are mines. Two significant environmental issues have been brought on by this kind of behaviour. River and stream pollution comes first, followed by deforestation and alluvial degradation. In addition to harming the ecosystem, the contaminants resulting from chemical leaks also have an impact on local residents' health. The findings indicated that as the population of the study area grows, so does the rate of deforestation. The predicted increased forest area for the 1991–2019 period was 517.99 km2, whereas the overall forest loss was 606.53 km2. The total area of open forest, mixed forests, and dense forest is expanding at a pace of 1.95 km2/year, 0.15 km2/year, and 0.02 km2/year, correspondingly.

It explores the region's historical and geographical context while assessing the effectiveness of existing environmental laws and policies. By analysing governance structures, legal measures, and judicial responses, the research identifies gaps in enforcement and proposes practical strategies for sustainable development. The study also highlights the role of community participation in environmental conservation, emphasizing the need for policies that balance economic growth with ecological protection. The findings aim to contribute to ongoing discussions on environmental justice and provide recommendations for improving policy implementation and promoting sustainable practices. The government will prioritize the sustainable management of vital life support systems and natural processes. In all domains—land, air, water, forests, biological diversity, minerals, manufacturing, farming, urban planning, and transportation—this would ensure environmentally friendly and sensible use, conservation, and coordinated management of the environment.

KEYWORDS: - Deforestation, Pollution, Chhattisgarh, Sustainable Development

1. HISTORICAL AND GEOGRAPHICAL BACKGROUND

The term Chhattisgarh translates to 'thirty-six forts', which characterizes the domain of the Haihaya dynasty of Ratanpur, which was established around 750 and maintained its rule for six centuries,

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

ending in the 14th century. Fourteen feudal princely states in the eastern region were included under British governance in Chhattisgarh; the headquarters of this division was located in Raipur.[1] (DB Das, 2015)

Until November 1, 2000, Chhattisgarh was included within Madhya Pradesh (M. P). In the 1920s, the call for the separation of Chhattisgarh gained traction. Around 1924, the 'RAIPUR CONGRESS UNIT' advocated for the division of Chhattisgarh from Madhya Pradesh, and this issue was deliberated at the Indian Congress in Tripuri. In 1954, a Regional Congress Organisation was established, which later presented the demand for separation through the state organization commission, but unfortunately, their request was rejected. Again in 1955, the Nagpur assembly of Madhya Bharat reiterated the call for Chhattisgarh's separation.[2]

The separate Chhattisgarh bill was forwarded by the Madhya Pradesh Assembly, which was approved by the new national democratic alliance government, and subsequently submitted to the Lok Sabha and then to the Rajya Sabha. Both houses later approved it, and K. R. Narayan was the first individual to provide consent on August 25, 2000, for the MP Reorganisation Act.[3] (S. Ahmad, 2012)

Regarding the geographical aspect of Chhattisgarh, it has a shape reminiscent of a sea horse. Chhattisgarh is a landlocked state situated in central India and ranks as the 9th largest state in the country. The state contains the third largest forest area in India, covering approximately 44% of its total territory. Chhattisgarh experiences a tropical climate, with summer temperatures reaching up to 49°C (120°F); however, Ambikapur, Mainpat, Pendra Road, Samri, and Jashpur are recognized as the coldest locations in the state. The state receives an average rainfall of about 1,292 millimeters (50. 9 inches).[4] (2. S. Jena, 2011)

Chhattisgarh is comprised of 33 districts (Raipur, Bilaspur, Durg, Korba, Raigarh, Rajnandgaon, Koriya, Surguja, Balrampur, Jashpur, Surajpur, Janjgir-Champa, Mungeli, Kabirdham, Bemetara, Balod, Balod Bazar-Bhatapara, Gariaband, Mahasamund, Dhamtari, Bijapur, Narayanpur, Kanker, Bastar, Dantewada, Kondagaon, Sukma, Gaurela-Pendra-Marwahi, Manendragarh-Chirmiri-Bharatpur, Mohla-Manpur-AmbagarhChowki, Sakti, Sarangarh-Bilaigarh, Khairagarh-Chhuikhadan-Gandai.) The most populous cities in Chhattisgarh are:

