

## **RESILIENCY OF HISTORICAL BUILDINGS TO MITIGATE CLIMATE CHANGE IMPACTS THROUGH VERNACULAR ADAPTATION**

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### **ABSTRACT**

Resiliency of historical buildings has become more venerable because of the climate change impacts and rapid urbanization of 21st century. Every year, Bangladesh is affected by devastating calamities for the ge-ographic location, which threatened mostly the existence of historical buildings in the southern portion. Though the archaeology department has made some efforts to preserve ancient structures, the majority of these efforts have failed due to socioeconomic and cultural factors that have devastating consequences. Vernacular adaptation is considered a specialized conservation approach to adopt contextual needs to enhance the resiliency of cultural heritage over the last few decades. The purpose of the study is to demonstrate resilience of built heritage with its distinctive characteristics, opportunities, and obstacles to adapt to cli-mate change impacts emphasis on the practice of vernacular adaptation. The need to rehabilitate historic buildings to make structures more adap-tive to changing climates, as well as the comprehensive efforts required to minimize additional harmful emissions, will help to preserve the significance of cultural heritage. Vernacular adaptation aids to find out the contextual need by engaging the community people, which could be a fruitful initiative to preserve the resiliency of cultural herit-age. Cultural diversity is known as a tool for adaptation and will allow measures to mitigate the impacts of disasters. The resiliency of cultural heritage tries to adapt them to meet specific functional and aesthetic needs prerequisites of that context have become highly specialized prac-tices to preserve the historical building will also help to regenerate it. For examine the approach Jashore Collectorate Building, Town hall and the Old judge court are taken as a case which carries specific architectural characteristics from the British colonial period and a 200-year exploita-tion history, that is losing its pride due to the absence of nourishment and concentration of the community and concerned authority. Engaging the community people to preserve the cultural heritage can be a sustain-able initiative to adapt with the challenges of the 21st century. As a methodology, after reviewing applicable research to compare types of methods to determine the compatible method to enhance the resilience of historical buildings as well as hybrid approaches (both qualitative and quantitative approaches) such as participatory evaluation, questioner survey, photography and activity mapping to decide the need for local significance and vernacular adaptation could be the optimal approach to preserve the ancient history. In conclusion, the vernacular adaptation method will be described as an approach to enhance the resiliency of the built heritage, will also help to regenerate it, this method focuses on contextual need, exploring the possibilities and risks of joint interven-tions between community and context.

**Keywords:** *Resiliency, historical infrastructure, climate change, Vernacular adaptation*

### **1. INTRODUCTION**

Heritage carried inherited traditions, monuments, objects, and culture from the past to shape the future with the range of contemporary actions, meanings, and behaviours, and the craving for an interpretation of heritage is so deep-rooted that, unless having the constrictive outlook of the past, we are drawn either to mysticism or cynicism(TISA and KHAN). Heritage is far more than the protection, discovery, exhibition, or reconstruction of a set. It is local and specific, global and shared,

and may serve as a platform for political recognition, intercultural conversation, ethical reflection, and the potential basis for economic growth. Bangladesh, particularly the southern portion, has become more vulnerable to changing climate due to its geographic location and rapid urbanization. Every year, severe natural disasters threaten the majority of the historical infrastructure. In the past, the structure of the building connected with the distinctive traits of each landscape. Construction techniques were flexible to engage the environment and local materials were used. Globalization, on the other hand, has resulted in a gradual uniformity of architecture. The diverse repercussions of climate change, on the other hand, are forcing architecture to reclaim its vernacular perspective. Rainfall, droughts, floods, and storms are becoming more frequent and strong, posing a variety of threats to communities. The creation of tailored adaptation strategies that take into consideration the different consequences of climate change has emerged from government initiatives to address particular concerns. Though the archaeology department has made some efforts to preserve ancient structures, these efforts have failed due to socioeconomic and cultural factors that have devastating consequences. Vernacular adaptation is considered a specialized conservation approach to adopt contextual needs to enhance the resiliency of cultural heritage over the last few decades.

