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How Colonialism, Militarization, Insurgency and Adivasi Movements Have Shaped India's Landscapes

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Abstract

Conflicts are often assessed through casualties and political outcomes, yet their ecological toll on land, water, air, and biodiversity remains underexplored. While the environmental impacts of wars have been widely documented, the subtler but enduring consequences of low intensity and protracted conflicts receive far less attention. This paper examines how such conflicts have reshaped India's landscapes, tracing pathways of ecological harm from colonial extraction to contemporary insurgencies and resistance movements. Recognizing these environmental consequences is essential, not only for understanding the full cost of conflict but also for designing policies and research agendas that integrate ecological resilience into peacebuilding and sustainable governance. British colonial rule established the foundations of ecological disruption through deforestation, monoculture plantations, introduction of invasive species, and the displacement of indigenous stewardship systems. Postcolonial conflicts intensified these legacies: militarization in the Himalayas fragmented habitats and accelerated glacial decline; insurgencies in the Red Corridor and Northeast fuelled resource extraction, deforestation, and biodiversity loss; while Adivasi movements in Jharkhand and Kerala emerged as counter currents, defending land, water, and forests against state and corporate exploitation. Together, these cases reveal how conflict-driven ecological change is cumulative, often invisible, and deeply entwined with social justice. By situating India's present environmental crises within this historical continuum, the paper argues for integrated approaches that combine indigenous knowledge, community rights, and ecological restoration as essential pathways toward environmental peacebuilding and resilience.

Keywords: Conflict, Colonialism, Militarization, Insurgency, Adivasi, Environmental Impacts, Resource Extraction, Biodiversity Loss.

Introduction

India's diverse and ecologically rich landscapes have, for generations, been shaped by low-intensity social and political struggles. While these struggles are often viewed mainly through political or economic lenses, they have also left lasting marks on the environment, reshaping ecosystems in ways that are too often overlooked. Taken together, these dynamics make India a compelling case study of the complex intersections between conflict and ecology. This paper analyses how colonial policies established extractive land systems that transformed forests, agriculture, and wildlife, laying the groundwork for present-day ecological crises. It further explores how postcolonial dynamics- militarization in the Himalayas, insurgencies in central and north-eastern India, and conflicts over resource extraction, continue to degrade ecosystems through deforestation, pollution, and habitat fragmentation. In contrast, Adivasi movements in regions such as Jharkhand and Kerala reveal powerful counter-narratives of ecological protection rooted in indigenous knowledge. Using a political ecology framework, this study synthesizes historical and contemporary evidence to show how colonialism, militarization, insurgency and Adivasi movements have collectively shaped India's landscapes. The following sections trace these impacts chronologically and regionally, establishing a foundation for the policy and research recommendations developed later in the paper.

Colonial Legacies and Ecological Transformation

The ecological foundations of India were profoundly altered under British colonial rule, which prioritized extraction, profit, and control over indigenous systems of stewardship. Colonial policies and practices introduced a series of mechanisms that reshaped landscapes, disrupted communities, and created ecological legacies that persist till today.

- **Forest Enclosures and Monocultures**

The expansion of the railway network demanded vast quantities of timber, leading to the systematic clearing of diverse native forests. In their place, monoculture plantations of teak, pine, and cedar were established, species chosen for commercial value rather than ecological fit. The Indian Forest Acts of 1865 and 1878 converted customary lands and forests into state controlled property, restricting local access and undermining traditional rights. This displaced indigenous communities from their ancestral lands and marginalized traditional ecological knowledge [1].

- **Agricultural Transformation and Food Insecurity**

Colonial emphasis on export-oriented cash crops such as opium, cotton, jute and sugarcane displaced traditional food crops such as millets, sorghum and pulses. Irrigation systems were neglected, while fertile lands were diverted to commercial cultivation. The result was recurring famines, soil degradation, and declining per-capita food grain availability, linking ecological harm directly to human suffering [2]. Alongside the shift to cash crops and irrigation neglect, the colonial administration promoted the use of chemical fertilizers and pesticides to boost yields. This reliance on external inputs not only masked declining soil fertility but also introduced new forms of pollution, contaminating water sources and accelerating long term soil degradation [3].

- **Invasive Species and Hydrological Disruption**

Exotic plants such as eucalyptus and acacia were introduced for commercial gain. These species depleted groundwater, altered soil chemistry, and reduced biodiversity, creating long-term ecological burdens that continue to challenge restoration efforts till today [4,5].

- **Wildlife Exploitation and Habitat Fragmentation**

Hunting became a colonial pastime and marker of elite status, decimating populations of tigers, elephants, and other keystone species [6]. Road and railway construction fragmented habitats, compounding the ecological instability caused by deforestation and monocultures. Traditional conservation norms were side-lined and replaced by extractive practices that prioritized spectacle and profit.