- Raipur (with a population of 1,010,087)
- Bhilai - Durg (with a population of 1,003,406)
- Bilaspur (with a population of 717,030)
- Korba (with a population of 365,253)
- Ambikapur (with a population of 214,575)
- Rajnandgaon (with a population of 163,122)

[1] **D.C. PATEL,** *CHHATTISHGARH PCS* (2024).
[2] **Government of Chhattisgarh,** *History of Chhattisgarh*, HAMAR CHHATTISHGARH, https://cgstate.gov.in/Home/History (Jan. 1, 2024).
[3] **Government of Chhattisgarh,** *History of Chhattisgarh*, HAMAR CHHATTISHGARH, https://cgstate.gov.in/Home/History (Jan. 1, 2024).
[4] **HARI RAM PATEL,** *CHHATTISGARH VISHISHT ADHYAYAN* (HR Publications 2021).

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

- Raigarh (with a population of 150,019)
- Jagdalpur (with a population of 125,463)
- Chirmiri (with a population of 103,575)
- Dhamtari (with a population of 101,677)[5]

This study adopts a doctrinal research methodology, focusing on the systematic analysis of legal principles and statutory frameworks. It primarily draws upon primary legal sources, including the Environment Protection Act, related environmental legislation, and the Constitution of India. In addition, secondary sources such as scholarly books, journal articles, and legal commentaries are utilized to provide interpretative insights and to support the overall analysis.

2. FACTORS OF ENVIRONMENTAL POLLUTION

Agricultural methods, including pesticide and fertilizer usage, ought to be emphasized as they lead to soil and water contamination, impacting both human health and biodiversity. Urban development is another vital aspect, as growing population density results in waste management difficulties and increased resource demand, aggravating pollution levels further.

In the entire paragraph, I must ensure a coherent flow that connects these elements while providing sufficient detail to demonstrate their interrelation. Lastly, I should end with a statement underscoring the necessity for comprehensive strategies to tackle these pollution problems in Chhattisgarh, emphasizing the significance of sustainable development. (3. E. Burt, 2013)

Chhattisgarh, blessed with abundant natural resources, encounters notable environmental pollution issues that arise from various human activities. A key source of pollution in the area is industrial activity, especially the functioning of coal and steel factories that release harmful pollutants into the atmosphere, causing a decline in air quality. The burning of fossil fuels in these industries emits particulate matter, sulphur dioxide, and nitrogen oxides, which can lead to serious health concerns for local residents, contributing to respiratory ailments and other significant health problems. Moreover, mining operations, common in Chhattisgarh due to its extensive mineral resources, result in considerable land degradation and add to water pollution. (RR, 2006) The extraction methods frequently result in the leaching of heavy metals and toxic substances into adjacent water bodies, polluting not only surface water but also groundwater sources essential for drinking and irrigation. Agricultural practices further worsen pollution challenges; the rampant application of chemical fertilizers and pesticides in agriculture causes soil deterioration and runoff that contaminates rivers and streams, impacting aquatic ecosystems and human health. Urban expansion and population increase in cities like Raipur and Bhilai have heightened waste management challenges, leading to improper disposal of solid waste and untreated sewage, which taint land and water supplies. This mixture of industrial emissions, mining operations, agricultural runoff, and urban waste forms a complex network of pollution that presents a considerable danger to the environment and public health in Chhattisgarh. Tackling these diverse pollution sources necessitates comprehensive strategies focused on encouraging sustainable practices, improving regulatory frameworks, and fostering awareness among communities about the significance of preserving their natural environment.[6] (RR C.

[5] **Government of Chhattisgarh,** *History of Chhattisgarh*, HAMAR CHHATTISHGARH, https://cgstate.gov.in/Home/History (Jan. 1, 2024).

[6] **HARI RAM PATEL,** *CHHATTISGARH VISHISHT ADHYAYAN* (HR Publications 2021).