Climate change incorporates both human-caused global warming and its large-scale impacts on weather patterns. The current changes are more rapid than any other known event in Earth's history, resulting in devastating natural disasters such as rising sea levels, flooding, drought, hurricanes, and other calamities. Geographic location makes Bangladesh more vulnerable to face all of these phenomenon. Along with other socio-economic factors, the historical infrastructures are affected miserably every year. The resilience of historical buildings adapting them to meet specific functional and aesthetic needs and desires of that context has become a highly specialized area for vernacular adaptation in the field of heritage conservation practice over the last few decades. However, in juxtaposition with this incredibly humble activity, communities regenerate all manner of buildings in a cycle we term vernacular adaptation spontaneously and informally. In addition to being the legacy of the past, heritage plays a significant role in guiding economic growth and collective well-being. The concept of heritage was established in the eighteenth century, and the traditional architectural fabric was considered a container of material and immaterial assets (Plevoets and Van Cleempoel 2019). Dealing with historical structures was a prerogative of archaeologists, heritage-trained engineers, and architects throughout the 20th century, whereas contemporary architects focused their practice on new frameworks. Vernacular adaptation is an established method to preserve the inheritance of the past by adapting contextual needs by introducing sustainable materials. The historical buildings are being a vulnerable situation by the impacts of natural calamities, violence, crime, climate change. Community engagement can be a preferable initiative to revitalize the archaeological building with old traditions.

Here, we explored the durability of built heritage in the British colonial era that reminds us of slavery and abuse over 200 years of the East India Company. Here, we addressed three buildings of the ancient city Jashore to investigate distinctive characteristics, possibilities, and challenges to focus on vernacular adaptation activity. Jashore Collector's Building, Townhall, and Old Magistrate Judicial Vabon are the most significant buildings of the British Colonial Era losing their pried for tragic incidents, crime, climate change, and several other factors (Islam, Rahman et al. 2009). Through appropriate activities adapted to the region, these three building heritages may offer a direct and important contribution to sustainable development in terms of economic, social, and environmental dimensions. They may also be a valuable asset for attracting investments and fostering green, locally based, stable, and dignified jobs in sustainable activities like tourism, conservation, building, food production, traditional healing, and the creation of all types of crafts and the arts in general.

## **2. LITERATURE REVIEW**

Built heritage contains, senselessly and unbiasedly, the legacy of our silent past to human beings. Therefore, tradition bears the duty to unify the dignity and the shame of accountability. With time the dream of everlasting existence runs in history.

## 2.1 Historical infrastructure VS climate change

Historical structures, archaeological sites, monuments, their contents, and collections, as well as their intangible aspects, are a legacy from our past that provides a sense of place, identity, and aesthetic wellbeing to the community(Phillips 2015). Weathering processes have always been and will continue to be a part of these historical objects' relationships with their surroundings. Climate change is an additional potential threat as it exacerbates the expected rates of decay and contributes to the appearance of new phenomena. Climate change affects the frequency and intensity of hazardous events droughts, floods, and landslides, all of which have far-reaching consequences, including cultural heritage. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) has identified changes in temperature, precipitation, and atmospheric moisture, as well as SLR, desertification, and the interaction between climatic changes and air pollution, as threats to cultural heritage(Logan 2012), prompting the publication of a policy document the following year (UNESCO World Heritage Centre, 2008). More recently, a report published by the International Council on Monuments and Sites(Change 2019) summarized the key climatic factors and their mechanisms and impacts derived from consultations with experts.

## 2.2 Built heritage as resilience

However, in recent decades, perceptions of cultural heritage have shifted dramatically, with collections of movable and immovable artefacts in parks, libraries, historical resources, and collections bearing witness not only to the habits of royalty and the accomplishments of great artists but also to ordinary people's daily lives. At the same time, intangible values are fundamental aspects of heritage and have a powerful impact on the everyday choices and behaviours of the surrounding people. Cultural diversity is regarded as a sustainability catalyst that can help to minimize hazards. Maintaining cultural diversity into the future, and the knowledge, innovations, and outlook it contains, increases the human ability to adopt change. Built heritage, as a component of cultural diversity, is viewed as a key component of any community resilience plan. The “Managing Extreme Events and Disasters to Advance Climate Change Adaptation” defines resilience as: “the ability of a system and its parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions”(Jigyasu, Murthy et al. 2013). Resilience applies to both people, built and natural environment shaped by both physical and social factors. Table-01 shows how Socio-economic and environmental factors influence the resiliency of built heritage to mitigate climate change impacts. Heritage is not only a legacy of the past but also constantly influential in guiding the cultural growth and well-being of the community, also seems strongly related to the elements of sustainable social growth.

