International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 6, Nov.-Dec., 2024, pp:310-314 ISSN: 3048-6874
www.ijhssm.org

The Cost of Unplanned Infrastructure Development in Assam: Environmental and Social Impact of Roads and Bridges

Priyanka Konwar
M.A in Political Science, UGC-NET
Cotton University, Guwahati

Date of Submission: 03-11-2024 Date of Acceptance: 14-11-2024

Abstract: Transportation infrastructure is essential for nation's economic growth. However, unplanned and poorly executed projects have led to significant environmental and social consequences. In Assam State of North East India, the government's project on expanding roads to four lanes and reconstructing old routes, building flyovers have resulted in deforestation, pollution, soil erosion, displacement etc. These projects often involve cutting down of large trees, disrupting flora and fauna, and damaging natural resources like ponds and forest, pollution, soil erosion and biodiversity loss. Compounded by corruption and inadequate oversight, such activities accelerate climate change, evidence by shifts in precipitation and temperature pattern as well catastrophic disasters. This paper primarily aims to analyse how the reconstruction and expansion of roads in Assam contribute to environmental degradation through the environmental politics point of view, as well to inform policies to mitigate such destruction. A balanced, sustainable approach is essential to safeguard Assam's ecological landscape while enhancing transportation infrastructure with proper study and plan. This study is a descriptive research based on data gathered through secondary sources like government records, books, articles, web based journals etc.

Keywords: Unplanned development, environmental destruction, climate change, reconstruction, environmental politics

I. INTRODUCTION:

"*Modern technology owes ecology an apology". ~ Alan M. Eddison.*

Transportation infrastructure development is often viewed as economically beneficial, yet it poses significant environmental challenges. Thus, effective planning is crucial to balance these impact. In Assam, a northeastern state in India, recent road and bridge construction — both new and reconstruction projects have led to disruptions for the public resulting in air pollution, traffic issues, deforestation and noise pollution. However, rather than focusing on new connectivity projects, the Assam government is more investing in reconstruction efforts. Such projects of reconstruction may stem from past instances of unplanned development, where projects lacked forethought and currently required continual expansion and improvement for public use. Corruption also plays a role; funds intended for these projects have reportedly, leading to substandard work and materials that necessitate further reconstruction. Worryingly, the ongoing reconstruction projects appear to be plagued by similar issues, where inadequate materials and continued financial mismanagement compromise the effectiveness of infrastructure.

These infrastructural activities contribute directly to environmental degradation and climate change, evidence by shifts in rainfall patterns, rising temperature and other disasters affecting peoples of Assam. Seasonal changes are increasingly unpredictable— rains are delayed, winter delayed, and extreme weather events have become more common. This environmental impact reflects a broader trend where rapid infrastructure growth comes at high environmental cost, diminishing true developmental progress. It is become evident that this programs often comes with a hefty price tag for nature (Banik and Goswami, 2024). As a result, Assam's urban centers, such as Guwahati, lag behind cities like Bangalore and Hyderabad in terms of sustainable growth and liability. What Assam is experiencing is development without characteristics of true development (Jayswal and Saha, 2014). This situation highlights the urgent need for an environmentally conscious approach to infrastructure planning considering both ecological and societal aspects of development. This paper has been divided into five parts accordingly, overview of government's reconstruction initiatives; critical analysis of environmental and social impacts of the reconstruction; environmental politics and policy dynamics; finally the conclusion.

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II. OVERVIEW OF ASSAM GOVERNMENT'S RECONSTRUCTION INITIATIVES:

The Assam government is currently undertaking multiple four lane road construction projects across nearly every district in the state. Alongside these road expansion, flyovers are being constructed in key areas such as Guwahati, Dibrugarh, Baihata Chariali, Pathsala etc. These projects require extensive earthwork and resource allocation. While these infrastructure development aim to improve connectivity and facilitate growth, they are causing considerable environmental degradation. The destruction caused by these projects goes beyond the new construction initiatives. In the name of road reconstruction and expansion, longstanding trees, wetlands and other vital ecological resources are being sacrificed. For instance, the widening of roads to four lane has involved the cutting down of countless mature trees along highways and rural roads, raising significant environmental and social concern. Such pattern of destruction points to a lack of sustainable planning. The government's short-sighted approach to infrastructure development, with little foresight regarding ecological impacts, has led to a situation where repeated reconstruction is required, exacerbating environmental harm. The cutting down of more than 7000 Sal trees in the area of Krishnai Reserved Forest for expansion of 27 national highway in Goalpara district is a best example (Das, 2023). The national highway project from Baihata to Sonapur via Kuruwa proposed to cut down of over 3200 trees including some within the Amchang Wildlife Sanctuary (NortheEast Now, 2024). The current ongoing reconstruction of Dibrugarh-Duliajan road has also starting cutting down of significant numbers of trees, which road is significantly narrow that expansion is required, but that again harming nature. Notably, almost in all the districts construction and reconstruction of roads and bridges goes on with destruction of nature.

