

Chapter 1:

Challenges and Solutions in the Architectural Conservation of 'Zamindar Houses': Insight from Chattogram, Bangladesh

* Murchana Madhury, Shaptarshi Das Gupta, Shajia Mumtahina Niha and Sabreen Shafique Chowdhury

Introduction

The terms 'Zamindar' and 'Zamindari' has come to define the settlement pattern and land revenue system of the Bengal region under Mughal and British rule of the Indian Subcontinent. The Persian term "Zamindar" was introduced first after the Mughal invasion of Bengal. According to Akhtar (1973), Zamindars were considered mediators between the superior government and the inferior revenue peasants. Although the word refers to "holder of the land", it technically indicates the collection control of the royal rights in land parts where the manager bore the responsibility of fixed tax payment (Baden-Powell, 1896). After the British gained complete authority, the Permanent Zamindari System was established by Lord Cornwallis in 1793. The act categorizing Zamindars as landowners and peasants as their tenants also held Zamindars responsible for the revenue payments to the state (Harris, 1989). The estates varied in size with some covering over a hundred square miles and some only a few acres (Appu, 1974). Besides, the Zamindar themselves typically held a significant land portion under direct management. After this system was officially abolished by the Zamindari Abolition Act in both East and West Bengal, many portions of these estates have either been acquired or auctioned. Currently, only a few are occupied by the family members of the then-Zamindars.

The Zamindar houses of Bangladesh bear evidence of sociocultural development and point toward an incremental change in the architecture of Bengal. These traditional Zamindar houses are witnesses to the rising of the merchant class between the eighteenth and nineteenth centuries and the vanishing cultural history. As they serve as evidence of architectural evolution and symbols of the country's heritage and culture, the houses are highly significant (Masood Reza et al., 2007). The affluent "Babu" class or the social elites had a remarkable influence on the making of art and architectural styles as well as in their implementation in the architectural plans and layouts. Built with European concepts, these structures are notable for their functional arrangement, construction method, aesthetic elements, and climate-responsive design strategies (Israt, 2013).

After the abolition of the Zamindari system, many of these historic buildings have undergone years of neglect as well as suffered the damaging effects of war and natural disasters. Initiatives taken for the conservation and management after the independence of the country have been proved ineffective in most cases and further contributed to the poor state of these centuries-old buildings. It is therefore essential to identify their heritage significance, study the architectural considerations behind them and devise suitable methods for present and future preservation. More than 340 Zamindar houses are scattered all over the country with a small number enlisted as protected heritage. There emerges a necessity to review previous research on conservation challenges, document and analyze the architectural features of these houses, and gather data by conducting one-to-one interviews, focus group discussions, questionnaires, and field surveys in these important historical locations. The present study aims to investigate the varying architectural features and current state of three selected Zamindar houses in Chattogram and offer proposals to be adopted by policymakers and heritage conservators.

Corresponding Author: * Murchana Madhury
Chittagong University of Engineering and Technology, Chattogram, Bangladesh
e-mail: madhurymurchana@yahoo.com

How to Cite This Chapter:

Madhury, M., Das Gupta, S., Niha, S. M., & Chowdhury, S. S. (2023). Challenges and Solutions in the Architectural Conservation of 'Zamindar Houses': Insight from Chattogram, Bangladesh. In H.A. Nia and R. Rahbarianyazd (Ed.), *Convergence of Contemporary Thought in Architecture, Urbanism, and Heritage Studies*, (pp. 1-16) Cinius Yayınları, DOI: <https://doi.org/10.38027/ICCAUA2023EN0177>

Methodology

The study follows a mixed research design combining both quantitative and qualitative approaches and the survey involves a combination of the Likert-scale questions, semi-structured in-depth interviews, and focus group discussions using the selected case studies. Initially, as part of the survey, documentation research or a literature review has been conducted, followed by an evaluation of the architectural significance of the structures. The next step includes recording through photographs for archiving, as well as gathering feedback from participants through personal observations, focus group discussions, and interviews as mentioned. This allows an understanding of the current condition of the sites and examines a broad range of complex issues.

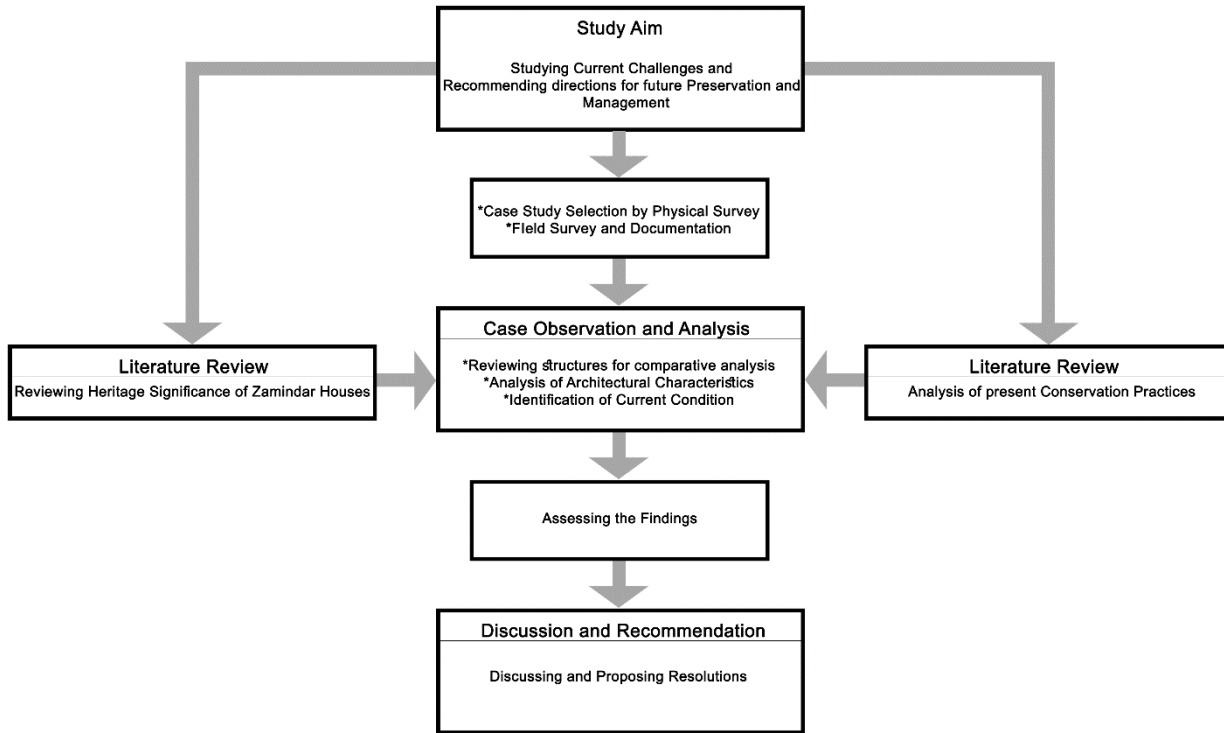


Figure 1. Structure of the Study (Developed by Author).