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

, 2006)

2.1 How Mining Evolved in Chhattisgarh and Degraded the Environment

The historical background of mining in Chhattisgarh is closely linked with the area's abundant geological resources and its socio-economic development. Mining activities in Chhattisgarh can be traced back to ancient eras when local tribes used naturally available minerals for their fundamental requirements, including tools and ornaments. Nevertheless, organized mining began to emerge in the late 19th century under British colonial administration, spurred by the industrial revolution and the increasing need for raw materials, especially coal and iron ore, to support the expanding industries in various parts of India and internationally. The British developed infrastructure to aid extraction and transportation, particularly railways that connected mining areas to major markets. This era signified a notable change as the exploitation of mineral resources became methodical, establishing the foundation for future mining ventures.[7] (Mishra PP, 2009)

After independence, the Indian government acknowledged the potential of Chhattisgarh's mineral resources to promote economic progress. The creation of the National Mineral Development Corporation (NMDC) in 1958 marked a significant milestone in the state's mining history, as it sought to encourage systematic mining techniques while ensuring that mineral resources were used for national growth. Chhattisgarh became a crucial contributor to India's mineral output, especially in coal, iron ore, and bauxite. The liberalization of the Indian economy in the 1990s further propelled mining activities, as the government promoted private investment in the sector. This surge in investment resulted in the emergence of both domestic and multinational mining firms eager to exploit the state's plentiful resources. As a result, Chhattisgarh experienced considerable enhancement in its mining infrastructure, including roads, railways, and processing plants, which enabled efficient extraction and transportation of minerals.[8] (Cropper, 2012)

This historical progress has not only influenced the economic environment of Chhattisgarh but has also created a basis for intricate socio-environmental issues. The swift growth of mining activities has frequently taken place with little consideration for environmental sustainability, resulting in extensive deforestation, soil erosion, and water contamination. Consequently, the historical context of mining in Chhattisgarh presents a dual narrative: one of economic prospects and advancement, and another of environmental harm and social dislocation, reflecting the continuous challenge to reconcile resource exploitation with ecological and community welfare. (Krishnamurthy, 2004)

2.2 How the Environment is Affected by Mining?

Mining in Chhattisgarh has significant environmental repercussions that appear across various aspects, greatly affecting the area’s ecology and the welfare of its inhabitants. One of the most immediate outcomes of mining operations is deforestation, as extensive areas of forest are cleared to accommodate open-pit mines and related infrastructure. This reduction in forest cover not only disrupts local ecosystems but also results in habitat loss for countless species, leading to a decrease

[7] **D.C. PATEL,** *CHHATTISHGARH PCS* (2024).
[8] **D.C. PATEL,** *CHHATTISHGARH PCS* (2024).

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

in biodiversity. Moreover, the removal of plants worsens soil erosion, as the protective layer of roots is taken away, making soil more vulnerable to being washed away during rain. The ramifications of this erosion are extensive, impacting agricultural productivity and causing sedimentation in rivers, which can be detrimental to aquatic life. (Singh, 2006)

Water contamination is another major environmental issue connected to mining in Chhattisgarh. The mineral extraction process frequently involves the use of chemicals and heavy machinery, which can release harmful substances into nearby water sources. Heavy metals like lead and mercury can seep into groundwater and surface waters, polluting drinking supplies and damaging aquatic ecosystems. The contamination of rivers and streams presents serious health hazards to local communities that depend on these water sources for everyday requirements. Furthermore, mining activities can disrupt the natural flow of rivers, causing changes in water tables and reducing the availability of freshwater for both human consumption and agriculture. (Singh V. a., 2004)

Deterioration of air quality is also a major concern, as dust produced from mining operations and emissions from heavy equipment contribute to air pollution. Residents living in proximity to mining locations frequently suffer from respiratory issues and other health complications due to extended exposure to airborne particulate matter and toxic gases. Additionally, the noise pollution created by mining activities can disturb wildlife and interfere with the daily routines of nearby communities.