The government justifies and put forwarded the construction projects with the directives and promises for plantation of trees along the national highways to balance the cutting down of trees in the name of the project (Public Works Building& National Highway, Government of Assam). Surprisingly,in Assam where the rate of deforestation has been faster than in many other states, no proper arrangements and policy has been framed and adopted, thus failed to ensure Green Highways. The proposal for cut down of trees for construction of ring roads show such failure and imbalance (The Sentinel,2024). In this debate around trees vs roads, the government is choosing the roads. The construction of six lane road from Basistha to Jalukbari, four bridges at Garchuk, Borgaon, Lokhra and Basistha Chariali in Guwahati caused cutting down of huge numbers of trees leaving Guwahati residence more vulnerable to high pollution level. The government has indeed succeeded in carrying out construction projects, but it has largely neglected the issue of replanting trees. While there are directives for plantation, they fall short because the old, established trees and the natural beauty of these areas are lost forever. Newly planted trees may not even thrive in these locations, and it takes years for a tree to grow and mature. This oversight has led to significant public criticism of the government, as the inconvenience and environmental impact ultimatelyaffect the people. Programs like the Amrit Briksha Andolan, aimed at planting one crore trees across the state, seem inadequate, as they cannot truly replace the trees cut down along highways (Grow Billion Trees).

III. CRITICAL ANALYSIS OF ENVIRONMENTAL AND SOCIAL IMPACTS:

The rapid and unplanned nature of development has resulted in ecological ruptures which are manifesting themselves in catastrophic disasters like flash flood (Rahman, 2022). Though, Assam is considered as least urbanized as compare to other states in India, a few large urban agglomerations have developed, all experiencing rapid growth. However, the environmental implications of this urbanization are negative with serious consequences for natural habitat (Neog, 2014). The positive growth of physical infrastructure, at the same time the negative impacts on nature brought these projects under fierce criticisms. It is a matter of concern as such acts of government ultimately add to the issues like climate change and that's how along with the local public suffers, it might have global impacts. The construction and reconstruction of the roads and bridges in Assam have significant environmental and social impacts and people are victim of it. The clearing of lands for these projects leads to deforestation, loss of green space and soil erosion, which harm natural ecosystem and increase flood risks due to reduced water absorption. Construction activities release dust and exhaust emissions degrading air quality and contributing to pollution in local water disrupts aquatic ecosystems. Noise pollution, waste management, traffic disruption affecting the local

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transportation and increasing road safety concerns. Overall, these infrastructure expansion threatens local flora and fauna, further reducing biodiversity in the region (Banik and Goswami, 2024). The relentless pursuit of economic prosperity frequently results in the degradation of our environment, manifesting deforestation, pollution, habitat destruction and climate change.

The problem is that everything is related — flood, deforestation, boulder extraction (Nongmaitheim, 2024). The construction of roads and bridges is closely connected to climate change. The intense activity involve cut down of trees, heavy traffic, pollution, large scale earthwork. These projects contribute to greenhouse gas emissions, furtherfueling climate change. The effects of climate change are increasingly evident in altered precipitation pattern and rising temperatures with delayed rainfall and extreme weather events. As per Indian Meteorological Department Records shortage of rainfall is observed in Assam and its adjoining states, North East India, which boast of the world's wettest place, has witnessed the highest rainfall deficit in the last 30 years which attribute to global warming (Bora, 2010). The primary sufferers are the local communities, the general public, and ultimately the people worldwide. These issues significantly impact daily life of people, health, vulnerable communities and most importantly agricultural practices. Recurring floods, changing weather pattern, untimely rains and construction debris from roads, highways and bridges deposition in rivers and farmland have impacted agriculture in the area (Bharadwaj, 2023). And due to such seasonal changes farmers have to adjust their cropping pattern, making it difficult to cultivate Ravi and Khariff crops on time. Another aspect is flood that Assam is not new to it, but the intensity of flood has been increasing every year due to changing timeline of intense rainfall. These are the consequences of rapid and unplanned infrastructure development and continuous environmental destruction (Rahman, 2022). The danger of climate change is alarming that we cannot ignore, and according to the reports Assam is highly vulnerable to its impacts. There is complex interplay between climate change, cultural heritage and infrastructural development. And the victims are those vulnerable groups depend on agriculture, street vendors. However, this paper mainly intends to analyse the consequence of road and bridge reconstruction in environment, with a critical focus on government projects and issues of corruption. Unplanned development programs and corruption in the part of government can severelyharm the environment under the guise of reconstruction. While some level of environmental impact may be tolerated for new construction, but destruction in the name of reconstruction is unacceptable, which double victimise the nature. Properly planned development should not damage natural resources or disrupt public utilities. The city's rapid expansion, accompanied by and infrastructural maze within the city and the highways and railways crisscrossing the peri-urban space destroyed critical natural infrastructure such as wetlands, floodplains and forests which are vital to the natural flood management capacity of the landscape that ultimately interlink with climate change (Rahman, 2022).

