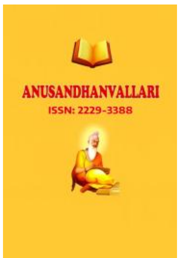

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Great Earthquakes in Assam (1897 and 1950): Environmental, Historical, and Societal Transformations in Colonial and Postcolonial Contexts

Jutika Patir[1], Prafulla Kr. Nath[2]

[1]PhD Scholar, Centre for Tribal Studies/History, Assam University Diphu Campus, Diphu, Karbi Along, Assam, India

[2]Assistant Professor, Centre for Tribal Studies/History, Assam University Diphu Campus, Diphu, Karbi Along, Assam, India

Abstract: This paper examines the two great earthquakes that profoundly shaped the environmental and sociohistorical trajectory of Assam - the 1897 Shillong earthquake and the 1950 Assam earthquake. This research employs an interdisciplinary framework that combines environmental history, colonial and post-colonial governance studies, and seismotectonic analysis to contextualize these disasters within the broader environmental and political changes of the Brahmaputra Valley. Archival data, geological surveys, anthropological testimony, and local oral histories were used to analyze transformative impact of seismic events on Assam's landscape, revealing the intricate conflicts that arise between nature, governance, and society in both colonial and postcolonial contexts. The earthquake of 1897 posed significant challenges to the infrastructure and administrative frameworks of British colonial governance, while the earthquake of 1950 assessed the resilience and reconstruction capacity of a newly independent India. This paper asserts that earthquakes in Assam ought to be regarded not merely as natural disasters but as pivotal historical events that transformed the relationship between humans and their environment, linking geological processes with socio-political responses. The findings emphasize the necessity of interpreting environmental hazards through long-term frameworks of ecological adaptation, governance, and cultural memory.

Keywords: Assam, environmental history, earthquake, colonialism, seismotectonic, governance, resilience

1. Introduction

The history of Assam is characterized by frequent natural disasters that have influenced its physical and cultural environment. Among these, earthquakes are distinguished by their magnitude and transformative effects. The significant earthquakes of 12 June 1897 and 15 August 1950 were not only geological events but crucial turning points in the environmental and political history of Northeast India. The seismic events, with magnitudes of 8.7 and 8.6, are among the greatest inland earthquakes documented worldwide (Ambraseys & Bilham, 2003; Bilham, 2001; Oldham, 1899; USGS, n.d.). Their deleterious impacts included the Brahmaputra Valley, the Khasi–Jaintia Hills, the Patkai–Arakan mountains, and reached beyond India's northeastern borders. Their ramifications transcended mere physical destruction; they restructured river systems, transformed landscapes, displaced communities, and instigated changes in governance, scientific inquiry, and cultural perceptions of nature (Ambraseys & Bilham, 2003; Bilham, 2001; Gogoi, 2005; Hazarika, 2012; Oldham, 1899).

In colonial Assam, the 1897 earthquake occurred during a period when the British administration was solidifying its authority over a recently annexed frontier province. The disaster revealed the vulnerability of colonial infrastructure, highlighting the shortcomings of Western technology and government in a geologically unstable area. R.D Oldham (Oldham, 1899) reported the engagement of British engineers, geologists, and administrators to comprehend the causes of the calamity, resulting in some of the earliest scientific investigations into seismo-tectonics in India. Indigenous tribes concurrently understood the event through cosmological and ecological lenses, integrating it into oral traditions and collective memory.

Fifty years later, independent India encountered a comparable challenge when the 1950 Assam earthquake, one of the most powerful recorded globally, struck the northeastern frontier on Independence Day. The earthquake, which occurred near the Sino-Indian border, had a devastating impact on the region previously referred to as the North-East Frontier Agency (NEFA) and Upper Assam. Significant land subsidence and uplift occurred, resulting in dramatic shifts in river courses, while landslides obstructed tributaries of the Brahmaputra, leading to severe downstream flooding (Bilham, 2001; Gokhale, 1951; Hazarika, 2012). The disaster resulted in significant human and ecological losses and impacted postcolonial strategies regarding disaster control, national integration, and environmental management in frontier areas. The devastating destruction characterized by obstructed rivers, significant landslides, and numerous displaced individuals, has revealed deficiencies in the early post-independence administrative institutions. This resulted in the enhancement of central disaster response capacities, communication networks, and stronger oversight of frontier territories such as NEFA (later Arunachal Pradesh). In 1950, NEFA had minimal control; yet the earthquake demanded a rapid mobilization of military and civilian institutions. The calamity provided the state with a strategic basis for increasing administrative presence, building roads, establishing posts, and better integrating hill villages into the Indian Union. The government conducted thorough river assessments, built embankments, and adopted flood control measures to regulate the Brahmaputra system.