- **Social and Ecological Consequences**

Indigenous communities bore the brunt of these transformations: displacement from ancestral lands, loss of subsistence resources, and erosion of cultural ties to forests and wildlife. Ecological degradation was inseparable from social marginalization, laying the groundwork for later conflicts over land, water, and resource rights.

This colonial legacy established the mechanisms of harm that would later be intensified by postcolonial militarization and insurgencies. At the same time, it seeded traditions of resistance, as displaced communities began to contest state and corporate control over their environments.

Postcolonial Conflicts and Environmental Degradation

- **Militarization and Environmental Degradation in the Himalayas**

The borders of South Asian nation states, largely drawn during British colonial rule, have created unresolved territorial disputes that continue to shape geopolitics in the Himalayas [7]. India's contested boundaries with Pakistan, China, Nepal, and Bhutan have fuelled a sustained military presence in this ecologically sensitive region, embedding militarization as a structural feature of the landscape.

- **Infrastructure Expansion and Habitat Fragmentation**

Military roads, bases, and pipelines have fragmented habitats and disrupted ecological corridors. Asphalt surfaces absorb and radiate heat, intensifying temperature fluctuations and stressing alpine ecosystems [8].

- **Waste Accumulation and Pollution**

Operations generate plastics, hazardous materials, and fuel residues that remain untreated due to terrain constraints. The 165 kilometer kerosene pipeline across the Siachen Glacier continues to pollute soils and water, accelerating glacial degradation and threatening downstream freshwater supplies [9].

- **Species Displacement and Biodiversity Loss**

Training exercises, heavy vehicle use, and encroachment have displaced snow leopards, ibex, and brown bears [10,11]. Soil compaction and drainage disruption have reduced vegetation cover and habitat viability, contributing to biodiversity decline [8].

- **Governance and Regulatory Exemptions**

Defense activities remain exempt from environmental regulations, weakening enforcement and allowing deforestation

and waste accumulation to persist. Remediation efforts, such as afforestation and the Ecological Task Force initiatives, have provided partial relief but do not offset cumulative damage.

Insurgency and Ecological Decline in the Red Corridor and Northeast India

• Origins of the Red Corridor and Insurgencies in the Northeast

The Naxalite movement began with the 1967 Naxalbari uprising, driven by rural inequalities such as poverty, hunger, land distribution issues, and caste discrimination. It arose in response to the government's failure to implement agrarian reforms, prompting poor farmers to take up arms. Though initially suppressed, the movement resurged in the 1980s [12] in underdeveloped tribal areas and expanded into the "Red Corridor," which by 2025 encompassed Chhattisgarh, Jharkhand, Odisha, Madhya Pradesh, Telangana, Maharashtra, and Andhra Pradesh, though it once included Kerala and West Bengal [13]. In parallel, insurgencies in India's North Eastern Region (NER)—Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim—emerged from colonial era marginalization, cultural suppression, and economic exploitation. Post independence neglect and ineffective governance compounded these injustices, deepening grievances and sustaining armed movements across the region [14]. The Maoist or Naxal insurgency in India has led to significant ecological consequences, primarily due to conflicts over land, water, forests, and mineral resources. Competition for these resources has contributed to environmental degradation and unsustainable practices [15].

• Resource Extraction and Deforestation in the Red Corridor

In the Baster region of Chhattisgarh and other parts of the Red Corridor, insurgency coincided with intensive mining of coal, iron ore, and bauxite. Logging and forest clearance accelerated biodiversity loss and soil erosion. Despite natural abundance, Scheduled Tribes experienced chronic poverty and malnutrition, as exclusion from decision making weakened traditional systems of ecological stewardship [16].

• Forest Fragmentation, Biodiversity Loss and Livelihood Impacts

Dense forests in the NER often served as strategic hideouts for insurgent groups. Counterinsurgency operations cleared land and disrupted ecosystems. Both insurgency and counterinsurgency contributed to biodiversity decline by fragmenting habitats and disturbing ecological balance. Agricultural development suffered as persistent violence hindered the construction of essential infrastructure such as roads and irrigation systems [17]. Communities dependent on forests for food, fuel, and medicine faced declining access to resources, deepening cycles of poverty and ecological degradation.

• Displacement and Secondary Ecological Stress

Violence and insecurity triggered the relocation of communities, which placed additional strain on the new ecosystems. New settlements saw intensified land use, increased pressure on forests and water sources, and disrupted agricultural systems, creating cascading ecological burdens beyond the immediate conflict zones.