Zamindar House and Heritage Significance

The word “significance” generally refers to the importance, worth or precise meaning of something. Although the meaning can simply be interpreted from different disciplines’ perspectives, its definition is yet to be clarified in the field of cultural heritage. (Manders et al., 2012). According to Russell and Winkworth (2001), an identification of an item’s significant qualities can recommend the appropriate way of conserving and interpreting its values. The European Standard defines “value” as the aspect of importance that people ascribe to an item and “significance” as a combination of all these values. For instance, historical, economic, artistic, social, technological, etc. values constitute heritage significance (CEN, 2011). Widely accepted as a standard document for guiding the conservation practice of heritage places, the Burra Charter (1999) describes cultural significance as aesthetic, historic, scientific, or social value meant for past, present, or future generations. The Charter however stresses that additional detailed typologies can be established to investigate the significance of a certain heritage area.

Table 1. Heritage Values: Adapted from the Burra Charter, 1999.

Aesthetic value	Evaluated considering the sensory perception and functionality of the place, as well as the form, color, material, etc. of the fabric.
Historic value	Assessed by the strong connection of the place with a historic figure, activity, event, association, etc.
Social value	Determined by the place’s quality of being important for carrying shared opinions and beliefs shaped by spiritual, political, etc. aspects among the majority or minority groups.
Scientific value	Recognized by the unique essence of the place and the involved data that may contribute considerably to generating information.

Though there is a lack of published literature on Zamindar houses (Masood Reza, 2008) or studies relevant to their heritage significance, the associated values have been discussed in several academic disciplines in the past decades. As stated by Mowla and Reza (2000), the colonial buildings show mixed-style architecture comprising Vitruvian classicism, Indian Neoclassicism, Tropical Euro-Indian, Racial classicism, Gothic Style, and Indo-Saracenic style. As colonial buildings, Zamindar houses have architectural and historical significance owing to their functional zones and layouts influenced by European typology. Built for residential purposes by wealthy landowners, these houses reflect the geographical setting, the region's climatic conditions, technological developments, the availability of building materials, the living pattern of the feudal class, and so forth of the colonial period (Masood Reza, 2008). With distinct aesthetic values (Masood Reza et al., 2007), the influence of traditional Bengali house patterns having rooms arranged around a courtyard, and European Renaissance architecture with Mughal ornamentations are generally observed. Bungalows and Mansions are two prevalent architectural styles found in buildings, with the houses of the affluent displaying extravagant design features such as large columns, arches, pediments, and openings (Adnan & Islam, 2018). The majority of houses feature courtyards that are encircled by multiple clustered structures, (Masood Reza et al., 2007), such as the Zamindar houses of Gangatia, Balihar, Teota, etc. The presence of brick and lime surki in wall construction, cast iron in railings, and wooden beams and rafters in roofs is apparent (Masood Reza et al., 2007). Besides, windows with tracery work, decorative plaster with rustic work, cornices with moldings, etc. portray unique features of European and Indian architecture. The perceptions of gender roles in the family are mirrored in the functional layouts. The "Andarmahal" or inner houses for women and the Kachari house or the outer houses for men have been discussed by Israt (2013) in her analysis of the zoning of such houses in Dhaka City.

The study of the Zamindari system in its entirety, along with the significant figures and events, serve as evidence of the structures' historical significance. The houses are deeply associated with historically significant figures as well as events. While discussing Karchmaria Zamindar Family, Karim (2006) mentions the contribution of Zamindar Rajkumar to the establishment of Rajshahi College as well as a primary school for the education of his subjects. For his own pleasure, a library was built in his house with a worthy collection of books sold by British officials. (Karim, 2006). As stated by Akhtar (1973), Zamindars influenced the political and economic turmoils greatly in their allocated regions during the colonial period. They were responsible both for performing notable administrative functions and dealing with the concerns of the peasants and the village community. Hence, these homes once served as centers of governance and decision-making, and as such, were often filled with courtiers, advisors, and other officials who helped the Zamindars maintain their power and authority. According to Israt (2013), the main functional block of most houses comprises an inviting entrance, a zone dedicated to the guests, a lounge, bedrooms, a dining zone, stairs, verandahs, etc., while a dancing hall, library, treasury, and garage form the other blocks. As most Zamindars followed Hinduism, temples of Durga, Bishnu, or other deities were constructed outside the main block (Masood Reza, 2008). Festivals and rituals following Hindu philosophy and religious institutions aimed at gaining reputations by arranging attractive ceremonies and entertaining performances (Bean, 2022). The festivals gained wide popularity and to date in many houses, Zamindari-style Durga Puja is celebrated by their descendants and the local community in both East and West Bengal.



Figure 2. William Prinsep, 'Entertainment during the Durga Puja', Water Colour 23 x 43.5cm, c. 1840. Source: Losty, 1992, p 104-105.

The residence compounds play a major role in promoting historical research. While information can be obtained by investigating the physical history of a house itself through construction materials, finishes, spaces,

proportions, etc., various data sources including library resources, published articles, land records, maps, photographs, etc. are pieces of evidence to its research value. To cite an instance, Zamindari "sanads" or charters have functioned as evidence to show that the revenue records of the regional authorities usually didn't extend to landowners below the intermediate level (Calkins, 1970). Such data regarding the evaluation of land revenue and settlement data during the colonial era is highly esteemed in different academic domains. A few houses, for example, Baliati Zamindar House, Madan Babu Zamindar House, Jadunath Roy Zamindar House (Bikrampur Museum), Tajhat Zamindar House, etc. have been converted into a museum with a collection of artifacts, statues, utensils, paintings, furniture, etc. previously owned by the Zamindar families.