This paper aims to integrate the geological and anthropogenic dimensions of these earthquakes, understanding them as interrelated events of nature and history. The study enhances the subject of environmental history by examining the connections between political authority and natural occurrences, also cultural importance, and changes of ecology. This article situates the Assam earthquakes within wider discussions on colonial modernity, environmental regulation, and the socio-ecological development of India's northeastern frontier.

2. Methodology and Sources

The methodology which is followed in the preparation of this study is both historical and analytical. The study is based on primary and secondary sources. Archival research, scientific data, and cultural analysis are also incorporated to achieve the objective of this research. The principal sources of this study include official reports from the Geological Survey of India (GSI), colonial administrative correspondence, district gazetteers, and missionary writings from the late nineteenth and early twentieth centuries. Post-Independence governmental documents, including records from the Indian Meteorological Department (IMD), rehabilitation reports, and publications from the Central Water and Power Commission (CWPC) and the North-East Frontier Agency (NEFA) Administration etc.

This research integrates oral histories, folklore, and ethnographic narratives from the Brahmaputra Valley and Arunachal frontier regions to examine the socio-cultural dimension. The materials are substantiated by secondary academic sources in environmental history, disaster studies, and colonial administration (Grove, 1995; Chakrabarti, 2010; Baruah, 2020). Geological and seismotectonic data are sourced from the research of Oldham (1899), Ben Menahem (1976), and more contemporary studies by Bilham (2009) and the National Geophysical Research Institute (NGRI).

The methodological framework is structured around three interconnected approaches:

- Environmental-historical analysis- putting natural disasters in perspective by looking at how resource exploitation, governance structures, and long-term landscape modifications have shaped them.
- Research on Colonial and Postcolonial Governance- examining how disaster response policies reflect broader ideologies regarding power, modernity, and the nation-state.
- Cultural and Ecological Interpretation- the study examines how the earthquakes also integrated into the public memory that eventually created various oral literatures (folklores). While specific folklores solely

focused on the earthquake may not be widely documented, the event undoubtedly became a part of collective memory and storytelling traditions of the people of Assam. It is found that within the different local communities of the region, there are folklores that have been passed down through generations about the earthquake and these have contributed enriching the local folklore thus preserving the people's experiences.

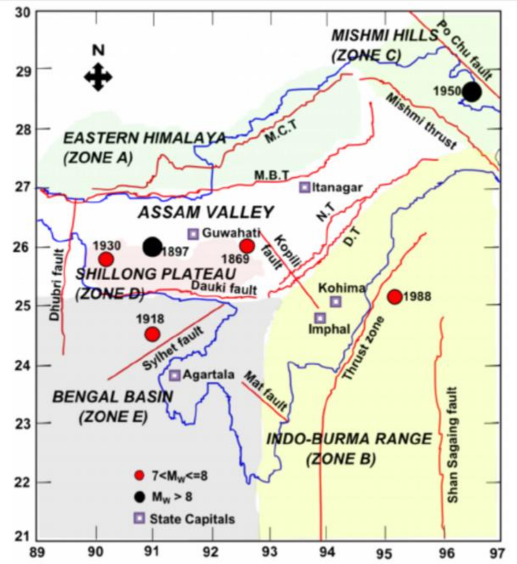

Figure 1: Tectonic Map of Northeast India – Showing the Main Boundary Thrust (MBT), Main Central Thrust (MCT), and epicentral locations of the 1897 and 1950 earthquakes [Jhaisi H P et al., 2014, Raghukant and Dash, 2009]

3. Environmental and Tectonic Setting of Assam

The landscape of Assam has been intricately shaped by a long history geological evolution, influenced by the movements of tectonic plates tectonic, #uvial dynamics, and climatic factors. The state lies at the junction of the Indian and Eurasian plates, where the continuing northward movement of the Indian plate - at approximately 5 cm per year - has produced one of the most complex and active seismic regions in the world. The Northeast Indian region, which includes the Brahmaputra and Barak valleys and the hills surrounded by a network of thrusts and faults that exemplify the significant deformation associated with the Himalayan orogeny (Bilham, 2009; Kayal, 2010).