• Governance Gaps and Development Failures

Weak governance and ineffective reforms allowed extraction and deforestation to persist. Insurgency violence undermined state capacity to deliver infrastructure and services, reinforcing ecological decline. Policies often ignored indigenous knowledge systems, further marginalizing local communities and eroding traditional ecological stewardship.

Adivasi Movements in Jharkhand and Kerala: Resistance and Ecological Restoration

• Historical Roots of Resistance

Unlike the colonial legacies, militarization, and insurgencies that have degraded India's landscapes, Adivasi movements in Jharkhand and Kerala represent a counter current of resistance rooted in environmental protection. These struggles emerged not to exploit land and forests but to defend them. Adivasi movements in Jharkhand and Kerala emerged from long histories of dispossession, resource exploitation, and marginalization. Colonial forest laws and postcolonial development projects displaced indigenous communities, eroded customary rights, and undermined traditional systems of ecological stewardship, laying the foundation for organized resistance.

• Jharkhand: Defending Land and Forests

Adivasi resistance in Jharkhand took multiple forms, each linking social justice with ecological protection. In the Koel Karo Movement, communities opposed dam projects that threatened to submerge villages and forests, emphasizing the ecological and cultural value of their lands. The Netarhat Campaign mobilized against the establishment of military training grounds, drawing attention to the risks of deforestation and habitat destruction. Through the Pathalgadi Movement, Adivasi groups asserted self governance by inscribing stone plaques, reclaiming authority over land and forest resources and challenging state and corporate encroachment. Collectively, these movements defended biodiversity, safeguarded water systems, and protected traditional livelihoods, while exposing the ecological costs of militarization and extractive development [18].

• Kerala: Reclaiming Degraded Landscapes

In Kerala, Adivasi movements reclaimed degraded landscapes and resisted exploitative development projects by

linking ecological restoration with social justice. The Muthanga struggle sought to recover eucalyptus plantations and reintroduce native crops, challenging monoculture practices that depleted soil and water. Despite the non-violent nature of the occupation, the state responded with violent repression, leading to casualties and injuries [19,20]. The Silent Valley campaign mobilized against a hydroelectric project, preserving one of India's richest biodiversity hotspots [21]. Protests against Endosulfan exposed the toxic consequences of pesticide use [22], while the Plachimada movement resisted Coca Cola's excessive groundwater extraction and pollution of local water sources [23]. Groundwater and well water declined sharply and became cloudy or milky when boiled, making it unsafe for drinking, bathing, or washing. The company also distributed toxic sludge containing heavy metals such as cadmium, lead, and chromium, falsely marketed as fertilizer, which caused long term soil degradation and reduced agricultural productivity [22,23]. These movements highlighted the Adivasis' commitment to protecting natural resources and promoting sustainable practices.

Conclusion

India's modern ecological crises cannot be understood without tracing their historical roots. Colonial rule initiated large-scale resource extraction, habitat disruption, and the erosion of indigenous land management systems. These pressures intensified after independence through militarization in the Himalayas and insurgencies in the Red Corridor and Northeast, accelerating biodiversity loss, habitat degradation, and undermining long-standing ecological knowledge. Yet, despite these challenges, Adivasi movements in places such as Jharkhand and Kerala illustrate how local communities have consistently acted as strong custodians of the environment, promoting conservation and sustainable resource use amid persistent political and legal marginalization.

Addressing these challenges requires a fundamental reorientation of environmental governance in conflict-affected regions. This includes removing exemptions that allow defense activities to bypass ecological regulation and ensuring that environmentally sensitive zones receive strict and consistent protection. Equally important is the need for putting communities at the centre of decision-making. Recognizing Adivasi rights to land, water, and forests is essential not only for social justice but also for restoring longstanding stewardship systems that have historically sustained these landscapes. Their ecological knowledge should be systematically integrated into conservation and resource-management strategies. Likewise, shared natural resources such as rivers, glaciers, and forests should be approached as opportunities for cooperation, not as battlegrounds. Strengthening corporate accountability through transparent waste-management practices, meaningful penalties, and incentives for sustainable practices is equally essential.

Future research must support these policy directions by establishing long-term ecological monitoring capable of tracking the cumulative effects of militarization, extraction, and displacement. Public-health investigations are urgently needed to assess exposure to pesticides, heavy metals, and other pollutants, as well as emerging risks such as antimicrobial resistance in environmentally degraded settings. Documentation and analysis of indigenous ecological practices are equally important, as these provide context-specific models for ecosystem restoration and biodiversity conservation. Additionally, research should explore how glacial retreat and water insecurity fuel geopolitical tensions, helping to design strategies that build ecological resilience into peace building and conflict resolution.

Together, these policy and research directions shift the focus from reactive responses to proactive measures that advance environmental justice, strengthen sustainable governance, and protect the landscapes on which millions depend across South Asia.

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