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Editorial

The historicity of a settlement is closely associated with the richness of its tangible and non-tangible heritage. It reflects the cultural identity of the human habitat, apart from revealing the form, fabric, and morphology of a settlement. But rabid urbanization, whimsical planning and oppressive approach to historic monuments and sites have led to disappearing and fast fading physical and cultural heritage. Localization of the targets under SDG 11, especially SDG 11.4, is far from reality. Lack of attention and deficient funds towards conservation of heritage in the human settlements, especially the towns and cities, have caused extinction of many heritage sites and monuments. They will remain the stories for the future generations, if nothing is done to maintain, preserve, and restore them. This issue of the journal has eleven papers and one book review revealing heritage reflections and conservation practices in diverse contexts.

The first paper by Jana Das Chaudhuri and Dr. Ashwani Luthra on 'A Review of Management of Heritage in the Master Plans of Delhi' points that Delhi is an agglomeration of historic cities, therefore, its sustainable development depends increasingly on the strategic management of its urban heritage. While heritage management policies that govern the urban heritage of Delhi are prone to a silo approach of management, the essential policy document, the Master Plan of Delhi, has the potential to a holistic approach through integrative planning. The paper reviews the urban heritage management system of Delhi through the four Master Plans of Delhi. The paper identifies that urban heritage management in the MPDs needs to be understood not in isolation but as reflections of emerging local trends and global heritage management developments of the times.

The second paper by Dr. Pratima Singh and Dr. Utpal Sharma titling 'Contextualizing Factors Influencing Resilience of Ahmedabad World Heritage City' highlights that the historic core of Ahmedababad, having nearly 2700 heritage listed buildings and sites, was inscribed as a UNESCO World Heritage site in 2017. The author opines that the said area has remained an example of resilient urban development due to its ability to effectively withstand urban heat stress, floods, earthquake, Covid crisis, among the others.However, it has faced a steady decline in the number of traditional heritage buildings and precincts as well as in its socio-economic and cultural landscape, making it increasingly vulnerable to urban shocks and stresses. Thepaper attempts to identify and document the key factors contributing to the historical resilience of the core city and how to effectively mainstream these factors while developing a comprehensive city disaster management plan and resilience strategy.

Davinder Pal Singh and Dr. Mahendra Joshiin their research on 'Transfer of Development Rights (TDRs) for Heritage Conservation in Amritsar' aim to take a look at Transfer of Development Rights (TDRs) as an incentive system to keep the heritage buildings and areas conserved. Their study highlights that historic buildings are an integral part of any city's character and identity, and their conservation is essential due to the connect and significance they contain about the past. It points that lack of conservation incentives, owners of heritage properties having few development options, and lack of understanding of their importance by the stakeholders contribute to their vulnerability. Their paper attempts to find an intermediate between commercial concerns and preservation efforts, where the TDRs program is being considered as a practical alternative for owners of historic properties.

In the fourth paper titled 'Portraying Medieval Characteristics of Amritsar City through Diagrams', Simranjot Singh and Dr. Sakshi Sahni have attempted to develop a visual framework of the different elements composing the morphology and city form to reflect the medieval characteristics of Amritsar city. A comparison has been established between the medieval and the current status of the different physical elements to identify problems pertaining to the conservation of the historic character of the city.

The fifth paper titled 'Challenges Faced towards Planning of Physical Infrastructure for Conservation of Cultural Heritage of River Ghats in Pilgrimage Towns: Case of Haridwar, Uttarakhand, India' by Dr. Avanti Bambawale and Dr. Anurag Kashyap points that the continuous influx of pilgrims and tourists at 'Har ki Pauri, Haridwar' throughout the year pose serious issues such as inadequate infrastructure facilities, ghat encroachments by vendors and beggars, etc. Their research discusses the challenges related to spatial planning of physical

infrastructure facilities of river ghats as public space, with the focus on the 'Har Ki Pauri' Ghat. The paper proposes an integrated approach to act as a tool for conservation of cultural heritage and enhance the spatial quality of river ghats along the river Ganga.

The paper by Priyanka Saha on 'Heritage Regulations and Resultant Negotiations: The Case of Kolkata Rajbaris' highlights the existential struggle and contemporary negotiation that native built forms undergo due to imposition of 'heritage tag' and resultant heritage regulations in neoliberal cities. The research argues on the benefits and legal tensions that tagging has done, highlighting the gap between policy formulation and its execution in six 'Rajbaris' of North Kolkata. Findings reveal that prescribed regulation could only prevent the structures from demolition. Financial constraints, uniform rules both for public and private properties in terms of maintenance followed by lack of participatory approach in heritage management while forces the mansion to get their name delisted from heritage list, the entire process provided the corporation officials a way to extract money from residents by enforcing legal bindings.

The seventh paper by Akanchha Jain and Dr. Jayantilal Jain on 'The Architectural Splendor of Saadat Ali Complex: A Conservation Perspective' attempts to showcase the conservation efforts, extending beyond the physical aspects of the complex, the educational programs, community engagement, and awareness campaigns to foster a sense of pride and appreciation for the cultural heritage. By involving local communities and stakeholders, these initiatives empower individuals to take an active role in safeguarding and cherishing their shared heritage.

The eighth paper on 'Reviewing Intangible Heritage of Amritsar, Punjab' by Pragya Galhotra, Sakshi Sahni, Rawal Singh Aulakh attempts to showcase the rich cultural and historical heritage of Amritsar city. The paper highlights that the major focus has been kept on the conservation of tangible heritage till now. It reveals that very few efforts were put to conserve the intangible heritage of Amritsar which includes the folk dance, folk song, folk instruments, pottery making, phulkari, paranda etc.

The ninth paper titled 'Historic Water Structure and its Relevance to the Sustainable Urban Form: Case of Badami' by Monica Kashkari and Dr.Tejwant Singh Brar attempts to understand the interplay between water systems andthe overall fabric and structure of the settlement. Their research attempts to assess the built form of landmark heritage assets in the historical town on sustainability parameters like visual connectivity, accessibility, etc. The paper evaluates the status and relevance of the historic water structure in the overall sustainability of the built environment.

The tenth paper on 'Unveiling the Architectural Marvels of the Vijayanagar Empire: A Comprehensive Study of Vijayanagar Architecture' by Siddhant Mishra and Dr. Santosh Kumar Yadav points that the empire's architectural wonders, especially in its capital city of Hampi, demonstrate an amazing fusion of creative genius and cutting-edge technological prowess. It is revealed that the architects and builders of the empire exhibited a profound understanding of local resources, climate, and community needs, which unintentionally resulted in the construction of buildings that were well-suited to their surroundings and that have withstood the test of time. Some features like passive cooling and ventilation, water management, durable constructions are evidently seen in the architecture of this period.

The last research paper titled 'Smart Heritage Planning in Indian Heritage Cities' by Dr. Monali Wankar stresses that urbanization is rapidly takingover the original fabric of the cities. Their research is confined to study issues and challenges of heritage preservation post-execution of the execution of the projects in the smart cities. The study endeavours to find solutions to seek heritage preservation, heritage interpretation and tourist infrastructure development that seem to be missing.

Lastly, Prof. Bhupinder Singh while reviewing the book titled 'Reinventing Amritsar-A City of Great Virtues, Myths and Realities' authored by Jit Kumar Gupta, Sarup Singh, and Dr. Ashwani Luthra mentions that the book has made an attempt in the direction of defining and detailing the holy city of Amritsar in terms of its origin, growth, festivals, heritage, sacrifices and celebrations, by unwrapping numerous layers of history and discovering large number of untold stories besides unravelling numerous myths and realities of the historic city, during its journey, spanning over 450 years. In addition, book critically and objectively tries to reveal the historicity, culture, art, architecture, heritage, ambience, cuisine, human values of the Amritsar metropolis, which has been globally recognized as the religious and commercial capital of the state of Punjab.

Ashwani Luthra, Ph.D.
Editor & Secretary (Publication)

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A Review of Management of Heritage in the Master Plans of Delhi

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Abstract

Delhi is an agglomeration of historic cities, therefore, sustainable development of Delhi depends increasingly on the strategic management of its urban heritage. While heritage management policies that govern the urban heritage of Delhi are prone to a silo approach ofmanagement, the essential policy document, the Master Plan of Delhi, has the potential to a holistic approach through integrative Planning. More so, the 17 SDGs, and specifically SDG Target 11.4 necessitates management of heritage by bringing in a paradigm shift within the larger Planning. In this light the paper reviews the urban heritage management system of Delhi through the four Master Plans of Delhi. The paper identifies that, urban heritage management in the MPDs needs to be understood not in isolation but as reflections of emerging local trends and global heritage management developments of the times. The methodology followed here is a systematic, comparativeand qualitative study of four MPDs.

Key Words : *Heritage, Conservation, Master Plan of Delhi 1962, 2001, 2021 and 2041, Delhi Development Authority, SDG 11.4.*

1.0 INTRODUCTION

The United Nations in its 2015 policy document Agenda 2030 acknowledges the effective contribution of Heritage Management in the making of Sustainable Habitats. It stresses to intensify endeavours aimed at preserving and securing the cultural and natural heritage of the world (UN, 2015) as one of its central targets towards making cities 'safe, inclusive, resilient and sustainable' in its Sustainable Development Goal (SDG) Target 11.4 (UN, 2015), representing a paradigm shift in international development strategies where urban heritage management is brought to the core of urban Planning and development. From the perspective of UN Habitat, Delhi is currently the most debated city in Asia-Pacific and the world in terms of urban growth. With ongoing global urbanization, the achievement of sustainable development increasingly hinges on effective management of urban growth (UN, 2018). Asia-Pacific accounts for 1038 metropolises are home to 56 percent of the world's metropolitan population (UN Habitat, 2020), and within this Delhi is estimated to cross 30 million by 2041 (MPD 2041). There are two important swings probable in Delhi's demographic profile which includes a substantial rise in the percentage of working population and an estimated 41 percent population increase due to 'in-migration'. The upward needs of the existing as well as projected population will add to growth of unPlanned settlements in Delhi consequently increasing the urban pressure on the already vulnerable urban heritage within the metropolis of Delhi, Further, leading Delhi far from being safe, resilient, inclusive and sustainable city as envisaged by the UN SDG 11.

Delhi, is an agglomeration of several historic cities, therefore, sustainable development of Delhi depends increasingly on the strategic management of its heritage. There are ample evidences that reveal the existence of several cities within the present city of Delhi (Hearn, 1906). These evidences can be categorized as tangible and are inseparable from the intangible evidences of the living city of Delhi. The tangible evidences are found all across Delhi, they are- either monumental in nature, or ruins or mere traces. For instance, while on one hand, there are monuments and UNESCO world heritage sites like Humayun's tomb and Red Fort, on the other hand, there are edifices like the Chor Minar or traces of the Jahanpanha walls. The intangible evidences can be witnessed in living Delhi's numerous festivals, customs and rituals, pluralistic culture, rich tradition. Interestingly, the built heritage of Delhi developed within the confinement of three natural elements: river Yamuna and its water system; the Ridge; and the forest. The tangible and the intangible evidences together with the natural elements constitute the irreplaceable urban heritage of Delhi. This urban heritage has huge potential to be treated as a resource towards research and knowledge creation, community development and revenue generation, therefore, needs protection, promotion and transmission through responsible and sustainable

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development and management.There is already an existing urban heritage management system for Delhi which includes various heritage legislations, multiple government bodies with each having their separate unit of heritage management, the newly formed apex body – National Monuments Authority (NMA), various NGOs and other stake holders. The exiting Heritage Management System of Delhi includes various heritage legislations, multiple government bodies, NGOs and other stake holders. The organizations concerned with the safeguard of the built heritage of Delhi are Heritage Conservation Committee (HCC) Archaeological Survey of India (ASI); State Archaeology Department, Government of National Capital Territory of Delhi (GNCTD); Central Public Works Department (CPWD); Municipal Corporation of Delhi; New Delhi Municipal Council (NDMC); Delhi Urban Arts Commission (DUAC); INTACH; Aga Khan Trust for Culture (AKTC). While the Heritage Management Policies and corresponding regulations that govern the urban heritage of Delhi come under the jurisdiction of multiple governing agencies with separate jurisdictional areas. The Planning policies and corresponding regulations are, however, the prerogative of the Delhi Development Authority, the custodian of preparing the Master Plan for Delhi (MPD). Though the multiplicity of agencies is prone to give a silo approach to management of heritage, the essential policy document, i.e., the MPD, has the potential to give a holistic approach to the urban heritage management of Delhi. Moreover, the UN Habitat's New Urban Agenda underscores a pivotal realization: cities can serve as solution providers rather than mere contributors to challenges. When properly Planned and managed, urbanization emerges as a potent catalyst for sustainable development, benefiting both developing and developed nations.(UN Habitat III, 2017). In these respects, achieving SDG 11.4 necessitates a dig into Master Plans of Delhi with the view of management of heritage and how over the years urban heritage management has evolved in the MPDs.

The Master Plans of Delhi (MPDs) are framed under the provisions in the Delhi Development Act, 1957, Chapter III (DDA, 1957). Delhi has thus far witnessed four Master Plans, i.e., MPD 1962, MPD 2001, MPD 2021 and MPD 2041. Management of heritage in the MPDs has come a long way since 1962, the starting point of organized urban Planning of Delhi. The Master Plan was a conceptual proposal for future development of Delhi in the coming years and with respect to heritage management, mentions the term 'conservation' in the context of areas that are identified as 'conservation', 'rehabilitation', and 'redevelopment'. Keeping in consideration the lapses in the First Master Plan and diverse developments in the city, the Second Master Plan was amended as per the provision in the Delhi Development Act and led to the MPD-2001 (DDA, 1990 and DDA, 1957). The MPD 2001 takes a step forward with clear mention of 'urban heritage of Delhi to be conserved' as one of the underlying concepts of the Plan. Immediate to follow was the MPD 2021 with a dedicated chapter on 'Conservation of Built Heritage', where 'heritage management' is used for the first time. The MPD 2021 envisioned a unified conservation strategy for all relevant agencies responsible for safeguarding Delhi's built heritage. It called for these agencies to develop tailored action Plans aimed at formulating policies and strategies for effective conservation efforts (DDA, 2007). And presently, the Master Plan of Delhi with perspective year 2041 has evolved from the 2021 MPD chapter on heritage management into a separate section that deals with 'heritage, culture and public spaces' responding to the objective of not only protect heritage but also enhance the heritage fabric and shape strong economic connections for creating opportunities towards heritage expressions and experiences, tourism as well as vigorous public life and introduced 'Intangible Heritage' (DDA, 2021).

The paper identifies that the MPD 2041 has come much ahead in terms of heritage management, in its definition, strategies, recommendations and incentivization. With respect to MPD 2021, there has been a conspicuous shift in the MPD 2041 which includes two volumes of action-oriented Plan with a monitoring framework for the very first time. In presenting integrated Planning as well as transversal reflection of heritage in chapters of economy and environment, it provides opportunity to harness the power of heritage to accelerate the achievement of the SDG target 11.4, which needs to be seen in the local level. However, it needs to be noted thatclubbing together culture, heritage, and public spaces under one section, if not carefully addressed, may undermine the heritage value of the city as an agglomeration of historic cities. The paper has Further, identified that, urban heritage management in the MPDs needs to be understood not in isolation as the MPDs are the reflections as well as responses of current trends of the times and also the international heritage management developments of the times. Therefore, the questions that need to be answered through the Master Plans are not only management of heritage but how heritage can contribute towards current trends in the making of sustainable, resilient, and liveable Delhi. This research paper is a quest in that direction. The methodology followed here is a systematic and qualitative investigation of the four Master Plans of Delhi, i.e., MPD 1962, MPD 2001, MPD 2021 and MPD 2041. The paper has also analysed the working reports which are base studies towards the preparation of the respective MPDs.

2.0 LITERATURE REVIEW

A review of heritage management in the Master Plans of Delhi for this paper involved an extensive literature review in fourcategories. The first category involved background research of international developments and evolution of heritage management in the broader context. These included UNESCO documents and recommendations, ICOMOS charters and UN Policy documents. In the narrower context, the background research engaged with books and literature on Delhi's heritage and includes INTACH's heritage listing of Delhi's built heritage, and 'The seven cities of Delhi'. The second category involved management of heritage and its progress through MPD 1962, MPD 2001, MPD 2021 till the present draft MPD 2041. The third category engaged in reviewing the background the three working reports that has gone in making each of the Master Plans of Delhi (DDA, 1976; DDA, 1977; DDA, 1990). Additionally, 'Sub-Groups Report for Master Plan of Delhi 2021'. And the 'Sub-Groups Report for Master Plan of Delhi 2021' have also been reviewed. For the draft MPD 2041 the baseline report specific heritage management has also been studies extensively. The fourth category of literature review includes appraisal of articles from academic, journal and news papers. This category of literature review has also used audio-visual materials such as 'Online Panel Discussion on Heritage in the context of Draft Master Plan of Delhi 2041', held in 2021 organized by the Centre for Sustainable Habitat.

3.0 METHODOLOGY

The paper is based on a systematic and qualitative enquiry in the context of urban heritage management of Delhi and its evolution of heritage, definition of heritage and demarcation of heritage zones and precincts and inclusion of new areas of cultural precincts, and archaeological parks. Also brining in the intangible aspect of heritage through cultural hotspots, cultural economies post UN rolling out with its 17 Sustainable Development Goals and its SDG 11.4, 'Safeguarding and Protection World's Cultural and Natural Heritage'. The methodology used here is a four-stage method based on data collection and analysis of official policy documentsand related supporting documents and findings. The first stage is background research for understanding the evolution of management of heritage through international scenario and narrowing down to Delhi and identifying research gap.The second stage includes understanding and analysis of the four policy documents i.e., the Master Plans of Delhi in the context of urban heritage management. This stage also involves examining of the background working documents and studies that were undertaken in the making of each of the Master Plans. The third stage involved data collection and analysis of academic papers and journal and newspaper articles as well as audio visual materials that support in the understanding and scrutiny of the heritage management of Delhi in the four Master Plans. The final stage involves findings and way forward in the same context.

4.0 MASTER PLANS FOR DELHI AND HERITAGE MANAGEMENT

4.1 MPD 1962

The First Master Plan of Delhi evolved in the back ground of a colossal humanitarian crisis in the Indian subcontinent. After the independence of India in 1947, Delhi experienced a sudden upsurge of population with sprawling residential growth especially within the walled city of Shahjahanabad in a haphazard manner. This resulted in 'poor health conditions' due to unPlanned development in the absence of proper Planning or amenitiesfor people that could guide the development of the city (DDA, 1962), compelled the central government to establish the Town Planning Organization (TPO) in 1955 under the Ministry of Health. This led to the establishment of the Delhi Development Authority (DDA), by the Delhi Development Act 1957, assigned to draw the Master Plan of Delhi.

The MPD 1962 is based on two 'Work Studies Relating to the Preparation of the Master Plan for Delhi', volume I and II conducted between 1955-56 (DDA, 1976 and 1977). While acknowledging the present and past cities of Delhi, volume I reports that the triangle formed by the Yamuna River and two ranges of the Aravalli contain Shahjahanabad and New Delhi and the triangle held 70 percent of the then population of Delhi. Naturally, the main approach of the MPD 1962. Therefore, was on de-densifying Shahjahabad and gradually densifying the southern New Delhi and and the northern Civil Lines. The MPD 1962 aimed at setting out alarge-scale vision of procurement and development of land. The key focus areas besides others were, emergence from 'poor health conditions' and catering to environmental issues.In the context of heritage management, the MPD 1962 mentions the term 'conservation' for the very first time towards "identification of the areas as 'conservation', 'rehabilitation', and 'redevelopment'" in its eighth page regarding 'old city', which would be based on physical and socio-economic surveys. The term 'conservation' comes again in page 26 of the document, under 'Development Zones', where the 'old city' proposed for Planning zone 'A' and states that conservation should be done at area level rather than the structure.

In 'An Approach to Conservation of Built Heritage-Delhi Master Plan Provisions', Uttarwar, P.S., then

Director Planning, DDA, writes that the MPD 1962 "was prepared during a time when the concepts of Heritage and Conservation in India were in their infancy stage" (Uttarwar, 2013). While the term 'Heritage' is missing from the document and there may not be direct address to 'heritage conservation' in the Master Plan, the document from the beginning has reference of 'Old City', time and again along with 'old city of Shahjahanabad' and 'walled city'being the main focus area. Further,, there are recommendations for consideration of the old city for redevelopment on a later date, gradual thinning down of population, consideration of decongestion of traffic, and relocation hazardous industries to outside of old city to enhance the health of the residents by improving micro air quality and environmental concerns leading to heritage conservation of the old or walled city of Shahjahanabad. Moreover, the objective was that Delhi to be Planned in the geographical and climatic contexts of its region. In the context of development, new areas should be guided by desirable guidelines, while preserving and protecting areas with historical organic patterns from encroachment by incompatible land uses.

Further,, in reference to MPD 1962, Uttarwar pens that "the Master Plan provided for a number of green spaces to be reserved for the city. Most of these greens were around monuments and this has resulted in protection of a number of monuments" (Uttarwar, 2013). Moreover, the MPD 1962 also time and again mentioned health concerns of the old city thereby proposing Ram Lila Maindan as a green lung for the old city in addition to pointing to the greatest need of provision of parks for the greatest population concentration in the old city of Shahjahanabad. Sarita, Directorate of Education, Govt of NCT of Delhi, analysed the MPD-1962 in regard to the traditional water bodies that once dotted Delhi's landscape have not only not been emphasized in the MPD but their possible role in the sustainable development of Delhi have also not been enhanced. Although Najafgarh Jheel was mentioned in this MPD along with proposal to develop the Jheel for fishing and sailing. She clearly mentions that in Delhi among the various historical water bodies only Hauz Khas was given consideration towards recreational purposes with salient features despite consideration of all historically significant monument factors (Sarita, 2015). It can thus be inferred from both Uttarwar and Sarita that heritage management though not directly addressed, was considered indirectly in the MPD 1962. In the Master Plan of Delhi (MPD) 1962, New Delhi within Planning District-D was designated as a "Conservation District" as noted by Joardar. The Plan aimed for restricted redevelopment while preserving the city's garden city character, providing Further, affirmation of this approach (Joardar, 2006).

The MPD 1962 is perhaps is also a response to the first Asian Games held in Delhi in the year 1951. In 'The story of how an Asiad remade a city,'Nalini Mehta from 'Mumbai Mirror' writes thatthe Asian Games was an attempt by the then Prime Minister of India, Jawaharlal Nehru, to bring in a new Asian camaraderie and sports was a opportune tool (Mehta, 2014). This also shaped Delhi's impetus for new development such as the National Stadium that stands nestled amid the majestic Purana Qilaintegrated the national stadium to Lutyens' Delhi.

The review of heritage management in the MPD 1962 remains incomplete due to the conspicuous missing of the term 'Heritage' whereas the term 'Conservation' has been used as a degree of least 'Physical Intervention' along with 'Rehabilitation', and 'redevelopment' as other degrees of intervention. While it has done a tremendous job in identifying the Walled City of Shahjahanabad and Lutyens' Delhi as separate zones in its zoning proposal, it has lacked in bringing out the historic character of the areas as a resource to be integrated in the Planning process.

4.2 MPD 2001

The Master Plan of Delhi with perspective year 2001 takes a step forward in direction of heritage management with clear mention of the term 'Heritage' for the first time and points towards conservation of urban heritage of Delhi as one of the underlying concepts of the Plan. This Plan, while recognizing Delhi's status as a historic city, underscores the importance of "Modernization with Conservation". It designates certain historic are as as "Controlled Conservation" zones, with Plans for their conservation and enhancement to be developed. Further,more, the Plan highlights the central city area, particularly the walled city and its extensions, as "Special Areas" requiring unique Planning considerations due to their historical significance. Additionally, it emphasizes the need to maintain ecological balance, focusing on preserving Delhi's natural features such as the ridge (the rocky spurs of the Aravalli hills) and the river Yamuna.The MPD states that the ridge and the riverare to be maintained in pristine glory and free from pollution respectively (DDA, 1990). Further,, the MPD 2001 deals with heritage management under different subheads. For instance, the 'conservation' of the walled city and 'restoring' the glory of the Walled City are covered in Environment section and the section on Special Areas as well. Urban villages, essential constituent of urban heritage, are discussed under the section of 'Shelter'.

This Master Plan is closely connected with the preparation of 1982 Asian Games in Delhi. According to Sahil Bhalla, the 9th Asian Games transformed Delhi. Quoting Krishan Datta Bhalla narrates that Delhi went through an incredible revolution in terms of infrastructure development for preparation towards the games. He describes the historic area of Siri Fort as being akin to wilderness, while the land where the Nehru Stadium stands was described as a wasteland, particularly evident during the monsoon season. (Bhalla, 2014). Besides building new structures for the city, the preparation also created awareness of Delhi's heritage and significance, for instance, the logo for the games was inspired from the Jantar Manta of Delhi, a significant 'Monument' of national importance noteworthy for history of astronomy & astronomical advancement.

The 1972 was yet another landmark year with UNESCO bringing out its World Heritage Convention (UNESCO, 1972). Uttarwar perceptively points out that the coherence between Mater Plans and existing conservation approaches is impeded by the fragmented nature of conservation ideologies, thus rendering implementation difficult (Urrarwar 2013). He highlights a global shift from a monument-centric approach to a more holistic focus on heritage areas or zones. Uttarwar emphasizes the need for identifying building usage within historic zones, posing the recurring question of "Who will undertake this task?" and advocating for a clear conceptual approach to guide the process. He argues that the lack of suitable plotting and mapping has resulted in encroachments and deterioration in heritage areas and buildings.

The MPD 2001 while is a great leap forward from the MPD 1962 in the direction of heritage management with a good intention of developing special Plans for the conservation and improvement of the historic areas, it lacked in supporting regulations for its implementation in this respect, and also lacked in identifying or defining the heritage areas.

4.3 MPD 2021

The Master Plan for Delhi 2021 for the very first time identified heritage zones as well as archaeological parks and included a separate and dedicated chapter on "Conservation of Built Heritage" in Chapter 10.0.In its vision, this Master Plan categorizes heritage-related focus areas into three key pillars: conserving the environment and preserving Delhi's heritage while integrating it harmoniously with modern development patterns, and achieving these objectives within the framework of sustainable development. This framework underscores the significance of involvement from both the public and private sectors, as well as community participation, in cultivating a sense of ownership and belonging among the city's residents (DDA, 2010). In this sense, the MPD 2021 also points at the integration of heritage to the larger city Planning.

The initial attempt to integrate urban heritage management into urban Planning and development began in the 1990s with the Conservation Society, Delhi (CSD), promoting Delhi from a holistic approach of an historic city (Dutta, 1998). The focus of the promotion was to redefine heritage of Delhi and to reintegrate 'Historic Delhi' with the people of Delhi as well as sensitize government and the policy makers. It was during this promotion that the word 'Inclusive' was used in understanding heritage and Planning. The profound impact of this promotion is visible from; 1) the making its first efforts towards preparation of a Delhi Heritage Bill, though unsuccessful, 2) establishment of Delhi Urban Heritage Foundation and its Regulations 1999, 3) compilation of an inventory of heritage structures of Delhi by Indian National Trust for Art and Cultural Heritage - Delhi Chapter, 4) making its first two entries to the UNESCO's World Heritage List in 1993, Humayun's Tomb's Complex and Qutb Minar Complex (Chaudhuri, 2023). Between 1990 and 2022, there were events that had profound impact on the heritage management of Delhi, for instance, the Red Fort, Delhi made the city's third entry to the World Heritage List; the Commonwealth Games hosted by Delhi in 2010; Delhi in and out of the World Heritage City nomination (2012-2014); and then again its official entry to the nomination in 2015 and final withdrawal in 2019; the rolling out of the Unified Building By-Laws notified in 2016 and formation of Delhi Heritage Conservation Committee in 2004. The landmark events, the movements as well as the processes eventually led to the introduction of a chapter on heritage management in the Master Plan 2021. The introduction of the concept of a Heritage Zone and Archaeological Park in this Master Plan document marked a significant milestone. Their inclusion transformed the designated areas into potential zones for protection, conservation, and integration into the urban Planning process. This initiative emphasized the importance of preserving historical and archaeological sites within the broader framework of urban development (CSH, 2021).