Indian plate led to shortening induced largely by the principal thrusts developed progressively from north to south: The Main Central Thrust (MCT), the Main Boundary Thrust (MBT), and the Himalayan Frontal Thrust (HFT), also known as MFT in Nepal Himalaya are the most important three principal structural features. Between the sub-Himalayan foothills and the plains, they together indicate the principal tectonic boundaries. In addition, The Assam-Arakan Fold Belt, which runs from the Naga and Patkai hills to the Indo-Myanmar border, is another area of active deformation caused by the Indian and Burmese microplates coming together at an angle. From the Brahamaputra River and its tributaries The Assam Valley is a foredeep basin between these structural belts that filled with thick alluvial deposits. Assam is especially prone to both seismic treats and instability in rivers because of its geology.

3.1 Seismotectonic Framework

Some of the largest and most devasting seismic events in the Indian subcontinent occurred in North-East India. These include the Cachar earthquake in 1869, the Shillong Plateau earthquake in 1897, and the Upper Assam earthquake in 1950. Deep crustal faults, such as the Oldham Fault, the Dauki fault and the Naga Thrust, predominantly influence the seismicity of the region. These faults can withstand the stress induced by continuous tectonic compression. The Shillong Plateau is a block of Precambrian rock that has been pushed up by faults. These faults sometimes relieve the strain that has built up over time through big earthquakes. For example, the 1897 Shillong earthquake happened because of a huge slip along the Oldham Fault, which is a structure that dips to the north and separates the plateau from the alluvial plains to the north (Bilham & England, 2001). The 1950 earthquake also started in the Assam syntaxis zone, which is where the Himalayas and the Arakan Yoma mountains meet and the Indian plate bends strongly eastward under the Burma plate. This unique geological setup drives the high magnitude and frequency of seismic events in the area.

3.2 Fluvial and Environmental Dynamics

The Brahmaputra River is one of the world's largest braided river system. It has been fundamental in shaping the ecological landscape of Assam. The river transports an impressive volume of sediment- exceeding 600 million tons annually—resulting in channel migration, avulsion, and bank erosion (Sarma, 2015). Seismic events exacerbate riverine processes by altering gradients, initiating landslides, and obstructing or rerouting waterways.

After the earthquakes of 1897 and 1950, large sections of Brahmaputra River changed its course. For example, in 1950, huge landslides temporarily blocked the Subansiri river for three days, and when the natural dam failed, it brought total devastation in the downstream area. Similar landslides dams were formed along Dihang and the minor tributaries of the Brahamputra , which caused huge floods when the natural barriers broke down. These events created serious problems for nearby villages, inundating agricultural land, and requiring the relocation of many residents. The occurrences highlighted the region's vulnerability to interconnected geomorphic threats and underscored the necessity for comprehensive river and flood management in the eastern Himalayas (Bilham, 2001; Gokhale, 1951; Hazarika, 2012).

3.3 Climatic and Ecological Context

This climatic regime enhances the erosional and depositional processes that contribute to the formation of its dynamic floodplains. Natural disasters like frequent flooding, seismic activity, and landslides, severely degrade the region's ecological diversity, affecting its rainforests, wetlands, and grasslands. This leads to cycles of ecological destruction and restoration (Baruah, 2020).