Conservation Practice in Bangladesh

The recommendations outlined in the conservation and management plan, as stated by Avrami, Mason and Torre, (2000), aim to ensure the long-term preservation and advancement of heritage places. According to Burra Charter (1999), the next step to assessing heritage significance is establishing policies and procedures for conservation and management. The Department of Archaeology (DOA) is the leading authority for heritage conservation and preservation in Bangladesh, operating under the Ministry of Cultural Affairs. Despite the country possessing a significant amount of tangible and intangible heritage for centuries (Khalid & Chowdhury, 2018), the concept of heritage conservation and management is fairly recent (Huq et al., 2017). The disregard for heritage has endangered certain areas, while others are on the brink of disappearing due to a lack of awareness. (Ali, 2017). To date, most of them have not been documented as a part of heritage conservation (Parvin, 2016) and many have not been listed. The generalized policies recommended for preservation do not provide the appropriate solution for many dissimilar categories of heritage structures in Bangladesh (Huq et al., 2017). Studies indicate the need for amendment and upgradation of the existing conservation legislation followed by the Department of Archaeology through expertise and in-depth research. Analyzing the case of Dhaka, Huq (2017) mentions the lack of documents presenting the total number of heritage structures, their heritage significance, present situation, and required steps for safeguarding them. Besides, the restoration or adaptation of heritage structures to a new function is a much-overlooked concept in the country (Rahman, 2003). Again, the potential for financial gains through heritage tourism is impeded by insufficient staff and a lack of hospitable behavior towards visitors at heritage locations. Bhuiyan and Darda (2020) detect tourists' dissatisfaction with the knowledge gap of the assigned workers, their unprofessional appearance, the unclean condition of the sites, inadequate recreational and sightseeing facilities, etc. As stated by Ali and Islam (2020), many sites are exposed to vandalism, uncontrolled development, and poor maintenance. The endangerment of these sites is largely a consequence of insufficient policies and ineffective approaches to their implementation (Afroz, 2022).

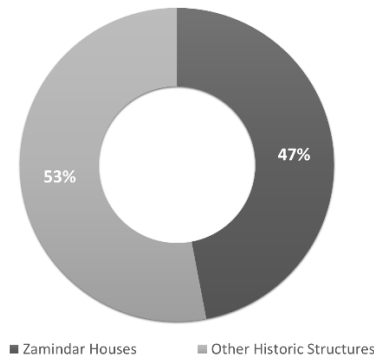


Figure 3. Highlighted Topics on the Requirement for Historic Conservation in Newspapers.

The majority of Zamindar houses show comparable situations. Despite the extensive newspaper coverage of the deteriorating state of Zamindar houses in Bangladesh, little has been done in terms of conservation strategies to protect them or prevent their extinction. While discrete houses may be observed separately from the usual tourist paths, various examples indicate rapid population expansion and inadequately implemented urban development that encroach on these structures and their adjacent areas. To this day, the conservation process has been applied to only a handful of Zamindar houses. With insufficient information about colonial structures (Parvin, 2016), a detailed exploration of conservation and management policies for most of these houses and their surrounding sites has not yet occurred.

Examples of Preservation Projects

Among the structures that have been recognized in Bangladesh for their heritage significance and underwent preservation in recent times, Tajhat Zamindar Palace and Baro Sardar Bari are noteworthy.

Tajhat Zamindar Palace

Popular by the name Tajhat Palace or Rajbari, the Zamindar residence of jeweler Kumar Gopal Lal Roy was built at the beginning of the 20th century. Standing in the south of Rangpur City, the house exemplifies neoclassical architecture (Ahmed & Kabir, 2010). The palace's layout takes the form of a U-shape and contains 22 apartments distributed over two levels (Ahmed, 1986). Two water reservoirs, a backyard court, a water spring in the frontcourt, flower gardens, and trees altogether create a pleasant landscape. With a fusion of traditional Bengali, North Indian and European architectural design, the house forms a distinguished style regarded as Racial Classism (Ahmed & Kabir, 2010). Representing 20th-century occidental architecture, the palace displays a grand staircase, raised platform, symmetrical wings, an octagonal dome, Corinthian columns, and ornate semicircular arches (Kabir, 2009).



Figure 4. Tajhat Palace (Source: Author).

Following the abolition of the Zamindari system, the owners emigrated from the country. The house initially served as the Rangpur High Court Branch of the Supreme Court from 1984 to 1991 (Ahmed & Kabir, 2010). Throughout that duration, the house was in a reasonably well-maintained condition (Ahmed, 1986). According to Chandan (2016), some modifications, for instance, the construction of a police barrack on the rooftop took place afterward. After being acquired by the government's archeology department, the house has been declared a protected monument owing to its heritage value. In 2005 a part has been converted into a museum possessing antiquities belonging to the city (DOA). By prioritizing the preservation of the original building materials as much as possible, conservation efforts involved minimal modifications and no new construction. The Zamindar residence is presently among the top tourist attractions in Rangpur City.

Baro Sardar Bari

The historic Baro Sardar Bari in Sonargaon stands as a unique example of the restoration of heritage buildings in Bangladesh. According to the inscription on the entry wall, the construction of the house dates back to the early Mughal period. The residential complex was constructed in 1892 with an addition in 1902 by a wealthy Bengali Zamindar (Lee, 2021; Bari, 2021). An addition of a verandah, a front courtyard, and a new entrance occur during that period. The new entrance was designed using a traditional ornamentation technique known as "Chinni Tikri" or China mosaic (Adnan, 2021). According to the locals, the house was once comprised of a treasury, courtroom, Thakur Ghar (pray zone), dance hall, bathing zone, and secret passageway. The vast complex displays a remarkable example of colonial architecture covering over 27000 square feet and more than 80 rooms (Mohsin, 2018).



Figure 5. Baro Sardar Bari (Source: Author).

After the 1947 partition, the building deteriorated and collapsed, with its roof and other sections sustaining significant damage. The structure was acquired by the Bangladesh government after the country's

independence. The restoration of the house to its original state was the goal of a public-private partnership formed in 2012. In total 150 experienced and skillful masons from Naogaon and Paharpur were appointed to restore the original beauty of the house (Bari, 2021). According to the conservation architect, the process included documentation and preparation of detailed drawings of the façade and ornamentation, reconstruction of the inner courtyard, and plastering of interior walls (Ahmed, 2018). As stated by him, the lack of available published literature on its social history made the process challenging. To safeguard the evidence from the Mughal to Colonial period and its complex history, the majority of the building underwent restoration. This entailed employing new techniques and materials for structural stability, such as replacing the stained glass with broken bottles in the columns and swapping cast iron railings with aluminum railings. As of 2018, the house remains a top tourist destination serving as the Folk Art Museum of Bangladesh.

Study Area Selection and Participants

Despite its status as Bangladesh's second-largest city as well as its abundance of notable cultural sites, none of Chattogram's Zamindar houses have been recognized or documented as protected heritage sites as yet. Rapidly increasing urbanization has a considerable effect on the structures and thus is taken as the main criterion. A preliminary survey has been conducted on different parts of the city to identify the existing houses. The selection has been considered by marking the shift of urban pressure from the urban to peri-urban to rural settings as each area has its unique characteristics and challenges. This made it possible to conduct a comparative analysis of the three regions and the growing influence of urban development on houses.