Table 1: Socio-economic and environmental factors for the resiliency of built heritage to mitigate climate change impacts.

<b>Informational</b>	knowledge behind the patterns of land use, spatial development or arrangements across historic landscapes and archaeological sites
	knowledge about resilient historic structures, techniques and materials used in the design and construction of historic buildings and structures
<b>Social</b>	Foster social cohesion and sense of place through connection between social life and built environment
	Enhance cultural identity, togetherness, collective history and shared memory
<b>Economic</b>	Conservation through adaptive reuse to enhance heritage continuity(transformation of churches into business spaces, reuse of historic canals for rainwater storage, transformation of the original function of water mills into renewable energy infrastructure)
	Driven of a tourism sector
<b>Aesthetic</b>	influence the design of appealing and interesting living and business environment
	improve spatial quality of urban and rural areas
<b>Environmental</b>	Carbon footprint reduction through retrofit of historic building and structures

### 2.3 Vernacular adaptation approaches the practice

Vernacular adaptation is a specialized method to regenerate a built environment by following its opportunities, threats, and obstacles according to contextual needs. Some buildings, however, slipped away from the formal approaches and are used, reused, and adapted in a spontaneous, user-led, or “vernacular” way. In his work, Fred Scott (2008) introduces the word vernacular in the context of building adaptation (Plevoets and Sowińska-Heim 2018). The reasons for the residents' change of the constructed heritage and historical remains in Split were practical, allowing scholars to obtain insight into the living situations of former individuals and societies. Apart from housing, however, ruined historical buildings and sites within the urban fabric have been reused in an informal, spontaneous way for artistic, cultural, or social activities, such as by squatting communities. The usage of the word vernacular in the context of user-led, spontaneous modifications of existing historical structures adds a new dimension to the urban fabric. Vernacular adaptation has been preserved as a significant aspect of built heritage from the last few decades through its spontaneous and user-led transformations. Today, the historical centre of Split is a palimpsest, an interweaving of fabric from different periods, conserved and shaped through constant vernacular adaptation. Sandler (2011, 2016) introduces “counter preservation” to point to an informal approach towards the historical build environment. She explains: In contrast with official preservation practices sponsored, defined, and approved by governmental agencies (including public projects and private developments), the informal treatment of historical buildings by diverse social groups is often more open-ended and dynamic by its very nature. Informal or unofficial approaches to the built environment often lack funding, support, and permanent legal status; as a result, these approaches involve improvisation, temporary solutions, and incomplete or makeshift interventions (Sowińska-Heim 2020). Table 02 illustrates the conditions of heritage resiliency and action on climate change adaptation by understanding the definition of adaptation priorities and implementation processes.

Table 2: The conditions of built heritage resiliency to mitigate climate change impacts through the vernacular adaptation process

Heritage resiliency and action on climate change adaptation	Define vernacular adaptation priorities	Implementation of adaptation processes
<p>Conditions:</p> <ul style="list-style-type: none"> <li>• Consciousness to climate impacts on historical building</li> <li>• Access to climate information</li> <li>• Connection between archeologists, policy makers and practitioners</li> </ul>	<p>Conditions:</p> <ul style="list-style-type: none"> <li>• Contextualize in historical and social needs</li> <li>• Link to development priorities according to contemporary need</li> <li>• Build structural capacity</li> </ul>	<p>Conditions:</p> <ul style="list-style-type: none"> <li>• Ensure understanding of need for implementation across adaptation strategy according to context need.</li> <li>• Strengthen technical capacity by using contemporary materials.</li> <li>• connections to other relevant development initiatives</li> <li>• Space for re-evaluation and reflection on responses</li> </ul>

### 3. METHODOLOGY

The study takes case-based hybrid approaches to examine how vernacular adaptation will revitalize the historical buildings to mitigate the climate change impacts in the southern part of Bangladesh. The study requires a thorough understanding of the present condition of selected structures and background significance. The historical data of the historical infrastructure (jashore collectorate building, town hall, old judge court) and other related documents have been collected from secondary sources. Google Scholar, PubMed, and other national archive web sites were utilized to verify the

materials' authenticity. Several research publications were thoroughly examined to grasp the notion of "Vernacular Adaptation".