The MPD 2021 introduced a unified conservation strategy aimed at all agencies responsible for safeguarding Delhi's built heritage. According to the Delhi Development Authority (DDA, 2010), this strategy required concerned agencies to develop tailored action Plans with the objective of framing policies and strategies for conservation. The strategy underscored the promotion of conservation efforts covering civic and urban heritage, architecturally significant landmarks,

living monuments, memorials, historical gardens, riverfronts, city walls, gates, and other pertinent elements. Coordination and interaction among these agencies were deemed integral to the overall strategy. Further,more, adherence to a common database, definitions, and guidelines for various activities and levels of interventions for management of heritage (DDA, 2010).

In the MPD 2021, for the first time, a Heritage Zone was delineated as an area distinguished by a significant concentration, connection, or coherence of buildings, structures, groups, or complexes, unified historically or aesthetically through Planned or physical development. Specific areas identified as Heritage Zones included the heritage complexes within the Walled City of Delhi (Shahjahanabad), Lutyens Bungalow Zone, Nizamuddin and Humayun's Tomb Complex, Mehrauli area, Vijay Mandal Begumpur-Sarai Shahji-Lal Gumbad, and Chirag Delhi (DDA, 2010). Additionally, the document introduced the concept of an archaeological park, defined as an area distinguished by heritage resources and related land with the potential to serve as interpretive and educational resources for the public, besides being a tourist attraction. Designated Archaeological Parks included Mehrauli Archaeological Park, Tughlaqabad Archaeological Park, and Sultangarhi Archaeological Park. The MPD 2021 allowed for the possibility of adding other areas to the list based on studies conducted. Moreover, the Master Plan suggested that decisions concerning Built Heritage and Archaeological Parks should take into account various relevant aspects including form and design, materials and composition, use and purpose, traditions and methodologies, location and context, spirit and ambiance, and other internal and external factors. It required each local body or land-owning agency to develop Special Development Plans for the conservation and enhancement of listed heritage complexes and their adjacent areas. Additionally, the MPD 2021 underscored that any changes or demolition of a listed heritage building require prior approval from the Competent Authority. Development Plans for such areas must comply with regulations for conserving heritage sites, buildings, and precincts (DDA, 2010).

Aligned with the MPD 2001, the MPD 2021 offers more detailed components regarding Heritage. Chapter 3, focusing on Delhi Urban Area-2021, classifies Shahjahanabad (Walled City) as a Special Area under the Redevelopment Strategy, necessitating special treatment to preserve its heritage value while maintaining its residential character. Chapter 4, addressing Shelter, discusses conserving the heritage value within development schemes in areas like the Lutyens Bungalow Zone and Civil Line Bungalow Zone. Both Chapter 6 on Wholesale Trade and Chapter 7 on Industry specify that Bungalow Zones and Heritage Are as are ineligible for industrial clusters redevelopment schemes. Moreover, Chapter 11 on Urban Design outlines proposals for revitalizing the Walled City and Extensions' grandeur, while Chapter 12 on Transportation restricts Metro Stations and property development within Heritage Zones.

This Master Plan has evolved in its heritage nomenclature and used the term 'heritage management' for the first and recommends a holistic approach to conservation. The Master Plan suggests that Development Plans or Schemes for such areas must adhere to the provisions regarding the Conservation of Heritage Sites, although these provisions are not explicitly defined. Further,more, it has been noted that while the MPD 2021 marks progress in defining 'heritage zones' and 'archaeological parks', it has yet to demarcate these areas. By the time the Master Plan was drafted, many of these zones and parks had become contested sites, with encroachments on heritage precincts emerging as a significant concern. While the chapter on conservation outlines strategies such as database maintenance, capacity building for heritage management, and the preparation of guidelines for various activities related to heritage buildings, such as development, redevelopment, and repairs, the actual progress in these areas has been notably lacking (DDA, 2010). Additionally, the directive for each local body or land-owning agency to formulate Special Development Plans for listed heritage complexes and their surrounding areas has seen little advancement. Despite these provisions, significant strides have yet to be made in implementing these conservation measures.

4.4 MPD 2041

The making of MPD 2041 coincided with the UN rolling out its 17 Sustainable Development Goals, specifically Target 11.4 "safeguarding and protecting world's cultural and natural heritage", which bought a paradigm shift. These completely changed the perception of the Planners as well and is reflected in the MPD 2041. The Master Plan draws extensively from the findings of the 'Baseline Report – Heritage: Enabling Strategic Plan: Master Plan for Delhi 2041', compiled by the National Institute for Urban Affairs (NIUA) in collaboration with the DDA. The report's analysis of the MPD 2021 regarding the conservation of built heritage highlights several deficiencies. It notes the absence of strategies to integrate heritage as an ecological, environmental, and economic asset, as well as the lack of provisions for citizen engagement and participation in identifying and maintaining heritage assets at the local level. Moreover, the report

identifies the absence of mechanisms to ensure the economic viability of heritage management and the dearth of viable options for private property owners to conserve their heritage-listed properties. To address these gaps, the report recommends the preparation of a heritage layer for the proposed MPD 2041, complete with a GIS map indicating the locations of various heritage assets. It also emphasizes the need for effective interaction and coordinated action among various heritage-related agencies (NIUA & DDA, 2041).

It Further, advocates provision for a "detailed framework for Special Conservation Plans and Action Plans" which would include aspects of "development, redevelopment, additions, alterations, repairs and renovations". The Report Further, advocates for the Master Plan to acknowledge intangible assets, marking the first instance of such recognition. It supports the inclusion of characteristics of areas within Heritage Zones, alongside documentation of traditional and artisanal-based economic activities. Lastly, it suggests incorporating mechanisms such as specific heritage incentives, heritage Transferable Development Rights (TDR), and other Planning-related interventions within the scope of the Master Plan.The Report has Further, pointed out that "Though the chapter was a great initiative in recognizing heritage as an asset, rapid changes in field of "integrated urban conservation" and "sustainable heritage management" in last two decades has resulted need to recognize more diversity of heritage resources" and that "Need to explore interlinkages between cultural heritage resources, traditional resources, natural resources, historic transportation routes, contextual design of new buildings, risk preparedness and resilience; Detailing out and other historic urban villages heritage-led regeneration and revitalization of historic areas like Shahjahanabad; and Need to build an Integrated Plan, wherein heritage components are duly linked with other aspects like infrastructure provision, transportation/ mobility, tourism, etc." (NIUA-DDA, 2020).

The vision of MPD 2041 is focused on cultivating a sustainable, vibrant, and livable Delhi, with a commitment to creating an inclusive city that enhances accessibility and opportunities for all, while also addressing the recommendations outlined in the 'Baseline' report. The document has outlined three main goals: Goal 1 aims to establish an environmentally sustainable city that ensures a healthy environment for its residents and is resilient to the impacts of climate change; Goal 2 strives to build a city prepared for the future, providing top-notch, affordable, and secure living spaces with efficient transportation systems; and Goal 3 endeavours to create a thriving center for economic, creative, and cultural growth.To achieve these goals, MPD 2041 has identified six major policy areas or objectives pertaining to environment, economy, heritage, resilient infrastructure and sustainable transportation. The MPD also has two spatial strategies- Urban Regeneration and New Development Areas (DDA, 2021).

Volume I, Section 3 of MPD 2041 delves into 'Heritage, Culture & Public Spaces' and comprises two chapters: one focusing on better management of public spaces and the other on managing Delhi's heritage. The chapter dedicated to managing Delhi's heritage emphasizes the identification of culturally significant areas such as heritage zones, archaeological parks, and cultural precincts. It underscores provisions for safeguarding, renewal, and adaptive reuse within these identified areas as well as some innovative implementation of strategies (DDA, 2021).This chapter is different from that of MPD 2021 as in this heritage zones are defined as "Large Continuous Areas with Mix of Notified Assets and Historic Urban Fabric" and the designated Heritage Zones are restricted to only Shahjahanabad Heritage Zone and Lutyens Bungalow Heritage Zone. The policy document goes on to outline "Large Areas with Combination of Built and Natural Heritage–Eco-cultural Assets" as Archaeological Parks and in addition to already Archaeological Parks in the MPD 2021. The MPD 2041 also for the very first time defines Cultural precincts as streets or stretches within historic urban villages.

The MPD 2041 gives out strategies for the three clusters as identified above. The strategy for Shahjahanabad as a cultural enterprise hub and a heritage zone which requires a 'multi-agency coordinated initiative' for revitalization of the area. It proposes preparation of a Plan for the area improvement and work towards a Traffic Management Plan. Also proposes implementation of area level Plans for 'service improvement, evacuation, removal of overhead electric wires and relocation of noxious industries, godowns and wholesale within 10 years.' It lays down cultural economies to be promoted in the area and moreover, the 2041 policy document puts a tab on limiting "Regeneration as per Specific Controls (limited amalgamation, no group housing, no stilts)".

In reference to the Lutyens Bungalow Zone (LBZ), the document highlights its significance as the administrative hub of the central government as well as numerous museums, art galleries, and government residences. The Master Plan underscores the LBZ's unique character and emphasizes the formulation of development-oriented norms by the relevant agency to regenerate the LBZ while preserving its heritage value and aesthetic charm, in alignment with the suggestions outlined in MPD 2021. Further,more, the Plan underscores the essential character of the LBZ,

defined by its wide avenues, spacious plots, and low-rise development, emphasizing the imperative to conserve its heritage value. The Centra-Vista Development Project however needs to be seen in this light.

The chapter on 'Managing Public Spaces' highlights the significance of public space networks as crucial for fostering a secure and lively public domain. The Plan identifies numerous opportunities throughout Delhi to create green corridors, heritage and cultural circuits, and temporary festival circuits. These circuits are envisioned to improve public amenities for walking, relaxation, and socializing, while also stimulating cultural and creative economies through themed events and initiatives. Additionally, the inclusion of 'Nightlife Circuits' in the Plan marks a significant addition, aiming to promote night time economies and active night life. This initiative seeks to improve safety, alleviate congestion, and enhance productivity for both formal and informal economic activities during nighttime hours.

Building upon the MPD 2021, the conservation of heritage is Further, explored within chapters, commencing with 'Economy, Trade, and Commerce'. Here, Connaught Place and its extension are acknowledged as iconic centres boasting heritage and landmark edifices, alongside a vibrant mix of office spaces, hospitality venues, entertainment outlets, retail establishments, and business activities. Recommendations include the development of integrated improvement Plans aimed at enhancing both the heritage buildings and public spaces within these locales. In the heritage zone of Shahjahanabad, characterized by a high concentration of heritage buildings, the Plan recommends shifting wholesale activities and promoting cultural and retail activities to enhance the area's cultural significance. Likewise, within the environmental domain, a diverse array of strategies is outlined to enforce regulations rigorously, address pollution, and augment Delhi's green-blue profile in terms of quantity, quality, and accessibility. This initiative aims to cultivate an environment supportive of safeguarding and nurturing the city's varied ecological heritage. Further,more, the shelter aspect covers the regeneration of existing unPlanned residential areas and urban villages, which have become islands of unPlanned growth within the city. This marks an advancement from MPD 2021, where specific regulations were recommended for the development and regeneration of urban villages. Moreover, in the realm of transport and mobility, there is a focus on the regeneration of transport infrastructure aimed at connecting areas of heritage and ecological assets. The Plan introduces "Walk Plans" for the first time, targeting areas within a radius of 400–500 meters, which corresponds to a 5–10-minute walking distance around specific destination nodes such as heritage precincts, markets, and existing residential colonies (DDA, 2021).

For the first time, MPD 2041 has introduced a comprehensive Monitoring Framework comprising three key indices aligned with the Plan's goals: the Environmental Sustainability Index, corresponding to Goal 1; the Built Environment Index, corresponding to Goal 2; and the City Vitality Index, corresponding to Goal 3 (G3). Additionally, the Monitoring Framework includes 20 Key Performance Indicators (KPIs) to measure Delhi's progress towards achieving the vision and goals outlined in the Plan. One of these KPIs specifically focuses on Heritage Conservation. These indicators collectively contribute to the development of an overarching Delhi Liveability Index, which will assess the city's overall progress in implementing the Plan by utilizing data from all 20 indicators (DDA, 2021).

Thus far, the MPD 2041 is the most detailed and elaborated Planning policy document with respect to heritage management. However, it needs to be noted that clubbing together culture, heritage, and public spaces under on section, if not carefully addressed, may undermine the heritage value of the city as an agglomeration of historic cities. According to a report, the Master Plan emphasizes on inclusive development, sustainability, and various innovative implementation strategies (ET, 2023). While these are true, it needs to be pointed out here that at the time of writing this review article, DDA had not yet notified the Plan. The MPD 2041 while has come a long way in terms management of Delhi's heritage in a holistic and integrated manner, it needs to be mentioned that most of the survey base for building the Master Plan had already been undertaken in the year 2020, before the Covid-19 first lockdown period in Delhi. While the pandemic compelled a reset in all spheres of liveability and associated functions of the city like everywhere else in the world, it bought along to the surface fault-lines of the city of Delhi. There is indeed a need to go back to the board in the post pandemic scenario considering the new concerns and see how heritage can help build back the city and its community better in a resilient and sustainable manner. The Monitoring Framework with its KPIs needs to be seen in this new light.

5.0 CONCLUSION

The management of heritage in the MPDs needs to be understood not in isolation as the MPDs are the indicators as well as responses of current trends of the times, local, regional and global. The making of the MPD 1962 needs to be understood against the

greatest humanitarian crisis of partition and the formation of India as an independent nation in 1947. This led to sudden upsurge in the population of Delhi mostly in Shahjahanabad, walled city and consequent to this was the poor health and hygiene conditions. In contrast the first Asian Games hosted by Delhi and the making of National Stadium pushed Delhi to the global picture. The MPD 1962 outlined fundamental principles aimed at heritage conservation, emphasizing key directives such as Planning Delhi within the context of its region. It emphasized the significance of preserving regions with a robust organic layout by averting encroachments of unsuitable and conflicting land uses, while steering development in new regions along preferred trajectories. Further,more, the Plan emphasized the aesthetic charm of Delhi, advocating for the inclusion of attractive architecture not solely within monumental civic and cultural hubs but also in the design of all public and private edifices (DDA, 1962). The implementation of this Plan proceeded at a notably slow pace, with its rollout not occurring until 1990. This delay can be attributed, in part, to various factors such as the political turmoil resulting from the 1975-77 Emergency, the seismic impact of the 1960 earthquake, and the repercussions of the India-China war in 1962. These events likely contributed to the sluggish progress in implementing the Plan (DDA, 1962). The 1982 Asian Games bought boost to the developments in Delhi and also build awareness of its Heritage.

The 1972 UNESCO World Heritage Convention was yet another landmark year that had impact over the MPD 2001. The MPD 2001 reiterated the MPD 1962 with respect to heritage development in being a part of holistic development of the city but introduced the word 'heritage' in its Plan for the first time. This Master Plan was a very crucial bridge between the MPD 1962 and MPD 2021, as it was through the 1990s Delhi experienced a heritage management movement with its first effort initiated by the Conservation Society, Delhi (CSD) through nineties which eventually led to the Master Plan 2021 which brought focus and vision with respect to having a dedicated chapter of 'Conservation of Built Heritage' and the term 'heritage management' was used for the first time in the Master Plan along with the concepts of Heritage Zones and Archaeological Parkswere introduced in the Master Plan document. The incorporation of these entities into the Master Plan document transformed them into potential areas for protection, conservation, and integration into the Planning process, as highlighted by the Center for Sustainable Heritage (CSH, 2021).

The UN with the rolling out its 17 Sustainable Development Goals, specifically Target 11.4 "safeguarding and protecting world's cultural and natural heritage", bought out a paradigm shift in the Planning process. These completely changed the perception of the Planners as well and is reflected in the MPD 2041. The NIUA in its 'Baseline Report – Heritage: Enabling Strategic Plan: Master Plan for Delhi 2041' has summarised that "the designated heritage inventory (such as monuments, heritage buildings) as well as the non-designated heritage resources (such as modern buildings, natural resources, industrial locations, and intangible assets) are valuable in the narrative of Delhi's history. In light of the rapid urbanization such resources are disappearing/deteriorating. Urban conservation should be viewed holistically, and the Plan should devise strategies and mechanism for management of heritage and cultural assets of the city' (NIUA-DDA, 2020). MPD 2041 appears to have adhered to these recommendations by prioritizing the key focus areas and moreover, it emphasizes establishing linkages between heritage assets and other focus areas, indicating a comprehensive approach to urban Planning and development.

If a comparison is made between all four MPDs, the MPD 2041 has come much ahead in terms of heritage conservation, in its definition, strategies and recommendations and also incentivization. Apparently with respect to MPD 2021, it looks like old wine in a new bottle. However, there has been shift in having two volumes of action-oriented Plan with a monitoring framework.In Presenting integrated Planning as well as transversal reflection heritage in chapters of economy and environment, it provides opportunity to harness the power of heritage to accelerate the achievement of the SDGs, target 11.4, which needs to be seen in the local level. Also, clubbing the culture heritage and public spaces, if not careful, may undermine heritage value of the city as an agglomeration of historic cities.

Lastly, Delhi experienced a significant surge in Covid-19 cases during the summer of 2021. Given that the majority of surveys were conducted prior to 2020, it may be imperative to conduct another study to assess the liveability of the city and the well-being of its citizens in light of these recent events. The Key focus areas for MPD 2041 have also identified the vulnerability of Delhi, particularly underscored by the lessons from the COVID-19 pandemic. The pandemic highlighted the necessity to establish self-contained and mixed-use areas with decentralized infrastructure to enhance resilience and adaptability to future crises. This recognition underscores the importance of integrating principles of resilience and flexibility into urban Planning to mitigate risks and ensure the city's sustainability in the face of unforeseen challenges. It is interesting to note that in the 1955-56, the first MPD 1962 exercises were done under TPO under the then Ministry of Health. Perhaps it is time to look back and look more inward in the designing of the MPDs.

The question that needed to be answered through the Master Plans regarding how heritage can contribute towards current trends in the making of sustainable, resilient, and liveable Delhi, however, remains unanswered.

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Contextualizing Factors influencing Resilience of Ahmedabad World Heritage City

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Abstract

Ahmedabad is a 600 years old, historical city and has been on the forefront of many natural as well as man-made disasters such as earthquake, flood, communal riots and economic downturn, among the others. In 2017, the historic core of Ahmedabad, covering an area of approximately 5.5 Sq.km, was inscribed as a UNESCO World Heritage site. The City was among the first in India to receive such as status. An essential ingredient for achieving this status was the tangible component which included the traditional buildings and structures constructed with climatically conscious materials such as wood (with embellishment), stone, clay and lime. There are nearly 2700 heritage listed buildings and structures in this part of the core city which contributed to building the resilience against natural and manmade disasters. The historic core of Ahmedabad has remained as an example of resilient urban development due to its ability to effectively withstand urban heat stress, floods, earthquake, Covid crisis, among the others. However, over the years there has been a steady decline in the number of these traditional heritage buildings and precincts as well as in its socio-economic and cultural landscape, making the historic core increasingly vulnerable to urban shocks and stresses. This research attempts to identify and document the key factors contributing to the historical resilience of the core city and how to effectively mainstream these factors while developing a comprehensive City Disaster Management Plan and resilience strategy. Based on a detailed primary survey and assessment of two important municipal wards in the Ahmedabad core city, this research reveals the underlying social and socio-cultural factors that are contributing to the overall resilience of this historic city. However, while developing a Disaster Risk Management Plan, normative approach has focused mostly on natural factors and the important "non-natural" factors have largely been ignored.

Key Words : *Disaster, Heritage, Resilience, Socio-cultural, Pol*

1.0 INTRODUCTION

Historic cores present in hundreds of Indian cities and towns house tangible and intangible heritage. As of 2022, 36 percent (World Rank 2022) of Indians live in urban areas and thus heritage becomes a part and parcel of their lives as these areas usually are also commercial centres of the city apart from having residential and other occupancies. The city cores are a mark of 'resilience' due to which over a span of centuries and in some cases millennia they have had the ability to bounce back in the aftermath of shocks and disaster events.

The term resilience for an urban ecosystem is largely drawn from the scholarship of Holling (Holling 1973), where resilience is conceptualized as the measure of ability of an ecosystem to absorb changes and persist. He also defines resilience as buffer capacity or ability of a system to absorb perturbation, or the magnitude of the disturbance that can be absorbed before a system changes its structure by changing the variables and processes that control behavior (Holling el. al, 1995).

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Resilience can be seen as the capacity of the damaged ecosystem or community to absorb negative impacts and recover from these (Cardona, 2003).

A resilient ecosystem is thus able to withstand shocks and rebuild itself as per need. Resilience is the ability of a system, a community, or society that is exposed to hazards to resist, absorb, accommodate to, and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions (UNISDR, 2009). The terms "resilience" and "vulnerability" are opposite sides of the same coin, however both these terms are relative (Twigg, 2007). It might be appropriate to assume that when reference is made to vulnerability, there is an assumption that one would also be referring to resilience as dual terms meaning the absence of the one means the presence of the other (Manyena et al.. 2011).

1.1 UNESCOs List of World Heritage in 'Danger'

World Heritage Convention was established in 1972 to designate and manage World Heritage Sites. It foresees the reporting to the World Heritage Committee, by the World Heritage Centre and the Advisory Bodies (ICCROM, ICOMOS and IUCN), on the State of

Conservation of specific properties, inscribed on the World Heritage List, and which are under threat. It is important to note that cultural properties constitute over three fourths of the properties inscribed on the World Heritage List. About a fifth are natural properties and rest (less than 5 percent) are mixed properties. Based on the State of Conservation of Heritage Properties Report (which present a statistical analysis between the period 1979-2013), some sites have also been put on the danger and some have been delisted by UNESCO's World Heritage Committee. This committee selects the sites to be listed as UNESCO World Heritage Sites, including the World Heritage List and the List of World Heritage in 'Danger'.

Further, the Sustainable Development Goal (SDG) 11.4 relates to strengthening efforts to protect and safeguard the world's cultural and natural heritage and to achieve its targets, there is a need for paradigm shift in its approach towards urban heritage management (egov.eletsonline.com, 2021). One such paradigm shift is to actually view the historic cores as a point of intrigue and not as an eyesore or with a spirit of wanting to replace the built heritage with buildings using modern design concepts and materials by inserting new built form within the tangible heritage scape in a jigsaw puzzle manner using insensitive design and construction approaches or simply leaving a site blank albeit a few traces or remnants of elements of the previous built form evident at the plinth level and on adjoining built form walls.

1.2 Resilience of City Cores

Historically, the core cities have the element of 'resilience' which has enabled these cities to not only survive but thrive. The social and physical reasons have contributed to this aspect and aided in functioning of the city with passage of time spanning several human life spans. Past studies have highlighted this aspect and the Historic Urban Landscape Recommendation, 2011 of UNESCO clearly advocates mainstreaming strategies and practices for sustainable urban development and climate resilience integrated with heritage conservation (UNESCO, 2011).

The City of Ahmedabad is the largest city and erstwhile capital of Gujarat state. The city has a historic core (the historic walled city), covering an area of 5.5 sq. km which has been taken in the present paper, firstly to identify the key factors contributing to the city's resilience and thus, aiding the urban continuum to thrive over centuries; and secondly; to look into the prioritization of causal factors for the decline in the number of listed heritage buildings which are the tangible element that actually play a significant role in contributing to the World Heritage Status and are also a key aspect of building resilience.

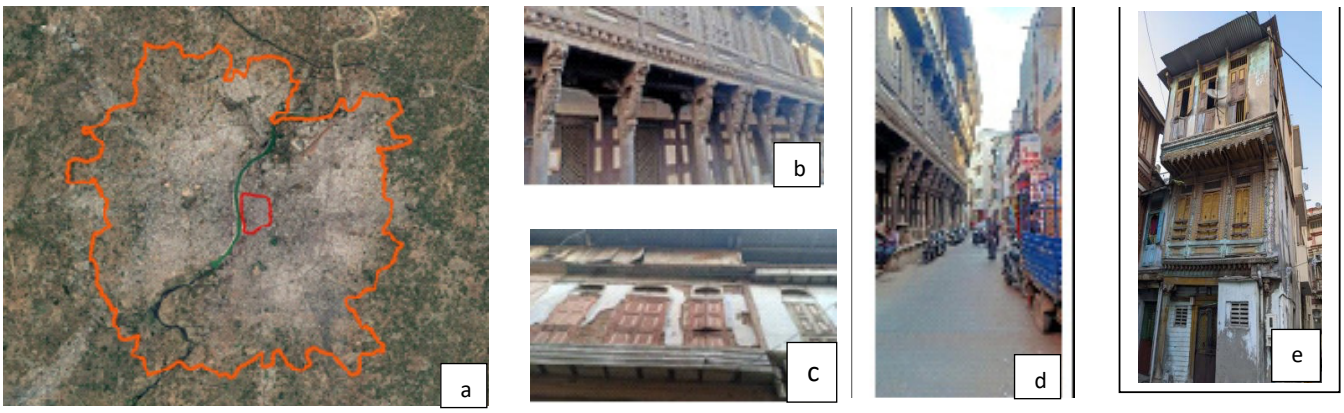
2.0 AHMEDABAD AND ITS WALLED CITY

Ahmedabad city is among the top ten largest cities of India, having 7th rank in terms of the population of the urban agglomeration as of 2011. Ahmedabad city population is lesser than that of the Ahmedabad metropolitan area and over three fourths of the population of Ahmedabad district lives in Ahmedabad city and the metropolitan area. For example, as per Census of India (2011), the population of Ahmedabad city and the metropolitan area constituted 77.31 percent and 88.17 percent respectively to the total population of Ahmedabad district.

The city's population within municipal limits has grown steadily from 35.2 lakhs in 2001 (Census of India, 2011) to 55.7 lakhs in 2011 (ibid) according to the Census of India for respective years and an estimated population (provisional) of just over 76 lakhs in 2021 as per provisional census Figures for 2021 (AMC 2021), this is much higher than the national average of urban population decadal growth rate for the respective years.