IV. ENVIRONMENTAL POLITICS AND POLICY DYNAMICS:

Transportation is said to be the spinal cord of economy (Subbu, 2022). However, the environmental destruction caused in the name of transportation infrastructure development is a matter of serious concern. This issue falls not only within the scope of environmental science, but should also be examined from an environmental political perspective, as such destruction often results from government's ineffective involvement and corrupt practices. The politics induced economic development causes the degradation of environmental quality and damages the ecological structure processes upon which have ultimately raised the question of environmental sustainability of the future generation. Thus, environmental issues are now become environmental political issues. However, the economic ecological issue has received minimal attention, though it holds important lessons for cities and towns in north east India. Approach of environmental politics would help to see these things with critical view. The construction of unplanned infrastructure in Assam reflects a complex interplay of environmental politics and policy dynamics with significant oversight by the government in prioritising environmental concerns. Projects like the expansion of four lane highway are driven largely by political agendas focused on economic growth and connectivity, often at the cost of environmental sustainability. Political leaders tend to prioritise rapid development over ecological integrity, pushing projects forward with limited regard for their environmental impact. This trend is exacerbated by Assam's flawed governance framework, where Environmental Impact Assessment (EIAs)s are sometimes hastily conducted or even bypassed to expedite projects, revealing both policy gaps and a lack of enforcement. Furthermore, the government's approach to frequent reconstruction and expansion projects suggest earlier mismanagement and

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corruption, where initial infrastructure was poorly planned and implemented. Had these projects been designed with long term sustainability in mind, reconstruction and expansion would not be as necessary, potentially avoiding much of environmental degradation that now occurs with each new project phase. Adding to these concerns is the exclusion of local and indigenous communities from meaningful participation in decision making, leaving marginalized groups vulnerable. They bear the brunt of environmental harm but have little voice in challenging these projects. In sum, Assam's ongoing infrastructure initiative expose a recurring tension between development driven political goals and the need for robust, environmentally sustainable governance.

The challenges of unplanned development in Assam stem largely from a lack of thorough scientific studies and effective planning. While the objective of the Assam State Road Project is to provide road users with high-quality, well-managed state highways and major district roads, the project brings significant negative impacts, including air and water pollution, soil erosion, waste management issues, and disruption to local flora and fauna, as well as increased noise pollution (World Bank Group, 2011). Environmental politics advocates for a development approach that balances economic growth with nature conservation, emphasizing that policies should be grounded in comprehensive planning that considers long-term environmental impacts. Although, it is impossibleto restrict development, but it has to be ensured that development proceeds in the right paths causing minimum impact on environment (Mili and Acharjee, 2017). It is important to note that the current reconstruction process continues to be handled ineffectively, often marked by misappropriation of funds and corruption. If the government had initially planned these projects with a focus on long-term sustainability, minimising the need for future expansion and reconstruction, much of the environmental degradation could have been prevented. Hence, not only the quantity but also the quality of the road network should be paid by government (Gogoi, 2013).

V. CONCLUSION:

Assam's recent infrastructure projects, though intended to enhance connectivity and support economic development, underscore the critical drawbacks of unplanned and inadequately executed development. Rather than relying on continuous expansions and reconstruction, the government would have better served the region by implementing these projects through careful planning and precise execution. Only by acknowledging and addressing the consequence of such actions we can hope to build a sustainable future where both human development and environmental health can thrive in harmony (Banik and Goswami, 2024). Such an approach would help to minimise adverse environmental impacts, including deforestation, habitat disruption and increased flood risks, while also addressing the social costs to local communities.

Geographical studies of Assam road networks find that districts of Assam have minimum road density and most of the districts are characterized by minimum efficiency of road networks in term of connectivity. The nature of development efficiency is poorer that a large scale deprivation taking place from immense potentialities like forest resource, minerals, agriculture, tourism etc. These facilities can not be utilised without improvement of existing transportation with well-plan (Gogoi, 2013). Therefore, Assam's infrastructure development urgently requires an infusion of environmental political approach that priorities ecological sustainability and holds policymakers accountable for environmental stewardship. By adopting a framework that integrates environmental considerations into the planning and implementation phases, Assam can avoid short-term solutions that often lead to long-term ecological degradation. Promoting environmental politics would not only ensure more responsible development but would also encourage active engagement from communities, fostering a model of growth that respects both nature and local livelihoods. Ultimately, rethinking transportation infrastructure development in Assam along these lines is but to creating a sustainable future for the state. A well-planned and environmentally conscious approach to infrastructure will definitely allow Assam to progress while preserving its rich ecological heritage for future generations.

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