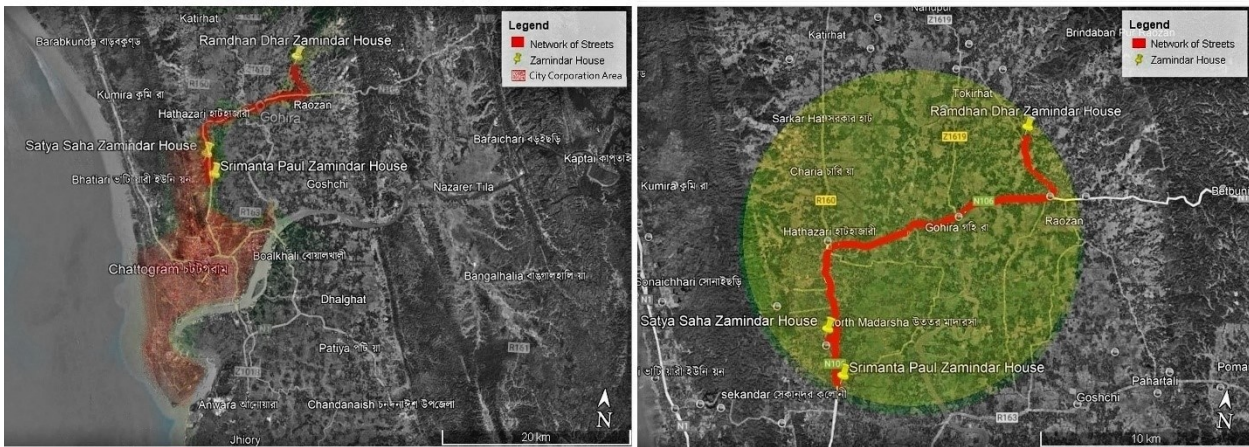


Figure 6. Selection of the Study Area (Developed by Author, Source: Google Map).

Taking a radius of 20km with the Halda bridge of Gohira as a center, the selected area indicates rural-urban linkage. Zamindar Houses of Srimanta Ram Paul and Satya Saha are respectively located in Chowdhuryhat and Nandirhat in the same upazila Hathazari. Ramdhan Dhar Zamindar House on the other hand is located at Dabua parishad of Raozan upazila. With a travel time of about one hour around the total route, the area is situated at a moderate distance from the city. The period of the survey spanned from October 2022 to May 2023. Three groups of 50 individuals from each area have been chosen by random sampling technique. The study followed ethical guidelines to assure that the participants' confidentiality is maintained. Out of a total of 150 participants, 57 women and 93 men have been selected. The survey covers the local community members, neighboring residents, tourists, owners, and local news reporters for the selected areas.

Description of the Selected Cases

The selected home compounds were erected during comparable timeframes, approximately one century prior. There have been no national or regional-scale investigations performed on these properties and none have been included in the protected heritage list by the Department of Archaeology. Thus, the sources of data mostly involve field surveys.

Table 2. List of Selected Study Areas (Source: Author).

No.	Name of the House	First Landlord	Establishment Year	Location	Area	Purpose of use (Initial)	Purpose of use (Present)
1.	Srimanta Paul Zamindar House (Compound 1)	Srimanta Paul	1930	Fatehabad, Hathhazari, Chattogram	Approximately 3.5 acres	Residence and Kachari of the landlord, Worship place.	Residence (heir to the landlord and family), Worship Place, Rental housing.
2.	Satya Saha Zamindar House/ Laksmicharan Saha House/ Nandirhat Zamindar House (Compound 2)	Laksmicharan Saha	1890	Nandirhat, Hathhazari, Chattogram	Approximately 5 acres	Residence and Kachari of the landlord, Worship place.	Residence (heir to the landlord and family), Worship place, Rental housing.
3.	Ramdhan Dhar Zamindar House (Compound 3)	Ramdhan Dhar	Late 19 th Century	Dabua, Raozan, Chattogram	Approximately 10 acres	Residence and Kachari of the landlord, Worship place.	Residence (heir to the landlord and family), Worship place.

Srimanta Paul House Compound

The Zamindar house stands as a significant example of the brick architecture of the early 20th century. The structure with little-known history has not been documented to date. As stated by local people, the area was the center of most activities for the peasants and communities of Chikondondi and Dakshin Pahartali. The war resulted in armed robbers looting the mansion of ornamental and expensive parts worth over Taka 3 Crore. The landlord's family moved to Kolkata to safeguard themselves from the Pakistani army's assault, where 'Radio Akashvani' broadcasted songs of freedom performed by the landlord's sons. The Kachari House and Durga Temple were burned. The family returned a few months after the country's independence, and presently the house is inhabited by the Zamindar's grandsons and granddaughters.

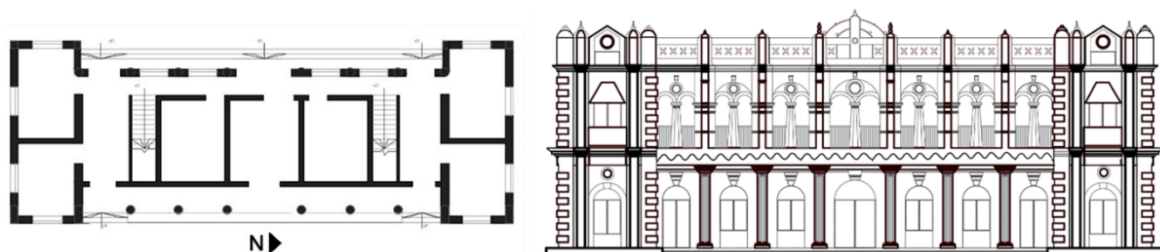
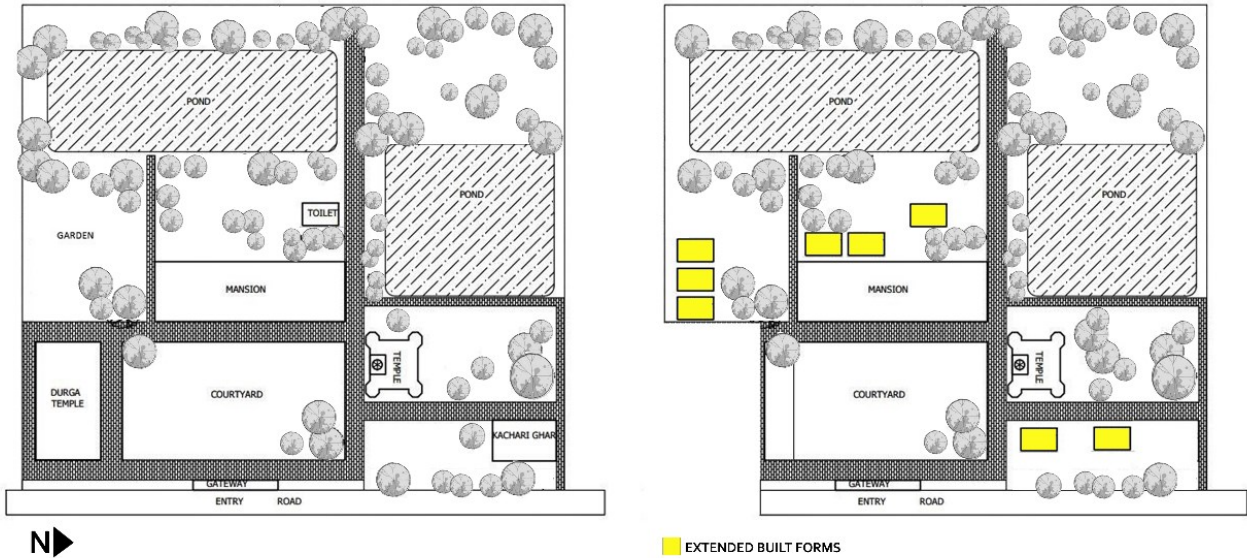


Figure 7. Ground Floor Plan of Andarmahal (left) and Andarmahal Elevation (right) (Source: Author).

