CHAPTER 28

Balancing Urbanization and Cultural Preservation in Construction Practices in Northeast India

Shubham Sharma[1], Tanmay Sharma[2], Yash Singh[2] and Ronak Khajekar[2]

ABSTRACT

Urbanization in Northeast India is speeding up with the growth in population, economy, and infrastructure development, posing a significant impact on the area's rich cultural heritage. The present study discusses the equilibrium between modernization and culture conservation through the investigation of traditional architectural strategies, native values, and the socio-economic context of urbanization. Based on a quantitative survey-based methodology, information was gathered from 74 stakeholders, i.e., urban planners, architects, policymakers, and local community members. Statistical analysis using SPSS resulted in a high Relative Importance Index (RII) of 0.851 for preserving culture, showing strong support from the populace. It is seen that 74.3% of the respondents answered that cultural preservation was "Important" or "Very Important," and this indicates broad concern about the disappearance of traditional architecture. The research also shows that the preservation of culture increases economic advantages, like tourism and traditional crafts, with 82.4% of the respondents agreeing on it. The study calls for participatory urban planning, adaptive reuse policies, and financial incentives for promoting sustainable growth and conserving cultural heritage. The study suggests integrated policies, which harmonize modernity with heritage conservation, and promotes inclusive and sustainable development in Northeast India based on global models such as Kyoto and Bhutan.

Keywords: Cultural preservation; Urbanization; Traditional architecture; Economic benefits; Sustainable development.

1.0 Introduction

Northeast India, renowned for its breathtaking landscapes and rich biodiversity, is experiencing rapid urbanization driven by population growth, economic expansion, and improved connectivity. Cities like Guwahati, Shillong, and Imphal are transforming with infrastructure projects such as highways, airports, and smart city initiatives. While urbanization promises economic growth and improved living standards, it also poses significant challenges, including environmental degradation, loss of cultural identity, and socio-economic disparities.

[1]*Corresponding author, School of Construction, NICMAR University, Pune, Maharashtra, India (E-mail: P2370029@student.nicmar.ac.in)*
[2]*School of Construction, NICMAR University, Pune, Maharashtra, India*

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Unplanned urban sprawl threatens ecosystems, traditional livelihoods, and regional sustainability, particularly as modern construction practices often overlook local cultural and environmental contexts (Pautunthang & Institute for Social and Economic Change, 2018; Mandal *et al.*, 2022). The region is a cultural mosaic, home to over 200 indigenous communities, each with unique languages, traditions, and architectural practices. These traditions, such as the stilt houses of the Mishing tribe and the bamboo structures of the Khasi people, are deeply intertwined with the natural environment and reflect cultural identity and communal values. However, rapid modernization and globalization risk erasing this heritage, replacing it with generic urban landscapes devoid of historical significance. Preserving this cultural wealth is essential not only for honoring the past but also for fostering a sense of identity and pride among future generations (Pandiya, 2024).

Balancing modernization with cultural preservation is a critical challenge in Northeast India. While infrastructure development is vital for economic progress, it often comes at the cost of environmental and cultural integrity. Large-scale projects like highways and dams have displaced indigenous communities and destroyed sacred sites, while Western-style architecture has marginalized traditional building practices. Addressing this tension requires participatory planning that integrates local cultural and environmental aspirations. By incorporating traditional knowledge and sustainable practices, such as flood-resistant stilt houses and living root bridges, urban development can achieve a harmonious blend of modernity and cultural preservation, ensuring inclusive and sustainable growth (O'Connor, 2024; Sharma *et al.*, 2024).

