

Navigating the Complexities of Climate Change, Cultural Heritage and Infrastructure Development in the Brahmaputra River Valley: Insights from Majuli, Assam

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Abstract: Situated within the confines of the Brahmaputra River in the state of Assam, Majuli stands as a river island profoundly influenced by the impacts of climate change, characterised by alterations in precipitation patterns and temperature dynamics. This geographical entity harbours a diverse demographic tapestry, encompassing various ethnic groups. This study highlights the complex interplay between climate change, infrastructure development, and cultural heritage in Majuli, Assam, and focuses on the challenges faced by communities, especially the Kumars of Salmora. It discusses how climate change exacerbates flooding and erosion, impacting livelihoods and cultural identities. The complexities deepen with the shortcomings of infrastructure initiatives and the geopolitical dimensions of hydropower ventures. The imperative for holistic policies, encompassing environmental, social, and cultural dimensions, to nurture resilience and sustainable development in flood-prone regions like Majuli is underscored. Employing qualitative research methodology, the study offers insights into the lived experiences of communities grappling with diverse climate risks. Through descriptive analysis, it describes the multifaceted challenges and underscores the urgency for inclusive approaches to safeguard vulnerable regions and their cultural legacies.

Keywords: Climate Change, Cultural Heritage, Impacts, Infrastructure, Livelihood

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1. Introduction

The Sixth Assessment Report by the IPCC highlights that climate sensitivity can be observed through various large-scale indicators, such as alterations in regional precipitation patterns and global surface temperatures. These changes, along with extreme weather events like droughts, floods, storms, and rising sea levels, contribute to the likelihood of future disasters. The intensification and increased frequency of such events in specific regions will place settlements worldwide at the forefront of climate change-induced disasters. The IPCC report specifically categorizes many regions, including Asia, as having medium to high confidence in terms of heavy precipitation. In particular, the South Asian region is projected to experience fluctuations in summer and annual rainfall, accompanied by

heightened interannual variability (IPCC, 2021). The previous special reports by the IPCC, focused on mitigating risks associated with extreme events and disasters, define hazards as potential threats or adverse occurrences that can result in damage to infrastructure, livelihoods, environmental resources, and loss of life. For instance, one such extreme event, riverine flooding, poses a significant risk to communities (IPCC, 2012).

As per the special reports of the IPCC, it is indicated that both the frequency and magnitude of flooding, along with the vulnerability of human and natural ecosystems, will escalate over time (Reisinger, Garschagen, Mach, Pathak, Poloczanska, van Aalst, Ruane, Hoden, Hurlber, Mintenbeck, Pedace, Rojas Corradi, Viner, Vera, Kreibiehl, O'Neill, Portner, Sillmann, Jones, & Ranasinghe, 2020). It has been proposed that the characterisation of flood risk should focus on climate-related hazards rather than solely on changes in the frequency or magnitude of flood events. The uncertainty associated with the magnitude and probability of such events is subject to alterations over time due to socio-economic factors and prior actions taken in terms of adaptation, mitigation, and management.

Among natural hazards, floods have the highest frequency and broadest geographical distribution worldwide. They are the most commonly occurring phenomenon, resulting from both climatic and non-climatic processes. Excessive rainfall and the inability of landforms to accommodate the excess water are often considered the primary causes of flooding. Various types of floods, including riverine floods, flash floods, urban floods, and coastal floods, have had significant impacts on ecosystems. Many small-scale flood events that previously occurred have now transformed into major flood hazards. In recent times, there has been an increase in the occurrence of devastating floods, often referred to as 'monster floods' (UNISDR, 2017). Floods not only represent the most frequent and recurrent disasters but also have the highest economic impact among natural disasters.

India experiences severe floods during the monsoon season, primarily from June to September. The Brahmaputra, Ganga, and Meghna river basins in North and Northeast India are particularly prone to flooding. Among these riverine regions, Assam, located in Northeast India, is highly susceptible to various natural disasters such as earthquakes, landslides, droughts, cyclones, and severe floods. The annual floods in Assam cause extensive damage to both life and property for thousands of residents living in the river basin and floodplains (Sharma, Johnson, Hutton, & Clark, 2010).