"A few years back, we composed an article to emphasize the significance of preserving it. Despite publishing it, we received a limited response. As a result, we began the preservation work ourselves but failed to continue for the lack of correct renovation guidelines." -Adult Male, Family member

A Kachari House, Andarmahal, Durga temple, Kitchen, Bathing zone, and two ponds were originally planned to be included in the structure. The colonial architectural style is represented by attractive ornamentations both in the interior and exterior walls, plain columns with decorative bases, and arched openings. The structure has suffered severe damage over time. Due to the deformation, cracks, and decay of many parts, the owners renovated a few areas. The use or influence of original materials or patterns has been neglected during the replacement. The railings previously made of expensive wood were looted during the war and have been replaced with railings of stainless steel. Iron rods instead of wood have been used in the reconstruction of the window frames. The plan has been interrupted from various sides as new structures for residence extensions, renting houses, and a few shops have been built in an unplanned manner. The garden features various rare plants that are useful to the people in the area. The temple was restored in 2006. Durga Puja and its colorful fair have been continued for more than a century. People from around the city visit and



witness the grand celebration during the puja.

Figure 8. Original Roof Plan (left) and Existing Roof Plan (right) (Source: Author).

Satya Saha House Compound

Laksmicaran Saha House or Nandirhat Zamindar Bari are alternative names for the renowned Satya Saha Zamindar House. According to the locals, the areas controlled by the Zamindar were Hathazari, Nazirhat, Dhalai, Gumarmardan, Jobra, Alipur, and Fatehabad. About 10,000 farmers from these regions paid rent every year and participated in the Raj Punyah celebration. Zamindar’s grandson Satya Saha gained widespread recognition as a music director and a composer as well as awarded Independence Day Award by the government. The common people currently refer to the house as Satya Saha House owing to his popularity. The families presently living here include their descendants up to the great-grandchildren.



Figure 9. Andarmahal Elevation (left) and Kachari House Elevation (right) (Source: Author).

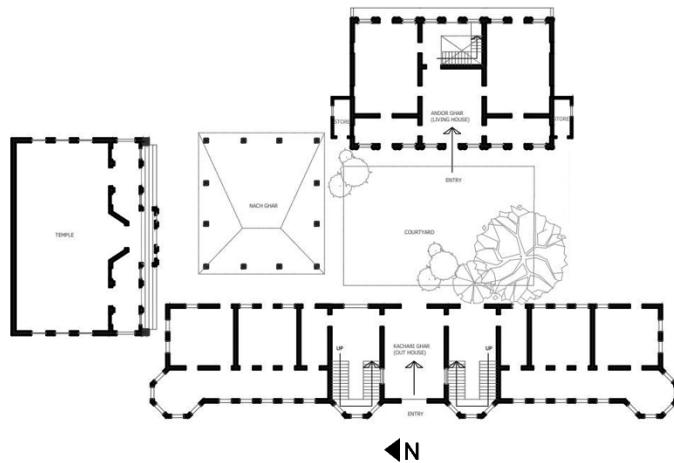


Figure 10. Ground Floor Plan of Andarmahal, Kachari House and Temple (Source: Author).

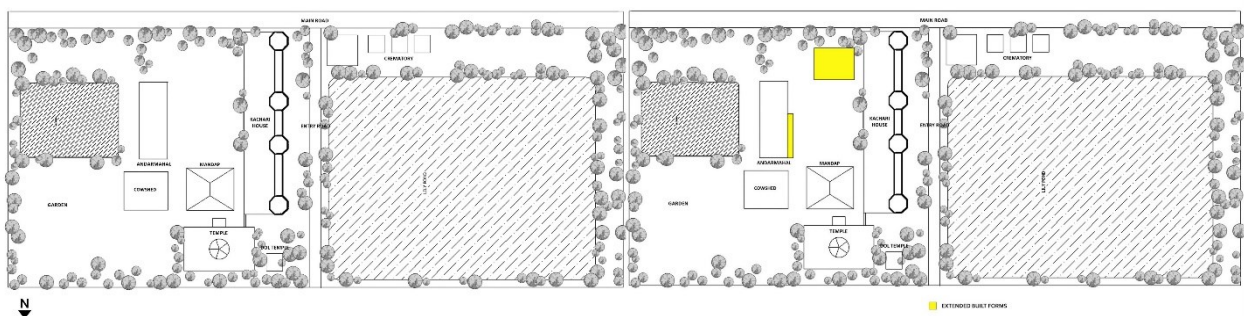


Figure 11. Original Roof Plan (left) and Existing Roof Plan (right) (Source: Author).

The area comprises a two-storied Andarmahal, a two-storied Kachari house where the accounts of plots and properties were calculated and preserved, a temple, a warehouse, a kitchen, and a mandap of worship. Besides, a small stable for cows and horses, cropland with three ponds, a vegetable garden, and paved pond-ghat have been planned in the region. The family crematorium has been placed on the bank of the pond. The Kachari house is a double-domed house at the entrance of the complex. It also served as an "Atithishala" or guest house during the colonial era. The inner house or Andarmahal encompasses arched openings with decoration, detailed wall ornamentation, and ornamented columns. During the war, the well-known lion gate was looted together with the expensive ornamental components on it.

Aging and deterioration of materials are observed in most parts of the buildings. Cracks in the roofs and deformation in the decorative elements are visible. The poorly executed urban planning in the locality has affected the adjacent area and the central residential complex. Currently, multiple constructions are observed clustered around the property. Although the family members have allowed limited renovation works, extensions on the ground floors of both houses tend to hide the dramatic facades of the buildings. The use of substitute materials led to further structural damage during the repair and replacement of various parts. To cite an example, valuable cast-iron railings looted during the war have been replaced with low-cost wood. The usage of this resulted in joints cracking. In addition, a few openings in the walls have been sealed off with red bricks for security purposes. Nevertheless, the exterior currently shows poor work quality of modern replacement.