These natural disruptions, yet they significantly contribute to the ecological health and productivity of the region. These natural disturbances, though challenging, play a significant role in enhancing the fertility of the plains. They also encourage cultural adaptation among local communities. Over the years, Assamese society has developed a robust ecological culture, deeply connected to riverine agriculture, architecture utilizing bamboo and other natural materials, and time-honored strategies for coping with disasters. For instance, the Mishing people build raised dwellings (chang-ghars) that can handle seasonal #oods and move them to higher land when the riverbanks overflow. They also grow rice varieties that can handle #oods and changing channels. Likewise, people on the Majuli River Island have come up with ways to build homes and farms that can handle flooding every year. So, knowledge of natural risks must be a part of this larger environmental continuum.

4. The 1897 Earthquake: Colonial Modernity and Governance

The Shillong earthquake that occurred on 12 June 1897 stands out as one of the most significant and widely experienced seismic events in the annals of Indian history. The event, with an estimated magnitude of 8.1, resulted in significant destruction across an expansive area of 160,000 square miles, spanning from Bengal to Burma, and was felt over a remarkable 1.75 million square miles (Oldham, 1899). The epicenter was located beneath the Shillong Plateau, in proximity to the Khasi Hills, where notable ground ruptures, fissures, and vertical displacements reaching up to 11 meters were documented (Oldham, 1899). The tremor virtually demolished the town of Shillong - the capital of the Chief Commissionership of Assam - and caused severe damage in Sylhet, Guwahati, and other parts of the Brahmaputra Valley. Oldham reported that due to the earthquake the government house Shillong, Quinton memorial Shillong, All Saints Shillong, Tomb in Cemetery Cherrapunji etc. were demolished. Further, Bengal railway reported the displacement of railway lines such as Bent Railway at Rangapara, Manshai bridge in eastern railway etc. and telegraph poles to the extent of 10 to 15 feet which were originally set up straight line (Oldham, 1899).

Table 1: Summary of 1897 Earthquake Impact — Affected Districts, Damage Extent, and Recorded Casualties

Region	Estimated Casualties	Major Damage	Administrative Response
Shillong	154+	Destruction of buildings, landslides	Government relief camp, rebuilding with earthquake-resistant designs (e.g. Assam type house)
Sylhet	545+	Severe structural collapse, liquefaction	Emergency medical aid, road clearance
Guwahati	200+	Collapse of masonry, ground fissures	Rapid inspection and temporary shelters
Goalpara	100+	Riverbank failure, building damage	Minimal state relief, community self-help

Source: Compiled from Oldham (1899) and Government of Assam Reports (1898)

4.1 Colonial Scientific Inquiry and the Birth of Seismology in India

The 1897 earthquake was a turning point in India's scientific study of seismology. The first detailed study of the event was conducted by R. D. Oldham, a geologist of Geological Survey of India. His landmark study (Oldham, 1899) was not only described the extent of the damage, but it also introduced the ideas of P, S, and surface waves. This work put Indian seismology on the international scientific map. Oldham's work exemplified the intersection of imperial science and colonial governance, demonstrating how natural calamities functioned as platforms for scientific exploration and bureaucratic rationalization. This scientific endeavor was profoundly rooted in the colonial ideology of domination. The British administration aimed to interpret and handle the crisis by emphasizing technical efficiency, infrastructure resilience, and bureaucratic order. Relief initiatives were centralized, and rehabilitation programs favored administrative centers and European settlements over indigenous communities. This divergent response highlighted the racial hierarchies inherent in colonial rule (Chakrabarti, 2010).

4.2 Environmental and Urban Transformation

The restoration after the 1897 catastrophe altered the urban landscape of Assam. Shillong was reconstructed utilizing a more dispersed and earthquake-resistant design, employing timber and bamboo rather than heavy masonry (Oldham, 1899; Ramchandran, K., 2001). This adaptation combined indigenous knowledge and colonial engineering. It reflected a form of environmental negotiation shaped by local ecological conditions.

Transportation and administrative system were changed to make them more connected and better able to respond to disasters. This marked the beginning of Assam's growth as a modern provincial hub (Assam Secretariat Press, 1898; Barpujari, 1993).