Vernacular Adaptation is an established method that uses to preserve historically significant monuments all around the world. In some ways, this can revitalize the area by adding a new dimension. The study conducts informal discussion, semi-structured interviews of the communities, who are the main stakeholders. Key informant interviews with authority respondents were used to develop plans for heritage structures to mitigate climate change consequences. Additionally, spatial mapping, detailed drawings, photographs are used for a thorough understanding of the structure.

#### 4. FINDINGS FROM CASE STUDY

Jashore district, the first district of Joint Bengal and presently Bangladesh's 13th biggest metropolis, is located on the country's south-western border. Jashore was an autonomous state from the late 17th century until the middle of the 18th century. Historical events like the Indian subcontinent's territorial division and the liberation war influenced the proper documentation of building heritage. Lack of sufficient proof, management issues, many catastrophic events, violence, and a lack of finance, the age map, and comprehensive drawings of historical structures from the British colonial period was not documented thoroughly. We've chosen three of the period's most important architectural landmarks. The Jashore Collectorate Building, Town Hall, and the ancient magistrate judicial vabon have lost their significance for failing to take suitable initiatives not only from the standpoint of the government but also from the perspective of the users (Islam, Rahman et al. 2009). Figure 01 shows the location map of Jashore collectorate building, old judicial vabon and Townhall with existing conditions for the better understanding about the features of colonial periods building characteristics.

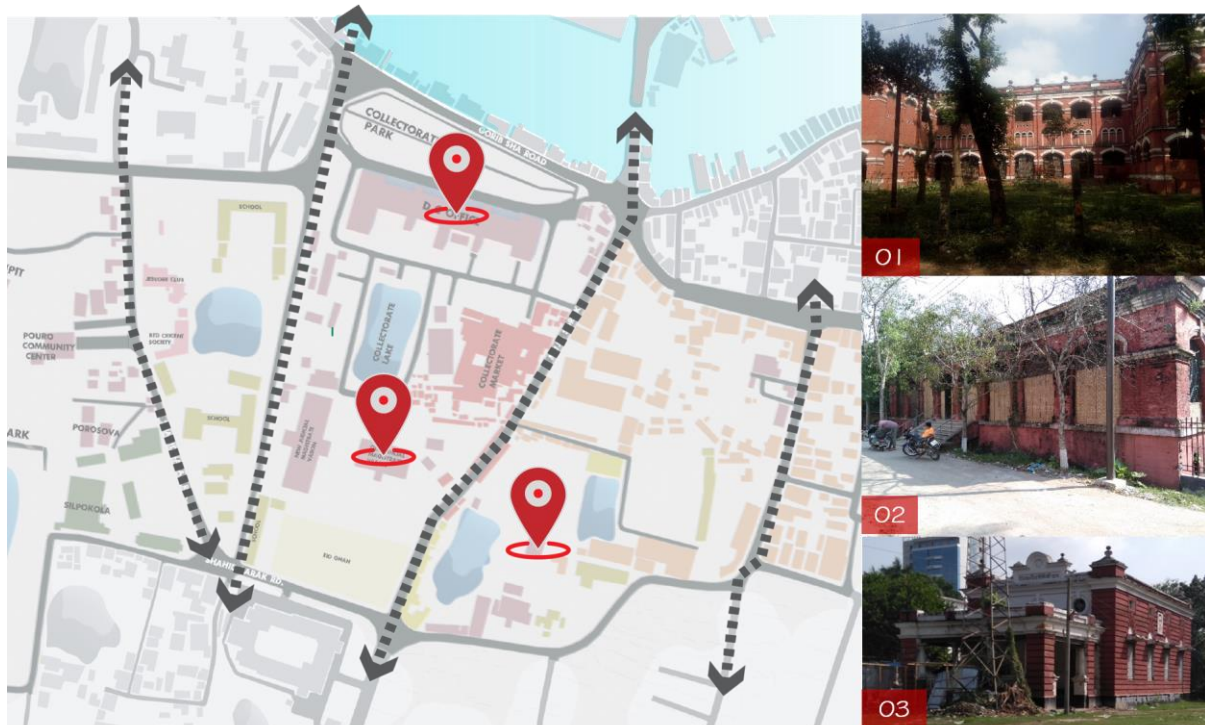


Figure 1: Location map of historical site, (1) Jessore Collectorate Building, (2) Jessore Old Magistrate Judicial Vabon, (3) Town hall or Alamgir-Sha-Hall. (Source: author constructed)