The combined effect of these environmental challenges is a worrying indication of ecological imbalance in Chhattisgarh. The interaction of deforestation, soil erosion, water and air pollution, and loss of biodiversity establishes a cycle of degradation that endangers not just the environment but also the livelihoods of the local populace. As communities encounter displacement due to mining activities, the socio-economic structure of the region is increasingly strained, with traditional lifestyles disrupted and dependence on unsustainable practices growing. In conclusion, while mining has played a role in the economic development of Chhattisgarh, it has also brought about considerable environmental costs that necessitate urgent attention and sustainable management strategies to prevent further degradation and safeguard the region's ecological integrity. (P.K, 1986)

3. Environmental Degradation and the Loss of Chhattisgarh's Natural Richness

Chhattisgarh, a region located in central India, possesses an abundance of natural assets, such as lush forests, rich mineral resources, and varied biodiversity. Traditionally[9], this abundance has formed the foundation of its economy, supporting local populations via agriculture, forestry, and mining. Yet, throughout the years, environmental degradation has greatly reduced this abundance, resulting in serious socio-economic effects for the area. The interaction between rapid industrialization, unsustainable farming practices, and extensive mining operations has initiated a series of environmental problems that endanger the ecological balance and deplete the natural resources essential for the livelihoods of millions. (Ahsan, 1999)

[9] **HARI RAM PATEL,** *CHHATTISGARH VISHISHT ADHYAYAN* (HR Publications 2021).

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

One of the most crucial factors leading to the decline of Chhattisgarh's resources is deforestation, mainly influenced by the growth of mining and agricultural endeavours. The state boasts some of India's most unspoiled forests, which deliver vital ecosystem services such as carbon sequestration, water regulation, and habitats for numerous species. Nevertheless, the unrelenting need for land to facilitate mining activities has resulted in extensive deforestation. For example, coal mining, which is predominant in areas like Korba and Raigarh, requires the clearing of large expanses of forestland[10]. This loss of trees not only decreases the supply of timber and non-timber forest products, essential for local economies, but also disturbs the habitats of countless plant and animal species. The reduction in biodiversity is concerning; numerous species are on the brink of extinction as their natural environments are obliterated; leading to an imbalance in the ecosystem that further intensifies environmental degradation. (Verma, 2019)

Furthermore, deforestation leads to soil erosion, which considerably affects agricultural productivity. The protective layer of vegetation that previously held the soil intact is removed, rendering the land more vulnerable to erosion during rainfall. Consequently, nutrient-rich topsoil is washed away, resulting in diminished fertility and reduced agricultural output. Farmers depending on these lands for their survival increasingly struggle to provide for their families, driving them toward poverty and food insecurity. This predicament is especially severe in rural regions where farming serves as the main source of income. The loss of cultivable land not only hampers local food production but also compels farmers to utilize chemical fertilizers and pesticides to make up for declining soil health, which further contaminates the environment and undermines the quality of produce. (Kala, 2012)

Water pollution represents another significant facet of environmental degradation in Chhattisgarh that has directly influenced the wealth of the area. Mining activities frequently result in the pollution of rivers and groundwater supplies due to the release of heavy metals and hazardous chemicals employed in extraction methods. For instance, the leaching of iron, manganese, and other detrimental substances into water bodies [11]poses severe health hazards to local populations who rely on these water supplies for drinking, cooking, and irrigation. The pollution of rivers not only jeopardizes human health but also devastates aquatic ecosystems, leading to a decrease in fish populations and disrupting the livelihoods of fishing communities. This cycle of contamination creates a harmful loop where the deterioration of water quality reduces agricultural efficiency, further straining the economic structure of the region. (Joshi, 2009)

In addition to mining and agriculture, industrialization has significantly contributed to the environmental decline of Chhattisgarh. The development of industries, especially in urban areas such as Raipur and Bhilai, has resulted in heightened emissions of pollutants into the atmosphere and waterways. Factories emit particulate matter, sulphur dioxide, and nitrogen oxides, which worsen air quality. The health consequences of this pollution are serious, with an increase in respiratory illnesses and other health issues among the local population. Furthermore, the surge in urban waste due to rapid population growth has strained waste management systems, resulting in improper disposal of solid waste and untreated sewage contaminating land and water resources. (Chopra, 2016) This urban

[10]**HARI RAM PATEL,***CHHATTISGARH VISHISHT ADHYAYAN* (HR Publications 2021).
[11]**D.C. PATEL,***CHHATTISHGARH PCS* (2024).