The earthquake changed how colonists thought about nature. Some British officials viewed the disaster as evidence that Assam was a ‘Frontier of instability’. They portrayed it as a region prone to floods, earthquakes and severe weather. In such condition Urban life was seen as difficult . It was not just a description, this farming served a political purpose by casting Assam as a region requiring constant intervention and oversight. Following the 1897 disaster, colonial engineers and officials increasingly characterized earthquakes, floods, and landslides as expressions of an inherently chaotic environment that necessitated regulation through scientific management, encompassing embankment construction, river training, seismic-resistant building codes, and improved mapping of the Brahmaputra Valley (Goswami, 2004; Lahiri, 2011).Such interpretations reinforced the imperial assertion that a robust state presence was crucial for converting Assam from a "wild frontier" into a manageable economic zone, hence legitimizing the extension of administrative authority and the implementation of novel environmental governance technologies.

4.3 Cultural and Indigenous Responses

Local societies, nonetheless, understood the 1897 earthquake within the context of their unique cosmological and ecological perspectives. Khasi and Assamese oral traditions often frame seismic events as spiritual consequences, interpreting the shaking earth as a divine reprimand or the response of an earth goddess disturbed by human transgression.

Folklore gathered from the Khasi Hills and the Brahmaputra region interprets earthquakes as a profound, integrated aspect of the symbiotic bond between humanity and the environment, rather than viewing them solely through the lens of disaster. The narratives played a significant role in fostering a cultural ecology of resilience, allowing communities to come together to rebuild their homes and livelihoods through collaborative efforts and mutual support. Consequently, the 1897 earthquake represented a significant intersection between colonial modernity and indigenous knowledge. Colonial response relied on systematic and scientific frameworks. In contrast, local understandings emphasized on moral responsibility and ecological interdependence.

The catastrophe highlighted the inherent instabilities of imperial governance while simultaneously demonstrating the adaptive capacity and endurance of native populations facing ecological shifts.

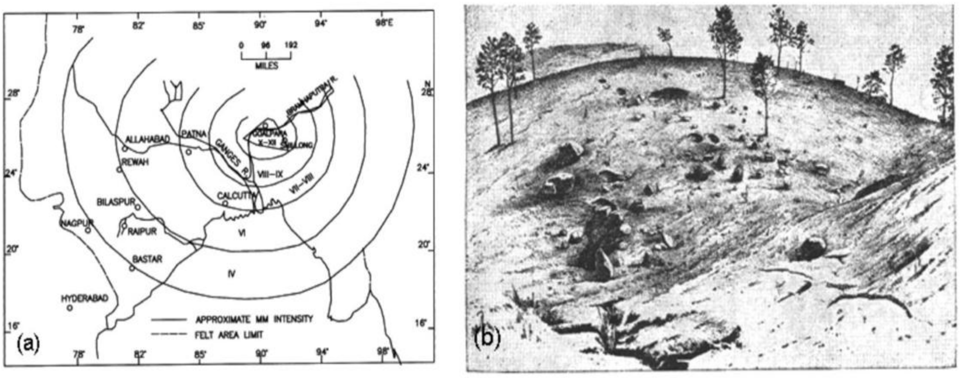

Figure 4: (a) Isoseismal Distribution Map of the 1897 Shillong Earthquake, and (b) dislodged boulders in the maximum intensity zone (Oldham 1899)

5. The 1950 Earthquake: Postcolonial Reconstruction and Ecological Change

On 15 August 1950, precisely three years after India's independence, the northeastern frontier experienced one of the world's most powerful recorded earthquakes. With a magnitude of 8.6, the event originated in the Indo-China border region near Rima, along the Assam syntaxis, marking a zone of tectonic complexity where the Himalayan arc bends sharply eastward (Ben-Menahem, 1976). The earthquake significantly impacted extensive areas of the North-East Frontier Agency, presently known as Arunachal Pradesh, as well as Upper Assam. It resulted in great destruction, loss of life and geomorphological changes. (GSI, 1953: Gupta & Gahalaut,2014).

Anusandhanvallari
Vol 2024, No.1
December 2024
ISSN 2229-3388

5.1 Geological and Geomorphological Impact

The 1897 earthquake was characterized predominantly by crustal faulting; the 1950 earthquake was marked by a combination of tectonic rupture and severe geomorphic hazards.