The flood plains of Brahmaputra River in Assam is one of the most hazard prone regions in the country, with more than 40% of its land (3.2 million hectares) susceptible to flood damage (Sarmah

& Das, 2018). Climate change is having an extremely adverse effect on flooding and erosion in the region. First, since rainfall is currently one of the root causes behind overflowing of the Brahmaputra river, any increase in precipitation as predicted in a few studies outlined in the State Action Plan on Climate Change is likely to make the floods more extreme (TERI, 2018). Second, since the river also receives glacial run-off through its tributaries, the rapid melting of snow due to global warming will also increase the volume of water that the river holds (Sarma, 2004).

This study delves into the intricate relationship between climate change, infrastructure expansion, and cultural heritage preservation in Majuli, Assam, with a particular focus on the tribulations confronting the indigenous pottery-making community, the 'Kumars'. It explores how climate change intensifies flooding, erosion, and related hazards, adversely affecting both livelihoods and cultural identities. The inadequacies of infrastructure initiatives and the intricate geopolitical dynamics of hydropower development further compound the challenges.

2. Context of the study area

2.1 Locale and profile of the study area

The study area is situated in Majuli, Assam, in the northeastern part of India, serving as the nucleus of Neo-Vaishnavite culture. It is enclosed by the Brahmaputra River to the south, the river Subansiri to the northwest, and the Kherkatia Suti (an anabranch of the river Brahmaputra) to the northeast. This riverine landmass spans an average height of approximately 77.5 m above mean sea level (Hussain et al., 1993).

The climate in the area falls within the monsoon rainfall regime, receiving an annual precipitation of around 2,150 mm. The temperature ranges from 28°C to 33°C, and relative humidity varies from 54% to 86% (Singh & Goswami, 2011). As an active floodplain, the region is marked by various alluvial features, including natural levees, crevasses, splay deposits, point bars, and channel bars. The formation of islets, known as chaporis, is another notable feature resulting from the braided nature of the river around Majuli island. The island also features small ponds and oxbow lake formations, locally referred to as beels, covering around 14% of its total area (Bhasker, Frank, Hoyer, Naess, & Parker, 2010).

Majuli has now attained the status of a district in Assam, becoming the first island district in the country. The district comprises two development blocks – Namoni Majuli Development Block and Uzani Majuli Development Block – and three Tehsils (Mauza), namely Ahatguri, Kamalabari, and

Salmora. Majuli encompasses approximately 248 villages, with 210 cadastral villages supported by revenue maps and 33 non-cadastral villages lacking revenue maps. According to the 2011 census, Majuli's population is 1.68 lakhs, with 70% belonging to tribal communities (Board, 2012).

2.2 Floods and Erosion in Majuli

Flood is a perennial problem affecting people of Majuli every year during the monsoon season. Majuli gets inundated not only in severe floods but also in normal flood cycles. Being a floodplain of the Brahmaputra basin, the whole area is susceptible to flood hazard. However, the Namoni being located at the confluence zone of the river Brahmaputra and the Subansiri river, is highly susceptible to flood hazard. Furthermore, this region lies in the high seismic activity zone of the Eurasian and Indian tectonic plates, due to which the river tends to change its course frequently.

Presently, Majuli is also subjected to the impact of bank erosion, causing a gradual loss of geographical area. The island's erosion rate has shown an upward trend over time. From 1917 to 1972, the average annual erosion rate was 1.77 sq. km, which increased to 1.84 sq. km during the period from 1972 to 1996. In the five years preceding 2001, the erosion rate escalated to 6.42 sq. km, indicating a significant acceleration in recent years. Historical data reveals that the island's area was 1325.51 sq. km in 1901, diminishing gradually to 1324 sq. km in 1941, and further declining to 564.01 sq. km between 1966 and 1972. By 1996, the island's area had reduced to 453.76 sq. km, reaching a mere 421.65 sq. km by 2001 (Sarma and Phukan, 2004).