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

pollution not only lowers the quality of life for inhabitants but also intensifies the environmental issues faced by nearby rural regions.

The socio-economic impacts of environmental degradation in Chhattisgarh are significant. The depletion of natural resources has led to reduced returns for local economies that rely on agriculture, forestry, and mining. As conventional livelihoods become unsustainable, communities are compelled to migrate to urban areas in search of improved opportunities, resulting in overcrowding and increased strain on urban infrastructure. Such migration frequently leads to social fragmentation and the erosion of cultural heritage as communities leave their ancestral lands and traditional lifestyles behind. Moreover, the economic gains from mining and industrial endeavours are often not fairly distributed among local communities, causing heightened inequalities and social discord. (Biswas, 2018)

The reduction in environmental richness also affects the overall resilience of the region. Healthy ecosystems are essential for alleviating the impacts of climate change, offering services like flood regulation and carbon storage. Nevertheless, as deforestation and pollution persist in undermining these ecosystems, Chhattisgarh becomes more susceptible to climate-related disasters, such as floods and droughts. This vulnerability further jeopardizes food security and the livelihoods of communities already facing challenges due to environmental degradation.

To tackle the urgent issue of environmental degradation and its effects on the richness of Chhattisgarh, it is vital to implement sustainable practices that can aid in restoring and safeguarding the region's natural resources. Enforcing thorough policies that encourage reforestation, sustainable agriculture, and responsible mining can help alleviate the negative consequences of environmental degradation. (Kumar, 2020)

4. GOVERNMENT INITIATIVES AND POLICY RESPONSES

In light of the critical state of environmental degradation, both state and national governments have launched various initiatives aimed at addressing these pressing issues.

- **Afforestation and Reforestation Initiatives:** Programs like the Green India Mission [12] and regional reforestation efforts are dedicated to restoring depleted forest areas. These initiatives prioritize sustainable management practices and foster community involvement, striving to harmonize economic development with ecological preservation.

- **Regulatory Enhancements for Mining and Industrial Operations:** Enhanced environmental regulations have been established to monitor mining activities and industrial emissions. The implementation of Environmental Impact Assessment [13] (EIA) protocols aims to mitigate the negative impacts of these operations on local ecosystems.

[12] **Ministry of Env't, Forest & Climate Change,** *National Mission for a Green India*, GOV'T OF INDIA, https://moef.gov.in/en/major-initiatives/national-mission-for-a-green-india/ (last visited Apr. 4, 2025).
[13] The Environment (Protection) Act, No. 29 of 1986, INDIA CODE (1986).

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

- **Promotion of Sustainable Agricultural Methods:** Various districts are implementing extension services that advocate for organic farming, integrated pest management, and soil conservation practices. These initiatives seek to decrease reliance on chemical inputs while promoting methods that enhance soil fertility and water retention.

- **Urban Development and Waste Management Strategies:** Urban centers are progressively embracing smart city initiatives that incorporate green infrastructure, including urban forests, improved waste recycling systems, and sustainable transportation networks. Nevertheless, the rapid urban expansion often surpasses the pace of policy execution, underscoring the necessity for ongoing evaluation and refinement of urban planning approaches.

Despite these initiatives, obstacles such as enforcement challenges, limited financial resources, and conflicting development objectives continue to hinder effective environmental management. A collaborative strategy that integrates local expertise, scientific research, and robust economic policies is crucial for achieving long-term sustainability. (Singh A. R., 2023)

4.1 Discussion and Implications for Sustainable Development

The environmental issues faced in Chhattisgarh are not unique; they mirror wider global patterns where economic advancement frequently incurs ecological repercussions. The combination of deforestation, mining activities, industrial pollution, unsustainable farming practices, and urban expansion creates a complex network of causes that necessitates comprehensive solutions. (Stern, 1996)

- **Interconnectedness of Factors:** The deterioration of one ecological element often leads to negative consequences for others. For instance, deforestation not only reduces biodiversity but also leads to soil erosion, which subsequently impacts water quality and agricultural output. This interconnection highlights the necessity for integrated environmental management strategies. Understanding these relationships is crucial for developing effective interventions, as tackling a single issue without considering its broader implications can unintentionally worsen the situation in other areas.