1.1 Objectives

- To identify the Perception of Urbanization and Cultural Heritage.
- To recognise the Attitudes toward Cultural Preservation.
- To understand the Preferences for Construction Practices.
- To find the Barriers to Using Traditional Practices in Urban Development.
- To identify the Policy and Community Recommendations

2.0 Literature Reviews

Kiruthiga & Thirumaran (2019) explored the impact of urbanization on heritage buildings in Kumbakonam, Tamil Nadu, emphasizing how rapid urban growth threatens the integrity of historical sites. Their study focused on the physical, socioeconomic, and sociocultural influences that affect the preservation of heritage characteristics, particularly in temple towns facing modern urban pressures. Similarly, Chandra & Sinha (2023) examined the role of urban planning in preserving cultural heritage while boosting tourism, using Gwalior as a case study. They highlighted the importance of integrating heritage conservation into urban planning to enhance tourism without compromising cultural identity, stressing the need for a collaborative approach involving government bodies, local communities, and tourism

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stakeholders. Pokhriyal & Kawatra (2024) discussed the role of tourism in cultural heritage conservation in India, specifically at UNESCO-designated heritage sites. While tourism promotes awareness and economic benefits, they noted it also leads to overcrowding and ecological degradation. They recommended a balanced approach that integrates sustainable tourism with heritage conservation, a principle that could be applied to Northeast India, where urbanization is rapidly altering traditional landscapes. Roy *et al.*, (2023) emphasized the need for documentation and cultural preservation of indigenous technical knowledge in Northeast India, focusing on local construction techniques and traditional ecological knowledge at risk due to urbanization and modern construction practices. They stressed integrating indigenous knowledge into contemporary planning systems to maintain cultural continuity and support sustainable development.

Bhardwaj (2024) analyzed shifting cultivation practices in Northeast India, discussing how traditional agricultural methods, such as the jhum system, contribute to biodiversity conservation. While urbanization and policy changes have led to the decline of these practices, the study suggests maintaining a balance between modern agricultural methods and traditional practices to ensure environmental sustainability. Sharma *et al.* (2024) investigated the integration of traditional knowledge and modern planning practices in cultural heritage conservation, arguing that urbanization and development pose significant challenges to preserving cultural heritage in cities.

They proposed fostering communication between stakeholders and incorporating traditional knowledge into urban planning to create a more resilient and culturally sensitive framework for heritage conservation. Sahu & Ahirwar (2024) examined the balance between urbanization and heritage preservation in Jaipur, India, focusing on integrating heritage sites into urban development plans. Their findings emphasized the importance of a holistic urban planning approach that includes heritage preservation without hindering urban growth. This insight is relevant for heritage cities in Northeast India, where rapid urban expansion threatens both tangible and intangible cultural heritage. Doley (2014) studied the changing cultural practices among the Missing tribe of Assam, particularly in the context of rural-urban migration. His research highlighted how modern urbanization is influencing traditional practices, including construction techniques and social structures, stressing the need to preserve cultural identity while adapting to urban lifestyles.

Riganti (2017) discussed the pressures of rapid urbanization on cultural heritage in Indian cities, noting the increasing challenge of preserving historic sites amid unplanned urban growth. He called for a “smartheritage” approach, where smart technologies are applied in conservation practices to improve decision-making and sustainability, aligning with modern urban development. Guerrieri (2022) highlighted the evolving field of heritage conservation in postcolonial India, emphasizing the importance of local perspectives that differ from colonial legacies. He pointed out the role of institutions like INTACH in advocating community-based preservation and integrating traditional knowledge with modern planning systems.

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Meitei & Das (2024) analyzed urbanization patterns in Northeast India, focusing on urban population growth and its impact on infrastructure and cultural landscapes. They noted that urban growth, particularly in Assam, has strained both the environment and traditional cultural practices. The study suggested that a comprehensive urban planning framework, which incorporates environmental and cultural heritage protection, is essential for sustainable development in the region. Khakha (2019) explored urbanization challenges in tribal areas, particularly in Shillong, Meghalaya, and how it has affected tribal populations and their cultural identity. The research emphasized the importance of understanding tribal governance and land tenure systems to integrate heritage conservation with urban growth effectively.