##### 4.1 Jashore collectorate building

Jashore Collectorate Building is one of the oldest British structures in the area followed by the British colonial style from 1883. It reminded everyone of the architectural and building design similarities that the British had used practically everywhere in India, primarily for government projects. The

arched entrances, enormous ceilings, enormously fat pillars, and thick walls of these structures were inspired by the prevalent colonial architecture observed in Punjab and Pakistan. Now, this building is used as a district magistrate's office. Archaeologists found a significant document of “Shipahi Bidroho” and “Nil-Bidroho” from the record room of this building.



Figure 02: Jashore Collectorate Building (Source: author constructed)

#### 4.2 Old judicial judge court

The building was another identical documentation of the British colonial period, conducted as Magistrate Judicial Vabon, the court building was an attractive one and not that much rush inside of it. People crowded in the court premises with their problems, and they needed solutions. However, as time passed, it became clear that adapting to population expansion was insufficient to deliver justice to the required people. As a result, the court operations were relocated to the new structure, which was retained as a large open area with the potential to be transformed into a museum, public meeting place, clubs, or other uses depending on the context.



Figure 03: Jessore Old Magistrate Judicial Vabon (Source: author constructed)

#### 4.3 Alungir-sha-hall or Townhall

Townhall located in the same belt of Doratana, is currently utilized for public gatherings at its front premises due to a lack of maintenance and user ignorance. It is one of the most important public spaces in Jashore City, serving not only to entertain the public but also to host a variety of festivals and cultural events. A club for adult groups, an open stage, and a Central public library are available, while local children occasionally use the playground to play cricket.



Figure 4: Jessore Town Hall (Source: author constructed)

### 5. FINDINGS AND ANALYSIS

Vernacular adaptation is a widely accepted form of reinvigorating heritage by addressing user-dependent incentives, challenges, and obstacles. However, certain buildings slipped away from the traditional approaches and became naturally utilized, reclaimed, and adjusted. In the sense of spontaneous, user-led renovations of existing historic structures, the use sheds fresh light on the

debate. The heritage's globally recognized importance has inspired the introduction of modern restoration strategies and initiatives designed to create a harmonious partnership with the history and current urban planning processes by architecture schemes and social action. Table 03 examine the features of Jashore Collectorate Building, TownHall, Old Judicial Vabon according to its vernacular adaptation.

Table 3: Features of Jashore Collectorate Building, TownHall, Old Judicial Vabon according to its vernacular adaptation.

<b>Justifying component</b>	<b>Jashore Collectorate Building</b>	<b>TownHall, Jashore</b>	<b>Old Judicial Vabon</b>
Structural system	Following share wall structural system which is mainly followed in British colonial period.	Following share wall structural system which is mainly followed in British colonial period.	Following share wall structural system with arch which is mainly followed in British colonial period.
Building material	Brick wall, wooden door-window, cun-surki, concrete floor, iron railing, kori-borga roof cusing	Brick wall, wooden door-window, cun-surki, concrete floor, iron railing	Brick wall, wooden door-window, cun-surki, concrete floor, iron railing
Variation of adaptation	It's the main building used to run administrative district activities as DC office, front premises known as collectorate park. In the morning and afternoon, people gather here to enjoy the outdoors, playing, gossiping, and sharing their beliefs and thoughts. Many vendors are operating their livelihood by selling their goods into the built-up type backyard.	The main structure of it operates as adult male club. There is an open stage in front of the premises for performing art and cultural activities, Central public library for all groups of people, Local kids sometimes use the front playground to play cricket, social gathering, and fair and political parts seminars.	The built form is now kept as an abundant space, sometimes recognized as a crime zone for certain group of people.
Social participation	People gather here in different times for administrative works, passing their leisure times.	This hall building itself plays the role of youth club, front premises used for social gathering, fair or seminars.	For lacking of proper maintenance and social security people not come here.
Environmental factors	Lacking of proper policy making environmental factors are affected badly, unplanned infrastructure also become a threat to conserve the heritage both historical and natural.	Front premises of this built heritage also used for public gathering, playing and other activities but there is no authentic authority to preserve the environment, people damage the environment by throwing garbage here and there, used materials and so on.	This significant built heritage is now became abundant space, the existing ecological system are playing their role unaffectedly but by taking proper initiatives it can be a source resources.
Economic factors	Collectorate market is a bigger source of economic sources of the built heritage to preserve and maintenance of it, also many vendors are gathering here to serve the people.	Many vendors are gathering during the fair or seminar times with their contextual products.	There is no economic activities but proper initiatives can make it a productive way.