- **Socio-Economic Aspects:** The environmental decline in Chhattisgarh carries profound social consequences. The deterioration of ecosystem services has a direct impact on the livelihoods of rural populations, resulting in heightened vulnerability and economic inequality. This situation underscores the critical need to integrate environmental conservation initiatives with social development strategies. Policies must prioritize not only the preservation of natural resources but also the promotion of inclusive economic growth, ensuring that disadvantaged communities gain from sustainable practices. Attaining social equity necessitates tackling the fundamental causes of poverty, enhancing education and healthcare access, and creating economic opportunities that are environmentally sustainable. (Abraham, 2014)

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

- **Pathways to Sustainability:** The analysis presented in this chapter indicates that achieving sustainable development in Chhattisgarh relies on a variety of strategies aimed at enhancing environmental resilience. Key approaches include integrated land use planning, community-driven resource management, and the implementation of green technologies, all of which are essential for addressing environmental degradation. These methods can create a harmonious balance between economic growth and ecological sustainability. For example, integrated land use planning can direct urban development while preserving important natural ecosystems, and community-driven resource management can empower residents to protect their environment. Additionally, green technologies, such as renewable energy and sustainable agricultural practices, can greatly minimize environmental impact while fostering economic advancement. Collaborations among government bodies, local communities, educational institutions, and the private sector are vital for sharing best practices and promoting innovation in environmental stewardship. (Omer, 2008)

5. FUTURE RESEARCH DIRECTIONS

Current research sheds light on the factors contributing to environmental degradation in Chhattisgarh and its repercussions. However, there is a need for further investigation that includes comparative studies with other regions experiencing analogous issues. Such analyses could provide critical insights into the effectiveness of various environmental policies and interventions in similar settings. Detailed case studies that highlight successful policy measures and community-driven conservation efforts would serve as exemplary models for sustainable practices that can be replicated. Moreover, research should also examine the economic ramifications of environmental degradation and how the adoption of sustainable practices within local economies can enhance long-term resilience. Interdisciplinary collaboration will be crucial in formulating comprehensive strategies that foster sustainability in Chhattisgarh and other regions.

Achieving sustainability in Chhattisgarh necessitates a comprehensive and cooperative initiative that tackles not only environmental issues but also the social and economic factors closely associated with ecological well-being. Only through a unified and holistic strategy can we realize significant and lasting transformation.

6. CONCLUSION

The environmental decline in Chhattisgarh results from a variety of interconnected factors arising from swift economic and demographic transformations. Although the state's abundant natural resources have historically fostered a thriving ecosystem, current practices in forestry, mining, industrial activities, agriculture, and urbanization have collectively placed immense pressure on the environment. The cumulative impact of these actions, exacerbated by the unpredictability of climate change, necessitates immediate and comprehensive action. To tackle these issues effectively, a collaborative approach is essential, extending beyond conventional regulatory frameworks. The restoration and safeguarding of the environment in Chhattisgarh should be pursued through diverse strategies that integrate scientific inquiry, technological advancements, and active community involvement. While government initiatives are crucial, they must be supported by ongoing, evidence-

ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-4 | April-2025 | Page 363-373

based research to adapt to changing environmental circumstances and improve the efficacy of intervention methods. Strengthening the relationship between local communities and ecological governance can also foster more sustainable, community-led solutions.