3. Methodology

3.1 Scope of the Problem Statement

The study aims to comprehensively examine the multifaceted impacts of global climate trends on vulnerable communities, with a particular focus on Majuli Island. It encompasses various dimensions, including the tangible consequences of heightened precipitation, and soil erosion, which exacerbate risks to lives, property, and cultural heritage. Specifically, the study delves into the profound challenges faced by the pottery-making community in Salmora village, situated within the Majuli Island, highlighting the detrimental effects of soil erosion on livelihoods, cultural identity, and economic stability. Moreover, the study extends its scope to analyse the complex interplay of geopolitical dynamics and environmental challenges, particularly concerning hydropower development and its impacts on local communities and ecosystems in the Brahmaputra River Valley. Through a holistic lens, the research aims to elucidate the urgent need for global and local efforts to

address the multidimensional impacts of climate change and inform strategies for sustainable development, climate resilience, and community well-being in flood-prone regions like Majuli.

3.2 Rationale of the Study

The study is motivated by the pressing need to understand, adapt to, and mitigate the adverse effects of climate change on vulnerable communities in flood-prone areas such as Majuli Island. By studying the tangible consequences of climate-related hazards, such as flooding and erosion, the research aims to shed light on the intricate challenges faced by local populations, particularly the pottery-making community in Salmora village. Furthermore, the study seeks to explore the broader geopolitical and environmental dynamics shaping development policies and responses to climate change in the region. Through collaborative efforts from government bodies, researchers, and stakeholders, the research endeavours to identify comprehensive solutions to address the profound challenges faced by vulnerable communities and preserve cultural heritage amidst environmental threats. Ultimately, the study aims to contribute to the formulation of evidence-based strategies for enhancing resilience, promoting sustainable development, and safeguarding the well-being of inhabitants in the face of an evolving climate landscape and geopolitical complexities.

3.3 Research Design

The study utilises qualitative research methodology and it is descriptive in nature, providing an in-depth exploration of the lived experiences of communities facing climate risks.

Table: 1. Sampling Framework of the Study

	Majuli
Site selected	Salmora, Dakhinpat, Besamora, Baghargaon, Jengraimukh, Kamalabari
Households selected	90 (Randomly sampled; 15 from each village)
Primary Respondents	Heads of households, women, youth, elderly members
NGO functionaries	South Asian Forum for Environment (SAFE), Impact NE, MIPDAC, NEICORD, Oxfam, ACTED, Save the Children, PAD, Prachodhan, Rural Volunteers Centre (Purposive Sampling)

Government officials	5 Panchayat Members, 1 Block Office Member, District Administration Office Member, Assam State Disaster Management Authority official (Purposive sampling)
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3.4 Sources of data collection

The primary data sources for this study are diverse, encompassing individuals and groups from various backgrounds. Firstly, data is collected from the heads of selected households. Additionally, insights are sought from female members of these households, as well as from both youth and elderly members. Moreover, data is collected from members of non-governmental organisations (NGOs) and government officials responsible for addressing the impacts of climate change. Secondary sources of data encompass documents generated by governmental and NGOs. Furthermore, previously conducted academic and empirical work offering relevant insights into the study's theme is taken as part of the secondary data collection process.

3.5 Methods of data collection

Various methods are employed to facilitate data collection, including interviews with the heads of households in selected villages, as well as with women, youth, and the elderly. Furthermore, interviews are conducted with members and officials of governmental and non-governmental bodies. Additionally, non-participant observation and transect walks are utilised as methods to collect data.

3.6 Tools for data collection

To streamline the data collection process, tools are utilised, including interview schedules tailored for heads of households and interview guides designed for officials from governmental and non-governmental agencies. A guide for non-participant observation activities is also employed.

4. Findings and discussion

4.1 "Kumars" of Salmora

Salmora village which is situated on the Southeastern bank of the Brahmaputra River in Majuli serves as a poignant case study highlighting the adverse impact of soil erosion on livelihoods. The population residing in this region is a mix of diverse communities distributed across three hamlets, namely Borboka, Kamjan-Alengi, and Bessa Mora-Aflamukh. However, the village's distinct

identity is shaped by the traditional group of potters known as the Kumars, who dominate Salmora's cultural landscape.