Figure 05 demonstrates the transformation criteria of historical building according to contextual need. The initiatives to mitigate the climatic change impacts on historical building is much more important to preserve the glorious past.

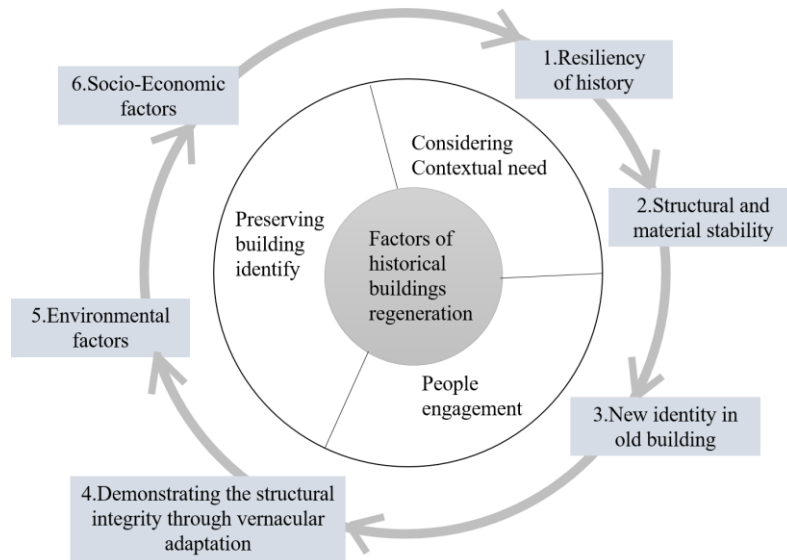


Figure 5: The transformation criteria of historical building according (Source: author constructed)

## 6. DISCUSSION AND SYNTHESIS

This research decodes the strengths and capacity of the built heritage to mitigate the consequences of climate change such as rising temperatures, high rainfall, rising sea level, strong wind, salinity, landslides, and so on through vernacular adaptation. Through such activities, gaining a greater awareness of the built heritage is required for the community to keep its image. This information should be focused not just on abstract discussions and meetings but realistic behaviors, gaining a better understanding of the community's needs for the proper role of a specific place. It is not necessary to adapt all buildings for a single function, such as a museum, instead of depending on the context to satisfy the community. Vernacular adaptation will regenerate the physical heritage with specific social value, adding a new dimension to mitigating the effects of climate change. Figure 6 shows the regeneration scopes of historical building according to contextual need.

