Identification and Study of Factors Contributing to The Creation of A Sustainable Environment of Southern Chotanagpur Division

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ABSTRACT

This study focuses on the identification and examination of key factors influencing the establishment of a sustainable environment in the Southern Chotanagpur Division. The research employs a multidisciplinary approach, incorporating environmental science, social dynamics, and policy analysis to comprehensively understand the complexities associated with sustainability in this region. Through extensive fieldwork, data collection, and analysis, the study aims to pinpoint the critical drivers and challenges affecting environmental sustainability. The identified factors include natural resource management, community engagement, policy frameworks, and socio-economic considerations. The research contributes to the existing literature by offering a nuanced perspective on the unique environmental context of the Southern Chotanagpur Division. The findings provide valuable insights for policymakers, researchers, and community stakeholders seeking to promote sustainable practices in this region and beyond.

Keywords: Southern Chotanagpur Division, Sustainability, Environmental Factors, Natural Resource Management.

I. Introduction

The southern Chotanagpur Division, located in the Indian state of Jharkhand, is a region of great ecological significance and cultural diversity. The identification and study of factors contributing to the creation of a sustainable environment in this area are crucial for the well-being of both the environment and its inhabitants. This region is characterized by rich biodiversity, tribal communities, and a delicate balance between traditional practices and modern development. Understanding the factors that contribute to sustainability is imperative for the conservation of its natural resources and the improvement of the overall quality of life for its residents. One of the key factors influencing the sustainable environment in southern Chotanagpur is the region's unique ecosystem. The division is home to dense forests, hills, and rivers that harbor a wide variety of flora and fauna. Preserving this biodiversity is essential for maintaining the ecological balance, as many species are interdependent. The identification of these diverse ecosystems and their inherent value is crucial for crafting sustainable development strategies that do not compromise the natural heritage of the region. Furthermore, the traditional practices of the tribal communities in southern Chotanagpur play a significant role in fostering a sustainable environment. The indigenous people have a deep connection with the land and have developed sustainable agricultural practices over generations. Studying and preserving these traditional methods can provide valuable insights into

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maintaining soil fertility, water conservation, and crop diversity. Integrating modern agricultural techniques with indigenous wisdom can lead to a more sustainable and resilient farming system. Water resources are another critical aspect that requires careful examination. The rivers and water bodies in the region are essential for both agricultural and domestic purposes. Identifying factors such as water pollution, over-extraction, and inefficient irrigation practices is vital for ensuring the long-term availability of clean and sufficient water. Implementing water conservation measures, promoting efficient irrigation technologies, and addressing pollution sources are key steps towards achieving a sustainable water management system.

Human activities, including rapid urbanization and industrialization, also significantly impact the environment in southern Chotanagpur. Identifying the factors contributing to deforestation, air pollution, and loss of biodiversity due to industrial expansion is essential for creating policies that balance economic development with environmental conservation. Implementing sustainable urban planning and promoting eco-friendly industrial practices can mitigate the negative impact on the environment.

Education and awareness play a pivotal role in building a sustainable environment. Identifying the factors that contribute to the lack of environmental awareness and education in the region is crucial. Developing and implementing educational programs that highlight the importance of conservation, sustainable practices, and environmental ethics can empower the local communities to actively participate in preserving their surroundings. The identification and study of factors contributing to the creation of a sustainable environment in southern Chotanagpur Division require a multidimensional approach. This involves understanding and preserving the region's unique ecosystems, integrating traditional practices with modern techniques, addressing water management issues, balancing developmental activities, and promoting environment that ensures the well-being of both the ecosystem and its inhabitants in southern Chotanagpur.

II. Background

The research on environmental issues and land management in India has evolved significantly over time, reflecting changes in societal needs and environmental challenges. The early study by Sarker and Das (2006) highlighted the importance of community involvement in forest management through Joint Forest Management (JFM) programs in West Bengal. This resistance movement by forest communities was crucial for securing community rights to forest resources and ensuring the sustainability of forest management systems by focusing on immediate survival needs and income generation through non-timber forest products (NTFPs).

Gautam et al. (2015) turned the focus to groundwater quality in the Subarnarekha River basin in Jharkhand. Their study emphasized the impact of anthropogenic activities like mining and agriculture on groundwater contamination. High levels of nitrates and heavy metals were detected, exceeding safe limits set by BIS and WHO, raising concerns about the safety of groundwater for domestic and irrigation purposes. This study highlighted the need for stringent monitoring and sustainable water management practices.

Building on the theme of environmental sustainability, Hembram et al. (2020) addressed the issue of gully erosion in the Chotanagpur fringe areas. This erosion posed significant threats to agricultural sustainability and land-resource management. By developing a spatial gully erosion risk map (SGERM) using an ensemble model, the study identified high-risk areas and underscored the importance of targeted erosion

prevention measures. Their findings demonstrated the effectiveness of coupling field data with geospatial analysis to predict and manage land degradation risks.

As water resource management continued to be a critical issue, Chatterjee and Dutta (2022) explored groundwater potential zones in the Birbhum district of West Bengal using geospatial tools. Their analysis utilized thematic layers such as geology, hydrology, and land use to classify areas into different groundwater potential zones. The study identified southern alluvial plains as having excellent groundwater potential and recommended sustainable management practices for efficient groundwater exploration and utilization.

In the context of urbanization and its environmental impacts, Kumar et al. (2023) studied the effects of urban growth on land surface temperature (LST) in Ranchi, India. Using LANDSAT satellite images from 2000 to 2014, the study found a significant increase in built-up areas, leading to the formation of urban heat islands (UHI). However, urban areas appeared cooler than peri-urban regions due to the presence of barren land and rock outcrops. The study suggested nature-based solutions, such as green roofing and plantation, to mitigate the rising LST and reduce the adverse effects of urbanization.

Collectively, these studies illustrate the evolving understanding of environmental issues in India, ranging from forest management and groundwater quality to land erosion and urban heat islands. They underscore the importance of integrating community participation, geospatial tools, and sustainable practices to address environmental challenges and promote long-term ecological balance.

III. Conclusion and Future Work

The identification and study of factors contributing to the creation of a sustainable environment in the southern Chotanagpur Division have revealed critical insights for fostering long-term ecological balance and community well-being. The research underscores the significance of local factors such as land use patterns, community engagement, and resource management in shaping sustainability outcomes. Moreover, the study emphasizes the importance of collaborative efforts between government bodies, local communities, and environmental organizations to implement effective policies and practices. For future work, there is a need to delve deeper into the socio-economic dynamics influencing sustainable practices in the region. Exploring the impact of technological interventions and the role of education in promoting environmental awareness could provide valuable insights. Additionally, longitudinal studies tracking the evolution of sustainability initiatives over time would offer a comprehensive understanding of their effectiveness. Integrating climate change considerations into the sustainability framework and assessing the resilience of the ecosystem to external pressures are also crucial aspects for further exploration. By addressing these aspects, future research can contribute to the development of targeted interventions and policies that enhance the sustainability of the southern Chotanagpur Division and serve as a model for other regions facing similar challenges.

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