With a total population of 3245, Salmora is home to various communities. The majority, comprising 75.93%, belongs to the Kumar community. Other significant communities include Kaibarta (10.07%), Kalita (4.62%), Mishing (4.56%), Jogi (2.52%), Bania (1.69%), Brahmin (0.43%), and Ahom (0.15%), as recorded in the Directorate of Census Operations Assam, 2011.

This village, known for its unique pottery-making craft by the 'Kumars', has faced severe threats due to the escalating issue of soil erosion. Traditionally, the Kumars would engage in pottery production, trading their pots for the staple food of the island, paddy. However, the erosion along the banks of the Brahmaputra River has posed a significant challenge to this ancient craft. Additionally, frequent flooding in Majuli has compelled islanders to relocate from one village to another, disrupting their settled livelihoods.

To combat soil erosion, the government organization, the Brahmaputra Boards, initiated anti-erosion activities in 2004, including restrictions on clay pit digging near the river banks. Unfortunately, this measure has severely impacted the livelihoods of the Kumars. The limited availability of raw materials, coupled with the increased cost of collecting and purchasing them, has significantly reduced the profitability of their pottery trade. Consequently, the Kumars have been compelled to use low-quality clay, resulting in reduced output and diminished demand for their products. In Dakshinpat Kumargaon, a majority of the Kumar community has discontinued their age-old pottery-making practices due to these challenges (Regon, 2019). The inability to access high-quality clay and the diminishing profitability of their trade have forced them to abandon their traditional craft.

The plight of Salmora village exemplifies the grave consequences of flood and soil erosion on livelihoods. The erosion-induced loss of agricultural resources and the disruption of traditional crafts not only harm the economic well-being of the community but also erode cultural heritage and identity. It is worth noting that all Kumars reside outside the main embankment that was constructed long ago to protect the island from floods. They typically extract clay from deep within the earth, reaching depths of up to approximately 40 feet. This community heavily relies on the time-honoured craft of pottery-making, creating various household utensils that find a supportive market both within and beyond the river island. Women make up most of the labour-intensive home-based industry, significantly contributing to their families' earnings, while men oversee the marketing of the products crafted by women.

The ancient legacy of the potters of Salmora, spanning over 500 years, is facing a grave threat as the relentless River Brahmaputra gradually engulfs their land. Ironically, the measures taken to prevent erosion have only compounded the potters' woes, leaving their traditional craft in jeopardy. Furthermore, the next generation's lack of interest in the art further exacerbates the challenges faced by these skilled artisans. A respondent mentioned, *"Although the new year signifies hope and dreams for numerous individuals, our circumstances diverge. Our main priority is survival, and we navigate each day without dwelling much on the future."* She further added, *"The once easily accessible clay has now become a costly commodity necessitating us to source it from other districts across the river, leading to increased expenses. It is due to the absence of alternative livelihood opportunities in this area, we somehow manage to sustain and persist in our age-old occupation, ensuring our survival."*

Another respondent also pointed out, *"Our profits have been severely impacted in recent months due to the exponential rise in the cost of wood, fuel, and other raw materials used for making earthen items. Now, our primary concern is survival, and we are left with little else to consider."*

An elderly woman respondent, seated inside the temporary shed constructed by her son, which is situated on the protective spur of the main embankment, reminisced about more pleasant times from her childhood spent in the original Salmora village. Unfortunately, that area now lies in the middle of the river's main watercourse, as the floodwaters swiftly eroded the homes of 26 families in the village before any preventive measures could be taken.