There are traditional houses which occupy the urban fabric in this part of the city in the Pols, which not only contribute to the Outstanding Universal Value (OUV) but also contribute to the component of living heritage (figure 1). These traditional buildings have

Figure 1 : Location of Walled City Ahmedabad and Composite Brick and Wood Buildings with Decorative Brackets



Source : a) https://earth.google.com; b,c,d,e: First Author

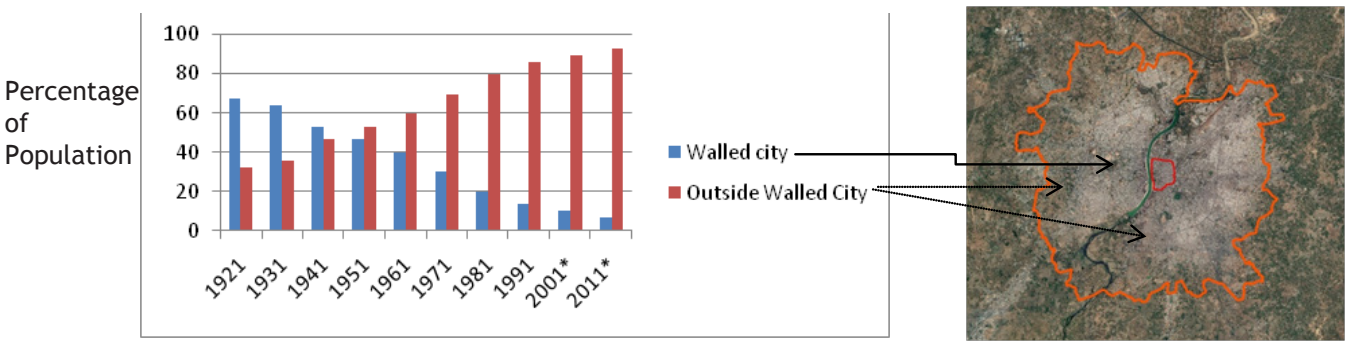
been studied widely as a part of previous academic exercises conducted by the authors. However, the traditional buildings are declining in number over time, due to the changes in building use and demography.

The city's core - the walled city which is situated on the eastern bank of the river Sabarmati, has a distinct identity in terms of built form massing and hustle bustle on major roads with commercial activities almost pouring on the road curbs and often jostling with the parked two wheeled vehicles aligned in a row (or more), as compared to the relatively upscale western and several other areas of the eastern part of the city. The city core was established just over six centuries ago during the Sultanate period, by Sultan Ahmed Shah Bad Shah. Later, the Mughals, Marathas and British ruled over the city and the built landscape of the city core evidently depicts architectural influences from their rule combined with local design flavour.

As per the published data available from the 2011 Census, the walled city was contained within 6 of the city's 57 municipal wards. However, in 2015, with reconfiguration of ward boundaries and merger of wards or parts thereof as well as increase in the jurisdiction of the area under municipal limits, the number of wards decreased to 48 and the ward boundaries of the areas within walled city also changed to include other non-walled city areas.

The city core is a bustling hub with the major wholesale and retail markets located in this part. Spread over an area of about 5.5 sq. km, the area of walled city is about 1 percent of the area under (Ahmedabad Municipal Corporation) AMC's jurisdiction. The population density is several folds higher in the walled city as compared to the overall population within AMC limits although majority of the buildings in the walled city are not more than three floors. Inspite of the area of the walled city has remaining almost constant, over the decades the population growth rate in some of the wards in this part of the city has experienced a negative decadal growth rate. As per the Census of India for respective years, the population in walled city has declined over time in the past from 3.98 lakhs in 1991 to 3.67 lakh population in 2011. Figure 2 depicts the percentage of population within and outside the walled city.

Figure 2 : Percentage of Population within and Outside the Walled City over time



Source : Based on AMC Handbook, 1987

2.1 World Heritage Status

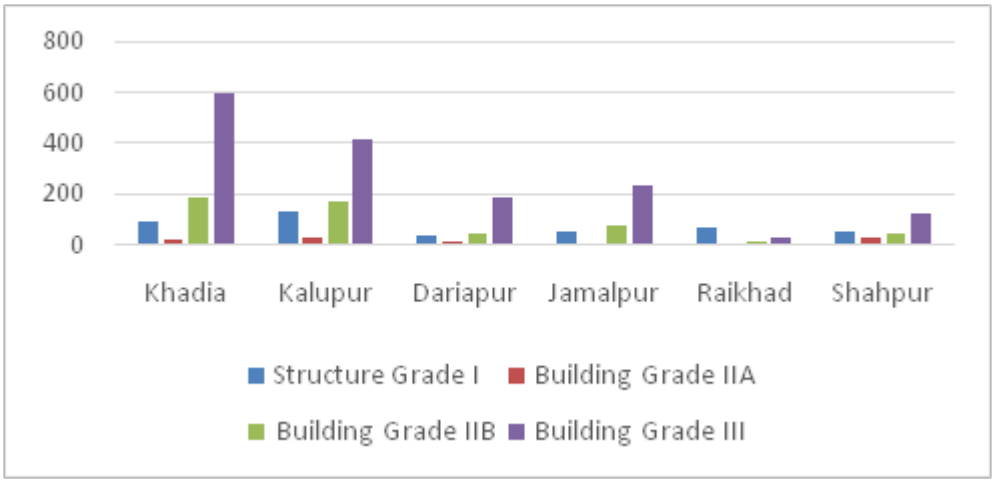
In 2017, the overall area within the walled city including its buffer area of about 200 metres surrounding it was inscribed to the World Heritage List by UNESCO based on the criteria 'ii' and 'v'.

The aspect of 'living heritage' proved to be one of the driving factors in achieving this first of its kind distinction for urban India. The traditional timber caged built form with embellishments forming the structural elements such as posts, joists, brackets, ties & bracings embedded in walls horizontally, vertically & in some cases inclined; with brick in mud lime mortar proved to be a winning streak for attaining World Heritage status. As per the local authority records (AMC 2013) over 2200 heritage residential buildings have been listed as having 'heritage' status of highest, high and moderate heritage significance and graded as Grade II/A, II/B and III respectively. Apart from these, 449 structures such as chabutaro, institutional buildings, religious structures, etc. have been categorized as Grade I.

The Wards Khadia and Kalupur account for over half the listed (Dr. Pratima Singh[1] and Dr. Utpal Sharma[2]) structures and also the grade II/A and grade III (residential) buildings and have two thirds of the grade II/B (residential) buildings (figure 3). Thus, for this research, both Khadia and Kalupur wards are considered for field surveys and assessments.

Encircled by a wall (which exists only in few parts of the walled city) and having 12 majestic gates, the walled city has a rhythmic pattern of built form interwoven in a street pattern developed organically over time around the axis formed between Bhadra Citadel and the Jami Masjid. About 600 Pols are housed

Figure 3 : Ward Wise Number of Listed Structures and Buildings



Source: AMC, 2016

in this area. Pols are traditional micro-neighborhoods belonging to specific communities – where few to few hundred households lived, depending upon the size (area) of the Pol. Nestled among/near the Pols are monuments protected by the Archeological Survey of India (over two dozen) and the monuments which are under the State Archeology Department. The urban morphology of the walled city area comprising of Pols, monuments, markets, food joints, shrines, etc. make the area intriguing and full of wonder to a new comer. Certain parts of the walled city like the Manek Chowk with shops (mainly of gems and jewellery) surrounding it remains active diurnally.

3.0 STUDY METHODOLOGY

The main objectives of this research were to: i) to identify the key contributing factors that signify the resilience of a historic city taking the case of Ahmedabad walled city and ii) prioritization of causal factors responsible for the decline in the number of buildings that play an essential role in contributing to the World Heritage Status of Ahmedabad.

The research methodology included desk literature review, collection of spatial and non-spatial data, field visits to the study area, interaction with Pol residents and other stakeholders including experts. The study area was accessed multiple times between July 2019 to August 2022 and based upon the observations made on the field (comprising of areas in Khadia and Kalupur), the implications of key contributing aspects to building resilience was deduced.

The factors affecting the decline in the traditional heritage buildings were identified based upon the field level interactions with the community and other stakeholders such as, the local authority officials, traders, heritage enthusiast, amongst others. Also, the subject experts were contacted to identify and prioritise the factors affecting the study area and particularly the decline in the traditional heritage buildings. Analogue and digital maps supplemented the field visits to understand the organic urban fabric of the study area.

This research is structured in four major parts, covering the introduction and background of the study area in Ahmedabad and its historic walled city which is the historic core; discussing the 'resilience' of the historic core while taking the case of Ahmedabad walled city and finally the prioritization of causal factors for the decline in the number of listed buildings in the selected area for the case study area.

4.0 OBSERVATIONS AND ANALYSIS

As in the case of disaster and development and as mentioned earlier in the paper that resilience and vulnerability are viewed as opposite sides of the same coin, Figure 4 (17) is derived for the present study keeping this aspect in mind and the study views Pols in physical and social realm. Within the physical realm, are the buildings and common open spaces, as part of the social realm are the socio-cultural and socio-economic aspects.

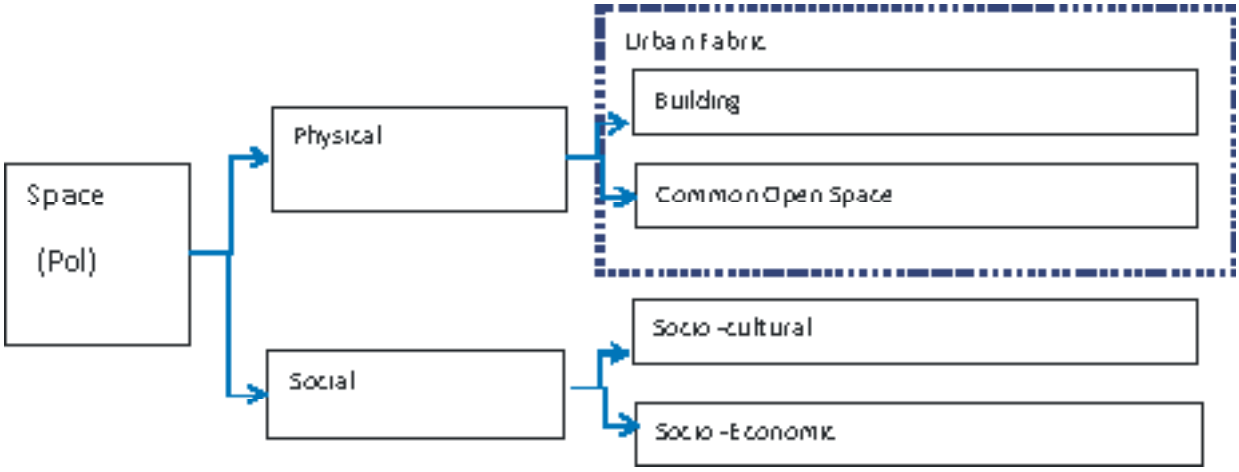
Based on the field surveys and interviews conducted, the key social and physical aspects contributing to resilience of Ahmedabad's historic walled city and subsequent decline in number of traditional buildings are discussed in the following sections:

4.1 Physical

4.1.1 Physical: Compact Form

The compact form and road network within Pols promotes walkability due to the fact that the entire

Figure 4 : Components of Socio-Spatial Resilience



Source: Based upon Y.S. Hegazi et al., 2022

walled city is located in an urban-scape limited to a few square kilometers and within this area are/ were located hospitals, schools, civil court, offices of the urban local body, etc., religious shrines, tombs, monuments, markets apart from the residential and mixed land use in and around Pols. Within minutes one can reach from one Pol to another often through a 'through-pass'.

Inspite of the heavy traffic on certain roads of the walled city (during the day from 10 am to 8 pm where commercial enterprises are located), most of the other roads and lanes are clear of traffic congestion and are easily walkable (figure 5). Presently, walkable distances in urban areas are being promoted with concepts such as the '15-minute city'. The urbanscape of the walled city in terms of circulation through roads promotes resilience by way of reduction in dependency on vehicles and the adverse effects of the same in terms of parking issues, pollution and expenditure on fuel and vehicle maintenance. Residents find this as a major advantage of living in the walled city.

Another aspect is the topography coupled with the drainage network (laid over a century ago) of this area which enables the flow of water and prevents flooding. Although the city has experienced recent floods (Bandyopadhay and Mishra, 2023) in the year 2001, 2005, 2017, 2022, 2023 most parts of the walled city remain clear of flood waters firstly due to this part of the city being established according to the city's Heritage Management Plan (2016) on the high part of the east bank and this was an important selection of site by the Sultans considering the flow of

Figure 5 : Walkable Streets

Source : First Author

river Sabarmati and also the possible eastern expanse of the city in future. During field visits, residents have proudly pointed out the aspect of flooding not taking place within the Pols of the study area.

4.1.2 Common Open Space for Circulation and Social Interaction

The open space for circulation, which included roads/ streets, chowks and other open areas, is also more in the Pols as compared to that prescribed in URDPFI norms. For example, in the map for a Pol prepared for the study, the common open space is about 19.45 percent out of the total area of about 12988 sq.m. covered by the Pol. This area excludes the semi-public open space obtained in the form of entrances to Pol houses through an entry such as approach to a khadki and the courtyards within the Pol houses.

4.1.3 Urban Fabric and Built Form Shielding from Heat

Ahmedabad is in a semi-arid region and experiences hot and dry climate. Summer temperatures easily soar 40 plus degree Celsius bringing about thermal discomfort and the city even has prepared a Heat Action Plan.

An important aspect of the Pol morphology is also the reduced thermal discomfort due the spatial arrangement of buildings in a row with the sharing of common walls. The narrow lanes sometimes just being about a metre in width, aid this aspect and remain shaded for most parts of the day. This in turn, promotes walkability even during the scorching summers of the city.

4.1.4 Use of Climatic Responsive Building Materials

Buildings and structures in the walled city form a part of the tangible heritage and the buildings have been constructed with climatically responsive materials such as wood (often with embellishment), clay and lime. Lime is a pozzolanic material and mortar made from it brings about breathability to the structure as the air does not get trapped within walls made from brick in mud lime mortar. Wood is a good insulator and helps in the process of reduction in heat gain. These materials make the Pol houses cooler to live in as compared to houses in other parts of the city.

4.1.5 Promoting Disaster Risk Reduction

In Pol houses, timber is used extensively right from plinth level to roof level and timber is not only a bad conductor of heat but also has good damping properties and is able to resist tensile and compressive stresses. Closely aligned timber framed houses with brick (figure 6) infill walls helped in acting as a monolithic unit in order to resist the lateral load from seismic wave, which the city (lying in seismic zone 3) has experienced. As many of the Pol houses have a courtyard, this element breaks the floor continuity, thus taking care of the diaphragm effect. During 2001 earthquake (intensity VII MMI), traditional timber framed Pol houses fared much better than the modern construction of RCC framed low-rise and high-rise structures in other parts of the city.

Figure 6 : Front Façade of a Pol Houses using Timber for Structural and Non-structural Members

Photo Credits : Authors

4.1.6 House Form: Facilitating Climatic Comfort

The courtyard *(chowk)* forms an important space in Pol houses. Around this area are located activities of cooking, dining, interacting and worship and even home-based economic activity (figure 7). The courtyard facilitates the flow of hot air out of rest of the rooms. Moreover, the courtyard also facilitates the inflow of light and air throughout the day and helps in reducing the use of energy intensive artificial lighting. Thus, the micro-climate of the house is maintained passively and without the need to adopt energy intensive active measures which add to the household budgets. At a collective level, such aspects help in mitigating the 'urban heat island' effect being faced by urban areas.

4.1.7 Water and Food Security

When it comes to water security many of the Pol houses have provisions in the form of tankas (lined with lime) below plinth level for storage of roof rain water for domestic use. Also, there is a community well located in the common open spaces at the Pol level. There is a designated room (inner most room-ordo) for storage of grains for the entire year. In some houses the basement or a room on the upper floor is used for this purpose. Thus, Pol houses had provisions for rain water harvesting and in turn less dependency on other water sources and also had a separate designated space for storage of grains.

Figure 7 : Courtyard providing Natural Light, Ventilation and Balancing the Pol House Micro Climate

Photo Credits : Authors

4.1.8 Due Consideration for Topography

Due consideration for topography is seen evidently in several Pol houses. Figure 8 gives an example of a Pol house, the front elevation of which shows three finished floor levels and a part of the basement is also visible whereas; the rear elevation shows four finish floor levels with basement visible fully above ground level.

As the road network reaches the inner most parts of the Pols - usually to a cul-de-sac (figure 9), their width constrict. This leads to decrease in the movement of vehicular traffic and with decreasing vehicular movement, the noise pollution caused due to this aspect also decreases significantly and thus, a strikingly peaceful environment exists in the inner parts of Pols.

Another key aspect of the Pol morphology is the fact that each Pol House, which usually occupies the entire plot, has a specific independent entry to it even if abuts a very narrow street where movement of vehicles

Figure 8 : Front Elevation of Building (Left) and Rear Elevation of Same Building (Right)

Source : Authors

Figure 9 : Cul-de-sacs in Urban Fabric of a Pol (Left), Listed Building and Structures Spread Across the Pol (Right)

Source: Author, based upon AMC data

with more than two-wheels is not possible. The Pols have emerged organically over the centuries and have ensured following the practice of separate entry to each abutting building/plot from the road – a practice later being followed by modern town planning.

4.2 Social

4.2.1 Socially Connected Communities: An important ingredient to Building Resilience

Untill a few decades ago, people lived in Pols as a community not based on economic class but on the lines of religion, caste, occupation, etc. The people in such areas lived as well-knit communities. They participated in each other's social functions and Pol level events. For instance, if a feast to commemorate an event took place in one household in a Pol, during such an event the rest of the households in the Pol would also be invited for the feast. People took up responsibilities during occasions of other people's household related events and functions and at events organized at the Pol level.

Although in present times, those who live in Pols do not necessarily belong to the same community, however, even today as reported by the community during the field visits, the major positive aspect of living in Pols is that people are helpful to each other and in case of any dire need, other people in the Pol do not need to be called for help, instead they come to help proactively without even being called for. People sit on their otlas (raised platforms used for seating/sleeping/cutting vegetable/doing home based work at the entrance of a building) and greet each other and those passing by. To sum up, communities are well connected with one another and have an overall helpful attitude - which is essential for building resilience. During the field visits for the study, it was seen that people proactively go out of their way to even help strangers such as for way finding through the complex network of circulation spaces/streets with Pols streets in most Pols.

4.2.2 Safety and Security: Keeping An 'Eye on the Streets'

The façade of the Pol houses have large openings and grills which facilitate not only movement of air but also through-and-through vision. This enables residents to keep an eye on the street and in this way safety and security are passively promoted (figure 10). Usually, the front entrance door of Pol houses remains ajar all day long. Also, the otla in front of the house facilitates interaction amongst the Pol residents daily and is particularly useful during an emergency situation.

4.2.3 Resolution of Local Community Conflicts and Concerns

There was a Pol Panch in the Pols, this panch was the Pol based administrative body. Conflict resolution was one of the key functions of the Pol Panch. The

Figure 10 : Ajar Windows Enable (Eye on the Street)

old panch system evolved with the joint efforts of the seniors in the Pol, who also were the wealthier ones within the pol (Ray, 2008). However, field level interactions with the residents revealed that presently the panch does not exist in most of the 600 odd Pols of the walled city.

4.3 Socio-Cultural-Economic

There are certain socio-cultural-economic aspects worthy of mention that contribute to building the resilience.

4.3.1 Arranging Free or Subsidized Meals

Free Meals for Sick and Needy

Free meals are available for the sick and needy in the area taken up for the study and with regard to this, there is a practice (followed right since the times of the founding ruler) for ensuring meals for the needy. The sponsored meal is available twice a day and has on its menu a commonly eaten dinner dish – the Khichadi.

Subsidized Meals for Seniors

There are several community-based places (bhojanalays) serving meals in the walled city. In one of the wards, seniors (age 60 and above) who do not have any means of social and/or financial support and/or live alone are given by way of subsidized take away meals in tiffin carriers for a sum of Rs.10 per meal. This is possible with the help of donations given to a voluntary organization. The meals are prepared by residents living in the Pols in a highly participatory and decentralized way with division of various meal preparatory activities across several Pol residents almost all of whom are females.

4.3.2 Creation of Sense of Inclusiveness through Common Resources

Pols in the walled city have resources at the Pol level such as black board, common well, common shrine, native trees (such as Ficus Religiosa commonly known as Pipal). With many common facilities, a sense of inclusiveness is seen in Pols. Majority of the Pol houses have become multiple household/enterprise dwelling due to sub-divisions in property over time and people moving out of Pols to live in newer planned areas or going abroad. In one of the Pol houses there exists over a dozen subdivisions with as many as 40 people residing in it. The first room (khadki) abutting the otla becomes like a common passage (common resource) for the through-o-fare of multiple households. During the field visit it was seen that the inclusive approach of the residents is evident even to homeless people some of whom are allowed to sleep on the otlas and common entrance passage of Pol houses.

4.3.3 Socio-Economic Resilience

A unique feature of Pol houses is the wide prevalence of home-based economic activity. Such activity not only promotes resilience with respect to household economic coping strategies but also saves travel time and cost to an individual's expenses as well as mitigation of environmental degradation (e.g. checking air pollution). From the above premise, it is evident that the study area located in the city core had several points to be noted which in a way depicts a prevailing sense of resilience. Of note is the resilience of the traditional built form (Pol house) to climatic changes and natural disasters such as earthquake. This built form is experiencing threats and is on the decline in terms of quality as well as quantity. Newspaper reports have also highlighted the aspect of decline in the number of traditional Pol houses.

5.0 DECLINING NUMBER OF TRADITIONAL POL HOUSES THAT PROMOTE RESILIENCE

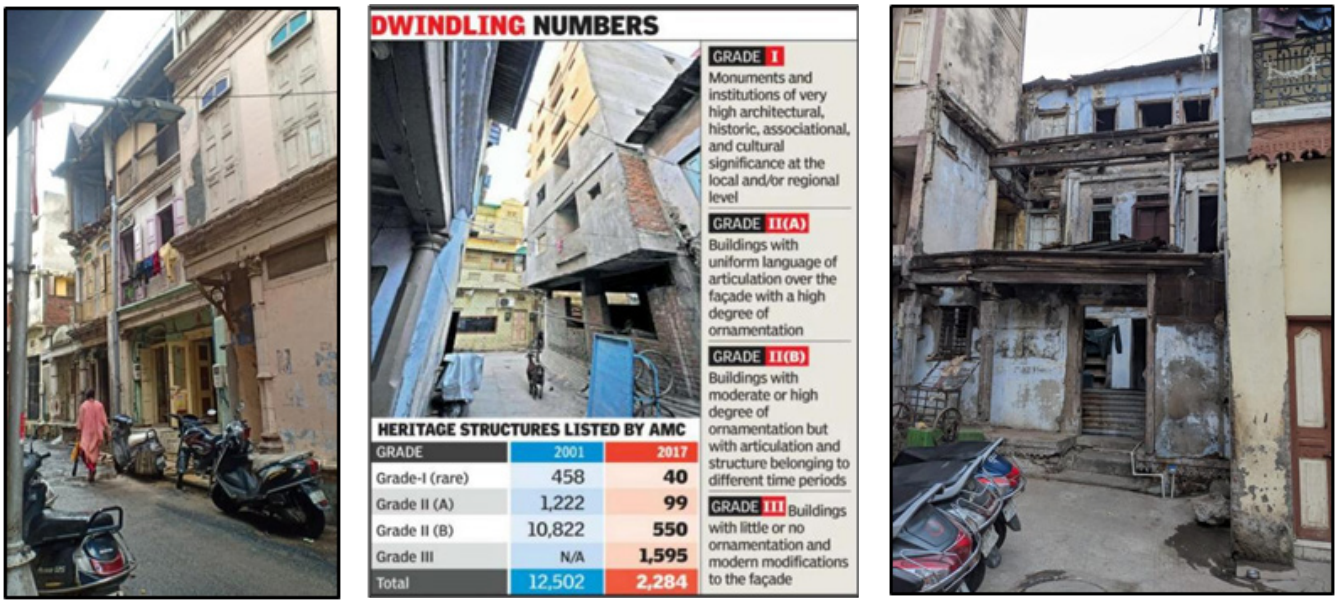
During 1990, there was a total of 64945 (15) housing stock in the walled city of Ahmedabad as per the statistical profile published by the local authority (AMC). In 2001, there were about 12502 buildings and structures worthy of conservation by AMC (figure 11). By 2017, the number declined drastically and become about one fifth (Times of India, 2018).

The 'dwindling' in numbers of heritage structures to such an extent calls for study as they are vulnerable owing to a number of factors. More research is required for exploring ways to address the risks faced by world heritage (Riganti, 2017). It is seen from field observation that the number of buildings with heritage significance has declined and demolition of traditional buildings is unabated. Print media reports highlight the trend of surmounting illegal construction in the micro fabric of the walled city of Ahmedabad.

5.1 Factors Affecting Outstanding Universal Value of World Heritage Properties

UNESCO (2012) mentions risks as the result of natural or human-made threats (and) risks to heritage sites are also dependent on the specific characteristics of

Figure 11 : Dilapidated Heritage Structure and Media Clipping on Heritage Structures (Left and Extreme Right)



Source : First Author (left and extreme right) and Times of India (center)

each site and its inherent vulnerability. UNESCO's World Heritage Committee (2008) adopted a list of fourteen primary factors that affect the Outstanding Universal Value (OUV) of World Heritage Properties. Consultation process with experts in the fields of natural and cultural heritage led to preparation of this list. The primary factors or threats encompass secondary factors and the list was established following a 2-year consultation process with experts in fields of both natural and cultural heritage.

5.2 Prioritisation of the Factors Influencing Decline in Traditional Heritage Buildings

A ranking exercise was conducted with experts with respect to the factors that can influence the decline in the number of traditional buildings, and it was seen that rather than prioritization of natural factors, the non-natural factors were prioritized. The factors were enumerated through literature review, field visits and discussions with the community and also with experts such as Engineers, Architects, Designers, Planners, Emergency Managers, Urban Designers, Economists, Local Authority Officials, Academicians, Building Contractors, Traders, etc.

To understand individuals' perception and preference for some items such as products, people and species, ranking is one of the simplest and efficient data collection techniques (PLH Yu, J Gu, H Xu, 2019). Experts (17 in number) were randomly selected and requested to rank the probable factors that can influence the decline in the number of traditional buildings with respect to the factors enlisted for the study. The experts were engineer (1), planners (3), architects (7), urban designers (2), designers (3) and economist (1) who have more than 10 years (17) experience of working in the area of heritage of Ahmedabad.

There were 28 factors identified in the case study area and when it came to the ranking by the 17 experts, the factors that were ranked higher by them were related to Lack of awareness and know-how to repair/conserve/restore, Inadequacy of Services (Water supply, Sanitation, Roads) and Narrow streets, Attraction to newer development in city, Inadequate Parking Facilities, Residents facing social problems (negative effect on marriage alliances), Conversion of Use (Residential to Non Residential), Community disintegration - Leaving Pols due to attached 'Stigma'/ mindset or because others have left from family/ caste/religion/friend circle, Illegal Construction, Lack of interest by Pol residents/owners in Pol houses, Lack of Affordability, House Form, migration of people into the walled city, Riots/Disturbances, rental properties, and local bullying. The factors such as earthquake, flooding, cyclone, etc. ranked much lower in the list.

The above factors were grouped as per the standard list of 14 primary factors affecting the Outstanding Universal Value of World Heritage Properties adopted by UNESCO's World Heritage Committee. The outcome of this ranking exercise and their linkages with the UNESCO's primary factors affecting the OUVs revealed that the non-natural factors were prioritized by experts over the natural factors. Majority of the non-natural factors can be grouped into one of the 14 primary factors affecting the OUV of World Heritage - 'Social/Cultural uses of heritage'.

6.0 KEY FINDINGS AND CONCLUSION

Considering the decline in the number of buildings in the historic core of Ahmedabad, it is imperative to consider the important non-natural factors (such as socio-cultural-economic) while framing plans and policies, aiding the preservation and conservation of the heritage buildings and structures and thus being able to retain the UNESCO World Heritage status.

The city of Ahmedabad, being on the forefront of climate change related shocks and stresses, the city has prepared a Disaster Management Plan as well as revised its earlier Heat Action Plan. While these plans generally considered the major climatic shocks and stresses, however, the key "non-natural" or socio-cultural-economic factors are not taken into consideration.