The great earthquake 1950 has resulted in numerous landslides across the eastern Himalayas, notably affecting the Mishmi and Abor hills. This has resulted in the blockage of multiple tributaries of the Brahmaputra, such as the Subansiri, Dibang, and Dihang, as recorded by the Geological Survey of India in 1953. The eventual rupture of these natural barriers led to considerable flooding downstream, negatively impacting villages, agricultural areas, and infrastructure within the Dibrugarh, Sadiya, and Lakhimpur districts. The event trigged vertical crustal adjustment- both uplift and subsidence which altered river gradients and permanently changed the Brahmaputra's course. Geological studies, including those associated with the Geological Survey of India, identified vertical displacement of up to 6 meters along the Abor Hills section of the Main Frontal Thrust, resulting from the 1950 Assam earthquake. (Kayal, 2010). Consequently, the phenomenon of river erosion intensified, resulting in the extensive deposition of sand throughout the fertile paddy fields, while sedimentation impeded the flow of waterways. Floodplain of Upper Assam have gradually changed which was formerly stable. They are transformed into a complex mosaic of silted areas and sandbars. The transformations have significantly altered the region's ecological and agricultural practices over the years (Goswami & Sarma, 2013; Sinha & Sarkar, 2014; Thakkar & Gole, 1970).

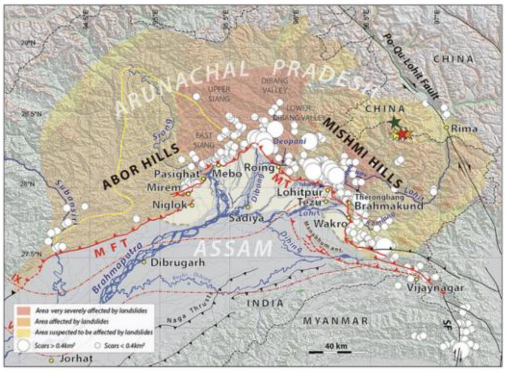

Figure 5: A map showing the epicentral region of the Assam Earthquake of 1950, indicating significant landslides and locations of river damming(Coudurier-Curveur, A. et al., 2020).

5.2 Humanitarian and Administrative Response

The Assam earthquake of 1950 occurred at a vital moment, accelerating the state's interaction with the Northeastern frontier and bringing the region into the focus of national consciousness. The Assam administration under Chief Minister Gopinath Bordoloi has faced critical situation in leading the coordination of relief efforts, alongside the rehabilitation of refugees. The region's deteriorating infrastructure and limited connectivity significantly hindered the operation. Entire districts were isolated as a result of the destruction of roads, bridges and telegraph lines. The Indian Army and Air Force commenced relief operations by air-dropping vital supplies to the region's most severely affected.

The Central Relief and Rehabilitation Board set up temporary camps for displaced people. The North-East Frontier Administration (NEFA) supervised rebuilding in the hill areas. However, the magnitude of destruction significantly surpassed the state's capabilities. The event prompted one of the early instances of coordinated disaster management on a national level in independent India. The event helped the establishment of future disaster governance and rehabilitation policy (Das, 1953).The initiatives undertaken in the aftermath of the earthquake were focused on restoring communication systems, rebuilding administrative structures, and aiding the displaced population. Nonetheless, the methodology exhibited colonial inclinations through its hierarchical framework, often disregarding local viewpoints and the tenets of ecological sustainability. Sadiya and Dibrugarh redevelopment, particularly post-disaster, often highlights a struggle between to -down infrastructure development and the immediate needs of the local communities. This strategy has resulted in ongoing difficulties regarding flood management, settlement stability and land degradation. (Baruah, 1999; Gogoi, 2016; Misra,2002).