Vinutha (2023) studied Kanchipuram, Tamil Nadu, to illustrate how urban development and heritage conservation can coexist. The research emphasized sustainability in balancing urbanization with cultural preservation, advocating for adaptive reuse of historic buildings and creating heritage zones. This study stresses the importance of integrated planning approaches that recognize both modern needs and the significance of preserving cultural and historical assets. Overall, the literature on Northeast Indian urbanization and cultural conservation underscores the challenges posed by unplanned urban expansion to cultural heritage. The degradation of tangible and intangible heritage, compromising cultural identity, is evident. To reverse this, there is an increasing demand for incorporating heritage conservation into urban planning through sustainable strategies. Several studies stress the need to apply smart technologies and holistic urban planning frameworks to balance infrastructure development with the conservation of cultural and environmental resources.

3.0 Research Methodology

This research adopts a quantitative, survey-based research approach to examine the equilibrium between urbanization and culture conservation in Northeast India. A standardized questionnaire was administered to 74 stakeholders consisting of urban planners, architects, policymakers, and local people via online and face-to-face surveys. The data were examined with SPSS to test reliability (Cronbach's Alpha), descriptive statistics, and Relative Importance Index (RII) for ranking influencing factors.

The results present major trends and essential drivers influencing the interaction between modernization and cultural heritage, maintaining data integrity through extensive cleaning, coding, and management of missing values. Comparative analysis with international heritage conservation models—Kyoto, European cities, Bhutan, and Singapore—unveils strategies for sustainable urbanization. Kyoto's zoning regulations and economic incentives, Europe's adaptive reuse policies, Bhutan's traditional architecture requirements, and Singapore's tax remission schemes provide useful lessons. Conversely, Northeast India is saddled with issues of insufficient heritage zoning, absence of financial incentives, and loss of traditional crafts. The research stresses the implementation of integrated policies that harmonize

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contemporary development with cultural conservation and promotes community participation, regulatory instruments, and economic inducement to foster sustainable and culturally responsive urban development.

4.0 Data Analysis

Table 1: Heritage Mapping of North-East India

State	Traditional Architecture Style	Key Features	Cultural Significance	Threats Due to Urbanization
Assam	Chang Ghar (Saikia, J., Hazarika, M., Singha, K. D., Paul, M., & Talukdar, F. 2016)	Stilted bamboo houses with thatched roofs	Protects from floods, sustainable & climate-responsive	Concrete buildings replacing bamboo houses
Nagaland	Naga Longhouses (Sharma, A., Pawar, T., & Ji, S. 2023)	Large communal wooden houses with tribal carvings	Symbol of community bonding and tribal identity	Rapid urban migration, decline in wood availability
Meghalaya	Khasi & Jaintia Houses (Sharma, A., Pawar, T., & Ji, S. 2023)	Bamboo & wooden houses with steep roofs for high rainfall	Efficient drainage system & eco-friendly	Modern steel structures replacing traditional homes
Manipur	Meitei Houses (Saikia, J., Hazarika, M., Singha, K. D., Paul, M., & Talukdar, F. 2016)	Bamboo-mud hybrid structures, earthquake-resistant	Adapted to seismic activity	Cement-based housing replacing vernacular styles
Arunachal Pradesh	Monpa & Apatani Houses (Chhipa, N. & L.J. 2017).	Stone-wood houses reinforced with beams	High-altitude weather adaptation	Traditional techniques being lost due to modern urban expansion
Mizoram	Lushai Stilt Houses (Saikia, J., Hazarika, M., Singha, K. D., Paul, M., & Talukdar, F. 2016)	Elevated bamboo & hardwood houses	Ventilation & humidity control	Preference for concrete houses
Sikkim	Buddhist Monasteries (Saikia, J., Hazarika, M., Singha, K. D., Paul, M., & Talukdar, F. 2016)	Tibetan-influenced colorful wooden structures	Religious and cultural hub	Lack of restoration, modern modifications
Tripura	Risa-Rignai Houses (Saikia, J., Hazarika, M., Singha, K. D., Paul, 2016)	Compact homes using clay & bamboo	Traditional community housing	Loss of artisans skilled in bamboo construction