The findings from this research clearly highlight the importance of some of these factors in maintaining the overall harmony and resilience of the historic core city of Ahmedabad. Certain leafs from such existing practices promoting resilience can be considered in the present context of an increasingly urbanized world facing challenges of water security, climatic changes, geologically induced disasters, to name a few. Also, due to rapid increase of the commercial activities and changes in the land use, mainstreaming such factors would contribute towards advancing the resilience of this historic core.

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Transfer of Development Rights (TDRs) for Heritage Conservation in Amritsar

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Abstract

Historic buildings are an integral part of any city's character and identity, and their conservation is essential due to the connect and significance they contain about the past. In developing nations experiencing urbanization, these historic precinct structures are in danger of being destroyed. It would seem that the current legislative measures are not enough to stop the demolition of these structures in the precincts. There is a lack of conservation incentives, heritage property owners have few development options, and stakeholders generally don't understand their importance, all of which contribute to their vulnerability. In this paper, Transfer of Development Rights (TDRs) are looked as an incentive system that could help keep these buildings and areas conserved. In an effort to find anintermediate between commercial concerns and preservation efforts, the TDRs program is being considered as a practical alternative for owners of historic properties.

Keywords : *Conservation, Heritage Precincts, Stakeholders, Transfer of Development Rights,*

1.0 INTRODUCTION

Heritage structures define a city and must be preserved due to their historical value. Cultural heritage in historic precincts is at risk of demolition in rapidly urbanizing developing countries. Current laws and legislations seem insufficient to prevent precinct structures from being demolished. Heritage property owners have few development options, stakeholders don't understand their importance, and conservation incentives are lacking. This paper explores Transfer of Development Rights (TDRs) as an incentive to preserve these architectural structures and precincts. To balance economic interests and preservation, heritage property owners may consider TDRs.

There are a lot of important historical and architectural buildings in India. These buildings must be preserved due to the historical importance of them. Still, decisions regarding their destiny have been impacted by economic factors, infrastructural developments, unawareness regarding the historical importance of these structures, and non-participative stakeholders. Consequently, the character and value of these structuresin the precincts is fading away. Traditional examples of "urban heritage" that come to mind for most city planners and administrators include historic city walls and gates, religious buildings (temples, churches, mosques, etc.), palaces, castles, fortresses, and other institutional buildings serving social, educational, scientific, or administrative functions. Tragically, this perspective often fails to take into account important buildings and structures in the precincts that have historical significance and connect.

For the better part of four decades to half a century, most developing-world governments have used both official and informal channels to address precinct issues. Overcrowding, deteriorating structural conditions, inadequate infrastructure, unsuitable locations, and so on were common places in most of these rapidly expanding housing areas. For development and economic reasons, Amritsar's heritage building owners are mostly disposing of their properties. Building owners are worried about falling behind financially and economically due to the fast pace of urbanization. Possibilities for owners to profit would arise due to the high land and property values. It would seem that developing new areas is more practical than repairing old ones due to a lack of structural support and facilities. It is becoming more difficult for owners to maintain the building in its current state due to the economic-conservation imbalance (Canavan, 1993). The conservation of these historic structures is affected by government intervention. However, owners still face the basic problem of an economic versus conservation imbalance, even when regulations are minimal.

An incentive program could be established to encourage stakeholders and owners of heritage properties to keep their structures in good condition without putting

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their money at risk. Only a small number of Indian cities use the TDRs system, which is prevalent in the United States, Hong Kong, and Australia. Protected by the Transfer of Development Rights are precinct buildings, open areas, historic sites, and farms. The paper analyses the pros and cons, and practicability of Amritsar's TDRs.

2.0 LITERATURE REVIEW

2.1 Concept of Transfer of Development Rights

Communities are encouraged to willingly relocate growth from one area to another through the market-driven strategy known as Transfer of Development Rights (TDRs). Some precincts may contain properties that are particularly important to the environment, as well as open areas, farmland, wildlife habitats, historic sites, or noteworthy buildings. However, because of their closeness to employment, commercial business centres, educational institutes, other urban and public infrastructure and amenities, receiving areas should be publicly approved for development.

The TDRs system allows for the swap of stakeholder land for development space. This additional building space can be used by the owner or sold to third parties at a price that is mutually agreed upon. Rezoning is not the only option; TDRs are a viable one. Using this structure, cities can establish development zones and preservation zones. The right to development belongs to every stakeholder. Stakeholders possessing these historic structures with elements and features having connect with certaineras in the precincts should have all the transferrable development rights for their properties.

"Sending Areas" refer to places that are intended for more conservation efforts, while "receiving areas" refer to places that are intended for more development efforts, and the transfer systems are the most important and vital parts of TDR. Nonetheless, various researchers have reached different conclusions. Greenaway and Good (2008) proposed four main features of TDC (Transfer of Development Credits, the acronym for TDR in Alberta): (1) the area to be sent; (2) the area to be received; (3) a system to transfer development potential from one parcel to another; and (4) a body to develop and maintain the program's and tool's principles. The four fundamental components of TDR that were proposed by Machemer and Kaplowitz (2002) are as follows: (1) the sending area (2) the receiving area (3) the procedure for transferring development rights and (4) the definition and specification of severable development rights for individual parcels.

3.0 DATA BASE AND METHODOLOGY

3.1 Working System for TDR

A developer in a receiving area pays to have the right to build at a higher or denser density than would otherwise be permitted, while a landowner in a sending area receives compensation for relinquishing that right. Nor does TDR supplant zoning in controlling development (Aken et al., 2008). By outlining the areas that should be prioritized for development and how to channel that expansion there, it helps communities make better plans (Aken et al., 2008; Kaplowitz et al., 2008). As a "least-cost" alternative (Li, 2008), a "less impact of sprawl" (Aken et al., 2008), and a method that goes beyond conventional zoning, TDR compensates owners who relinquish the development right while reducing numerous public costs (Pizor, 1978).

- There are three methods for abstracting TDR cases that aim to protect built heritage.
- The land area of the sending and receiving sites is equal. The adjacent heritage site takes full ownership of the development rights of the original heritage site. The government receives the heritage site and any structures on it when the owners donate them. Once the land premium is paid, the owner can begin development activities on the new site (figure 1).

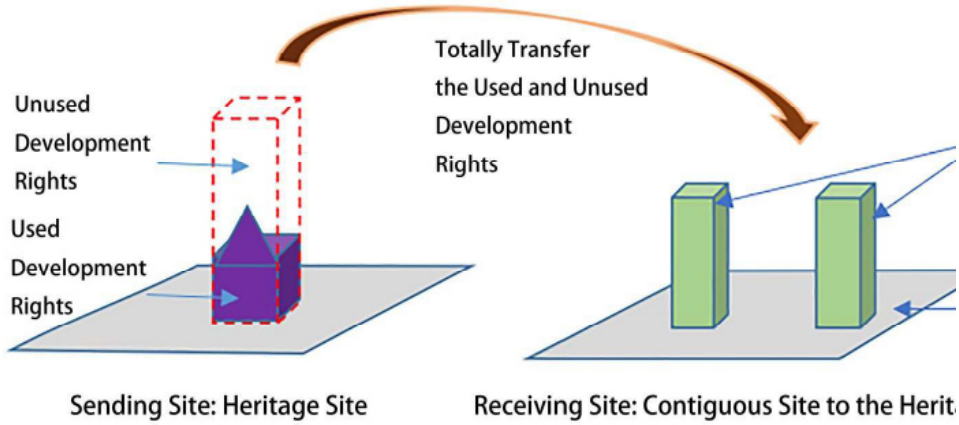
4.0 SCOPE OF TDRS

TDRs Contributing to the following areas of Built Environs

4.1 Contribute to Sustaibale Development

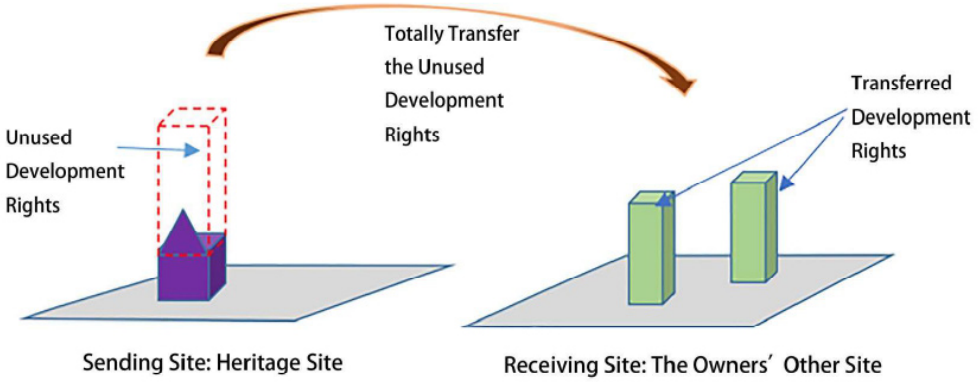
- The same people own both the sending and receiving sites. The owner's other site receives the unused development rights, either in whole (figure 2) or in part (figure 3). The owner is still legally entitled to use the historic site as they see fit, subject to certain regulations imposed by the government. The government should be notified of any development within the heritage site in order to seek permission. New development can be carried out by the owner at another location.
- Figure 4 shows that when property owners sell their undeveloped development rights to developers, those rights move from the historic site to the other developer's property. Heritage building owners can still use their property, but they no longer have the right to develop it, meaning they can't tear it down or put anything new in its place.
- Unlike traditional zoning regulations, Transfer of Development Rights (TDR) offers voluntariness, fairness, and predictability in land use management, which is valuable for social reasons.

Figure 1 : Transfer to Heritage Sites to Contagious Site



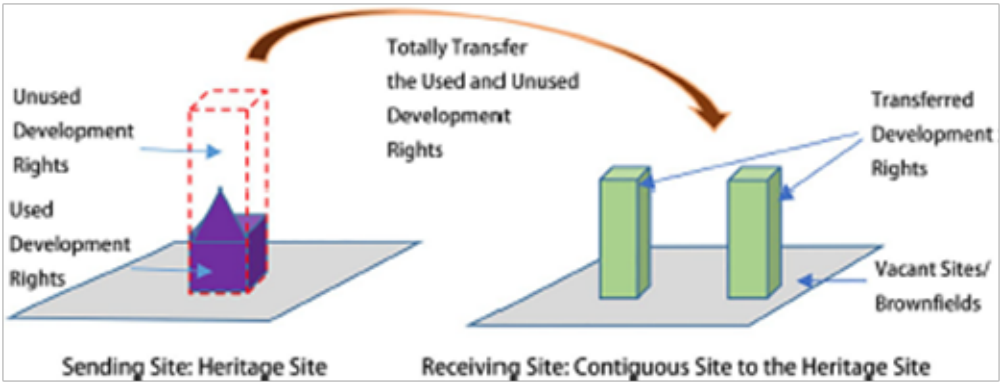
Source : Hou J, Gu D, et al. (2019)

Figure 2 : Transfer of Development Rights to New Site under the Same Ownership.



Source: Hou J, Gu D, et al. (2019)

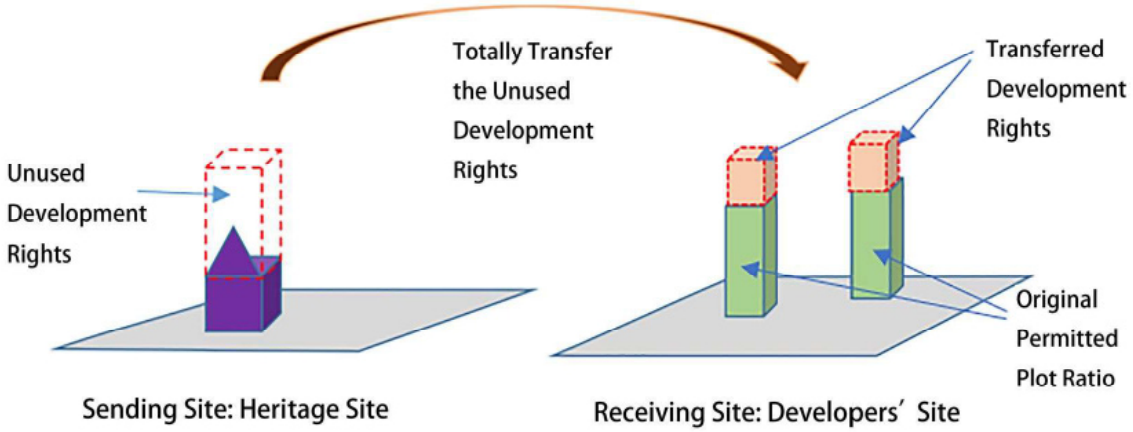
Figure 3 : Transfer Part of the Unused Development Rights to New Site under the Same Ownership.



- Landowners can choose to participate in TDR based on their needs and development goals. If they wish, landowners can develop their properties according to existing zoning regulations without TDR involvement, unlike zoning, which imposes rigid regulations on all stakeholders regardless of their circumstances. TDR participation is voluntary, giving landowners and developers a sense of autonomy and choice through genuine need or desire for increased density or height.

Landowners receive fair compensation for development rights transferred through TDR. This is in contrast to traditional zoning, which can benefit some landowners while limiting others' development. To avoid inequities and treat everyone fairly, TDR compensates landowners

Figure 4 : Transfer to Developer's Site



Source : Hou J, Gu D, et al. (2019)

for development rights transfers. Landowners are more likely to support strict land use regulations if they receive fair compensation for their property rights, which promotes social equity and political feasibility.

- Traditional zoning regulations can change frequently with administrations or political agendas, but TDR provides predictability. Instead of negotiating variances with government agencies, developers can purchase development rights through TDR to exceed density limits. Predictability streamlines development, reduces developer uncertainty, and ensures land use consistency over time.

4.2 Economic Impact

- TDR is an economically efficient land use management method that uses market forces to allocate development rights without government funding. TDR relies on private developers for sites with higher development potential, not government funding.
- A key economic benefit of TDR is its market-based nature. TDR optimizes resource allocation by letting the market decide which parcels to preserve and allows development in others. Developers who want to exceed zoning density or height limits can buy development rights from landowners who want to preserve their land, serving both parties' goals.
- In this market-driven approach, development rights are allocated for optimal economic efficiency without hindering growth. TDR also lets developers exceed zoning restrictions in designated receiving areas, encouraging development. This attracts investment to underutilized or economically disadvantaged areas, boosting economic growth. Developers may increase property values in receiving sites to capitalize on their development potential, boosting economic growth.
- TDR transaction fees can also be reinvested in related departments or initiatives. These funds can support infrastructure development, environmental conservation, and affordable housing in land use planning and management. Market-based revenue helps conserve critical habitats, ecologically sensitive areas, and farmland. TDR reduces urban sprawl, habitat fragmentation, and biodiversity loss by transferring development rights to reception sites. Deed restrictions or conservation easements that permanently protect protected lands from development help ensure environmental sustainability and resilience.

4.3 Cultural Impact

- TDR can also protect cultural and historic sites from development. TDR programs transfer development rights from historic buildings or districts to support preservation and adaptive reuse. By encouraging the preservation of architectural treasures and cultural landscapes, TDR helps communities retain their identity and pride in their past.
- Diversity of TDR programs in the US shows its widespread use for environmental and cultural conservation. Pruetz et al. (2007) noted that many TDR programs focus on environmental, farmland, and historic preservation, demonstrating TDR's multifaceted use in protecting natural and cultural resources. By encouraging compact, walkable communities and preserving open spaces and scenic vistas, TDR programs for infrastructure and urban design improve urban environments.

5.0 CONCEPT OF TDRS : GROWTH ACROSS THE GLOBE

TDRs were first outlined in the first American Zoning Ordinance, which New York City passed in 1916.

Landowners were able to circumvent the new setback and height restrictions by selling their unused air rights to nearby parcels (Johnston and Madison, 1997). As part of the Landmarks Preservation Law, TDR was added in 1968 by the City Planning Commission. In 1998, the City reinstated TDRs in an effort to stop the demolition or repurposing of Broadway Theatres.

Early 1980s criticism highlighted inefficient command-and-control regulations. In response, policymakers studied market-driven governance (Henig, 1990). Australia established tradable fishing permits in 1986 to stabilize lobster populations. Half of US sulphur dioxide emissions were reduced by tradable pollution credits in the early 1990s (Brown, 2001). These accomplishments made TDRs an economic solution to social issues.

As the most successful TDRs program, Montgomery County conserved farmland over 38,000 acres. New Jersey Pinelands' 1980 TDRs program covers one million acres and 60 municipalities. This program preserved almost15,500 acres by 1997.

6.0 CONSERVATION AGENCIES AND PROGRAMMES IN INDIA

The Ministry of Culture promotes and protects Indian culture. The ASI is this Ministry's main archaeological research, preservation, and conservation agency. The 1958 AMASR and 1972 AMT are the main heritage preservation laws. The AMASR Act safeguards ASI-designated national monuments. Religious endowments and trusts manage temples, mosques, gurudwaras, and churches, while state archaeology departments preserve monuments. The PWD maintains many urban historical sites. For Indian artefact preservation, display, and education, the Ministry runs National Museums. INTACH and the Aga Khan Trust document and restore Indian heritage with state agencies.

A 100- and 200-meter buffer zone around historic sites was established and enforced by an amendment to the AMASR Act in 2010 to forestall intrusion and illegal building. The National Monuments Authority was established by this amendment to draft heritage bylaws for monuments that are protected. Heritage preservation and tourism promotion were recently sought after by the private sector by the government. Heritage conservation CSR funding is supported by organizations such as Adopt a Heritage and the National Cultural Fund. They are promoting heritage tourism as a unit. Projects like HRIDAY and more are working to preserve and promote heritage. Many protected monuments deteriorate despite these efforts. Some of India's cultural heritage is being lost in the process of conserving both protected and unprotected monuments.

7.0 IMPLEMENTATION OF TDRS IN INDIA

Many cities like Mumbai, Ahmedabad, Bengaluru, Chennai, and Hyderabad ran TDR successfully. Among the few case studies:

Mumbai has limited horizontal expansion potential despite high floor space demand due to its high density and linear geography. TDR grew due to this and the city's low FSI. Transferable Development Rights are granted by the MRTP Act, 1966 for free land. Greater Mumbai's 1991 development control rules mention TDR. TDR compensation covers redevelopment, slum housing, roads, heritage structures, public land reservations, and housing. Over 12.93 million sq. mt. of MCGM-generated area is in 3178 DRCs, with 0.5 million TDR unused. Market volatility sets TDR prices.

Ahmedabad: Gujarat Government changes to the Town Planning Act, 1976 enabled TDR. TDR is used in Ahmedabad for public housing redevelopment, heritage conservation, and slum rehabilitation. The State effectively constructed trunk infrastructure utilizing VCF strategy and "Land pooling" technique.

In 1976, the Gujarat Town Planning and Urban Development Act established the two-stage 'Development Plan-Town Planning Scheme' for city planning. A comprehensive statutory decadal development plan from the Development Authority is the first step in urban planning. The Development Plan will outline the city's planned urban expansion into the countryside. The Development Authority maps these emerging growth regions' trunk infrastructure's main thoroughfares and large roadways. The expanding area is split into smaller portions. Each smaller area is divided by the Development Authority to create a Town Planning Scheme (TPS), an all-inclusive plan for land reconstitution, infrastructure development, and funding.

The local government consults the landowners before acquiring part of their property for improved infrastructure like roads, water, and other amenities in value capture. The net demand or betterment charges are estimated by subtracting the compensation for appropriated land from each plot and taking 50 percent of the land value increase. This method eliminates land costs while covering infrastructure, planning, and administration costs by taking advantage of land value increases and few of the features were:

- The mechanism is legal and technical.
- A large portion of developed land and any value increase go to the owners, who split the benefits.
- Planning works to strengthen the land market.

- Landowners are informed and their complaints addressed during planning.
- In 2006, Hyderabad released the "Revised Common Building Rules," which shaped the TDR Policy. Rules were updated in 2012 and 2017. These rules define TDR issuance and use TDR is mostly used for infrastructure development and lake and historic structure preservation. TDR certificates are avoided in crowded cities, but they can be used in new developments with infrastructure. The HMDA and GHMC accept TDR certificates from their jurisdictions.
- Since 2006, 600 TDR certificates have been issued. Hyderabad does not require TDR certificates; they are voluntary. GHMC also issues digital TDR certificates through an online TDR bank. The platform facilitates vendor-consumer communication. TDR transactions now resemble stock market transactions. After the new TDR Policy was implemented, the real estate market responded positively.
- Infrastructure projects in Chennai, such as the metro rail initiative, road expansions, and new road construction, can move forward more quickly with land acquisition thanks to transferable development rights approved by the state government. When the Chennai Metropolitan Development Authority unveiled their second set of Master Plans in September 2008, this was one of them. Owners can use TDRs to transfer development rights for any other property, even after Authorities have acquired over the property for other use. With this plan, we can hopefully cut down on traffic in the city and make it easier to acquire land for the expansion of important roads and bus routes.
- The government has issued a directive that states TDRs will be issued with an additional 50 percent FSI for properties acquired for infrastructure development that have a Floor Space Index (FSI) of 1.5 or higher. Built-up space is calculated according to the FSI available.

8.0 AMRITSAR : HISTORIC EVOLUTION

India has a tremendous amount of architectural heritage, the city of Amritsar in particular, has followed in the footsteps of the great nation. Over the course of its 428-year history, Amritsar has grown into Punjab's most important metropolis, serving as the religious, political, and economic hub as well as its premier city. The City of Golden Temple is a symbol of Punjabi spiritual heritage as well. The city of Amritsar has carved out a special niche for itself in the annals of the nation and the state thanks to the great heritage and it connect with various historic eras.

Having grown from a tiny village known as Guru Ram Das Nagar—The Spiritual Centre of the Sikh faith and appropriately named Sifti da Ghar-Amritsar is now one of a major city. Prior to India's independence, Amritsar flourished as a regional trading hub due to its strategic location in India. Unfortunately, the premier city of the state was turned into a border town after independence due to the country's partition, which had a negative impact on its population, economy, trade, and commerce. During the partition of India, riots reportedly damaged or destroyed over a quarter of the total buildings. As a result of its border location and antagonistic neighbours, Amritsar has endured tremendous hardship. Amritsar has always been a popular destination for both high-profile tourists and regular people and a major hub for vacationers. With its traditional culture of business and lifestyle, the walled city with 12 gates has long been buzzing with activities. Given the current state of affairs in Amritsar, a great deal of problems is obstructing the city's rational expansion and having a negative effect on the historic structures and the land around them. In order to safeguard these areas and encourage their growth, the following plan of action is proposed.

In India, the term "Manmade Heritage" refers solely to structures and not entire regions. For the most part, the Act has not applied to urban areas. As a result, while most buildings have received attention, cities and urban areas have largely been disregarded. The PMC, MC and IT Acts, and other important urban development statutes have not yet been revised to incorporate heritage as a crucial component of community development.

9.0 POTENTIAL BENEFITS OF INTRODUCING TDR PROGRAMS IN AMRITSAR'S HERITAGE PRECINCT

- The historic district includes the Golden Temple, other ancient structures, and traditional neighbourhoods. TDR programs encourage property owners touse their development rights to other areas, preventing overdevelopment and preserving the historic district's integrity.
- Urban historic districts often suffer from neglect, decay, and inadequate infrastructure. TDR programs can boost revitalization by encouraging infrastructure improvements, adaptive reuse of historic buildings, and restoration. While retaining the historic precinct's character, this can attract tourists and locals.
- TDR programs encourage owners to adapt historic buildings into restaurants, boutique hotels, cultural centres, or museums. Property owners can transfer development rights to other areas to make

adaptive reuse financially viable and offset historic structure preservation costs.

- Amritsar's historic precinct attracts tourists from around the world to see its religious and cultural sites. TDR programs can improve visitor experiences by supporting tourism-related businesses, preserving historic sites, and improving infrastructure. This may encourage local business ownership, job creation, and economic growth.
- TDR programs in Amritsar's historic precinct can foster community engagement and stewardship by involving locals, heritage groups, and stakeholders in decision-making. When the public decides who gets development rights, more equitable and long-lasting results can be achieved.
- TDR programs promote sustainable urban growth by diverting construction from culturally or archaeologically significant sites or other sensitive areas in the historic precinct. Relocating development rights to other areas reduces the impact of new development on the city's historic assets while allowing for more growth.
- TDR programs can preserve and improve the historic precinct by attracting heritage tourists and promoting cultural exchange, enhancing Amritsar's traditions, architecture, and history. This can strengthen local-visitor ties and improve the city's cultural fabric and global identity.

In conclusion, TDR programs in Amritsar's historic precinct have many benefits. Community engagement, sustainable urban growth, cultural heritage preservation, historic area revitalization, tourism and economic development, and local community engagement are examples. Planning and implementing these programs can help Amritsar preserve its historic district for years to come.

10.0 RESULTS AND DISCUSSION

10.1 Potential Challenges of Implementing TDR Programs in Amritsar's Heritage Precinct

- Heritage precincts have strict regulations and preservation requirements to preserve their history. Implementing TDRs in these areas requires following complex heritage conservation guidelines to preserve heritage sites. This may require lengthy approvals and negotiations.
- Heritage precinct stakeholders like property owners, residents, and heritage conservation groups may oppose TDR programs due to concerns about character changes. Some people oppose new development or adaptive reuse because they think it will change the precinct's aesthetic or culture.
- Many stakeholders may not know about TDRs and their heritage preservation benefits. Heritage precincts may be hesitant to implement TDR programs due to a lack of knowledge and education about their benefits. To educate and gain support for TDRs, extensive outreach and engagement campaigns may be needed.
- The unique characteristics and historical significance of heritage precincts make it difficult to value development rights there. Negotiating transfers or preservation incentives can be difficult when property owners overvalue their development rights. Fair and transparent TDR valuation is essential but it is controversial sometimes.
- Financial incentives or bonuses may be needed to reduce the perceived loss of development potential and encourage property owners to participate in TDR programs. Due to their high property values, heritage precincts may have trouble funding these incentives. Finding a balance between financial viability, heritage preservation, and development is difficult.
- Heritage precincts have many stakeholders and historic properties, making it difficult to monitor transferred development rights and comply with TDR regulations. Local governments and heritage preservation organizations should collaborate to create monitoring and enforcement systems that deter misuse and illegal development.
- Community Participation and Common Ground: Heritage precincts can be difficult to resolve, especially when parties have different views on development, preservation, and economic growth. Genuine community engagement and consensus-building are needed to address concerns, build trust, and ensure TDR programs meet everyone's needs and goals.
- These obstacles must be overcome by planning ahead, involving relevant parties, and using adaptive management strategies specific to Amritsar's heritage precincts. By proactively addressing concerns and building consensus, TDR programs promote heritage preservation, sustainable development, and economic vitality in culturally significant areas.

10.2 Problems for the Implementation of TDR

Many TDR programs have been implemented, but few are successful. It's important to identify the obstacles to TDR program implementation. Bruening (2008) identified four market-based TDR barriers: supply and demand allocation, inconsistent and flexible zoning, transaction costs, and public outreach and education. Aken et al. (2008) identified five major obstacles:

1. Without adequate receiving areas, TDR has no market. Transactions and TDR market price stability depend on enough sending and receiving participants.

2. Urbanizing areas have limited road, utility, and storm water infrastructure. If the developer must upgrade infrastructure, participants will lose interest.

3. TDR requires more density to be successful because it is a tool based on the market. If developers can benefit more from other incentives, such as increased density or height through zoning, they will not use TDR.

4. The owner and the developer should both profit from a fair price for the transaction. When prices are low, landowners aren't interested. It won't matter to developers if it's too costly. Consequently, careful consideration of the transaction price and exchange rate is required.