Table 2: Summary of 1950 Earthquake Impact — Geographical Spread, Population Affected, and Economic Loss

Parameter	Estimated Figure	Key Observations
Magnitude	8.6 (Mw)	Among world's largest inland quakes
Affected area	~300,000 km²	NEFA and Upper Assam worst hit
Estimated casualties	1,500–2,000	Many deaths from landslides and floods
Houses destroyed	30,000+	Mostly bamboo/thatched structures
Major rivers affected	Subansiri, Dihang, Dibang	Landslide damming and course change

Sources: GSI (1953), CWPC (1954), IMD Records (1955)

5.3 Environmental and Societal Transformation

The seismic disturbance resulted in considerable and protracted ecological consequences. The Subansiri River, which was once a navigable tributary, has since become significantly silted and unstable. The frequency of flooding has escalated in the subsequent decades, particularly within the Dibrugarh plains. The conversion of fertile agricultural lands into barren landscapes due to sand accumulation has necessitated that communities either move or modify their farming methods and land use approaches (Goswami, 1985). The disaster subsequently transformed the socio-economic framework of Upper Assam, accelerating patterns of displacement, diversification of livelihoods, and ecological adaptation.

From a governance perspective, the occurrence in 1950 required a critical reassessment of the Indian state's engagement with the frontier. The newly independent government regarded disaster management as both a humanitarian imperative and a strategic avenue for political integration and administrative consolidation. The reconstruction of NEFA emerged as a component of a more extensive initiative aimed at national integration, wherein the restoration of roads, bridges, and outposts represented the manifestation of postcolonial sovereignty extending into the periphery (Baruah, 2020).

Concurrently, regional cultural narratives emphasized the themes of resilience and divine punishment, closely interconnecting spiritual cosmologies with ecological insights. The Adi and Mishmi communities viewed the earthquake as divine vengeance from Sedi Melo, the celestial deity, in response to humanity's disregard for the natural world. These interpretations offered ethical from works for living harmony with an uncertain environment, revealing deep, precolonial connections to nature.

6. Comparative Analysis and Cultural Interpretation

Comparing the earthquakes of 1897 and 1950 highlights the changing interplay between natural disasters, state administration, and local identity throughout Assam's History. Despite both geophysical catastrophes being of enormous magnitude, there was a significant display between their historical conditions and societal

Anusandhanvallari
Vol 2024, No.1
December 2024
ISSN 2229-3388

repercussions.

6.1 Colonial vs. Postcolonial Governance

The earthquake of 1897 transpired within the context of British colonial rule, where the reaction to the calamity reflected the dominant imperial frameworks and the prevailing scientific paradigms of the time.

The relief initiatives were chiefly aimed at administrative and European settlements, whereas the reconstruction process was guided by the tenets of civil engineering and bureaucratic reasoning (Chakrabarti, 2010). The British state used the event to project colonial benevolence and scientific advancement, even as it exposed their infrastructural and epistemic weakness.

In contrast, the 1950 earthquake served as a crucial test of the newly independent Indian state's administrative capacity and innovative, proactive strategies. The calamity emerged during a pivotal period in which India was diligently shaping its identity across various dimensions - territorial, technological, and institutional. The Nehruvian state viewed this calamity as an opportunity to demonstrate national unity and the competencies of a contemporary governance system. Relief and reconstruction were framed within the scope of a broad developmental initiative: engineers from the Central Water and Power Commission, newly formed Survey of India teams, and military units were involved in reestablishing communication networks, restoring river navigation, and stabilizing regions prone to landslides. This focus illustrated Nehru's conviction that scientific intervention and hydraulic engineering had the potential to "tame" nature and assimilate frontier regions into the national framework. Post-Colonial nations largely preserved the administration frameworks of their predecessors, prioritizing to down governance, rigid bureaucratic borders and technical engineering over the nuanced traditional knowledge of the local communities. The flood -adaptive settlement patterns of the Misihing, Adi or Apatani, which showcase sophisticated ecological strategies, are commonly disregarded in conventional reconstruction planning. Efforts were made to reestablish communication networks, restore river navigation, and stabilize regions vulnerable to landslides. As a result, disaster governance, though couched in the language of national development, continued to marginalize local participation and vernacular adaptive systems, exposing a continuity between colonial environmental governance and early postcolonial modernization efforts.