Source: Compiled by author

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4.1 Geographic mapping of heritage sites

4.1.1 Regions with high density of traditional architecture

- Majuli, Assam – Home to traditional Chang Ghar houses and unique Satras (monastic institutions)
- Kohima, Nagaland – Naga longhouses showcasing intricate tribal carvings
- Shillong, Meghalaya – Khasi traditional homes and heritage buildings
- Loktak Lake, Manipur – Phumdis (floating islands) with stilt houses
- Lunglei, Mizoram – Stilted houses adapted for hilly terrain

4.1.2 At-risk heritage sites

- Chang Ghar settlements in Assam (facing floods & modernization)
- Naga heritage villages (being abandoned for urban housing)
- Ziro Valley traditional homes (decline in traditional wood craftsmanship)
- Shillong's colonial-era Khasi architecture (being replaced by concrete buildings)
- Monasteries in Sikkim & Arunachal Pradesh (modern modifications diluting traditional styles)

4.2 Survey and analysis

With the help of descriptive statistics, you can find the frequency of the responses given. The Likert scale consists of 1-5 number each having its own meaning they are as follows

- 1 = Not Important/Strongly Disagree/Very Low
- 2 = Slightly Important/Disagree/Low
- 3 = Moderately Important/Neutral
- 4 = Important/Agree/High
- 5 = Very Important/Strongly Agree/Very High

4.2.1. Perception of urbanization and cultural heritage

- *Gender distribution:* The sample comprised 74 valid responses, with 47.3% male and 52.7% female participants. The gender distribution is nearly even, with a mean value of 1.5270, indicating a balanced representation. The Relative Importance Index (RII) for gender was 0.7635, suggesting a slightly higher number of female respondents.
- *Importance of urbanization:* The majority of respondents considered urbanization in Northeast India to be important, with 43.2% rating it as "Very Important" and 62.1% combining "Very Important" and "Important." The RII value was 0.792, indicating strong support for urbanization's role in development.
- *Cultural preservation and urbanization:* Cultural preservation amidst urbanization was highly valued, with 55.4% rating it "Very Important." The RII of 0.851 reflects widespread agreement on the need to preserve culture in urban development.

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- *Urbanization as a threat to cultural heritage:* Respondents showed varied opinions on urbanization's threat to cultural heritage. However, 55.4% considered it a significant concern, with an RII of 0.7135, highlighting moderate concern about this threat.

4.2.2 Attitudes toward cultural preservation

- *Risk to traditional architecture and landscapes:* A majority of respondents (64.8%) rated the risk of losing traditional architecture due to urbanization as "Important" or "Very Important." The RII of 0.7676 underscores the importance placed on preserving these elements.
- *Incorporating cultural heritage in urban development:* A significant majority (77%) viewed the incorporation of cultural heritage elements in urban projects as "Important" or "Very Important." The RII value was 0.8378, indicating strong support for this idea.
- *Cultural heritage and economic benefits:* The idea that cultural heritage preservation can contribute to economic benefits, such as tourism, was widely endorsed. 50% of respondents considered it "Very Important," and the RII of 0.8514 highlights the importance placed on this aspect.
- *Community-centered spaces reflecting local culture:* The importance of community-centered spaces reflecting local culture was widely recognized, with 48.6% rating them "Very Important." The RII of 0.846 suggests strong support for culturally inclusive urban planning.