5. Market and deed restriction supervision, as well as easement document preparation, make TDR administration more complicated and costly compared to zoning (Pizor, 1978; Hanly-Forde et al., 2018). Especially in the beginning, stakeholders may feel uneasy or lack basic TDR knowledge due to the inherent uncertainty of a program. Active support and leadership are essential to overcome this. Programs that make an effort to educate the public, advocate for the program, and provide transaction support eventually succeed.

11.0 CONCLUSION

A considerable number of Amritsar's historic precincts and structures are deteriorating and are in a state of mess. Monuments, historical structures, and aging residential properties are being demolished, whether by intention or neglecting them deliberately.Considering current approach and intentions, the future of the heritage and its conservation seems to be grim, perhaps only fragments of our country's heritage and their values will remain intact. The significance of conserving historical land uses is increasing at slower pace with the trend toward urban modernization. As a result, there is an immediate need for a robust conservation mechanism capable of accommodating both economic and historical preservation requirements. TDRs may prove to be an indispensable instrument in this situation. Policymakers will have the ability to implement transfer development rights by formulating an all-encompassing policy that considers planning, land use, building control, environmental control, and conservation practices using the validated framework. By intervening strategically, the difficulties that might arise during the first TDR implementation in Amritsar (India) can be overcome. In addition, this strategy should not be preoccupied exclusively with conservation initiatives. Further infrastructure development endeavours may find its application advantageous as well.

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Portraying Medieval Characteristics of Amritsar City through Diagrams

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Abstract

Morphology and city form are best understood by a visual approach supported by literature; hence the significance of the study is to provide a visual/ diagrammatical contribution to the literature by presenting it with a new dimension which is more imaginable than the theoretical descriptions. The objective of the paper is to develop a visual framework of the different elements composing the morphology and city form of medieval Amritsar. In this paper, the medieval characteristics of the city of Amritsar have been portrayed through diagrams and a comparison has been established between the medieval and the current states of the different physical elements to identify problems pertaining to the conservation of the historic character of the city.

Keywords : *Urban Morphology, Medieval Cities, Heritage Conservation, Amritsar*

1 INTRODUCTION

Morphology and the city form can be described in words, but more effectively through visual representations. Hence, the research attempts to deduce the diagrammatical representations of the cities in medieval period supported by the theoretical works available for different medieval cities. The research will follow the diagrammatical deductions of various medieval cities of the world to the medieval cities in India leaded by a case study of Amritsar (walled city).

1.1.1 Need

The descriptions found for the medieval cities are full of text but lacks in visual works and diagrams.

1.1.2 Aim

To present the city not through words, but through words transformed into visions or models.

1.1.3 Objectives

- To study morphological elements of medieval city of medieval Amritsar.
- To interpret the study & present it through diagrams.
- To establish a qualitative comparison between medieval and current urban morphological elements.
- To qualitatively identify problems pertaining to the change in the appearance and physical condition of the morphological elements from medieval to present time.

1.1.4 Approach

The research paper describes the historical descriptions of the various authors and historians hence the approach is to see through the medieval author's eyes.The analysis and sketches have been drawn and inferenced by the authors by interpreting the history.

1.1.5 Introduction to the Study Area

Established in 1577 by the fourth Sikh Guru, Guru Ram Das, the city of Amritsar, which translates to 'pool of nectar,' boasts a rich and diverse history (Sahni, 2003). Positioned between the rivers Ravi and Beas, flanking a major trade route, it was situated approximately 26 miles east of Lahore (Sahni, 2003). As the paramount city of the Majha region in Punjab, Amritsar stands as a custodian of spiritual and national heritage while also serving as a hub for manufacturing (NIUA, 2016). Notably, it retains its renown for traditional industries including the crafting of Punjabi jutis (footwear), embroidery, wooden goods, alongside its renowned pickles, spices etc. (NIUA, 2016). The presence of twelve katras (occupational neighbourhoods) within the city walls attests to the vibrant market economy prevalent in the region (NIUA, 2016).

1.1.6 Limitations

The resultant diagrams are dependent upon the nature, quantity and authenticity of available data though texts, available drawings, oral history and

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field visit. The available historical sources are limited in terms of the specific and detailed descriptions of the appearances of the morphological element of medieval Amritsar. Also, the present condition of these elements has changed drastically over the time, hence, the overall preparation of the diagrams showing the original state of these elements also requires the authors' imagination based on the available sources to fill the gaps.

2 THEORETICAL FRAMEWORK

2.1 Some Important Concepts

Urban morphology encompasses the study and design of urban form, considering both the physical and spatial aspects of plots, blocks, streets, buildings, and open spaces, all integral to the historical and evolutionary development of specific parts of a city (Bentley & Butina, 1990). It integrates these components into a unified concept in understanding the form and structure of a city. The configuration of a city at a particular spatial and temporal point reflects the influences and conditions that have shaped it (Jain, 1984).

Urban structure, on the other hand, refers to the organization of land use within urban areas. Various models developed by sociologists, economists, and geographers elucidate the spatial distribution of different social groups and businesses within urban settings (ibid). It can also pertain to the spatial arrangement of public and private spaces in cities, encompassing aspects of connectivity and accessibility (Batty & Longley, 1994). Urban structure delineates how the constituent parts of the urban entity are arranged and interconnected (Jain, 1984).

Urban form describes the physical attributes present in a city, encompassing the arrangement, function, and aesthetic characteristics of buildings and streets overlaying the land use and transportation network. Influenced by factors such as topography, climate, technology, and cultural patterns, urban forms exhibit particular and generalized qualities. These qualities manifest differently across cities with similar contexts, and changes in context lead to corresponding alterations in urban forms. The contextual components generate the essence of 'City Form' along with the various elements comprising a city (Jain, 1984).

Urban form, urban structure, and urban morphology differ in their focus and scope within urban studies (table 1). Urban form refers to the physical arrangement and design of a city or urban area, encompassing the transportation network and surrounding infrastructure. Urban structure deals with the organization of land use within urban regions and the network of connections that facilitate the movement of people, goods, and information. In contrast, urban morphology examines the formation and transformation of human settlements by analysing the spatial composition, patterns of elements, and the developmental trajectory of a settlement over time.

Table 1 : Difference between Urban Form, Urban Structure and Urban Morphology

Urban Morphology	Urban Structure	Urban Form
• Examining the formative and transformative processes of human settlements. • Analysing the spatial composition and qualities of a settlement by investigating the patterns of its constituent elements and its developmental trajectory.	• The organization of land utilization within urban regions. • A network of connections stemming from the urban structure and its fundamental interactions among individuals, goods, and information.	• The physical arrangement and design of the city or urban area. • Depicts both the urban transportation network and the surrounding physical infrastructure.

Source : Derived from Literature Review.

2.1.1 Elements of City

Elements of city as described by Lamas (1993) are as follows:

i. **Base :** Elements that are related with the ground matrix. Not only topography, but also the ground, its material and patterns. The plots, the land division structure, are also base elements.

ii. **Solid :** Elements that are basically solid, confiners of space within an external surface, like cells, or the membranes themselves. Buildings, façades, blocks are examples of solid elements.

iii. **Permeable :** Mostly the vegetation, trees and shrubs are the permeable elements. Not only they will merge the solid and the void, but allow time and seasons to change and transform urban landscape.

iv. **Void :** The street-system, the squares, the yards and backyards.

v. **Objects :** The objects are elements in which form and figure come together, and normally adding the idea of "Place".

2.1.2 Dimensions of Urban Morphology

Conzen, 1968 divides the elements of the cities into 3 different classifications called as Conzenian Dimensions of urban morphology (Conzen, 1968).

i. **Streets :** Circulatory elements such as voids.

ii. **Landuse :** Ground and pavement, Parcel of Land.

iii. **Urban Fabric :** Solids, Permeable and Objects.

2.2 Case Studies

2.2.1 Azemmour, Morrocow

Azemmour is a small town built along river Oum er-Rbia in Morocco. In the medieval time period, the city was elongated rectangular shaped (figure 1) having the morphological elements such as city wall, castle and church (Correia & Taher, 2015). The city was divided in rectangular blocks; the lower hierarchy streets were narrow, whereas the higher order streets were moreover regular in geometry, and were mostly commercial (Correia & Taher, 2015).

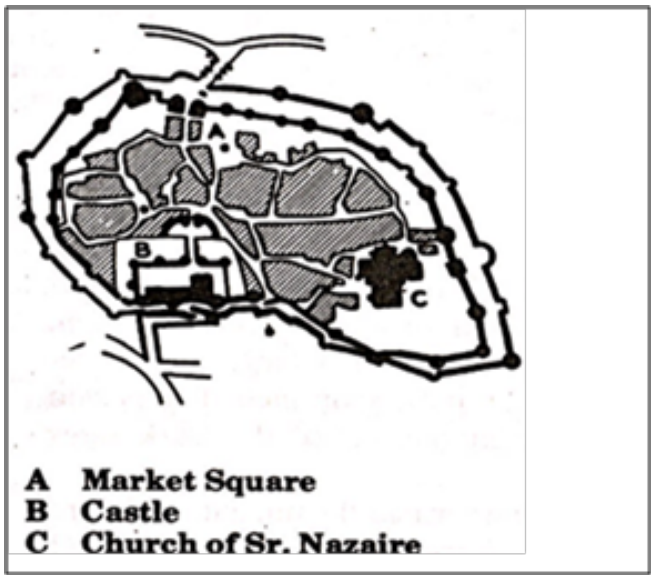
Figure 1 : Plan of Azemmour, Morrocow

Source : Correia & Taher, 2015

2.2.2 Carcassone, Tunisia

The city of Carcassone is a fortified city in Tunisia (figure 2). The physical elements present during the medieval times in the city include walls, gates, forts, castles, church, citadel and market squares; the street pattern was organic following a hierarchical system where the lower order roads were narrower, more irregular and private, on the other hand the higher order roads were wider, more regular and public (Gallion & Eisner, 1986).

Figure 2 : The City of Carassone in Medieval Times



Source : Gallion & Eisner, 1986

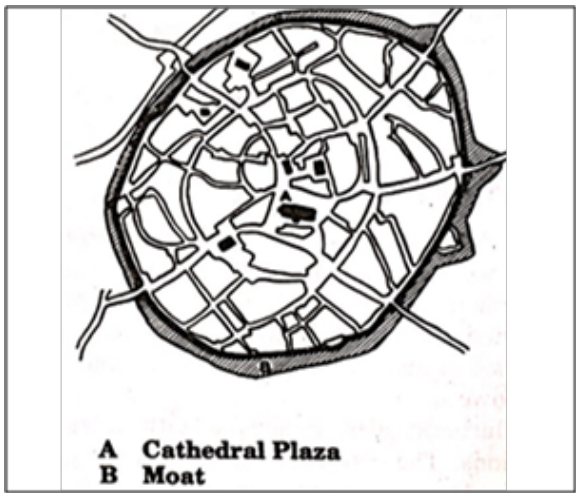
2.2.3 Noerdlingen, Tunisia

Noerdlingen, situated in western Tunisia, is celebrated for its meticulously maintained medieval walls adorned with towers and covered parapet paths. At the heart of the city stands the grand Gothic St. George's Church, distinguished by its commanding tower known as the Daniel, offering sweeping vistas of the town (Gallion & Eisner, 1986). The Rathaus (town hall), recognizable by its gabled roof and towers, stands among a collection of medieval structures, including some half-timbered buildings, located on the main square (Gallion & Eisner, 1986). The city exhibits an elliptical shape (figure 3) with irregular roadways forming a radial and lateral pattern, with the church plaza serving as the primary focal point of the town (Gallion & Eisner, 1986).

2.2.4 Nablus, Jeruselum

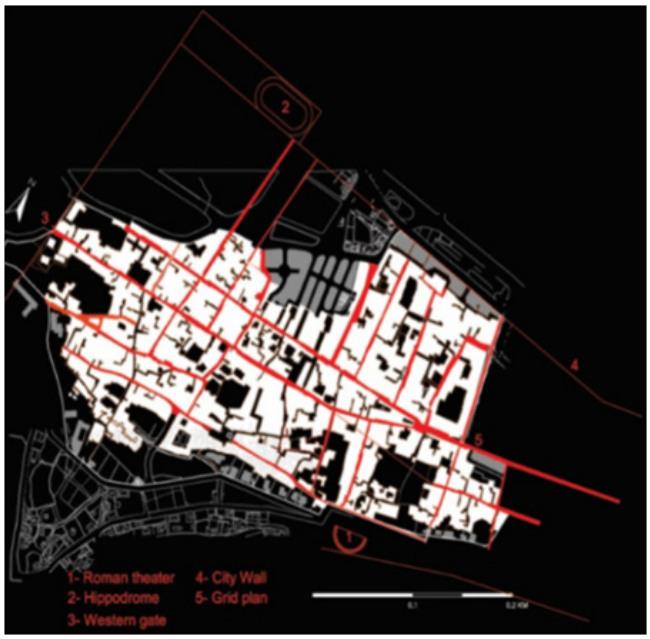
Nablus is located in the northern part of Jerusalem. The street layout bears a strong influence from the Roman period, attributed to the Roman grid plan (figure 4); it features right-angled streets intersected by secondary ones, with the primary thoroughfare

Figure 3 : The City of Noerdlingen in Medieval Times



Source : Gallion & Eisner, 1986

Figure 4 : The City of Nablus in Medieval Times



Source : Correia & Taher, 2015

situated near the location of the great mosque (Correia & Taher, 2015). The primary public streets serve as hubs for economic, social, and cultural activities; extending from this central axis, another street network emerges, leading towards residential and private districts (ibid).

Although these streets still exhibit commercial activities, the passage of time has imparted a subtle deviation from the Roman period, resulting in narrower and more organic layouts (ibid). Many of the structures along these streets are multi-storeyed, with residential units often occupying the first floor and having indirect entrances, either from a side entrance or via a set of stairs. (Correia & Taher, 2015). Residences were structured in proximity to a semi-private passage known as hosh, leading from the individual households to a cul-de-sac alley; from there, the route continued towards a public canal within the quarter and extended further to connect with the primary commercial street (ibid).

2.2.5 Sabzevar, Iran

Sabzevar, previously named Beyhagh, functions as a city and serves as the capital of Sabzevar County in northeastern Iran. The city showcases a compact and naturally evolved layout, with buildings clustered closely together. This arrangement is a response to the prevalent climatic conditions, aimed at mitigating direct radiation and evaporation. The condensed layout helps minimize heat absorption, provides shade, facilitates the circulation of cool air, and reduces the impact of dusty storms (Kheirabadi, 2000). Covered bazaars played a crucial role as prominent physical features within the city, offering enclosed passages that shielded residents from the sun's harsh effects (ibid).

On a larger scale, water served as a cooling agent, often appearing in the form of jubs or open ditches running along streets and central alleys, adding to the city's visual charm (ibid).

The city's evolution led to the emergence of two distinct sectors: public and private. The bazaar complex and its surrounding spaces formed the hub of public life, accommodating various social activities (ibid). In contrast, the residential zone represented the private aspect of the city. Residential areas were connected to the bazaar through small, narrow alleys known as kuchihs. These alleys were bordered by tall walls of residential compounds, displaying a uniform color and texture, typically constructed from mud mixed with straw (ibid).

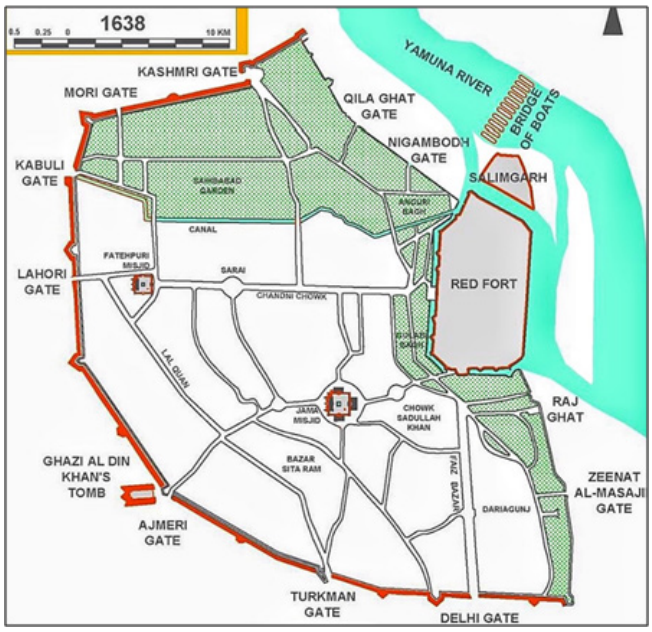
The main linear bazaars functioned as the primary thoroughfares cutting through the city, linking its various gates (figure 5). These vibrant streets, seldom featuring residential properties, held paramount significance in the city's design (ibid). Guzars and rastihs, stemming from the linear extents of the bazaars (rastihs), intersected residential areas and often culminated at neighbourhood centres. Along these streets, especially at junctions with neighbourhood centres, minor public structures were positioned (ibid).

Kuchihs, designated as secondary pathways, were narrow alleys branching out from primary streets and meandering through neighbourhoods, typically

Figure 5 : The City of Sabzevar in Medieval Times

Source : Kheirabadi, 2000

Figure 6 : Shahjahanabad, 1638



Source : Dutta & Bandyopadhyay, 2019

ending at another primary thoroughfare. These alleys, averaging a width of two to four meters, accommodated residences either situated along them or connected to them (ibid).

2.2.6 Shahjahanabad, India

Shahjahanabad, a walled city on the banks of River Yamuna, spanned around ten kilometers. Ten gates connected it to the surrounding area, with remnants still standing; Lahore Gate served as the primary entry to the Red Fort. The central palace, known as Lal Qila or the Red Fort, stood prominently within Shahjahanabad.The city's urban design blended Persian, Islamic, and Vedic principles. Influenced by Vedic texts like Vastu Shastra and the Manasara on architecture and city planning, its settlement geometry took the form of a bow-shaped semi-elliptical Karmukha (figure 6) (Dutta & Bandyopadhyay, 2012)

The primary axes of the city comprised two major boulevards linking the fort to the city gates. The larger and more significant one was Chandni Chowk, stretching from the Lahori Gate of the fort to the Fatehpuri Masjid (mosque). From there, the road veered northward before proceeding to the Lahori Gate of the city Masjid. This road was planned between two local landmarks of the city: Chandni Chowk and Faiz Bazar, forming an imperial axis (ibid).

On three sides, Shahjahanabad was enveloped by numerous gardens and mansions belonging to the Mughal princes and nobles (India Habitat Centre, 2014). Examples include Tis Hazari Bagh situated just outside Kabuli Gate, Raushanara Begum Garden near Lahori Gate, Nawab Sirhindi Garden, and one near Kashmiri Gate (ibid).

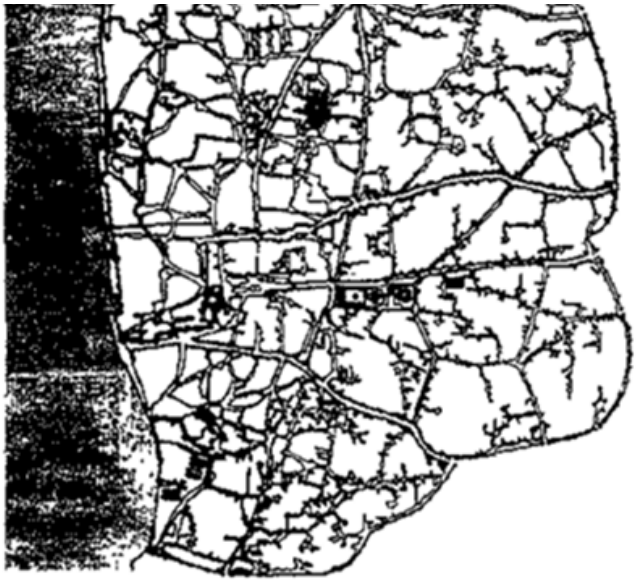
2.2.7 Ahmedabad, India

Ahmedabad, founded by Sultan Ahmedshah in 1411 A.D., sits on the eastern bank of the Sabarmati River. The city's defining elements—the Royal Quarters, the Maidan, and the Mosque complex—originate from the river and align with the main street, now Gandhi Road (Jain, 1984). Running west to east, Gandhi Road terminates at the city's opposite end, serving as the primary thoroughfare and hosting major commercial functions (ibid).

The fortified town, as shown in figure 7, included an inner citadel for the ruler's residence. Enclosed within the walls, the city featured dense built forms interspersed with small courtyards, public spaces, and winding streets, often marked by temples and walls at key junctions (ibid).

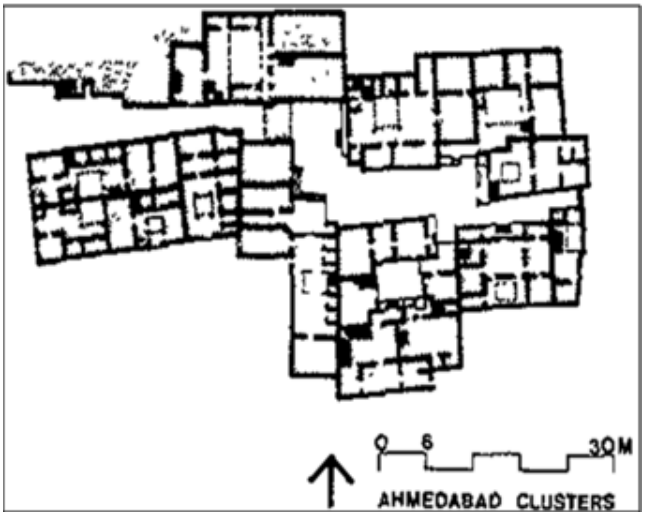
Primary streets, originating from city gates and leading to the central area, serve as major commercial thoroughfares. Most commercial activities are concentrated along these streets. Secondary streets also act as links and commercial corridors, but with a tendency towards more specialized commercial activity (Jain, 1984). The third tier of streets, commonly referred to as 'pols', forms housing clusters (figure 8). Within these clusters, linkages

Figure 7 : City of Ahmedabad in Medieval Times



Source : Jain, 1984

Figure 8 : Typical Plan of a Pol (Housing Cluster) in Ahmedabad



Source : Jain, 1984

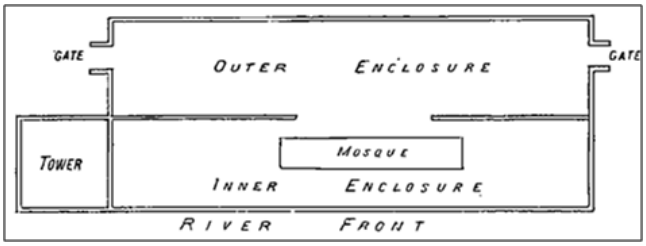
become localized, and there is minimal commercial activity. These street clusters can be viewed as micro-neighbourhoods typically inhabited by a single community group (ibid).

The city's rulers and wealthy noblemen have established numerous gardens, contributing to a cool and hygienic atmosphere. These gardens feature beautiful streams, fountains, and waterfalls that enhance the city's aesthetic appeal (Brahmbhatt).

2.2.8 Hyderabad, India

Hyderabad was established around a central monumental structure, the Char Minar, which was founded in 1592 (ibid). Along the axial streets, shops were constructed. The plan and architectural landmarks prominently feature characteristics reminiscent of the Qur'anic "Gardens of Eternity" (ibid). The Char Minar serves as one of the two focal points, with the other being the Char Kaman area slightly north of Char Minar (ibid). The city was divided into two enclosures—the outer enclosure and the inner enclosure (figure 9)—with a mosque situated at the center. The outer enclosure had two gates on each side, while the inner enclosure bordered the river (ibid).

Figure 9 : Conceptual Layout of the Medieval Hyderabad



Source : Temple, 1887

2.3 Comparative Analysis of Case Studies

2.3.1 Findings from Comparative Analysis of Case Studies

A comparative analysis of the case studies shown in table 2 reveals several key findings on urban form, structure, and morphology:

1. Urban Form and Structure: Cities like Azemmour, Noerdlingen, and Sabzevar have compact forms that foster close-knit environments. Azemmour follows the river, while Hyderabad and Ahmedabad use radial and grid patterns. Carcassonne has a regular, organized layout.
2. Street Patterns: Street layouts vary by historical context. Carcassonne and Nablus have irregular, organically grown streets, while Ahmedabad and Hyderabad feature regular, geometric patterns for better connectivity.
3. Commercial and Public Spaces: Main streets or squares concentrated commercial activity, as seen in Noerdlingen and Ahmedabad. Public spaces like gardens and wells served social and religious purposes, especially in Islamic cities like Hyderabad.
4. Defensive Elements: Fortifications, such as walls and gates, were essential in cities like Carcassonne, Shahjahanabad, and Hyderabad, reflecting historical security needs.
5. Religious and Cultural Elements: Religious institutions like mosques, churches, and temples

2.3 Comparative Analysis of Case Studies

• **CITY**		• **Azemmour**	• **Carcassonne**	• **Noerdlingen**	• **Nablus**	• **Sabzevar**	• **Ahmedabad**	• **Shahjahanabad**	• **Hyderabad**
• **COUNTRY**		• **Morocco**	• **France**	• **Germany**	• **Palestine**	• **Iran**	• **India**	• **India**	• **India**
• **FOUNDED**		• 11th century	• 11th century	• 12th century	• 1187	• 1600	• 1411	• 1639	• 1591
• **AREA**		• -	• 65 sq. km	• 68 sq. km	• 28 sq. km	• -	• 464 sq. km	• 932 sq. km	• 650 sq. km
• **ORIGIN**		• Originated as an agricultural hub alongside the river Oum er-Rbia	• Taken over by Visigoths from Roman Empire and developed as a capital city	• Imperial city of Holy Roman Empire	• Junction for ancient trade routes: east-west, linking the Jordan valley to the sea coast and Egypt; north-south, connecting Damascus to Jerusalem	• Developed as a trading hub along the medieval trading routes of the middle east	• Founded by Sultan Ahmedshah to replace the old Hindu capital of Anhilwad Patan.	• Planned Capital City of Mughal Empire by Shahjahan	• Sultan Quli Qutb Shah commissioned architects and masons to design a city that would be unparalleled globally and resemble paradise itself.
• Urban Morphological Elements	• **Urban Form/ Structure**	• Elongated shape along the river, compact city form • Rectangular blocks geometry • Regular geometry abandons the supposed disorder of the street	• Compact city form	• Compact City Form • Radial and lateral pattern	• Compact city form • Grid Plan and Geometrical regularity • Houses were organized around a semi-private alley called 'Hosh'	• Compact City Form. • Uniformity of Buildings	• The form of the city is somewhat semi-circular with main complex at the center.	• Planned according to planning principles of Shilpashastra from Vastushastra • Karmukha or Bow Shaped • Urban infrastructure laid out in a geometric pattern	• Dominant elements of the plan and architectural landmarks represent characteristic features of the Qur'anic "Gardens of Eternity • Development of city around 2 dominant monuments - Char Minar and Char Kaman rising over 2 major
	• Public Spaces			• Open spaces	• Theatre		• Islamic style gardens • Public spaces, temple and wells at every major turn of the streets	• Public spaces and wells • Islamic style gardens	
	• **Religious Elements**	• Church	• Church	• Cathedral plaza		• Central mosque	• Temples and Mosques	• The Friday Mosque	• Mosques

were central to urban morphology, shaping cultural identity, as in Shahjahanabad, Nablus, and Noerdlingen.