'We do not have many qualified professionals here. As the buildings are losing their structural stability, some family members are in favor of demolishing them and building new homes in the area.' – Local Reporter, Family Member.

Despite the publication of multiple news articles, the house compound is presently at risk of disappearing due to the absence of professional guidelines and budgetary support.

Ramdhan Dhar House Compound

The house ranks among the oldest in comparison to other study areas. During the colonial era, the house was a prominent landmark and attracted visitors from various social classes and professions. Recalling past events, the locals mention the contribution of the Zamindar in shaping the area's socio-economic and educational structure. The family contributed largely to the establishment of Dabua Jagatnath Hat, Dabua Hospital, Dabua Union Parishad Bhaban, Chikdair Police Outpost, and Rauzan RRAC Model High School. The opulent lifestyle of

the landlord's family promoted the growth of local businesses such as jewelry production and the manufacture of decorative utensils. The Durga Puja festival hosted a grand fair where sweets, jewelry, toys, and clothing were sold. After the death of Ramdhan Dhar, his adopted son Tejendra Chandra Dhar became the landlord. At present, Zamindar Tajendra's immediate family members residing in the house consist of his son and daughter, and their respective families. According to them, statues of gods and goddesses in the temples were made of Ashtadhatu, and "Kosti Pathor" (fine-grained dark siliceous stone), which were looted along with other expensive decorative elements of the house during the war.

"My grandmother worked as a cook for the family. She saw several luxury items at that time including ornamented plates and kettles made of original silver." –Female Adult, Local Resident

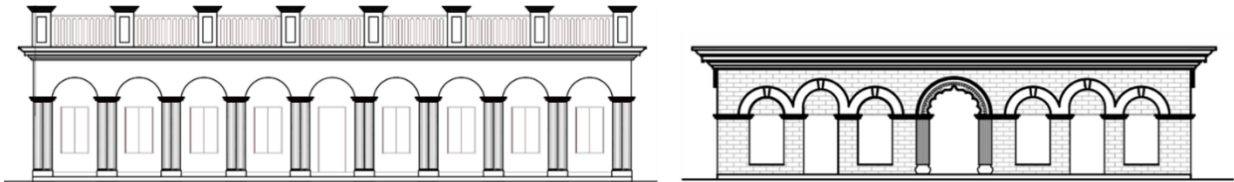


Figure 12. Andarmahal Elevation (left) and Kachari House Elevation (right) (Source: Author).

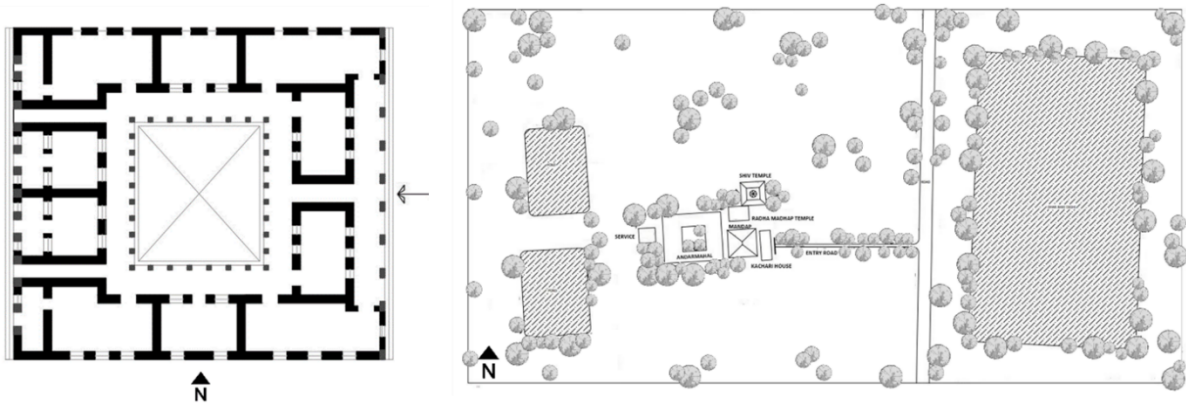


Figure 13. Ground Floor Plan of Andarmahal (left) and Original and Existing Roof Plan (right) (Source: Author).

The main compound is situated on the west side of the entry road and an enormous pond called "Dhar Bari Dighi" is on the east. The compound consists of a public zone with gateways, a Kachari house or outhouse, a prayer area, Shiv Temple, and Radha-Madhav Temple, and a private zone covering Andarmahal or inner house, dance hall, kitchen, bathing zone, and two ponds. Built with brick and lime surki, the house displays grandeur columns, arched openings, and exquisite ornamentation. Varieties of plants including Jackfruit, Mango, Black Plum, Guava, etc. trees are present surrounding the house. City dwellers make expeditions around the region as part of their visit. During Durga puja and Doljatra, the family members and the Hindu community in the city take part in the celebration following the earlier rituals and traditions.

"No one came forward from the local authority for conservation. We have not changed much inside and outside. Only a few sunshades were fitted a few years ago. Over time, many parts of the house have crumbled and decayed."–Male Adult, Owner.

Few articles have been published in the local newspapers regarding its conservation, but no official initiative has been taken to safeguard it as yet. The Kachari house is presently in a ruinous state and its ornamentations on the walls have faded. While chunks of plaster are falling off the plaster, heavy moss growth is weighing down the roofs of both the Andarmahal and Kachari house.










Data Analysis





The preceding segment implies that the urbanization pressure on historical structures is swiftly shifting from urban centers to rural regions, resulting in the encroachment of these sites and causing extensive damage to historic buildings and their surroundings. The assessment of the built forms and compounds involves conducting field observations and evaluating them based on a range of criteria, including typology, zoning, construction materials, architectural styles, notable architectural features, and their deformed or damaged parts.

Table 3. Analysis of Typology, Zoning, Materials and Architectural Style.