She narrated, *"In our experience, it is not uncommon for the river to encroach upon our habitation. When this happens, we retreat, patiently wait for a while, and then seek out new spaces to settle and survive, even if it means residing in swamplands or occasionally purchasing small plots from our neighbours. Such has been the trajectory of our lives. As inhabitants of an ancient village on this river island, we have always regarded dwelling on embankments as disgraceful. However, when the floods intensify to an extreme level, we are left with no choice but to seek refuge on the embankments. The constant erosion has already made our village congested and overpopulated."*

In addition to the ongoing struggle to combat hunger and secure a sustainable livelihood, residents dwelling on embankments face significant challenges concerning sanitation and access to safe drinking water. The victims express their dissatisfaction with the meager rations of rice and dal provided to them, which they deem insufficient.

According to a respondent, who narrowly avoided displacement in a flood, the village of Salmora, comprising approximately 400 families, has collectively experienced the need to establish new settlements within their habitations to escape continuous erosion. She emphasises that in severe circumstances, when no other alternatives exist, all community members resort to settling on the embankments.

Another respondent, who is also a flood victim, said that every family of Salmora has encountered the need to establish new settlements within their existing habitations to evade the continuous erosion. Reflecting on the situation, the respondent asserts, *“In the face of severe circumstances, we have no alternative but to seek shelter and establish our homes on the embankments.”*

Erosion, being a recurrent phenomenon due to the proximity of the river, has prompted similar stories from the villagers when asked if they have attempted to relocate to safer areas in the past. The living conditions are equally challenging for thousands of families from neighboring areas such as Besamora, Dakhinpat, Baghargaon, and others, as the extent of damage caused by the floods is widespread.

Due to heavy soil erosion, agricultural land has become scarce in Salmora, making agriculture an increasingly unviable option for livelihoods. Those engaged in minimal agriculture cultivate paddy varieties that can withstand flood conditions and require less time for harvesting, ensuring at least enough for household consumption.

Despite their ingenuity in coping with uncertainty, particularly future uncertainties, the villagers have not planned for the possibility of further land loss due to the rapid rate of soil erosion. The Brahmaputra Board’s proposal of complete evacuation from Salmora appears impractical, as the lives of these potters revolve around pottery-making. Relocating elsewhere is not feasible, as they lack other occupational skills, and rebuilding their lives around alternative professions would be extremely challenging.

The villagers’ situation is precarious, and in the face of this reality, a few are attempting to explore alternative occupations. However, viable options are scarce, leaving them with limited choices for diversification. The grave nature of their predicament calls for comprehensive solutions that consider the unique challenges faced by the pottery-making community in Salmora. Addressing the escalating

soil erosion and its impact on livelihoods requires not only immediate measures but also long-term strategies to ensure the sustainability and preservation of this distinctive way of life.

Thus, the case study of Salmora village in Majuli highlights the profound and far-reaching impacts of soil erosion on livelihoods and cultural heritage. The traditional craft of pottery-making by the Kumars, which has thrived for over 500 years, is now facing a grave threat due to the escalating issue of soil erosion along the banks of the Brahmaputra River. Frequent flooding in Majuli has further disrupted the settled livelihoods of the villagers, compelling them to relocate from one village to another.

Despite the efforts of the Brahmaputra Board in mitigating erosion, the pottery-making community in Salmora has not seen significant benefits, and their livelihoods remain at risk. The limited availability and increased cost of raw materials have severely impacted the profitability of their trade, forcing some of them to abandon their age-old craft. The challenges faced by the villagers are not limited to economic struggles but also encompass the erosion-induced loss of cultural heritage and identity.

Preserving the 500-year-old legacy of the potters of Salmora requires collaborative efforts from government bodies, researchers, and stakeholders. Immediate measures to mitigate erosion should be combined with long-term strategies to sustain and promote the traditional craft. Access to affordable raw materials and support for diversifying livelihoods can play a crucial role in ensuring the continuity of this unique way of life.

In the face of adversity, the resilience and adaptability of the villagers demonstrate their deep connection to their heritage and traditions. However, the grave nature of their predicament demands urgent attention and action to secure a sustainable future for these skilled artisans and their rich cultural legacy.