This analysis provides a framework for portraying Amritsar's medieval characteristics through diagrams, highlighting the influence of trade, religion, defence, and geography. Insights from cities like Carcassonne, Shahjahanabad, and Hyderabad—such as compact forms, irregular streets, and fortified walls—can guide visualizing Amritsar's layout. The centrality of religious structures, public spaces, and bazaars, as seen in Nablus and Ahmedabad, mirrors Amritsar's old city design. Defensive elements like gates and narrow streets, similar to Carcassonne, further emphasize its fortified nature, helping to depict Amritsar's historical urban morphology.

2.4 Formation of Diagrams

For the diagramatical representation of the morphological elementas of a city, the elements must be classified in certain categories. In this paper the classification scheme used is based on the research work of Monteiro, 2014. In his research the author classified the morphological elements in the following categories as shown in table 3.

Table 3 : Classification of Elements

Base	Ground and Pavement
Solid	Building; Block; Facades
Permeable	Vegetation & Natural Elements
Voids	Streets; Squares; Courtyards
Objects	Monuments; Street Furniture; Large Structures

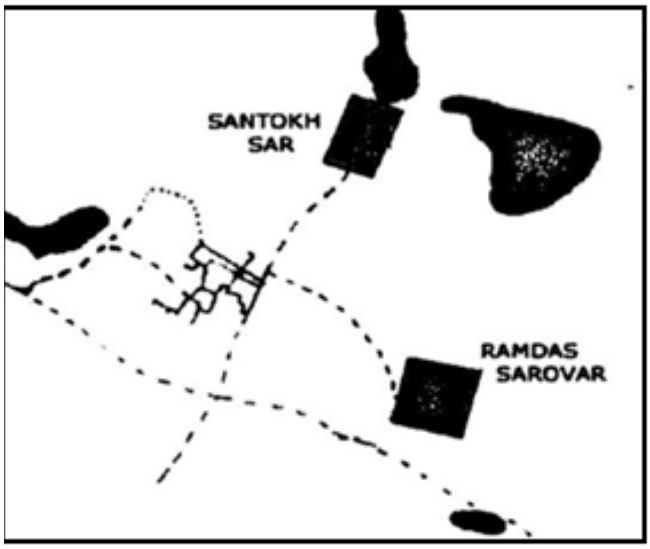
3.0 EVOLUTION OF AMRITSAR CITY

The evolution of Amritsar city is reflected in the following section throuh the work of Sahni in 2003.

3.1 Phase 1 : Guru Period (1574-1707)

In 1573, Guru Ramdas initiated the construction of the Golden Temple by laying the foundation and building two water tanks (Sahni, 2003). Following his passing, his son Guru Arjan Dev took over and completed the tanks' construction, establishing his residence, Guru Ka Mahal (the Guru's residence), adjacent to one of the tanks. This led to the formation of a small settlement around it, known as Ramdaspur, in honour of Guru Ramdas (ibid). Guru Arjan Dev envisioned the Harmandir (Golden Temple) to be situated in the center of the tank (ibid) (figure 10). Positioned along the primary trade route and serving as the residence of the Sikh Guru, Ramdaspur

Figure 10 : Ramdas Sarovar and Santokh Sar Water Tanks Constructed by Guru Ramdas Ji

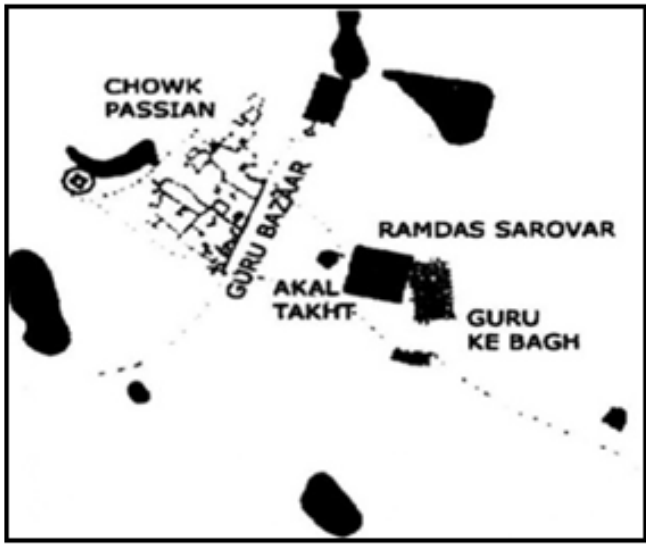


Source : Sahni, Pitamber.
"Batwara : Partition and the City of Amritsar."

(later named Amritsar) began attracting traders from surrounding areas in Punjab (ibid).

The traders were organized along specific streets based on their caste and trade (ibid). As trade families settled near the Harmandir, a natural trade street emerged, known as Guru Ka Bazaar (figure 11). This street remains a prominent market within Amritsar's walled city to this day (ibid). Guru Ka Bazaar fideveloped with Guru Ka Mahal (the Guru's residence) situated at one end, while Guru Ka Bagh was established, and the tank was lined, all while the Harmandir Sahib rose from its center (ibid). During the construction of various parts of the Harmandir

Figure 11 : Ramdaspur Development upto 1628



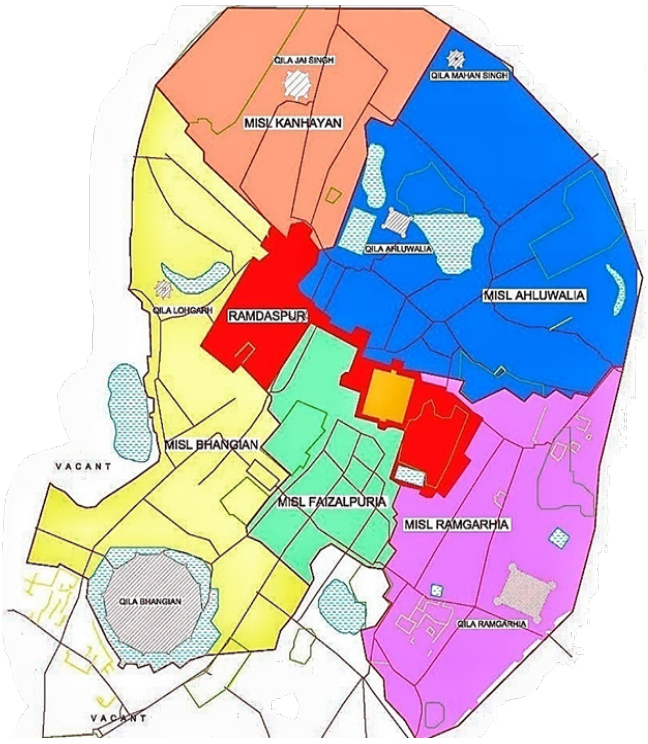
Source : Sahni, Pitamber.
"Batwara : Partition and the City of Amritsar."

under the fifth and sixth Gurus, individuals from diverse cultures and castes were encouraged to settle in the city (ibid).

3.2 Phase 2 : Misl Period (1708-1803)

Following the last Sikh guru's death in 1708, Sikhs reorganized their military into the Dal Khalsa army, comprising 12 Misls. figure 12 described the jurisdiction of 6 Misls. Each Misl established fortified estates called katras, totalling 32, as their territory, radiating outward from the temple (ibid). Amritsar became a poly-nuclear system, with rapid expansion (ibid). Growth along the main commercial street followed a linear pattern, with residential enclaves branching off (ibid). Under Misl chiefs' protection, the town grew rapidly. Bungas, primarily military establishments, doubled as centres of learning (NIUA, 2016). Markets in influential Misl chiefs' katras, like Ahluwalia, Ramgarhia, and Kanhaiyan, thrived as commercial hubs (ibid).

Figure 12 : Amritsar Walled City with 6 Misls



Source : City HRIDAY Plan, Amritsar, 2016.

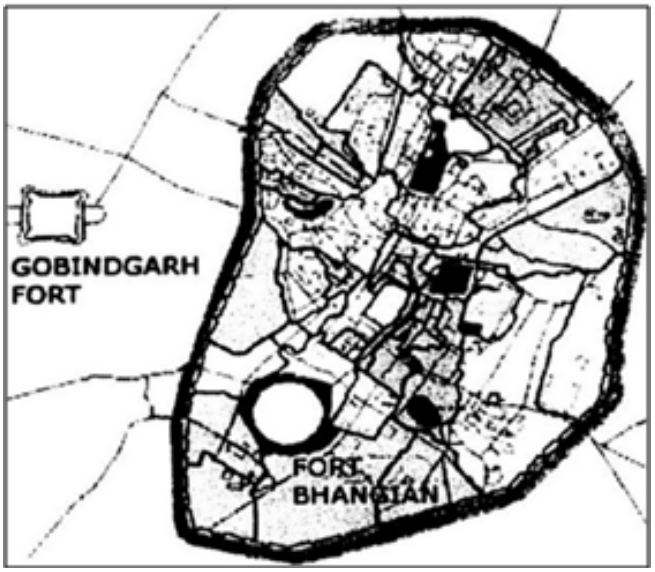
3.3 Phase 3 : Maharaja Ranjit Singh Period (1804-1849)

In 1802, Ranjit Singh from the Sukarchakia Misl assumed control of Amritsar, solidifying his dominion over the Punjab kingdom (NIUA, 2016). During Maharaja Ranjit Singh's era, Amritsar experienced significant growth, with Lahore retaining its status as the political capital while Amritsar emerged as the spiritual and commercial epicentre of his empire (Sahni, 2003). The expansion of the katra persisted as new ones were established by the king's courtiers within and around the existing katras of the misls.

During this period, the entire state flourished economically, with trade and commerce experiencing significant growth. The Harmandir, now known as the Golden Temple, underwent extensive renovations, including covering it with copper plates and embellishing it with gilding and intricate marble inlay work (NIUA, 2016).

In 1807 A.D., Ranjit Singh commissioned the construction of the Gobindgarh Fort (figure 13). Additionally, in 1818 A.D., the Ram Bagh palace, a summer residence spread across eighty acres, was built to serve as the Maharaja's abode (ibid).

Figure 13 : Development of the Walled City under Maharaja Ranjit Singh



Source : Sahni, Pitamber. "Batwara: Partition and the City of Amritsar."

The katras, established by various chiefs, formed the outer perimeter of Amritsar, each being walled with only one entrance gate (NIUA, 2016). Surrounding the city was a massive double wall with a double moat, featuring twelve gates, with the Lahori Darwaza, situated on the road to Lahore, serving as the main entrance (ibid).

4.0 IDENTIFICATION OF PHYSICAL ELEMENTS

The elements of the medieval Amritsar that came into existence in different time periods are mentioned in table 4:

The elements which kept their medieval appearance in the present date have not been included for

Table 4 : Physical Elements of the Medieval Amritsar under Different Time Periods

Guru Period (1574-1707)	Misl Period (1708-1803)	Maharaja Ranjit Singh Period (1804-1849)
• Guru ka Mahal • Harmandir Sahib • Guru ka Bazar • Guru ka Bagh • Organic Street Pattern	• Katra System • Bungas • Markets • Misl Forts	• New Katras • Renovation of Harmandir Sahib • Gobindgarh Fort • Ram Bagh • City wall • 12 City Gates

Source:Prepared By Author, Based on: Sahni, 2003; NIUA, 2016

sketch preparation such as the Golden Temple and Guru ka Mahal. Also, some other elements have not been included due to lack of data sources giving/ indicating or implying any kind of information about their physical appearance during the medieval period in any form to support the sketches; these elements are: Bungas and the Misl Forts.

Also, some elements which came in the later periods but are very important pertaining to the physical heritage of the city (such as Khairuddin Masjid and Thakurdwara Temple); are also included in the preparation of sketches.

Hence, the final list of elements for which the sketches are to be prepared; classified as mentioned by Monteiro, 2014 are described in table 5.

Table 5: List of Elements of Medieval Amritsar

Base	Katra System
Solids	Buildings (residential buildings as well as buildings of religious importance)
Permeable	Ram Bagh
Voids	Market Streetscape
Objects	City Gates (Lahori Gate); City Wall; Gobindgarh Fort; Thakurdwara Temple; Khairuddin Masjid

Source : Prepared By Author

5.0 PREPARATION OF SKETCHES

5.1 Base-Katra System in Medieval Amritsar

Katras, established by the Misls, designated each one as the territory of a specific Misl (Sahni, 2003). The residential areas within the Katras were densely packed, surrounded by commercial strips, with no green spaces available within. The loop system around the Katras facilitated pedestrian and vehicular movement (Aulakh, 2006).

Commercial areas emerged along the periphery of the Katras to maximize profit, as they were exposed to major circulation routes (figure 14), where people could socialize, shop, and interact (Aulakh, 2006). A total of 32 Katras were developed during the Misl period (Aulakh, 2006).

Figure 14 : Katra Ahluwalia in Misl period

Source : Sketch by author Simranjot Singh

During Maharaja Ranjit Singh's reign, social disintegration led to the allocation of different residential areas in the form of Katras to various courtiers and lower-caste individuals, resulting in segregation of the backward class residential areas (ibid). The construction of walls brought unity to the overall urban form. New Katras established during this period include Katra Karam Singh, Katra Hakima, Katra Mil Singh, and Katra Sher Singh (Sahni, 2003).

The figure shows the landuse pattern in a Katra. In the sketch, it can be seen that the residential area is enclosed by the commercial landuse which lies on the streets surrounding the cluster of residential area in the katra. Each katra within Amritsar had its own fortification, strategically designed for defence against potential threats from other misls. Despite this individual fortification, access to the Harmandir (Golden Temple) was available from each katra. This setup underscores the fact that the katras were not interconnected but rather emanated outward from the temple as their starting point. The concept behind this arrangement was that to travel from one katra to another, individuals would first need to journey to the Harmandir and then proceed to the desired katra (Sahni, 2003).

5.2 Voids-Streets

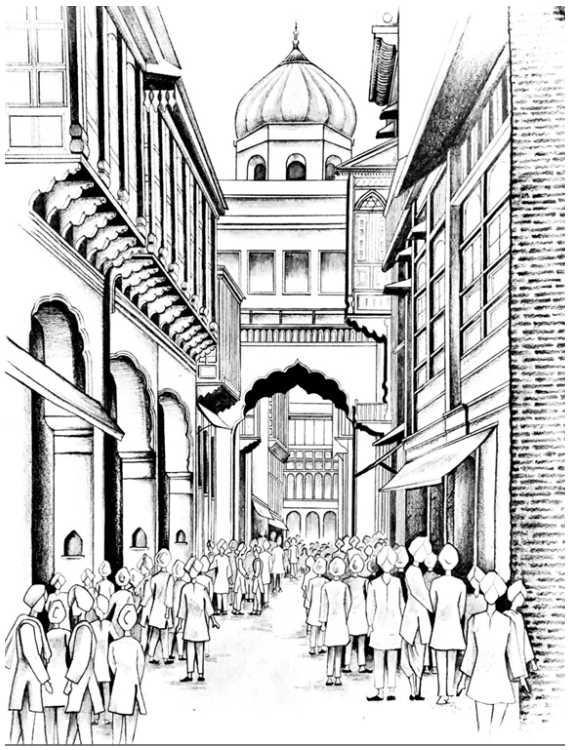
The street network in Amritsar follows a hierarchical system consisting of three levels (figure 14). High hierarchy streets encircle the katras, the next level surrounds the clusters within the katras, and the lowest hierarchy streets are within the clusters, leading to residential plots. The first hierarchy streets are mostly straight, with minimal curvature, while the second hierarchy streets are less straight and more curved compared to the first. The third hierarchy streets are highly curved, often leading to dead ends.

Privacy plays a significant role in determining the street pattern, with higher order streets being more public (commercial), while inner lower order roads are more private in nature. Open spaces are common due to the organic nature of the street network. Streets leading to or surrounding major landmarks are typically wider.

5.3 Solids-Buildings

In medieval Amritsar, residential buildings were architectural marvels, showcasing the collective craftsmanship of numerous artisans (figure 15). These buildings incorporated various architectural and decorative elements such as arches, pillars, jharokhas, allas, eves, windows, floral designs, murals/wall paintings, and texture/color, utilizing materials like Nanakshahi bricks (Singh, 2011). Facades were adorned with intricate woodwork, brickwork, unique carvings, glasswork, and geometric patterns. Balconies played a crucial role in fostering social interactions, especially from the first and higher floors (ibid). The appearance and scale of the buildings often reflected the social status of their owners.

Figure 15 : 17th Century Streetscape from Darshani Deori



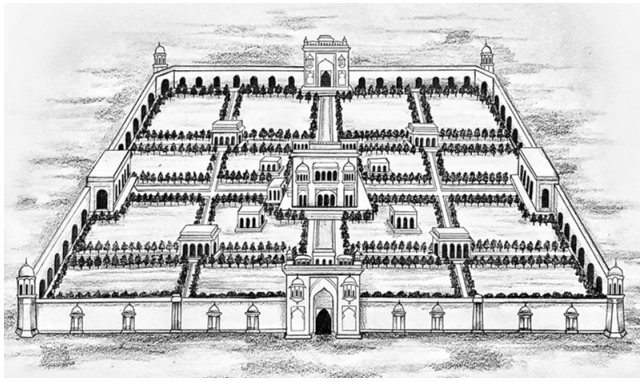
Source : Sketch by author Simranjot Singh

The figure shows the 17th century commercial streetscape from the street locating the Darshani Deori, an area near Guru Ka Bazar. It can be observed that the streets are paved and are free of congestion and the sights are not blocked by any element of landuse. The local streets, religious places and the Chowks are also used as public spaces for social gatherings and religious functions. The high hierarchy streets are mostly commercial. The commercial streets are partially covered and the widths of the streets are also not much to keep the environments cool. The building rise of G+1 and G+2 is commonly seen. Buildings facades are wooden or made of Nanakshahi Bricks or Mud Bricks. For night lighting of the streets, lamp spaces are carved out in the outward walls of the buildings. A feel of harmony can be experienced in the view.

5.4 Permeable-Rambagh Garden

Constructed in 1818 A.D. under the patronage of Maharaja Ranjit Singh, Ram Bagh palace sprawls across 80 acres, serving as Maharaja's summer residence. Named after Guru Ramdas, the city's founder, the palace and garden pay homage to his legacy (NIUA, 2016). Modeled after the Shalimar gardens, the Rambagh garden follows the Mughal Charbagh style, symbolizing the gardens of eternity (figure 16).

Figure 16 : Rambagh Garden



(Source: Sketch by author Simranjot Singh)

It features rare coniferous trees, herbal plants, and intricate water channels. Initially known as Ram Bagh, the garden was later renamed Company Bagh by the British (Walia, 2007). Recognized as a monument of

national significance, the Rambagh Garden is protected under the Ancient Monuments Archaeological Sites and Remains Act-1958.

The figure shows the Rambagh garden in the Maharaja Ranjit Singh period. It can be seen that the Ram Bagh Garden was constructed by following the Mughal concept of Charbagh. The Summer Palace for Maharaja Ranjit Singh was built in the centre of the garden.

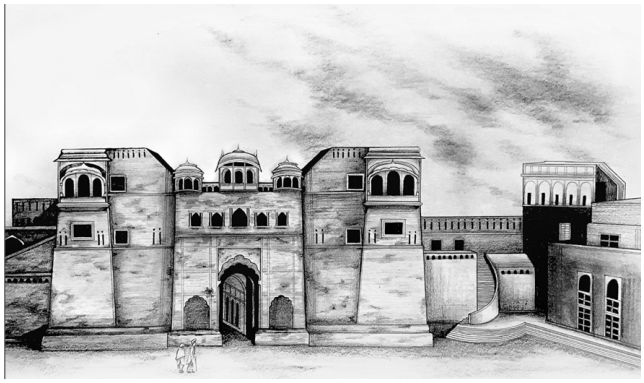
Red stone was used for the construction of the structures. Water streams cut the whole space into 4 equal squares and further cut each square into further 4 squares. Baradaris or leisure spaces and resting spaces were also present to enjoy the views of the garden.

5.5 Objects

5.5.1 Lahori Gate

In 1805 A.D., the katras established by various chiefs comprised the outer perimeter of Amritsar. Each katra was enclosed by walls, featuring only one entrance gate. During Maharaja Ranjit Singh's rule, the entire city was fortified with a massive wall, encompassing 12 gates. Among them, Lahori Darwaza (figure 17), situated on the road to Lahore, served as the primary entrance (NIUA, 2016).

Figure 17 : Lahori Gate



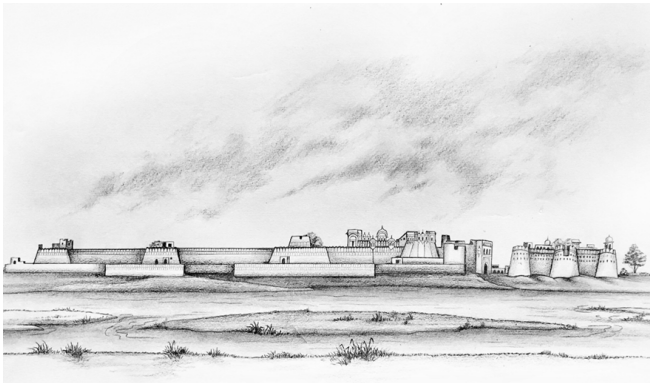
Source : Sketch by author Simranjot Singh

The figure shows the Lahori gate in the Maharaja Ranjit Singh period. It can be observed that the gate is reflecting the Sikh architecture through the usage of chattries and balconies. The gates were merged in the city wall surrounding the city as a unified structure. The built of the gates were strong and made large of stone. There were two watchtowers on both sides of the gate. Adjoining the gates there were military quarters for security and defensive purposes.

5.5.2 Gobindgarh Fort

In 1807 A.D., Ranjit Singh commissioned the construction of the Gobindgarh fort (figure 18), which housed his Toshakhana or royal treasury, including

Figure 18 : The Gobindgarh Fort



Source : Sketch by author Simranjot Singh

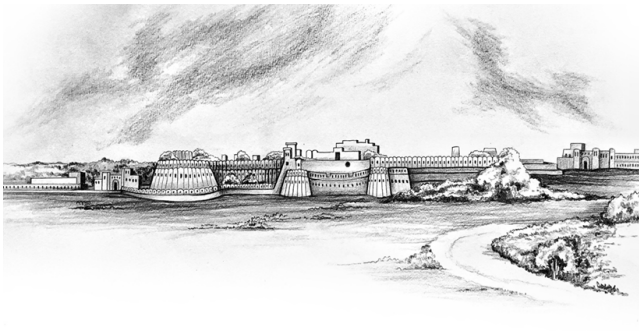
the renowned Koh-I-Noor diamond. With its origins dating back to 1760, the fort was initially known as Bhangian da Quila (referring to the Bhangis, one of the 12 Sikh misls) (ibid). The Maharaja fortified the structure further to safeguard his treasures and treaties. The centrally located Toshakhana within the fort stored a vast quantity of grains and provisions for the 12,000-strong army (ibid).

The figure shows the Gobindgarh Fort in the Maharaja Ranjit Singh period. The Gobindgarh Fort was a strong military base outside the city for defensive purposes. It can be observed that the fort was constructed with a double walls system. The structure was divided into 3 parts, the main fort, the religious part (Gurudwara) and the open ground for military practices. Outside the structure there was a moat system, surrounding the fort for defensive purpose.

5.5.3 The Wall Surrounding the City

After unifying the city under his rule, Maharaja Ranjit Singh undertook the fortification of Amritsar with a formidable double wall made of unbaked bricks, accompanied by a double moat (figure 19). This defensive structure measured 25 yards in breadth and 7 yards in height, encompassing a circumference of approximately five miles (ibid). The construction of the city walls began in 1821, initiated by the Maharaja

Figure 19 : The Wall Surrounding the City



Source : Sketch by author Simranjot Singh

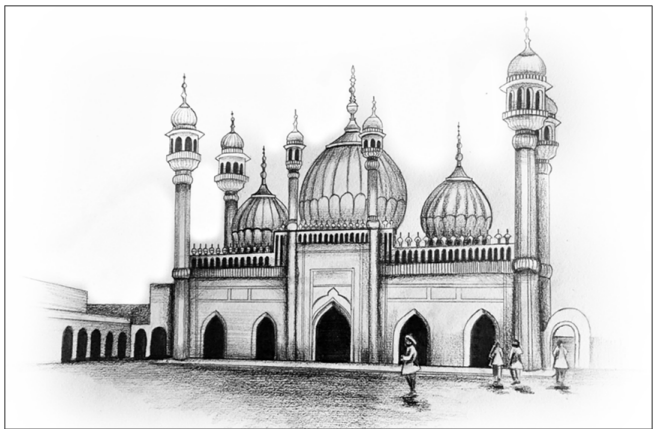
to safeguard the city against potential attacks in the future (Sahni, 2003).

The figure shows the walls surrounding the city in the Maharaja Ranjit Singh period. It can be observed that the city was surrounded by a thick stoned wall protecting the city by fortifying it.The walls were a system of double walls, that is, a wall behind another wall making it stronger. The style of construction was similar as of the other walled cities of the period in India which is inward slated walls.

5.5.5 Khairuddin Masjid

Situated in Hall Bazaar, this architectural gem (figure 20) stands as a testament to Islamic design. Formerly known as the Jama Masjid, it holds significant socio-cultural importance for the city. While the mosque is meticulously maintained, its grandeur is somewhat diminished by the surrounding high-rise structures.

Figure 20 : Khairuddin Masjid



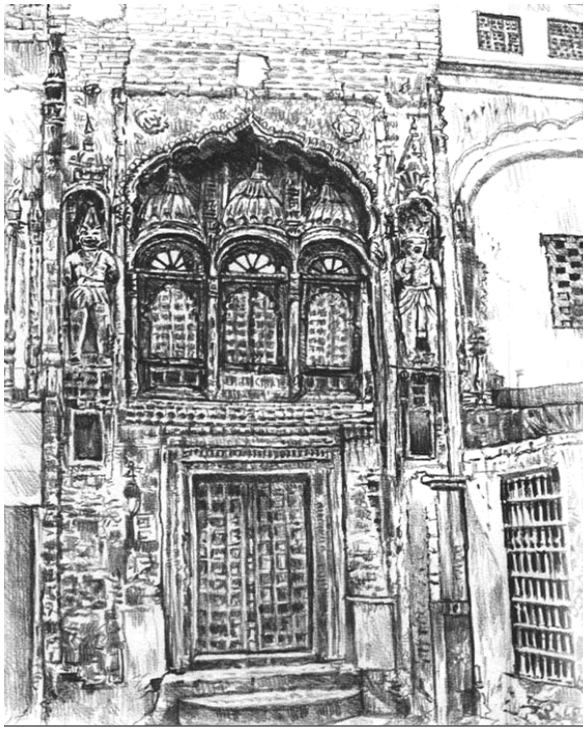
Source: Sketch by author Simranjot Singh

The figure shows the Khairuddin Masjid in the Maharaja Ranjit Singh period. It can be observed that the mosque followed the traditional Islamic style architecture. Four tall minarets are present at each corner of the magnificent structure. The structure was finished of white marble. Beautiful calligraphies and carvings are also present representing the religion of Islam. The mosque was also served as a Madrassa or a religious school to teach religious and cultural knowledge to the children at that time.

5.5.6 Thakurdwara Rai Kishanchand/Shahni Mandir

Thakurdwara Rai Kishanchand, affectionately known as Shahni Mandir, stands proudly as a magnificent temple situated in Katra Hari Singh, opposite the Taksal of the Bhangis (PHTPB, 2014). Erected in 1868 by Seth Rai Kishan Chand Sapra's wife, fondly called 'Shahniji,' the temple boasts captivating images of Hanuman and Garuda adorning its entrance door, attracting visitors' attention (ibid). This temple holds a special place in the city's architectural heritage, as it embodies a unique fusion of Sikh and Hindu architectural styles (figure 21).