Title	Typology	House Orientation	Spatial Organization	Construction Materials	Architectural Style
Compound 1	Introvert House (Courtyard Detached Type)	Andarmahal is oriented east-west, and the temple is oriented north-south.	Public Space: Entry road on the east, and Kachari House on the south. Quasi-Public Space: Temple on the north of the compound, and a courtyard in the center. Private Space: Andarmadal and a pond on the west and another pond on the north.	Mainly brick, while the lime mortar employed for bonding purposes. For decoration, lime surki, and plaster applied.	Racial Classicism
Compound 2	Introvert House (Courtyard Detached Type)	Andarmahal and Kachari House are oriented east-west, and the temple is oriented north-south.	Public Space: Entry Road, Kachari House, and a pond on the west. Quasi-Public Space: Temple on the north and prayer space in the courtyard. Private Space: Andarmadal and a pond on the east.	Mainly brick, while the lime mortar employed for bonding purposes. For decoration, lime surki, and plaster applied.	Hybrid, Indo-Saracenic and Euro Indian Style
Compound 3	Introvert House (Courtyard Enclosed Type)	Andarmahal and Kachari House are oriented east-west, and the temple is oriented north-south.	Public Space: Entry Road, Kachari House a large pond on the east Quasi-Public Space: Temple on the north and prayer space in the courtyard. Private Space: Andarmadal and two ponds on the West.	Mainly brick, while the lime mortar employed for bonding purposes. For decoration, lime surki, and plaster applied.	Euro Indian Style

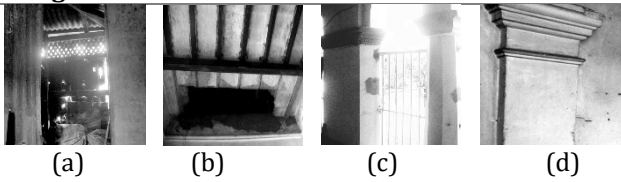

Table 4. Analysis of Architectural Features.

Architectural Features	Images			Compound 1	Compound 2	Compound 3
	Compound 1	Compound 2	Compound 3			
Roof				Rafters and beams used in building the roof	Rafters and beams employed in building the roof	Rafters and beams used to carry the span
Openings				Arched doors and windows made of wooden panels, colonnades present	Arched doors and windows made of wooden panels, colonnades present; jalousie shutters present	Arched doors and windows made of wooden panels, colonnades present
Column				Doric Columns and plain pilasters	Corinthian columns, Hybrid ornamented engaged	Doric, and Indo-Islamic columns with carved lotus bases borrowed from

				columns that support the arches	the Mughal period
Arch		Venetian and semi-circular arches	Decorative semi-circular, multifoil, and round arches	Decorative multifoil and semi-circular arches	
Dome		One small hemispherical dome or cupola on the temple	Hemispherical domes on the Kachari house and temple	Faceted domes on the temple and entry gate	
Stair		Timber, reinforced with steel or brick joists, and risers more than 8"	Both timber and concrete stairs and risers, more than 6"	Concrete stairs and risers about 6" high	
Decorative Elements		A decorative parapet with finials, a sole crest, and two pediments; carved moldings with decorative floral treatment on walls, arches, columns, ventilators, etc., and projecting quoins	Carved moldings with decorative floral treatment on walls, arches, columns, railings, ventilators, etc., and projecting quoins, ornamented cornices, eaves, and brackets present	Decorative parapets, and carved moldings with decorative floral treatment on walls, arches, columns, ventilators, etc. present	

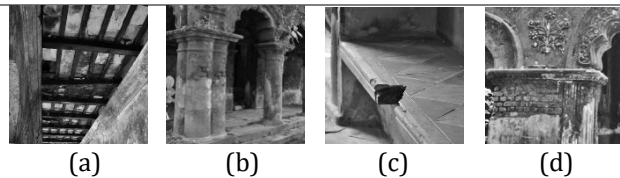
Masood Reza's (2008) analysis of courtyard arrangements and Mowla's (2000) style classification have been used as the basis for examining the typology and style. Following this, the responses of study participants are explored to explore their perception of the heritage, site condition, and current practices.

Table 5. Analysis of Deformed/Damaged Parts.

Name	Deformed/Damaged Parts	Images
Srimanta Paul Zamindar House	(a) Multiple rooms have dysfunctional doors, (b) certain areas on the roof have developed holes, (c) cracks emerged in the columns due to the addition of steel railings, and (d) a few pilasters are undergoing shape changes.	
Satya Saha Zamindar House	(a) In certain sections of the temple and Kachari house, the cornices are deteriorating, (b) plaster has come off in some walls, (c) several railings have collapsed, and (d) a few casement windows have been damaged, and substituted with low-quality materials.	

Ramdhan Dhar Zamindar House

(a) The roof is slowly developing holes in certain areas, (b) certain columns display cracks, (c) the seats in a few places are breaking down and (d) the ornamental designs on the walls and arches are gradually becoming less visible



Though people acknowledge heritage significance, the outcome reveals that inadequate expertise, insufficient budget, inadequate regulations for the site and lack of documentation primarily mostly pose obstacles in the decision-making process of preserving the buildings. Figure 15 (right) outlines the challenges encountered, while the suggested measures to overcome them have been analyzed in detail in the next section.

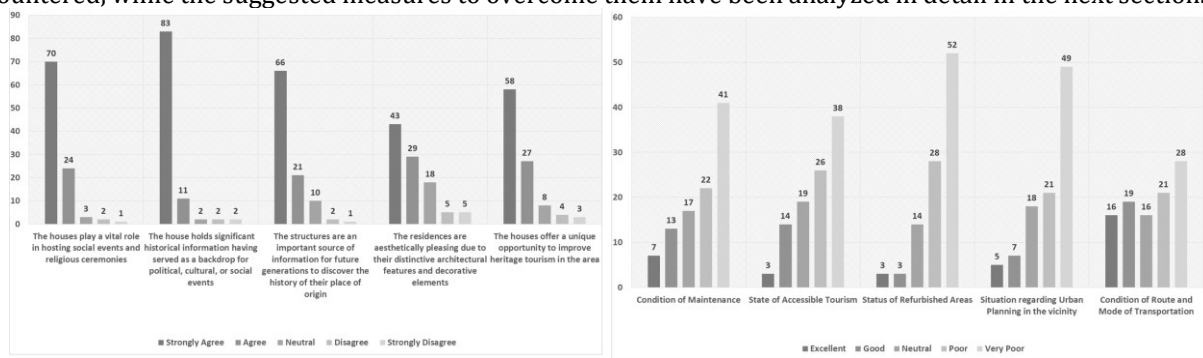


Figure 14. Perception on Heritage Significance (left) and Perception on Site Condition (right) (Source: Author).