To create lasting solutions, it is essential to recognize the wider implications of soil erosion and climate change on livelihoods and the preservation of indigenous knowledge systems. By prioritizing the preservation of cultural heritage and fostering a conducive environment for sustainable livelihoods, we can collectively ensure the survival and thriving of the potters' age-old craft and the unique way of life in Salmora for generations to come.

4.2 Geopolitical Dynamics and Environmental Challenges in the Brahmaputra River Valley

The Brahmaputra is a complex system, and its upper catchments are the rocky, mountainous landscape of the Tibetan Plateau and Arunachal Pradesh, which contrast with the silty floodplains of the valley below. The hilly borderland between the two states is an important site of development within the wider Look/Act East Policy. The topography shaped by the river in Arunachal Pradesh holds an extensive reservoir of unused hydropower. Based on information provided by the Central Electricity Authority, Arunachal Pradesh State Government, and CSO in 2018, it is anticipated that the implementation of planned hydropower projects along the Brahmaputra's tributaries will substantially increase the state's hydropower generation capacity. Projections indicate that this capacity, which stood at a modest 97.45 MW in February 2018, could witness a remarkable surge to around 47,000 MW by the year 2028.

Constructing dams along these tributaries has led to significant opposition from communities in both states, and the release of water has caused sudden floods in border areas like Dhemaji. A community organiser in the district attributed disastrous floods in 2000 and 2007 to intentional water releases and structural issues with upstream dams. The Subansiri Lower Dam, located just upstream of Majuli on the Assam-Arunachal Pradesh border, has become a source of controversy. The construction of this 2,000 MW dam, set to be the largest in India, has been halted since 2011 due to local protests and legal battles. The community organiser in Dhemaji expressed concern that the dam project is a "major disaster" with far-reaching impacts on downstream communities, extending to the confluence of the Subansiri with the Brahmaputra at Majuli. This sentiment is echoed throughout the Brahmaputra River Valley, where dam projects have sparked widespread resistance.

Beyond energy generation, hydropower damming serves strategic purposes for the state. Gamble (2019) argues that hydropower development in the Eastern Himalaya, a region contested by both China and India, reflects a competition in state-building between Beijing and New Delhi. This competition, driven by nationalist fervour and technical capabilities to alter the region's headwaters, poses a threat to the well-being of majority and minority populations and smaller neighbouring countries.

In essence, the fight for control over this watershed, though longstanding, takes on new dimensions with the combination of nationalistic motivations and the technological capacity to manipulate the region's water sources. From a vantage point high in the mountains, the competitive state-building of China and India is seen as jeopardising rather than safeguarding the interests of their diverse populations and neighbouring nations (Gamble, 2019). According to this analysis, the construction

of hydropower dams is not just a part of development policy but also a broader initiative for state-building in disputed regions. The transboundary watershed of the Brahmaputra is thus a battleground for both geopolitical rivalries and local conflicts related to development. Development policies, as highlighted by Korf, Haggmann, and Emmenegger (2015) in the context of Ethiopia, serve as the channel through which these conflicts are manifested. In Assam, similar to other approaches to watershed management policymaking, the issues of disaster management become closely intertwined with the broader goals of state-building development. In addition to dams, factors such as the removal of boulders and deforestation in the upper catchment area also play a role in causing floods. Residents of Majuli observe that building embankments with boulders sourced from Arunachal Pradesh exacerbates erosion and flooding downstream. The interlinked problems of floods, deforestation, and boulder extraction form a detrimental cycle. Apart from damming, the upper catchment's impact on flooding and erosion in the Brahmaputra is not solely due to dams. According to Majuli residents, boulder extraction and deforestation in the upper catchment also contribute to more severe flooding. The embankments along Majuli often use boulders taken from Arunachal Pradesh, a significant source of stone. A respondent noted that removing these boulders leads to increased erosion in the upper catchment and sediment deposition on the Brahmaputra's bed. Interestingly, the construction of embankments itself worsens flooding, prompting the construction of more embankments. While there are no formal studies linking boulder removal to downstream flooding, this perception is widely discussed in Assam. The respondent emphasised the interconnected nature of the problem, stating, *"The problem is that everything is related—flood, deforestation, boulder extraction."* He described how development activities along the Brahmaputra tributaries on the Assam-Arunachal border, including damming, deforestation, and boulder extraction, contribute to the worsening of flooding and erosion in the valley, forming a vicious cycle. The transformation of landscapes in the upper catchments is intricately linked with reshaping the Brahmaputra itself, including proposals by the Assam government to dredge the river and construct a highway along its banks. According to the plan, the dredging process will yield a significant amount of sand, which can be utilised in building the highway and reclaiming land lost to erosion. The government's approach can be seen as a forceful response to what is perceived as the Brahmaputra's own destructive tendencies. By extracting eroded land directly from the riverbed, the government aims to counteract Majuli's gradual loss. These initiatives intend not only to mitigate and reverse flooding and erosion but also to essentially immobilise the river's natural movement.