4.2.3 Preferences for construction practices

- *Traditional construction practices for environmental sustainability:* Traditional construction practices were seen as important for environmental sustainability, with 36.5% rating them "Very Important." The RII was 0.7946, showing a consensus on their environmental value.
- *Integration of traditional and modern practices:* Respondents strongly supported the integration of traditional and modern practices, with an RII of 0.7946, indicating that most consider it essential to balance heritage and innovation in urban development.
- *Bamboo as a building material:* Bamboo was highly regarded as a building material, with 48.6% rating it "Very Important." The RII of 0.8351 reflects its strong cultural, environmental, and economic significance in the region.
- *Timber as a building material:* Timber was considered moderately important, with an RII of 0.7703. While some respondents saw it as "Very Important" (35.1%), others expressed more mixed views, likely due to sustainability concerns.
- *Stone as a building material:* Stone was similarly valued, with 37.8% rating it "Very Important" and an RII of 0.795, indicating its significance due to its durability and cultural importance in traditional construction.

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- *Locally sourced brick or clay:* Locally sourced materials like brick or clay were regarded as important, with 41.9% rating them "Very Important" and an RII of 0.816, emphasizing sustainability and regional economic benefits.
- *Modern materials (Concrete, Steel, Glass):* Modern materials were viewed positively, with 35.1% rating them "Very Important." The RII of 0.743 suggests that while they are acknowledged, opinions on their use vary, balancing innovation and preservation concerns.
- *Hybrid construction (modern structures with traditional elements):* Hybrid construction that blends modern designs with traditional aesthetics received strong backing, with 54.1% considering it "Very Important." The RII of 0.862 demonstrates a high preference for this approach.

4.2.4 Barriers to using traditional practices in urban development

- *Higher costs of traditional materials and techniques:* Concerns about the higher costs of traditional materials and techniques were acknowledged, with 31.1% rating it "Important." The RII of 0.738 shows a moderate level of concern regarding this issue.
- *Lack of skilled labor in traditional techniques:* The lack of skilled labor in traditional techniques was seen as an important issue, with 36.5% rating it "Important." The RII of 0.762 indicates a significant challenge for preserving traditional methods.
- *Low demand or awareness among developers and planners:* Low demand and awareness among developers was recognized as a key issue, with an RII of 0.814, suggesting that many feel a need for greater awareness to support traditional practices.
- *Regulatory or policy limitations:* Regulatory and policy limitations were considered significant, with an RII of 0.781, indicating that respondents view policies as influencing the adoption of traditional building practices.

4.2.5 Policy and community recommendations

- *Construction policies mandating cultural preservation:* There was strong support for construction policies enforcing cultural preservation, with an RII of 0.8270, suggesting that most respondents favor policies ensuring cultural heritage is maintained in urban projects.
- *Providing subsidies for traditional building materials:* Providing subsidies for traditional materials was seen as crucial by many respondents, with an RII of 0.824, reflecting strong support for financial incentives to encourage the use of traditional building materials.
- *Establishing heritage conservation zones:* Establishing heritage conservation zones was viewed as important, with 43.2% rating it "Very Important." The RII of 0.838 indicates strong support for protected areas to preserve cultural heritage.
- *Supporting education and training in traditional skills:* Education and training in traditional skills was considered essential, with 52.7% rating it "Very Important." The RII of 0.803 highlights the need for educational initiatives to promote traditional craftsmanship.

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- *Raising community awareness and engagement in cultural preservation:* Raising community awareness about cultural preservation was highly valued, with 50% marking it "Very Important." The RII of 0.835 emphasizes the need for community involvement in heritage conservation.
- *Effectiveness of community programs in heritage preservation:* Community programs focused on heritage preservation were deemed effective by 36.5% of respondents, with an RII of 0.803, indicating strong support for grassroots efforts to preserve cultural heritage.
- *Integrating traditional practices for sustainable urban development:* The integration of traditional practices for sustainable urban development was strongly supported, with 36.5% rating it "Very Important." The RII of 0.805 reflects the importance of combining traditional knowledge with sustainable development goals.
- *Reliability analysis:* The reliability analysis showed excellent internal consistency, with a Cronbach's Alpha of 0.949 across all 34 items, suggesting that the measurement scale is reliable and the responses are highly correlated across the various factors. All 74 respondents were included in the analysis, ensuring a robust dataset.