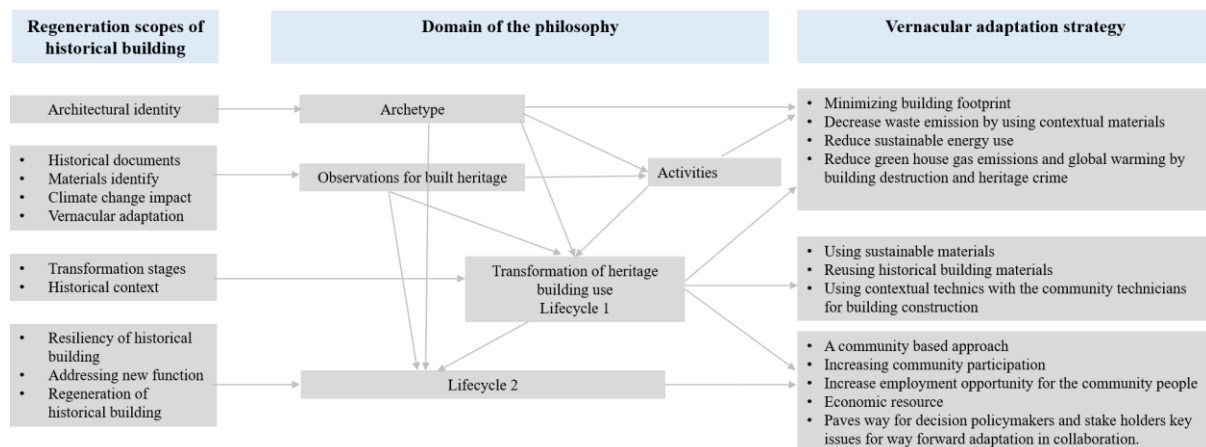


Figure 6: The regeneration criteria of historical building according to contextual need (Source: author constructed)



After examining various types of empirical research and consulting with citizens, taking proper vernacular interventions may be the concrete approach to address the needs of stakeholders, bringing another aspect to the cycle of heritage reinvigoration. Heritage conservationists are increasingly interested in adapting and repurposing historic structures for start-ups to protect the context. There are many explanations for this change, including the reality that the increasing scale of the developed infrastructure has restricted new building possibilities, the scope of heritage management boards, and the number and complexity of the buildings listed. The figure 04 shows climate change impacts on built heritage can be mitigated through vernacular adaptation process.

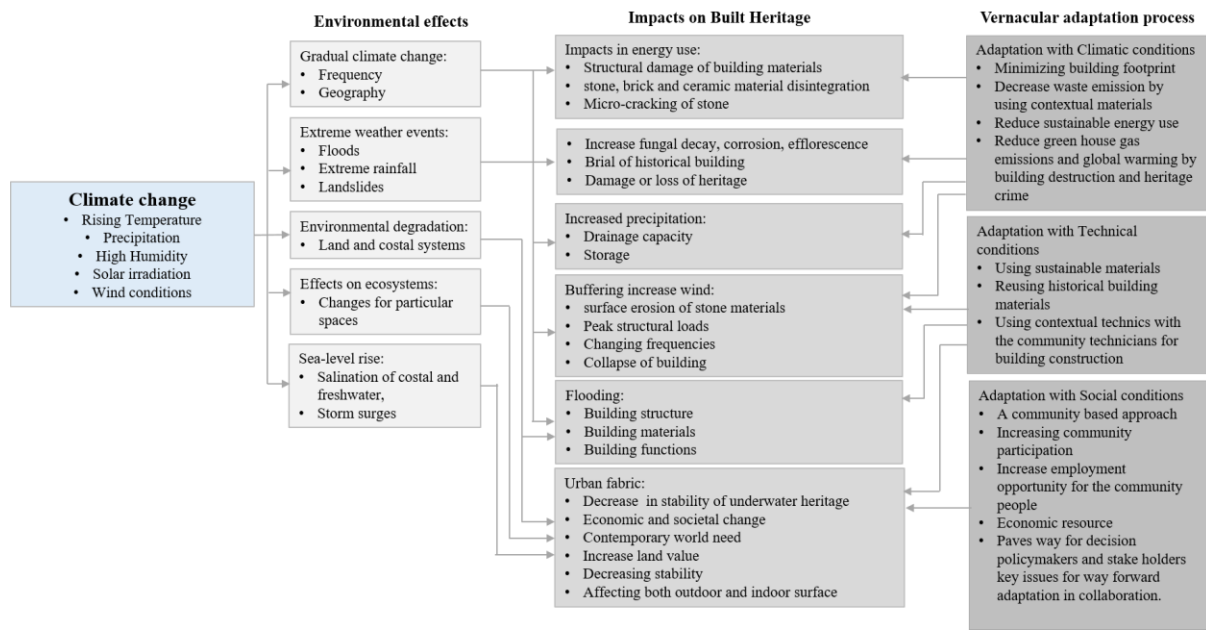


Figure 7: Climate change impacts on built heritage can mitigate through vernacular adaptation process (google & author constructed)