On a broader scale, the government envisions a revitalised Assam serving as a pivotal point for commerce between South and Southeast Asia. Post-completion of these projects, the new Majuli is expected to be connected to Bangladesh, China, and Myanmar through state infrastructure. If we view Majuli and the broader Brahmaputra region as dynamic entities, the government's vision transforms them into a static landscape—an arena where businesses can transport goods. In this scenario, the traditional river flows are supplanted by the movement of capital.

5. Conclusion

Majuli island vividly illustrates the tangible consequences of global climate trends and their impact on vulnerable communities. Positioned in a region prone to multiple natural disasters, Majuli faces exacerbated risks due to factors such as heightened precipitation and glacial melt driven by climate change. These hazards not only threaten lives and property but also contribute to broader issues like land loss and the impoverishment of riverine communities.

The case study of Salmora village in Majuli underscores the profound impact of soil erosion on the livelihoods and cultural heritage of its inhabitants, particularly the Kumars—the traditional group of potters who have shaped the village's distinct identity for over 500 years. Soil erosion along the Brahmaputra River banks has not only threatened the ancient craft of pottery-making but also disrupted the settled livelihoods of villagers, compelling them to face the challenges of relocation. Despite efforts by government organizations to mitigate erosion, the Kumars have struggled to access high-quality clay, leading to a decline in the profitability of their pottery trade. The consequences extend beyond economic struggles, affecting the erosion-induced loss of agricultural resources, cultural heritage, and identity.

The resilience of the villagers underscores the importance of preserving cultural heritage in the face of environmental challenges. Urgent attention and comprehensive solutions are needed to address the profound challenges faced by the pottery-making community in Salmora. Collaborative efforts from government bodies, researchers, and stakeholders are essential to preserve the 500-year-old legacy of the potters. Immediate measures to mitigate erosion should be complemented with long-term strategies, including access to affordable raw materials and support for diversifying livelihoods.

The Brahmaputra River Valley presents a complex interplay of geopolitical dynamics and environmental challenges, particularly regarding hydropower development and its impacts on local communities and ecosystems. The construction of dams, alongside factors like deforestation and embankment construction, contributes to flooding and erosion, forming a detrimental cycle of

environmental degradation. Moreover, the development of hydropower infrastructure reflects broader geopolitical competition between China and India, further complicating the situation. The Assam government's response includes proposals for river dredging and highway construction aimed at mitigating erosion and facilitating economic development. However, these initiatives risk transforming the dynamic river ecosystem into a static landscape focused on commercial transportation, potentially displacing traditional river flows with capital movement. Overall, the Brahmaputra River Valley represents a battleground for both geopolitical rivalries and local conflicts, where development policies intersect with environmental concerns and community resistance.

In conclusion, Majuli serves as a microcosm reflecting the urgent need for global and local efforts to address the multidimensional impacts of climate change. The lessons gleaned from Majuli can inform broader strategies for sustainable development, climate resilience, and community well-being in the face of an evolving climate landscape. As we navigate an uncertain future, understanding, adapting to, and mitigating climate-related risks become increasingly crucial for preserving vulnerable regions and the well-being of their inhabitants. **41** | Page

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