5.0 Discussion

The proposed framework for balancing sustainable urban development with the preservation of cultural and architectural heritage in Northeast India encompasses five key dimensions. The Policy and Regulatory Framework emphasizes enacting heritage zoning laws, adaptive reuse policies, architectural guidelines, financial incentives, and empowering heritage protection agencies to safeguard historically significant areas while supporting sustainable growth. Sustainable Construction and Material Integration promotes the fusion of traditional materials like bamboo and timber with modern engineering, sustainable supply chains, technical workshops, mandatory local material usage, and R&D for climate-resilient designs.

The Economic and Community Incentives component focuses on promoting heritage-based tourism, artisan training programs, cultural conservation funds, public-private partnerships, and community engagement to create economic opportunities and foster local ownership. Education and Awareness Programs aim to instill appreciation for traditional architecture through heritage education, cultural festivals, media campaigns, advocacy efforts, and university partnerships.

Finally, the Monitoring and Evaluation Mechanism ensures effective implementation through heritage conservation committees, key performance indicators (KPIs), annual audits, community feedback, and sustainability reports to track progress and maintain accountability. Together, these interconnected strategies create a holistic approach to preserving Northeast India's rich cultural heritage while supporting sustainable urban development.

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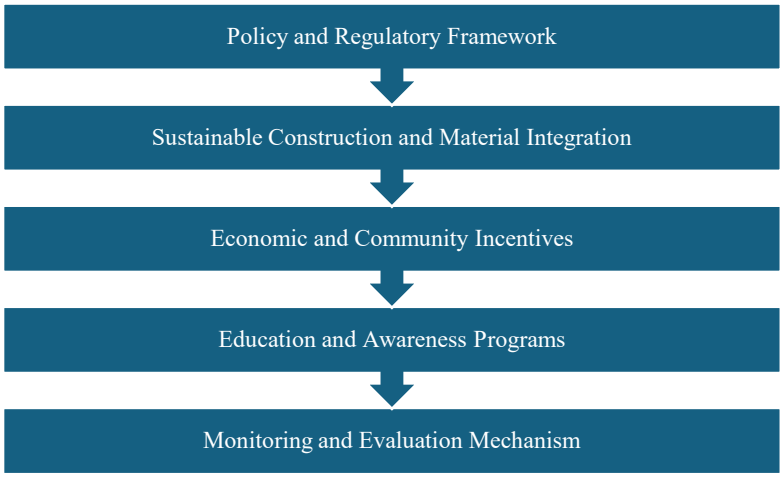
Figure 1: Flow Chart of Framework



6.0 Conclusion

The research "Balancing Urbanisation and Cultural Preservation in Construction Practices in Northeast India" sheds light on how current construction techniques affect cultural heritage and urban growth. Most categories scored over 0.75 in the Relative Importance Index (RII) research, indicating that respondents value cultural preservation alongside urban expansion. Although urbanisation is inevitable, research shows substantial support for indigenous architectural characteristics, green materials, and local building processes in new infrastructure. Low "Not Important" and "Slightly Important" grades emphasise the necessity for a development strategy that safeguards the region's cultural heritage. High RII scores (0.80 and above) for priority variables suggest a need for policy that promotes eco-friendly city development without compromising cultural heritage. The study shows a growing tendency towards green construction, public engagement in decision-making, and protecting historic sites.

However, modest RII values for certain components suggest that urban expansion must be in harmony with traditional methods and demand more awareness and government intervention. The findings suggest that policymakers and developers should use a hybrid approach that blends contemporary efficiency with traditional authenticity to provide Northeast India a unique architectural character. The study emphasises the necessity for a careful balance between modernisation and culture to support urbanisation in Northeast India. Economic progress demands urban expansion, but unplanned urbanisation undermines the country's rich architectural traditions and national knowledge systems. Participatory urban policy, stakeholder participation, and adaptive building approaches that respect progress and tradition are highlighted by the findings. Future study must develop region-specific case studies and frameworks to find sustainable and culturally relevant urbanisation solutions in Northeast India.

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