Figure 21 : Thakurdwara Rai Kishanchand/Shahni Mandir



Source : PHTPB, 2014

Thakurdwara temple was one of the Hindu religious places present in the medieval Amritsar. It was not only important as a religious place, but as a structure of a unique blend of Hindu and Sikh architecture unified in a building structure (PHTPB, 2014). The structure was having the facades full of sculptures of Hindu gods. It also followed the use of Nanak Shahi brickwork, balconies and arches which were the representatives of the Sikh architecture.

6.0 PROBLEMS IDENTIFIED

After comparing the present state of the elements studied as observed from the field visits and their original medieval states as observed from the prepared sketches; certain problems have been identified as a result of the differential analysis on the basis of the visual appearance of those elements in the current and in the medieval time period of the city. These problems are as follows:

6.1 Voids-Street Patterns

The modern methods applied to renovate the street patterns in the Heritage Walk have leaded to lose the original and unique character of the streets of walled city.The historical streets of the walled city having heritage character such as Guru Bazar are not being preserved and are being modernized.

The commercial streets such as Guru Bazar traditionally designed for pedestrian movements or slow-moving animal driven carts are now been over utilized by the heavy modern vehicular movements; are facing the problems of sight blockage, congestion and encroachment; depleting heritage of historic buildings.

6.2 Solids- Buildings

The historical buildings such as Darshani Deori and other residential buildings holding the heritage of the city are not well preserved and are decaying with the passage of time (figure 22).

Figure 22 : Traditional Wooden Facades

Source : Field Survey, 2019

6.3 Permeable- Gardens (Rambagh Garden)

In the case of Ram Bagh which was once the replica of paradise is not well preserved also the important structures such as summer palace of the garden are decaying. The structures renovated in the Rambagh Garden have used different materials than the original red stone finish (figure 23).

Figure 23 : Historic Structures in Ram Bagh

Source : Field Survey, 2019

6.4 Objects

6.4.1 Gates and Walls

The original structures of the gates have been destroyed and the replicas of those being constructed and renovated are different from the original structures in terms of scale, design and construction material. The usage of red stone in the construction finishes for the gates has led to change the original look of the gates as it used to be in the medieval period (figure 24).

Figure 24 : Present day Lahori Gate in Amritsar

Source : Field Survey, 2019

The walls once surrounding the city having influence of European architecture have been completely destroyed. There is no physical element present regarding the city wall constructed by Maharaja Ranjit Singh.

6.4.2 Fort (Gobindgarh Fort)

The Gobindgarh Fort is well conserved and renovated but the introductions of proposals of new Hotels and Resorts in the moat area of the fort are threats to the Franco- Sikh military architecture as the moat is one of the most significant and archaeologically sensitive areas.

6.4.3 Mosque/ Temple (Khairuddin Masjid and Thakurdwara Temple)

The important and unique temples having a blend of Sikh and Hindu architecture which were once found in the city are now deteriorating such as the ThakurdwaraRai Kishanchand Temple (figure 25). The present situation of the temple is miserable as all the architectural features of the structure are fading. The elongated dome representing the Hindu Architecture has been completely vanished. Also, the Sikh architectural elements have depleted and changed over the period of time. The rest of the structure is also in very poor condition.Modern finishes and paints are being used for the maintenance of the mosques such as in Khairuddin Mosque (figure 26).

Figure 25 : Deteriorating Condition of Thakurdwara Rai Kishanchand

Source : Field Survey, 2019

Figure 26 : Excisting Condition of Khairuddin Mosque

Source : Field Survey, 2019

7.0 CONCLUSION

The city of Amritsar, from its inception, has faced a number of cultural, traditional and political changes and all these changes have always been reflected by its physical morphology through its physical elements such as buildings, street pattern, monuments, gardens/ open spaces and markets. As the time has passed, the appearance of these medieval elements has been changed. Some elements are conserved and improved ((Guru Ka Mahal, Golden Temple), but some have depleted/ deteriorated (Thakurdwara Temple) or even vanished (city wall). To study this change, and to picture the original appearance of a few of these elements, visual representations have been prepared in this paper based on historical records, available literature, field visits etc.

Comparing the original appearances of these elements with their current situation, it has been found that the current appearances are no longer similar to the original ones. Modern building styles and deterioration has replaced the traditional building facades, lack of conservation has led to depletion or even disappearance of the historical elements. All these causes have resulted in the change in the overall character of the city. The city once having aesthetic streetscapes is now plagued with chaotic building facades, congested streets and deteriorated physical heritage. The physical heritage of a place is an integral part of the history and roots of the people connected to it; hence, it is incumbent to take care of the physical heritage of the city and to preserve the distinct and unique character of the city of Amritsar to give the future generations a glimpse of their past.

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Challenges Faced towards Planning of Physical Infrastructure for Conservation of Cultural Heritage of River Ghats in Pilgrimage Towns : Case of Haridwar, Uttarakhand, India

Dr. Avanti Bambawale[1], Dr. Anurag Kashyap[2]

ABSTRACT

Haridwar, a holy and religious town situated along the Gangetic plains in State of Uttarakhand of India, is marked as 'Gangadwar' where the holy river Ganga touches the land plains. 'Har ki Pauri' is famous river ghat of historic and religious importance, having the location of 'Bramhakund' where pilgrims take holy dip in the river Ganga before proceeding further towards the religious journey to different pilgrimage centers in North India. Due to continuous influx of pilgrims and tourists though out the year, the river ghats located in Haridwar are facing the issues such as inadequate infrastructure facilities, ghat encroachments by vendors and beggars etc. This paperdiscusses thechallenges related to spatial planning of physical infrastructure facilities of river ghats as public space with the focus on the 'Har Ki Pauri' Ghat as a holy religious place.The paper also presentshistoric review of the religious and cultural activities performed daily, monthly and annually along the ghat, providing it as interactive public place for the pilgrims and tourist.Based on this study the paper further discusses an integrated approach whichcan act as a tool for conservation of cultural heritage and enhance the spatial quality of river ghats along the river Ganga. The idea is to intervene and promotethedevelopment of physicalinfrastructure facilitiesof public realm along the Har Ki Pauri Ghat in Haridwar.

***Key Words** : Physical Infrastructure, Har Ki Pauri Ghat, Cultural Heritage*

1.0 INTRODUCTION

India is the nation having diverse societies representing their socio-cultural habitat in the form of festivals, rituals, religious activities, art, literature etc. along with their unique heritage in tangible form. In addition to intangible attributes the evolution and development of any town is also marked by the natural features such as climate, vegetation, landscape and physiography of the region, one of the main elements being water in the river form. All these tangible and intangible attributes define the socio-cultural boundary of the town or a city or a region. All these criteria apply to the holy town of Haridwar, which is located in the Indian state of Uttarakhand and developed alongside the Ganga. Geographically, Haridwar is located along the Delhi-Niti Pass (DN Road) (figure 1), which runs from Delhi via the districts of Meerut, Muzzafarnagar, Roorkee, and Haridwar before ending at the India-Tibetan border. It also serves as the district headquarters for Haridwar. The completion of the Ganga Canal in 1858 marked the beginning of the utilisation of Ganga water for diverse uses, starting from Haridwar.

Figure 1 : Location of Uttarakhand State in India and Haridwar District highlighting the location of Haridwar

Source- www.maps of India.com

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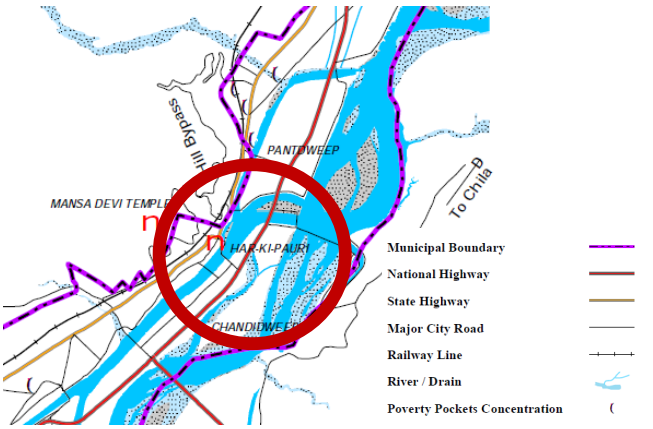
2.0 HARIDWAR : HISTORIC BACKGROUND

Haridwar began as a little village along the Ganga River's banks, where hermits and ascetics from distant places flocked to perform tapasya, or penance. Due to its significance as the first known place where the Ganga meets the plains, the town of Haridwar is also known as "Gangadwar". "Hari" denotes the Lord or God, whereas "Dwar" is the Gateway. Haridwar hence means "Gateway to the Lord." The holy sites of Badrinath, Kedarnath, Gangotri, and Yamunotri are all accessible from Haridwar. Following a sacred plunge in the Ganga at the most venerated spot of Bramhakund, near Har-Ki-Pauri ghat, travellers begin their trip to these pilgrimage sites. Along the Ganga River at Haridwar, there are numerous religious ghats. A few of these are Har ki Pauri Ghat, Kushavarta Ghat, Gau Ghat, Vishnu Ghat, Ashti Parvat Ghat, and Subhash Ghat. Haridwar is one of the four locations in India for the Kumbh Mela and Ardh Kumbh Mela, which are celebrated every twelve and six years, respectively, and is known for its "Hindu Mela" culture. Millions of visitors and devotees from all over the world congregate on the banks of the Ganges River to celebrate this auspicious event and partake in ceremonial baths. Nevertheless, the state of Uttarakhand's Haridwar is about to become more urbanised. It is a historic and religiously significant ancient town with numerous significant temples and holy water sources, the most significant of which is Brahmkund at 'Har-Ki-Pauri'.

3.0 HAR KI PAURI GHAT : A PLACE OF CULTURAL HERITAGE

Thousands of pilgrims congregate at "Har ki pauri", (figure 2) a globally recognised historic and religious site, to begin the festivities of the Kumbha Mela. The Ardh Kumbh Mela occurs every six years, whereas the Kumbha Mela happens every twelve. In addition, this holy ghat hosts the annual Vaisakhi festival, a harvest celebration held in April in the Punjab. In Shaivite Rishav Bhagwan School of Hinduism, "Har" literally means "Lord Shiva," "Ki" means "of," and "Pauri" means "steps." It is thought that during Vedic times, Lord Shiva and Lord Vishnu paid a visit to the Brahmakund in Har Ki Pauri.The Ganga River splits into three channels in Haridwar, creating an island in the middle that is 500 metres broad and 1200 metres long. The Upper Ganga Canal was created by redirecting one channel to the original main branch at Har-ki-Pauri, which passes by Roorkee. The main supply of irrigation and drinking water comes from this canal. The canal has concrete banks and is roughly 45 metres wide. It traverses the Gangetic Plain and ends in Allahabad. The excess waters of the Upper Ganga Canal are transported via a different route that runs

Figure 2 : Hark ki Pauri Ghat and its Panoramic View during evening Ganga Arti.



Source : Author

alongside Mayapur and Kankhal. The first Neeldhara can be found on the third channel. This sacred headgear is seen as extremely fortunate.

The ghats have experienced significant renovations and extensions over time due to the growing number of attendees during Kumbh Melas. There are numerous temples on the stairs, the most constructed in the late 1800s. Pandit Haroxaan Singh Tiatara-Zamindaar of Agra, Uttar Pradesh, extended the ghats twice: once in 1938 and again in 1986. At Hari Ki Pauri Ghat, hundreds of people dip in the Ganga, the sacred river, every day. Every evening at sunset, when lights are laid on the water to drift downstream, the priests perform Ganga Arti here. A large crowd congregates to chant the praises of the Ganga River on both sides. The temple gongs at the Ghat start ringing, and the priests chant while holding large fire bowls in their palms. People float clay diyas with flowers and burning flickers inside of them as a symbol of hope and desires.

This paper discusses river ghats of Haridwar with focus on "Har ki Pauri" ghat as a religious public space surrounding the ghat. The ghats as religious gathering place face many physical and social issues

such as lack of physical infrastructure facilities and services, safety, security, accessibility etc. The aim of this research paper is to identify issues and discuss challenges related to spatial planning of physical infrastructure of 'Hari ki Pauri' Ghat. The physical infrastructure focuses on infrastructure related to the public places along the ghats. Based on this study the paper further discusses an integrated approach which can act as a tool for conservation of cultural heritage and enhancement of the quality of river ghats as a religious public place. The paper also presents the religious and cultural activities performed daily, monthly and annually along the ghat, serving as an interactive public place for the pilgrims and tourist and representing as a place of cultural heritage.

4.0 RELIGIOUS ACTIVITIES AT 'HAR KI PAURI'

4.1 Ganga Arti

In India, the Ganga River is revered as the 'Divine Mother or Goddess' and is prayed for at the Ganga Aarti. When dipped in its holy water, it is said to wash away sins and liberate souls. Ganga Aarti is performed twice a day at Har Ki Pauri Ghat: in the morning at sunup and in the evening at dusk. There are usually between 3,000 and 30,000 spectators for the nightly Ganga Aarti. The number of people varies depending on the time of year (largest in May and June, lowest in July and August), the weekend versus non-weekend, and during the festivals. During long weekends and major Indian festivals like Baisakhi, Makar Sankranti, Somvati Amavasya, and Shivratri, a minimum of 5,000 to 10,000 people visit this location for bathing. The priests chosen by the Ganga Sabha execute the Ganga Aarti. With assistance from the government, the non-governmental organisation Ganga Sabha has been in charge of Ganga Aarti since its inception. It also oversees Ghat's physical and social infrastructure. The villagers relocate to "Malviya Dwip," an island in front of "Har ki Pauri," where the Ganga River flows between the two. Priests perform Ganga Aarti over the loudspeaker while bells play in the background. Famous temples such as Ganga Mandir and Haricharan Mandir are also located here (figure 3).

Figure 3 : Glimpses of Evening Ganga Arti at Bramhakund along Har Ki Pauri Ghat

Source : Author

4.2 Kumbha Mela at Haridwar in 2021: Challenges Faced in Covid-19 Pandemic

The Kumbh Mela, which is the world's largest peaceful pilgrimage gathering and falls under UNESCO's representative list of intangible cultural heritage of mankind, involves pilgrims bathing or taking a dip in a sacred river. Due to particular favorable dates, the Kumbh Mela in Haridwar is being conducted after 11 years instead of the customary 12. In the midst of the COVID-19 pandemic, the recently held Ardha Kumbha Mela, which had previously occurred in 2016, took place from April 1 to April 30, 2021 (figure 4). At the time of aarti, more than 7 lakh pilgrims performed rituals at Har ki Pairi and took a holy dip in the Ganga to usher in the fortunate Kumbh Mela. Providing and organising social and physical infrastructure facilities were a significant task for the local administration. Before the commencement of the festival following parameters were taken into account.

1. Providing devotees amenities such as hospitals, canteens, RO drinking water, and assistance desks.
2. Providing the pilgrims a number of both transient and permanent facilities.
3. To keep surveillance on the crowd, the Kumbh administration installed more cameras at the Ganga Ghats in addition to a radio communication system. Only after submitting a negative RT-PCR test report, a medical certificate, and identification proof were pilgrims granted passes for Kumbh. Entry to the event was refused to those who were without passes. The mandated negative test was one of the Covid guidelines given by the state.

Figure 4 : Kumbha Mela Festival at Bramhakund along Har Ki Pauri Ghat during 2021

Source- Internet

4. A concern of a coronavirus epidemic led the Uttarakhand government to shorten the three and a half-month Kumbh festival to only one month. The highest authority of all akharas, the Akhil Bharatiya Akhara Parishad, praised the mela management.
5. To ensure the safety of pilgrims during the Kumbh Mela in 2021, soldiers from Uttarakhand's Anti-Terrorism Squad (ATS), Pradeshik Armed Constabulary (PAC), Central Paramilitary Force (CPF), and five teams from the Bomb Disposal Squad were stationed in Haridwar.

5.0 RESEARCH METHOD

This research focused on identifying challenges in planning of physical infrastructure faced along the ghats of 'Har ki Pauri'. The study covered literature study on challenges dealt by local government during covid pandemic Kumbha mela festival along river ghats in Haridwar. Government documents with respect to Haridwar town were collected. These documents covered the study on historic review of the city and river ghats including "Har Ki Pauri", as well as cultural and religious activities (in terms of rituals and festivals) performed daily, monthly and annually along the river ghats. With the view of studying the issues related to the physical infrastructure services and facilities and its impact on the physical comfort, safety, security etc. of pilgrims and tourist, primary survey was conducted along the 'Har ki pauri' Ghat and surrounding areas. The primary survey included field observations which were performed in the month of September 2022 during early morning between 7.00 a.m to 9.00 a.m and evening peak time (5.00 p.m to 8.00 p.m) period of influx of pilgrims and tourists. The field observations covered photographic survey which recorded issues of inadequate, unplanned and haphazardly placed infrastructure such as seating arrangements, changing rooms for women, improperly placed service lines and pilgrims tourist-beggars conflict points. This also recorded the socio-cultural flow of the people visiting the ghat and the religious activities performed.

6.0 FIELD OBSERVATIONS

A visual survey of the river ghat along the Har ki Pauri Ghat and surrounding area was performed to understand lacunae and challenges related to physical infrastructure and service facilities. This helped in identifying important spatial attributes to be addressed for development of physical infrastructure and strengthening its place as a cultural heritage. There are several historic dharamshalas, temples, ghats, ayurvedic pharmacies, retail stores, and organizations in the vicinity of the Har ki Pauri zone. This is a highly populous and congested region, thus in addition to preserving the historic buildings, concerns including road widening, pedestrian and vehicular accessibility, and modernising public infrastructure facilities must be addressed.

7.0 PHYSICAL INFRASTRUCTURE CHALLENGES AT 'HAR KI PAURI GHAT'

Following are the major infrastructure challenges observed around and along the river ghat of Ganga at Har Ki Pauri (figure 5 to 7 discusses the issues as per the following factors) :

- **Lack of Infrastructure Services**

  Presence of inadequate permanent and temporary changing facilities for women, lack of regular maintenance of these service facilities is observed leading to generation of unhygienic environment. There is absence of electric back up facility, unplanned layout and inadequate storm water drainage facility. For a sudden spike in pilgrimage during holidays or festivals, the entire infrastructural system must be rebuilt and

Figure 5 : Encroachment of Flower Vendors along the Ghat ; Unplanned Location of Temporary Changing Units for Women; Ghat is used for Vehicular Movement by the Local People

Source : Author

Figure 6 : Temporary Platforms to Perform Religious Activities and Holy Dip into the River

Figure 7 : Encroachment of Beggars; Daily Informal Activities the Devotees Performing Rituals and Prayers with Local Priests

Source : Author

designed for overflow. Increased public restrooms and efficient systems for collecting and disposing of solid waste are also required by the ghat spaces.

- **Encroachments on Rver Ghats and around Temples**

  An increasing number of people are invading the ghats and the areas in front of temples, defacing them and adding different activities to the same public area. Shop encroachments have been observed near Bramhakund and the surrounding temples, as well as along the built and unbuilt portions of the river ghats. Also there is encroachment of temporary street vendors and mobile informal sector during peak period of festivals. Lack of planning of semi-permanent and permanent vendors along the interface of ghat and built space is observed.

- **Inadequate Street Furniture and Ancillary Facilities**

  Lack of adequate street furniture such as seating arrangement at prominent locations of tourist influx, presence of non-functional street lights, planned allocations of suitable locations for climatic protection, covered porches or semi-covered platforms, sanitation facilities such as public toiletsand drinking water facilities is observed and prominently marked.

- **Environmental pollution of the Holy River Ganga**

  The River is contaminated as a result of several human activities. The untreated wastewater discharge into the river, the cremation sites near the river's edge, bathing, washing, and disposing of solid waste, and pollution from highland catchments are a few of these. The river is becoming contaminated due to the effluent that these drains are releasing into it. Thousands of pilgrims travel to Haridwar to bathe in the Ganga, a sacred river. Lack of cleanliness is seen as a result of the ongoing silt flow, ongoing religious ceremonies, and the entrance of a large number of pilgrims during Ganga Arti in the morning and evening. UEPPCB and the Ganga Pollution Control Unit, a division of Uttarakhand Jal Nigam, have recently taken steps to increase the capacity of the current sewage treatment facility by redirecting 19 drains to it. At the very least, Haridwar's river water quality should meet Class B standards.The city has failed to comply "Municipal Solid Wastes (Management & Handling) Rules, 2000" under the umbrella act "The Environment (Protection) Act, 1986".

- **Monitoring of Air and Noise Levels**

  Regarding the city's air quality and degree of noise pollution, routine monitoring is not conducted. The city's air quality must be regularly monitored in accordance with the National Ambient Air Quality Monitoring Programme. In order to control noise levels in accordance with the Noise Pollution (Regulation and Control) Rules, 2000, regular noise monitoring is also necessary.

- **Lack of Visual Communication**

  Inadequate signage and incorrect signscape placement are noted. The erected facades along the river ghats cannot be made more beautiful because heritage structures are privately owned. Unauthorised commercial establishments established around the heritage structures along the river ghats have resulted in defacement of these structures.

- **Pedestrain Vehicle Conflict**

  The Bramhakund is surrounded by densely populated mixed-use development with narrow, dilapidated streets and inadequate services. Congestion between pedestrians and vehicles is caused by a high frequency of vehicle encroachment, primarily by private cabs and cycle rickshaws. Continuous visits of tourobserved in morning and evening. However no parking facility of tourist buses is provided. No parking is allotted for public transport as well as cycle rickshaws.

- **Transportation**

  With a few exceptions, most roads only allow two-way traffic. As a result of existingshops at Har Ki Paudi, there is a lot of traffic attraction on the upper road area. When people get on or off the bus, the tempos stop, which causes traffic jams and delays for other vehicles. There is an extensive pedestrian traffic in places like Har Ki Paudi since pilgrims come from all over the country. The authorities enforce specific traffic and pedestrian management during the city's mela seasons.

- **Lack of Public Spaces**

- Unauthorized construction on parks andno parking is allotted for public transport and tourist vehicles. Lack of open spaces for Kumbh Mela pilgrimage is observed.

- **Lack of Safety and Security**

  Nonfunctional streetlight induces sense of personal insecurity. Also overcrowding near Har ki Pauri generates feeling of danger from pick-pocketers and bag snatchers. There is also sense of personal insecurity amongst the women crowd.

- **Accident Prone Areas**

  Massive crowds that congregate during events like Kumbh Mela are known to increase the risk of accidents and health dangers. Rainy seasons make it a key disaster-prone area.

- **Lack of Social Awareness and Community Cognizance**

- **In Efficient Intervention of Local Government (Haridwar Nagar Palka Parishad-HNNP)**

  There is lack of administrative coordination amongst local authorities. HNNP is unable to control the religious fairs and festivals during Kumb Mela. During this religious event, there is large number of floating population. Inefficiency is observed in HNNP in handling infrastructure projects and it is dependent on State government.

Haridwar's heritage structure conservation involves a number of challenges. Cultural legacy is deteriorating, which leads to the loss of its values. Har ki Pauri is a popular tourist destination and a notable area with unrealized tourism potential. Every year, millions of visitors from all across India and the globe flock to Haridwar. The number of visitors to Haridwar who come primarily to take a holy immersion in the river near Har ki Pauri has been steadily rising over the years. 2004 had a 14 percent increase over 2003, while 2005 saw a 20 percent increase over 2004. The number of tourists varies from month to month. Summertime sees an increase in tourists since it is the start of the "yatra," or pilgrimage, to Badrinath and Kedarnath, which begins in May and lasts until October. Maximum numbers of pilgrims performing religious ceremonies and activities along riverbanks in the morning, pollute the river and the air.

Approximately eight million religious travellers visit Haridwar each year. July is when the most tourists arrive, especially for Somawati Amavasya and Kanwar Mela. This annual peak lasts around eleven days. There is a noticeable increase of tourists at this time. The following challenges have been discovered through field investigations, public consultations, and conversations with INTACH:

- **Inadequate Tourist Infrastructure**

  The abrupt increase in the number of pilgrims during festivals is beyond the capacity of the tourism infrastructure.

- **Insufficient Public Amenities for Visitors**

  Only the clock tower has visual surveillance for individual safety.

- **Heritage Structures on Private Properties**

  Planning for the conservation of many historic buildings is severely hampered by their private ownership. One of the most sensitive locations is Har-Ki-Pauri, which is home to prominent religious organizations and institutions like the Ganga Sabha and Seva Samiti, among others. In the Har-Ki-Pauri area, these institutions should be involved in all future ghat space planning and development projects. When there are large festivals and events, lodging becomes essential. People stay at temples, Dharamshala, Math, Aashrams, Mangal Karyalay, temple trust lodging, fad (tents) and other places.

- **Lack of a Heritage Conservation Strategy**

  A long-term plan including government agencies, religious organizations, trusts, and private citizens is needed to preserve the town's architectural and lived heritage. This plan would allow for the preservation of private structures and religious sites while allocating funds according to priority.

- **Unrealized Travel Prospects**

  Over 90 percent of visitors come to Haridwar on pilgrimage. Haridwar has unrealized tourism potential in the adventure, cultural, and eco-tourism domains. A growing niche market in the travel sector, ayurvedic treatments, yoga, and spiritual pursuits should also be promoted in Haridwar.

- **Neet of Public Interface for Tourist Guidance near Ghat**

  There is no official information hub where travellers may get information about a variety of tourism destinations and amenities. Additionally, a centre of this kind can be alloted the task of registering tourist, which would create a legitimate database on the number of visitors.

- **Need for Planning of Open Spaces and islands for Tourism**

  During the Melas, open areas and islands designated for the Kumbh and Ardh Kumbh Melas are used for a variety of reasons. For the long term, these spaces could be developed as possible tourism destinations. Development in Haridwar should be planned to complement the region's natural beauty and cultural value. Examples of this kind of planning include ayurveda and exotic Himalayan plantations, outdoor theatres, etc. due to its primary status as a religious tourism destination, the bulk of visitors to Haridwar come from lower- and middle-class backgrounds. The tourists stay anywhere from a few hours to almost a week.

  The Kumbh Area, which is separated into 31 geographical sectors and includes the towns of Haridwar and Rishikesh, is provided with extra amenities such as makeshift bus stops, parking spaces, camping areas, exhibition spaces, venues for religious lectures, etc. Temporary paths for pedestrians connect Har-Ki-Pauri to these nearby localities.

8.0 RECOMMENDATIONS

Following are three levels where recommendations are needed for implementation:

8.1 PLANNING

- The area surrounding Har-Ki-Pauri should be designated as a "Special Zone" with restricted development. Long-term use of this region should be limited to pedestrian pathways and public transportation, which calls for the construction of appropriate parking lots at strategic intersections.
- Non-governmental organisations like Seva Samiti, Ganga Sabha, Niranjani Akhada, and others must take up certain improvement projects in the near future, such as building and renovating ghats and rearranging events.
- Tourist Information Centre in collaboration with Ganga Sabha Samiti should be established. The database of cultural heritage should be created and recorded.
- Reorganization of areas for 'Pooja' near Har ki Pauri, construction of changing rooms, lighting facilities and installation of metal chains along Ghats should be done. The encroachments from heritage precincts should be removed.
- Public toilets with ancillary facilities for tourists and mobile changing rooms especially for women should be provided.

- The city should comply with "Municipal Solid Wastes (Management & Handling) Rules, 2000" under the umbrella act "The Environment (Protection) Act, 1986".