Jashore's Town Hall is used as a youth club, sometimes for fairs and seminars, but people are not concerned about the profile values in this built form, so they use it as an abundant place. The power of society-leading principles and setting community policies in different fields can allow them to rethink the heritage value to regenerate it through the vernacular process. But valuable heritage built form, we addressed here, Old Magistrate Judicial Vabon of Jashore, just kept as relic built form, increasing crime for not having social security. Proper community initiatives can add another dimension to regenerate this kind of built heritage. However, in practice, the division between the vernacular and the formal is not that strict, on the contrary, to regenerate the projects can be a successful example with collaboration between governments and user groups in establishing projects which are an added value for both groups. However, in the case of the Jashore, initiative, and collaboration must be matched to ensure a long-term favourable outcome for all parties. To regenerate the buried wealth of the past, more study and information about the various components underpinning (orchestrated) vernacular initiatives is required to meet the objectives in social, economic, and environmental dimensions.

## 7. CONCLUSIONS

Heritage is not only a relic of our history, but it also contributes to the development, redevelopment, and preservation of tradition, thinking, observation, monuments, items, and culture to form our future with the impact of the past. It is the range of contemporary activities, meanings, and behaviours that we draw from the past; the desire for an interpretation of heritage is so deep-rooted that, unless we have the constrictive outlook of the past, we are either to mysticism or cynicism. Heritage is a contemporary activity that has far-reaching consequences. It can be a farsighted feature in urban and

regional planning. It can be the political recognition platform, a medium for intercultural dialogue, ethical reflection, and the potential basis for local economic development. Most of the built heritage is struggling against contemporary development, climatic change, and functional adversaries. It was the demand of the past, to conserve the built heritage by regenerating it through vernacular adaptation. The government has established conservation rules that have frozen the lifestyle of the preserved region and have become a burden for future projections, so the regenerative program must understand and adapt the cultural fabric and social demands of the people to be more sustainable. Policies should provide to accommodate according to the need of the context to create interest in the private and public sectors to show their responsibilities to preserve the built heritage. In this paper, the documented features and historical context analysis of the British colonial period's socio-cultural, political, economic, climatic, and functional factors that increase vibrancy into day-to-day life at Bangle. The study will certainly open the possibility of re-evaluating the spaces of an evolving archaeological site0 area full of historical value through vernacular adaptation.

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## REFERENCES

- Change, C. (2019). *The Future of Our Pasts: Engaging cultural heritage in climate action* Outline of Climate Change and Cultural Heritage, International Council on Monuments and Sites-ICOMOS.
- Islam, A. M. K., et al. (2009). "ANALYSIS OF NODE PREFERENCE IN ASSUMING FUTURE URBAN GROWTH: A LOOK INTO THE CASE OF JESSORE TOWN, BANGLADESH." *PLAN PLUS* 5(1).
- Jigyasu, R., et al. (2013). "Heritage and resilience: issues and opportunities for reducing disaster risks."
- Logan, W. (2012). *States, governance and the politics of culture: World Heritage in Asia*. *Routledge handbook of heritage in Asia*, Routledge: 126-141.
- Phillips, H. (2015). "The capacity to adapt to climate change at heritage sites—The development of a conceptual framework." *Environmental Science & Policy* 47: 118-125.
- Plevoets, B. And J. Sowińska-Heim (2018). "Community initiatives as a catalyst for regeneration of heritage sites: Vernacular transformation and its influence on the formal adaptive reuse practice." *Cities* 78: 128-139.
- Plevoets, B. And K. Van Cleempoel (2019). *Adaptive reuse of the built heritage: Concepts and cases of an emerging discipline*, Routledge.
- Sowińska-Heim, J. (2020). "Adaptive Reuse of Architectural Heritage and Its Role in the Post-Disaster Reconstruction of Urban Identity: Post-Communist Łódź." *Sustainability* 12(19): 8054.
- TISA, S. A. And M. R. KHAN "HISTORY AS A LEARNING CONDENSER TO IMPROVE QOL (QUALITY OF LIFE)."