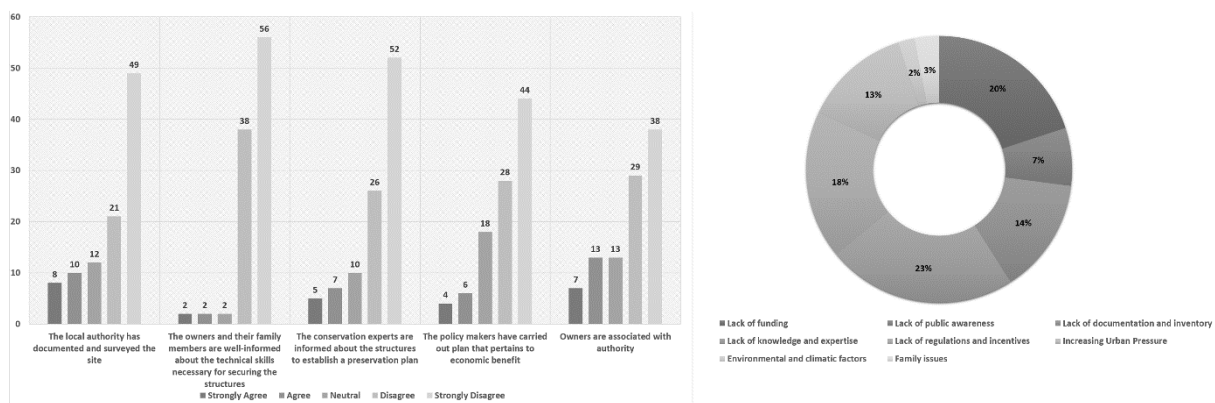


Figure 15. Perception on Current Practice (left) and Perception on Challenges of Preservation and Management (right) (Source: Author).

Discussion and Recommendation

As seen in the analysis, the studied structures are rapidly declining along with their colonial features and research value which could help address current architectural issues. Urban growth and high land prices in the areas are increasing the pressure for development, with multi-story buildings gradually invading the house compounds from urban to rural areas. Private ownership of the houses makes it challenging for the government, conservation architects, or archaeological departments to conserve them, whereas the loss of original plans and designs erases the knowledge and innovation behind these hybrid colonial design practices. Thus, the foremost priority is to ensure that the houses are incorporated into the official register of preserved historical sites in Bangladesh.

One of the most critical steps in protecting the sites is to strengthen legal protections. The effective enforcement of heritage conservation laws is the responsibility of the authority, and this can be accomplished by assigning qualified staff to monitor these sites and ensure that the conservation laws are followed. In addition, proper land use planning around heritage sites, the development of heritage conservation plans, and the effective management of heritage destinations are essential to support the improvement of conservation practices and sustainable use of these places. This highlights the need for a multi-sectoral approach involving various stakeholders such as tourism, agriculture, government bodies, religious and community institutions,

heritage conservation organizations, environmentalists, and development agencies to ensure the sustainability and community benefits of the heritage sites. The identification of the protection forms, that is, whether the structures require preventative or remedial conservation, reconstruction or restoration, preservation or adaptive reuse requires thorough investigation. This necessitates a comprehensive understanding of the rate and types of deterioration, as well as site requirements. Advanced technology should be utilized for documentation and structural analysis. According to Song and Selim (2022), when architectural heritage is managed using 3D modeling and IoT, it indicates a new interpretation of smart architectural heritage, which meets diverse demands like documentation, virtual tours, and adaptive reuse. Moreover, any modifications made to the building must maintain its original design and character, and work with the historic fabric to avoid damaging defining features and finishes. To restore the building's previous structural system without causing damage, a skilled team must be assembled. Environmental and climatic factors, including weather, temperature, and pollution, must be carefully scrutinized to measure their impact on the structures.

Heritage tourism has become increasingly popular in recent years. For the selected sites, it can offer significant economic benefits for both local communities and authorities. Tourism can create jobs for local communities around the houses, from tour guides and hotel staff to artisans and restaurant workers. Through sustainable tourism development, an established association between local requirements, natural resources, and tourism can eventually promote cultural heritage (Lim et al., 2023). As tourists are not purely guided by their emotions and they tend to seek out information to design their travel routes (Wei et al., 2022), the inclusion of cultural mapping or oral storytelling concepts may enhance the tourists' travel experience in the selected sites. This will allow them to gain a deeper appreciation for the history, culture, architecture, lifestyle, and festivals. The residents' perception of their duty to conserve heritage is strongly influenced by how much they recognize its value (Fang et al., 2021). Accordingly, by highlighting the significant historical sites through tourism, residents and community people will become more aware of their existence and value. Moreover, by utilizing the "Heritage Walk" concept, historic cities in Western countries have achieved long-standing success in promoting heritage tourism. Since the selected Zamindar houses are situated along one particular road, it presents an opportunity to create a heritage trail for visitors. Due to their proximity to the University of Chittagong, the houses could witness substantial interest from young visitors from the campus, thereby promoting the city's history.

Public and private collaboration is an essential aspect of heritage conservation. These partnerships can provide a reliable source of finance for preservation projects that may be too expensive for either the public or private sector to undertake alone. If the community and residents are permitted to participate in conservation practices, receive training and capacity building, and are involved in decision-making processes, the importance of the sites will become increasingly evident to them. Additionally, it is vital for the authority to establish education and awareness programs. This can include public outreach programs that highlight the importance of the conservation and management of these architecturally as well as historically significant houses.

Conclusion

The Zamindar houses possess heritage values and distinct architectural features that can provide a new outlook to individuals. If the structures are not safeguarded, the fundamental ideology and architectural importance of the colonial architecture of the region may not be appropriately acknowledged. The study approves that various factors that significantly affect conservation practices in the study areas include lack of funding and public awareness, insufficient documentation and inventory, lack of regulations and incentives, environmental and climatic factors, family issues, etc. Additionally, lack of stakeholder involvement and urban pressure around heritage sites have been identified as challenges hindering conservation efforts. The structural weakness of government and non-government institutions concerning heritage as well as the lack of knowledge and expertise in the area worsens the condition.

The findings also suggest that the conservation of the sites is a challenging task and requires the collaboration of the government, heritage architects, the owners, and the community. In safeguarding and promoting heritage sites through activities such as tourism, education, and awareness creation, a united effort among them is a prerequisite. Therefore, it is necessary to establish a management system that incorporates participatory decision-making processes and addresses significant issues and challenges to optimize the values and sustainability of cultural heritage in Chattogram.

This study strives to add to the expanding area of heritage conservation in Bangladesh by exploring the methods and obstacles to preserving Zamindar houses with distinct colonial design concepts, which are of utmost importance to designers and researchers. However, the study's limitation lies in the fact that it uses three case studies of a specific region, which may not be representative of all Zamindar houses of the country. Consequently, the findings cannot be implemented in all regions and structures. To overcome this limitation,

further study could include the addition of larger areas, more such houses and communities to achieve the intended outcome or grasp the broader perspective. This would assist to identify additional factors that contribute to conservation and management and a more complete understanding of their implementation. Moreover, the conservation of Zamindar houses should not be limited to preserving the heritage property itself, but should also consider the broader aspects such as the promotion of destination and country image, strengthening of sociocultural ties, and serving as a tool for economic integration through tourism. A comprehensive survey of more regions and the development of a holistic framework for conserving these structures involving collaboration with local stakeholders, conservation experts, and academics would thus result in the proper safeguarding of these historic buildings.

Acknowledgement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of Interests

The author declares no conflict of interest.

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