6.2 Environmental and Ecological Change

Both earthquakes caused lasting transformations in the physical and ecological landscape of

Assam. The 1897 earthquake profoundly altered the Shillong Plateau and rearranged the lower Brahmaputra plains and the 1950 earthquake drastically altered the river morphology of the upper valley through massive siltation. These changes Shifting landforms have fundamentally reshaped human settlements, farming techniques, and water system, revealing the deep link between tectonic activity and the human narratives. However, the colonial perspective regarded this disaster as anomalies needing correction, whereas postcolonial analyses began to acknowledge their structural inevitability in a seismically active region. During the mid-20th century, the focus on natural hazards evolved from spiritual judgment to a modern understanding of risk and human vulnerability. Following the 1897 Shillong earthquake, R.D.Oldham , Colonial Geologist pioneered a tectonic explanation, attributing the disaster to crustal faulting and vertical displacement rather than divine retribution. This indicated a transition from previous cosmological interpretations. Similarly, the 1950 earthquake triggered intense geomorphological studies by the Geological Survey of India, which recognized the resulting landslides, dammed rivers and sedimentation not as mere anomalies, but as predictable, direct consequences of active Himalayan tectonics. By the 1960s and 1970s, Indian institutions such as the Central Water and Power Commission and the Indian Meteorological Department began adopting the global language of "seismic zoning," "food hazard mapping," and "risk assessment," reflecting a broader scientific shift toward understanding disasters as recurring, structural features of the Eastern Himalaya.

6.3 Cultural Memory and Representation

The earthquakes also produced rich cultural repertoires of memory, embedded in oral narratives, songs, and local histories. Assamese ballads from the late 1800s called the 1897 tragedy the "earth's great trembling," tying it morally to social chaos, a lack of spiritual discipline, or God's anger. On the other hand, stories from the middle of the 20th century about the earthquake in 1950 showed it as a national disaster and a test of strength. This indicates how modern media has changed and how postcolonial nationalism works. The Deori elders recount the earthquakes of 1897 and 1950 through narrative songs, portraying these catastrophes as moments when the river “rose in anger,” destroying settlements and forcing communal migration, thus integrating these incidents into river centric cosmologies. The Mising people remember earthquakes through oral traditions such kaban (narrative songs), oi-nitom (folk songs), ceremonial narratives, and communal storytelling (Patir and Nath, 2025). In Arunachal Pradesh, the Adi and Apatani oral traditions tell the story of the 1950 earthquake as sikang iyang borang (the day the mountains screamed), linking it to stories of ancestor spirits that changed the region. In both cases, remembering earthquakes brought back memories of how fragile and strong we are. They serve as vital anchors, prompting a deeper reflection on our place within the environment, our role under governance and the essence of our true selves. By bridging the gap between ecological change and cultural memory, Assam’s seismic past is reframed within the environmental humanities as a critical driver of social and historical evolution.

7. Conclusion and Implications

The notable seismic events of 1897 and 1950 in Assam exemplify crucial instances that highlight the intricate relationships among environmental influences, social structures, and governmental power. This analysis underscores the way a singular landscape, shaped by significant tectonic dynamics, functioned as a setting for two divergent yet interrelated systems of governance: colonial scientific rationality and postcolonial developmentalism. Both endeavored to impose structure upon a #uid landscape yet ultimately encountered the limitations of human governance in the face of geological phenomena.

From an environmental historical perspective:

- The interaction of active faults and environmental susceptibility makes Assam a perennial hotbed for seismic activity, integrating powerful earthquakes into the core of its natural landscape.
- Administration, Contemporary Society, and the Dynamics of Reaction: The governance of disasters in Assam, both under colonial and postcolonial regimes, reflected the prevailing political ideologies of the time.
- The enduring nature of folklore, ritual, and oral histories associated with these earthquakes serves as a testament to the cultural resilience embedded within Assamese society. These narratives serve not merely as chronicles of distress but also as structures for understanding environmental ethics and the intricate relationship with an ever-evolving landscape.

The historical trajectory from 1897 to 1950, and beyond, illustrates Assam's continuous interplay between geological dynamism and human settlement. This study examines earthquakes through scientific, political, and cultural lenses, highlighting the importance of an interdisciplinary approach that integrates natural sciences with the humanities. This highlights the need for future research on the integration of historical memory, indigenous knowledge, and ecological sensitivity within contemporary disaster risk reduction and sustainable development policies.

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