As the state progresses, it is vital to prioritize integrating policy, technology, and local expertise in efforts to combat environmental degradation and ensure a resilient future for Chhattisgarh. By adopting an inclusive strategy that empowers communities, leverages innovative technologies, and builds upon robust policy frameworks, Chhattisgarh can create a pathway toward a more sustainable and prosperous future, preserving its natural heritage for future generations.3

REFERENCE

1. S. Ahmad, M.H. Fulekar, B. Pathak, Impact of Coal Based Thermal Power Plant on Environment and its Mitigation Measure, Int. res. j. environ. Vol. 1(4) (2012) 60-64.
2. S. Jena, Environmental Impacts of Fly Ash Generated from a Coal Fired Power Plant in Indian Subcontinent, The 17th annual conference of the ISDRS 2011
3. E. Burt, P. Orris, S. Buchanan, Scientific Evidence of Health Effects from Coal Use in Energy Generation, 2013, http://vindhyabachao.org/embeds/coal/Annexure%20A-7.pdf
4. Chakraborty M (1994). An analysis of the causes of deforestation in India. The causes of tropical deforestation: Economic and statistical analysis of factors giving rise to the loss of tropical forests. University College Pressure, London, 226-39.
5. Chowdhury RR (2006). Driving forces of tropical deforestation: The role of remote sensing and spatial models. Singapore Journal of Tropical Geography, 27(1), 82- 101.
6. Mishra PP, Reddy MG (2009) Mining in Forest Areas - Problems, Causes and Concerns: A Review; RULNR-CESS Working Paper Series No. 1. July, 2009.
7. The Health Effects of Coal Electricity Generation in India - Maureen Cropper et al - (Resources for the Future; June 2012).
8. Environmental Impacts of Coal Mining In India. Krishnamurthy, K.V. Proceedings of the National Seminar on Environmental Engineering with special emphasis on Mining Environment, NSEEME-2004, March 2004.
9. Environmental and social challenges facing coal industry - Gurdeep Singh, Proceedings of International Coal Congress and Expo 2006.
10. Singh, V. and Chandel, C.P.S., 2004. The potability of groundwater in terms of Water Quality Index (WQ1) of Jaipur city. Cheml. Environ. Res., 13(3&4):307-314
11. Tiwari R K and Goel P.K. ,1986. ”chemical and Biological method for water pollution studies “, Environmental Publication ,Karad India.
12. Ahsan, N., (1999) Solid waste management plan for Indian megacities. Indian Journal of Environmental Protection 19(2), 90-95.
13. Verma, S. An assessment of threat to biodiversity in Chhattisgarh 2019.
14. Kala, C. P., & Dubey, Y. (2012). Anthropogenic disturbances and status of forest and wildlife in the dry deciduous forests of Chhattisgarh state in India. *Journal of Forestry Research*, *23*, 45-52.
15. Joshi, P. K., Kumar, M., Paliwal, A., Midha, N., & Dash, P. P. (2009). Assessing impact of industrialization in terms of LULC in a dry tropical region (Chhattisgarh), India using remote

sensing data and GIS over a period of 30 years. *Environmental monitoring and assessment*, *149*, 371-376.

16. Chopra, R. (2016). Environmental degradation in India: causes and consequences. *International journal of applied environmental sciences*, *11*(6), 1593-1601.
17. Biswas, S., & Biswas, A. (2018). Impact of mining on forests and its biological diversity at kirandul iron Ore Mines, Dantewada, South Bastar, Chhattisgarh: A Case Study. *J Environ Sci Stud*, *1*(1), 16.
18. Kumar, S., & Barua, S. (2020). Impact of ecotourism on rural people and environment in Bastar District of Chhattisgarh, India.
19. Singh, A., & Rai, A. (2023). Evaluating Human Development Trends in Chhattisgarh after Economic Reforms in India. *International Journal of Research Publication and Reviews*, *5*(11), 1529-1535.
20. Stern, D. I., Common, M. S., & Barbier, E. B. (1996). Economic growth and environmental degradation: the environmental Kuznets curve and sustainable development. *World development*, *24*(7), 1151-1160.
21. Abraham, A. (2014). *Sustainable development and the environment: an aspect of development*. Anchor Academic Publishing (aap_verlag).
22. Omer, A. M. (2008). Energy, environment and sustainable development. *Renewable and sustainable energy reviews*, *12*(9), 2265-2300.