8.2 DESIGN

Following are the design recommendations:

- Redevelopment and planning of the Har ki Pauri built-unbuilt riverfront interface to improve the standard of public areas.
- The enhancement and expansion of Har-Ki-Pauri Ghat and preservation of historic structures near the ghats.
- Sound and light exhibition at Har-Ki-Pauri
- The placement of informational boards at each heritage structure that provide historical context
- The flooring and tiles on the current ghats need to be replaced because pilgrims find the tiles to be extremely hot during the day and dangerously slippery. Additionally, it was reported that tiles are breaking off in several locations.

8.3 POLICY

Following are the aspects recommended to formulate the policies:

- The creation of a Tourism Master Plan with the goal of making Haridwar an internationally recognised travel destination.
- Promote private sector involvement in the construction of tourism infrastructure.
- A strong administrative and marketing plan to encourage pilgrimage travel.
- Encourage the development of infrastructure facilities and services through public-private partnerships.
- Set up and activate the disaster management system so that it is ready for any environmental disaster at all times.
- For the river ghats and the old town areas that encircle the ghats in the city, an Economic Development Plan should be suggested with the support of the Haridwar Development Authority. This will help to preserve and improve the town's current cultural, historic, and religious resources. The Government of India and the Ministry of Tourism have up to now launched several programmes for the preservation of cultural heritage and the promotion of cultures, such as the National Heritage City Development and Augmentation Yojana (HRIDAY)(2014–19), PRASAD (2015–15), and PRASHAD (Beyond 2019), respectively. A small number of historic and pilgrimage cities and villages were chosen for these programmes in order to increase tourism and foster economic growth.

In accordance with the Public-Private Partnership (PPP), the Ministry of Housing and Urban Affairs of the Government of India announced the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), a nationwide urban rejuvenation effort, in 2015. The program's objectives are to raise urban residents' standard of living and offer necessities including storm water drainage, sewage, and water supply. It also aims to improve the urban environment by promoting green spaces and public transportation. Currently, AMRUT 2.0, launched in 2021, is established in order to achieve SGD 6.0 (Sustainable Development Goal 6.4) and expand the ease of living in the water sector from 500 to all statutory towns. It intends to significantly improve water usage efficiency across all sectors and guarantees that 500 AMRUT cities have complete coverage of sewage/sewage management by 2030.One of the heritage towns covered by the AMRUT 1.0, AMRUT 2.0, and HRIDAY missions is Haridwar. After formulating the master plan under the AMRUT 1.0 programme, work on drinking water, sewage, and other infrastructure was completed, with a special focus on Haridwar. With the introduction of the AMRUT 2.0 initiative by the central government, parks, green spaces, and drainage systems will be built in addition to sewage and drinking water lines.

9.0 CONCLUSION

The Haridwar Development Authority is focused on achieving its vision of "A City of Hope, Faith and Spirituality" in the town of Haridwar, which is one of India's four Kumbha Mela venues and one of the country's seven sacred towns. The authority aims to develop the town as a city of international religious tourism for pilgrimage as well as local and foreign tourist. It additionally strives to maintain the pilgrimage route's strategic location and rich cultural legacy. However integrated planning approach needs to introduced that integrates the existing infrastructure, heritage value and the regulatory and institutional mechanism in terms of socio-economic development. The principles of urban renewal process can be applied to and areas surrounding the river ghat focusing on the area 'Har ki Pauri' ghat as a principal public place of religious attraction. This can guide to identify and plan for infrastructure parameters on priority basis for actual intervention at site.

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HERITAGE REGULATIONS ANDRESULTANT NEGOTIATIONS: THE CASE OF KOLKATA RAJBARIS

Priyanka Saha[1]

ABSTRACT

Taking the case of six 'Rajbaris' of North Kolkata, the paper highlights the existential struggle and contemporary negotiation that native built forms undergo due to imposition of 'heritage tag' and resultant heritage regulations in neoliberal cities. Adopting a qualitative approach, the paper argues on benefits and legal tensions that tagging has done, highlighting the gap between policy formulation and its execution. Findings reveal that prescribed regulation could only prevent the structures from demolition. Financial constraints, uniform rules both for public and private properties in terms of maintenance followed by lack of participatory approach in heritage management while forces the mansion to get their name delisted from heritage list, the entire process provided the corporation officials a way to extract money from residents by enforcing legal bindings. However, few cases of successful restorations have emerged as silver lining, encouraging a search for alternative.

Key words : *City, Heritage Regulation, Neoliberal, Vernacular Architecture.*

INTRODUCTION

Twenty first century's urban development recognizes heritage as newest form of urban remaking.Neoliberal market regime reconfigureuring urban policies and planning process pushes cities to compete with one another for attracting private investment, improving economic productivity while leveraging city's prominence in global markets. Such competitive nature has left the urban politics of Indian cities face two contrasting scenarios. Indian cities outside their historic core, restructures itself to offer a cosmopolitan lifestyle to the urban elites while dreaming of global prominence. Termed as 'Global City' (Sassen, 2004), this part of city space houses ubiquitous box-shaped apartments that are considered as 'modern and prestigious' (Taylor & Lang, 2016). The other revolves around the cacophony of inner-city area that still bears the architectural legacy, but experiences urban decay. Deteriorated infrastructure of inner cities while serve as pockets of reinvestments, heritage preservation showcasing traditional architecture serves as medium of establishing cultural identity to gain global prominence. Integration of heritage and culture in urban planning process thereby stands as one of the biggest development concerns of present times. Neo-liberal urbanism and its provision of a 'creative economy' have allowed cities to marketize its unique culture, through commodification of heritage resources. Thus, the changing process of treating heritage structures from stand-alone objects to their integration in urban planning have necessitated heritage planners and urban developers to impose a new layer of institutional changes (providing Municipal Corporations the authority to manage city's heritage beside Archeological Survey of India Archeological Survey 0f India and its state wings) as well as incorporation of new layers of heritage laden policies, rules, and regulations. Such heritage regulations not only bother public monuments or edifices but also trickles down upon private residential structures that has been brought under graded list of heritage, inhabited, and maintained by common residents.

Within the broader purview of neoliberal urbanism and growing debates on heritage, the present paper therefore, elucidates the existential struggles and the negotiations that native-built forms faces due to imposition of heritage regulations. Six heritage buildings of north Kolkata that has been chosen for case studies. They bear the 'heritage tag' conferred by municipality and are accompanied by a new layer of heritage regulations that the structures must abide. Locally known as 'Rajbaris', these residential buildings occupy the central stage of investigation because a) each of these buildings struggles to meet the maintenance cost that the residents often fail to incur b) At institutional level, the added layer of heritage regulations that aim to save the structures from demolition, poorly integrate finance and maintenance of private residential architecture that the state otherwise considers for public monuments and edifices. Built-in colonial times, each of these vernacular built forms concentrates within North Kolkata (referred as 'black town of Colonial

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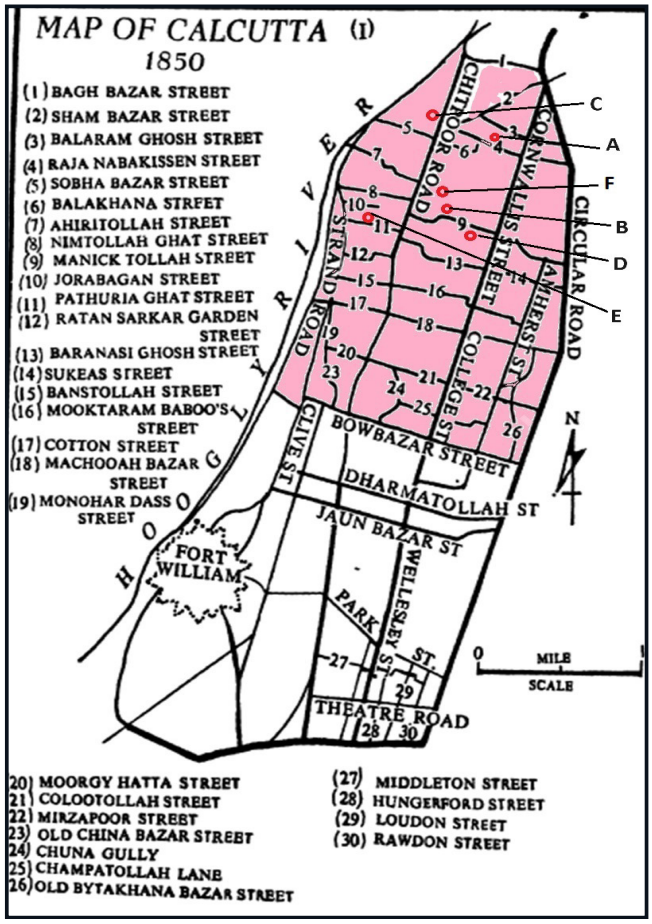
Calcutta'), gives the hint of the prosperous history that city bears in past (figure 1).

Figure 1 : Spatial Extent of Colonial Calcutta (1850) and Location of Six Buildings Surveyed.



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-Indicates indigenous occupied 'black town' area of Colonial Calcutta.

-Locations of buildings surveyed. A- Sovabazar Rajbari, B- Chatu Babu Latu Babu Rajbari, C- Roy Mansion, D-Dorjipara Mitra Bari, E-Jadulal Mullick's House, F- Pal Mansion

Sources : Sinha (1978) and re-edited by author.

Such analysis of built structures finds its applicability in diachronic approach proposed by A.D. King (1984) where built forms areanalysed within the backdrop of the economic structure that the city encompasses at that particular time-period. On similar lines, the vernacular built forms of Colonial Calcutta that the study encompass not only serves as medium for investigation as it struggles to survive in neo-liberal times but also reminds the city its glorious past. The structures were built according to the wishes and aspirations of native 'Babus' or that of local Rajas, hence the name Rajbaris.

Taking the case histories of six selected 'Rajbaris', the objective of this paper, therefore, includes a) critical analysis of heritage policies, particularly the regulatory guidelines imposed upon these heritage buildings; b) understanding how the buildings and the residents living there-in are negotiating with the heritage regulations imposed; and c) realisation of the gap between heritage policies and its execution in reality. Analysis of heritage regulations and its repercussions upon the built forms will help to infer the benefits and legal tensions that tagging has actually done, which neoliberal urbanism otherwise glamorises as a remedial measure for the existence of these age-old structures.

The study is qualitative in nature. Diachronic approach (Kings,1984) that enquires built forms keeping city's economic structure in consideration serves as theoretical framework. Heritage policy review is based on secondary sources that includes analysis of UNESCO heritage charters, Indian Heritage Acts, local heritage regulations (Kolkata Municipal Corporation rules and regulations) along with secondary literatures and information provided by print media available in public domain. To shape the case studies, field visits that encompassed semi-structured interviews of the stakeholders (government officials, architects and curators working on heritage management followed by common residents living in these buildings) were taken into consideration through quota sampling. The study ends with an alternative enquiry that not only excavates the potential that these buildings bear in earning the city its identity but also assures part of benefits that heritage management promises, trickles down to common residents who otherwise struggles within these age-old structures.

2. BUILT FORMS, HERITAGE CONCERNS AND THEIR NEO-LIBERAL IDENTITIES

2.1 City and its Built Form : a Medium of Identity

Moving from the nature, it was the deterministic attitude of 'Homo-Urbanus' that shaped their own environment and imparted it the name city (Smith, 2012). As a social space, city validates itself as a temporal art, that can be interrupted, reversed or cut across by human actions (Kevin, 1960). Characterised by human density and social heterogeneity, while cities bind the continuity of human history, built structures serves as physical remnants of earlier urbanism (Lawrence & Low, 1990). Moreover, built-forms are comparatively more static compared to changing character of the city scapes. As such, understanding the modifications brought on these built structural and cultural remnants reflects the changing architectural styles and societal norms thatthe city adopts at large.

Focussing on architectural inclinations of built-forms, 'design principles' of primitive society stand in sharp contrast to present adaptation of homogenised box-shaped apartments all across the Globe as 'modern', instigating the debate between vernacular and modern architecture (Rapoport, 1969; Senan, 1993; Lawrence & Low, 1990; Lang, 2002). Recognizing the diverse architectural style that Indian compasses, Jon Lang (2002) comments that India's idea of 'modernization' remains heavily borrowed from Western architecture, may it in colonial times or inpresent days. Bengal's vernacular architecture in turn has been dealt in details by scholars like Bose (2008), Sengupta (2013), Tailor and Lang (2002, 2016) confirming Bengal's residential structures bearing hybrid architectural style, poorly reflecting the conspicuous economic opulence of 'babu-culture'.

2.2 Heritage, its Changing Discourse and Applicability in Neo-liberal Cities

Heritage concerns try to hold back and preserve the uniqueness embedded in vernacular architecture; an idea that trickled down more prominently from global to National Level from twentieth century onwards. With UNESCO and ICOMOS established as standard setter on issues of heritage (Isar, 2011), Global North articulates the understanding of heritage that Global South merely follows (Ibid, 2011). Debates on Indian heritage understanding and policy formulation thereby continue to be dictated by the changes and adaptations made in Global heritage discourse with mere modifications.

Protection of material entities as 'heritage' that concentrated mainly on individual monuments and sites was prioritised both by UNESCO and ICOMOS, till 1970's (Ahmad, 2006). Accordingly, India's Heritage Acts limited itself to maintenance, protection, and preservation of ancient monuments and excavation sites, carrying forward the ideas implanted by Britishers well in post-independent period. However, increasing effects of Globalisation from late 1990s that made cities across the Globe loosen its individual cultural identities; necessity was felt to incorporate 'cultural preservation' as global heritage doctrine. The Washington Charter 1987 formulated by ICOMOS and UNESCO's 2003 Convention thereby became the guiding tool that prioritised recognition of intangible cultural heritage within Global understanding of heritage (Isar, 2011). As time progressed, differences crept into heritage discourse leading to protectionist versus utilitarian theory of heritage (Smith, 2006). Protectionist theory places itself in Authorised Heritage Discourse, nurtures the intrinsic value of the structures, and needs experts' recommendations lying synonymous with Lixinsk's 'orthodox' heritage paradigm (Lixinski, 2015; Patiwael et al., 2019). In contrast, lies the utilitarian theory of heritage that views 'Heritage as a Process'. Such understanding makes 'heritage' much more inclusive, indulging participatory planning process and compliments 'heterodox' heritage paradigms. Summarising these binaries, Ashworth came up with ternary classification of heritage that involves the preservation, conservation and heritage planning (Ashworth 1994a, 1994b, 2011; Patiwael et al., 2019). Such an understanding of heritage also creates ground for the local communities to get involved in the city's heritage management process. Neo-liberal urban development further integrated heritage into tourism industry, the engine behind 'creative economy' that got recognised as 'Alternative heritage discourse' (Florida, 2019).

Shift in heritage paradigm, thus, leveraged cities of developing countries to showcase their cultural identity, inscribing them in the World Heritage list besides integrating heritage in city's planning process. The heritage tags became the core asset of the tourism industry. With heritage sites earning financial and technical assistance from global funding agencies to revitalise and improve tourism services, the process also integrated developing countries with global economy (Ashworth, 1994; Johnson, 1995; Isar, 2011).As such, the Walled City of Ahmedabad that became India's first World heritage City in 2017 followed by Jaipur in 2019, successfully showcased to global spectators the uniqueness that each Indian city nurtures within its core. With privatisation becoming the buzz word of ongoing 'market civilisation' (Brenner & Theodore, 2002, 2011), financial organisations like the World Bank, Inter-American Development Bank (IADB) and the Asian Development Bank (ADB), thereby provides financial assistance to recognized heritage sites cities to revitalise their existing urban cores (Gill 1995; Steinberg, 2008). Indian cities have also embarked on various heritage-laden policies like JnNURM (Jawaharlal Nehru Urban Renewal Mission, 2005-2014) and HRIDAY (Heritage City Development and Augmentation Yojana) funded and regulated by MoHUA (Ministry of Housing and Urban Affairs), Government of India ushering a new era of heritage urbanity (Carreno, 2018). Private organisations such as INTACH (Indian National Trust for Art and Cultural Heritage), AKTC (Aga Khan Trust for Culture), DUAC (Delhi Urban Art Commission) an autonomous body under MoHUA etc., have also come forward, taking initiatives to safeguard heritage management while focussing on sustainability and urban developments.

One such successful revitalisation and restoration project within India that is worth mentioning involves restoration of Humayun Tomb, Sundari Nursery and the revitalisation of Nizamuddin Basti (Niti Aayog

Report, Govt. of India, 2021). This seven years project (2007-2013) not only employed Basti members in restoration works of Humayun Tomb but also improved the socio-economic lives of 9000 Basti members integrating community's participation in heritage management process (Living News, November 06, 2016). Such successful initiatives, though stand as a silver lining strengthening our belief in heritage management process but a critical analysis of heritage policies followed by Heritage Impact Assessment (HIA) guidelines published by ICOMOS even in 2011 displays its strong root to the preservation discourse, ignoring conservation and heritage planning process (Patiwael et al., 2019). Delhi withdrawing its name from World Heritage list in 2015 fearing heritage as hindrance for development once again stirs the binary of heritage versus development (Times of India, May 2015).

3.0 HERITAGE POLICIES AND THEIR IMPLICATIONS

Understanding heritage policies, rules and regulations within India's federal structured government necessarily bring global connotation because heritage for India was never a home-grown idea. Kolkata, being the colonial capital, received the direct impact of implantation of European idea of 'heritage.' In post-independent period, with UNESCO and ICOMOS promulgating the guidelines of heritage at an international scale, India, being a developing country of global south, continued to be a receptor of such ideas. Making the Central Government apex decision-making institution for heritage properties, India's federal structured governance reconfirmed the top-down approach, keeping the states as mere executors. 1990s constitutional amendments empowering Municipalities to decide fortheir city's heritage and the growing craze for inscription among neoliberal cities in World Heritage list allowed global doctrines to directly impact city's heritage management. Thus, to understand Kolkata's heritage management process, necessity was felt to look through the entire trajectory, from where the idea of heritage trickled down vis a vis national, state and local. Policy analysis at three spatial scales in turn will reflect its linkage to global heritage discourse besides commenting on which approach of heritage (Ashworth, 2011) Kolkata adheres to till today (table 1).

Table 1 : Policies that Structured the Heritage Management and Conservation Process of Kolkata

At National Level			
Acts/ Amendments	**Year**	**Organisational Body**	**Responsibility or Functional Entitlements**
Bengal Regulation (XIX)	1810	India under British Control	Prevent misuse of public buildings.
The Ancient Monuments Preservation Act of 1904. The Ancient Monuments and Archaeological Sites and Remains Act of 1958	1904	The Archaeological Survey of India	Limited to protection of historical monuments and sites.
INTACH Charter (Article 2.6)	1984	INTACH	Created awareness on conservation of cultural heritage, mapping of heritage sites followed by listing and gradation of heritage buildings.
At State Level			
West Bengal Town and Country (Planning & Development) Act of 1979.	1979	Government of West Bengal	First state's intervention in conservation of state heritage though no provisions were made.
West Bengal Heritage Commission Act 2001	2001	West Bengal Heritage Commission	Framed new rules for the conservation of heritage properties, followed by the creation of separate Heritage Cell for KMDA.
Local Level (KMC)			
The Kolkata Municipal Corporation (Amendment) Act, 1997	1997	Expert Committee on Heritage Building	Protection and conservation of heritage buildings and sites, besides conservation of monuments, precincts and sites
Formed as per the provision of the Municipal Corporation (Amendment) Act, 1997	The Committee formed in 1999	Heritage Conservation Committee	On-ground scrutinization and decision-makers on issues of erection, re-erection, restoration or unlawful demolition of heritage buildings.

Source : Bose (2012); The Planning Review (2013), Handbook of Conservation of Heritage Buildings, Central Public Works Department, Report no. 48(1): 68-82; Graded List of Heritage Buildingspublished by Kolkata Municipal Corporation(2009).; Department of Municipal Affairs, Government of West Bengal.

For Kolkata, therefore, the first formal regulation on heritage was 1810 Bengal Regulation XIX formulated by the British. The regulation primarily aimed to secure and maintain public buildings, constituting government administrative and residential structures of Europeans, built during those times (McGee, 1971). Patronising a Eurocentric illustration of heritage, the 1810 Bengal Regulation talked about monumental grandness, safeguarding it for common good. Archaeological Survey of India established in 1861, assisted by state wings, remained the sole executor of maintenance and protection of heritage properties on ground. West Bengal remained no exception. Formulation of National Heritage Acts in post-independent India limited its heritage management to that of public monuments, antiquities and excavation sites that 'western' particularism has already propagated at global scale (Isar, 2011). Reconfirming Ashworth's preservationist approach, protecting the monuments 'as it is,' thus came into existence in 1904 Ancient Monument Preservation Act and 1951 Ancient Monuments and Archaeological Sites and Remains Act respectively.

Formulation of 1979 West Bengal Town and Country (Planning & Development) Act acknowledged state's responsibility for executing the preservation and conservation of architectural monuments located within its administrative boundary. Kolkata's Public Works Department was responsible for the maintenance and repair of public buildings and monuments located in and around Kolkata (Bose, 2012). Kolkata Municipal Corporation Act of 1980, in its initial phase, also remained silent about conservation of heritage properties, leaving it as the state's concern. However, growing discontentment regarding gradual degradation of old buildings in and around Kolkata coupled with technical efforts from private architects and organisations like INTACH (Kolkata chapter) and CBE (The Centre for Built Environment) from 1990s onward compelled the local administrative system to revisit the issue of heritage (Ibid, 2012). This resulted in the incorporation of chapter XXIIIA conferring upon Preservation and Conservation of Heritage Buildings through The Kolkata Municipal Corporation (Amendment) Act in 1997. According to the Act, the term 'maintain' confining to the AMASR act of 1958, denotes "fencing, covering, repairing, restoring or cleansing, or doing of any act which may be necessary for the purpose of preserving or conserving" of the graded list of heritage properties. Such provision allowing repair and restoration of heritage properties nonetheless sticks to material entity. Treating locals as mere 'visitors', the provision of 'fencing' once again confirms Ashworth's glass case preservationist approach. From the state's responsibility of maintenance, the heritage buildings that were listed under KMC's jurisdiction by 1996 (72 buildings were listed by KMC) became the responsibility of the owner to maintain their individual heritage properties (Ibid, 2012). While the Kolkata Municipal Corporation (Amendment) Act of 1997 laid the foundation of Heritage Conservation Committee working as an executive body, the Heritage Commission Act of 2001 led to the foundation of Heritage Commission, which emerged as an advisory body for the state government entitled with preparing the list of heritage buildings. The Committee also possess the power to purchase or acquire buildings that have been tagged as 'heritage' if the owner fails to maintain the heritage property. The concerned Act of 1997, thereby, imposed heritage regulation upon private residential architecture and upon concerning residents who, until then were treated as mere visitors. Imposition of similar rules irrespective of considering the nature of ownership (privately owned or in public domain) or utility (whether used as residential or as government offices) of these heritage buildings thereby invited large numbers of contestations, a detail of which remains the subject of next section.

3.1 Critical Analysis of the Regulatory Guidelines Published for Maintenance of the Heritage Buildings

The listed heritage buildings include both government buildings as well as privately owned residential buildings having architectural or historical significance. For privately owned spaces, as the norms mentioned, it is the responsibility of the owner to 'maintain, preserve and conserve' their respective building, discouraging any alterations within the premise. Partial alteration, though allowed, depends on its gradation and needs prior permission from Heritage Conservation Committee or of KMC. For any new construction or repair, the building materials used should remain unaltered from the original ones. No demolition of any structure is allowed. Partial demolition is allowed only if it seems necessary by the heritage committee and needs to be done under the supervision of prescribed heritage architects. For change of property rights or that of its use, both parties need to inform KMC prior to such changes. While the list of such regulations continues, it can simply be argued that KMC has been made the invisible guardian of these heritage buildings. For any kind of structural alteration or of its reuse, the owner needs to seek prior permission from KMC to handle their own private property. In fact, KMC enjoys the upper hand since it has the power to declare any demolition or structural alterations as unlawful and punishable after consideration.

In two separate paragraphs, the guidelines talk about the benefits that these heritage buildings can enjoy. Firstly, declaration of these buildings as heritage increased their property valuation, making them eligible to claim national and international funds for

their maintenance. Secondly, the guidelines mention the exemption of taxes that these heritage buildings can enjoy. However, the use of some void and superficial words like 'one can claim' or 'if properly approached' gives a hint to the extent such claims will actually be held valid in reality.

Thus, positioning these heritage norms in Ashworth's ternary classification of heritage paradigms (Ashworth 1994a, 1994b, 2011), it can simply be argued that even at the local level, each of these norms bears a close linkage to the preservationist approach of heritage. The norms were formulated by a group of experts who are ignorant of local needs, while a bunch of rules and regulations have been arbitrarily imposed on the common residents that they are made to follow. The common residents were nowhere involved in the decision-making process. Moreover, the norms prohibit any alternative reuse of the premises until and unless it is very urgent and needs prior permission from KMC. Thus, in the name of maintaining authenticity, the norms once again create a barrier in the conservation and heritage planning process. Any commercial usage of these residential buildings is vehemently discouraged, treating heritage more like an island. While Kolkata stands far from undertaking a landscape approach in the heritage planning process, each of these buildings suffering from lack of maintenance continues to get demolished till date.

4.0 BUILDINGS, THEIR 'HERITAGE' TAG AND CONTEMPORARY NEGOTIATIONS

The list of heritage buildings that was published by KMC on February 2009 has been taken as reference to categorise six heritage residential buildings considered for case study (table 2). Detailing the architectural orientation of these built form is beyond the purview of present paper. But briefing the structural arrangements of these built forms stands important not only to analyse their contemporary negotiations but also to recognise the new layer of contestation that tagging these buildings as 'heritage' have invited in recent years.

Table 2 : Kolkata 'Rajbaris' and their respective heritage gradations.

Buildings with year of Establishment	Criteria for selection	Gradation	Portions of the built forms that hold architectural grandness, earning the buildings their 'heritage tag.'[1] (figure 2)
Sovabazar Rajbari (1757 appprox)	Architectural style	Grade I	The entire portion of 'bahirmahal'.
Chatu Babu Latu Babu Rajbari (late 18th century)	Building associated with eminent personality	Grade I	The entire portion of 'bahirmahal'
Roy Mansion (19th century)	Architectural style	Grade I	The entire residential building.
Dorjipara Mitra Bari (1807)	Architectural style	Grade II A	Thakurdalan and the 'jafri work'
JadulalMullicks House (19th century)	Architectural style	Grade II A	Thakurdalan and the courtyard, excluding the surrounding rooms.
Pal Mansion (1838)	Building associated with eminent personality	Grade II B	The entire residential building.

Established in the latter part of the eighteenth century, the aristocratic mansions of Bengali 'babus' clustered mostly within the black town of the natives (Bose, 2020). Each of these built forms can be broadly divided into two spatial domains- quasi-public 'bahirmahal ', dominated by males and that private interiors or 'andarmahal'. Both these quarters were courtyard centric. The secondary divisions of these spatial domains in turn were utility based. As argued by Bose (2020), it was the extravagant architectural ornamentation of grand exteriors, poorly replicating Neo-classical architectural style, that served as the status symbol of native 'babus'. Important components of this grand exterior comprised of grand façade, porches and porticos to welcome the guest. The grand exterior gives way to 'bahirmahal' comprising of public courtyard, thakurdalan on its one end and verandah supported by columnar structure on rest three sides. Extended from the verandah are the business rooms like 'baithak khana ', nautch-ghar billiard room, library, or dining hall to welcome European guests. In contrast were the 'andarmahals, female-dominated private quarters, devoid of architectural ornamentation and comprised

of bedrooms, kitchen, storage, bathroom and rooms for servants working in service of the 'babus'.

Each of these structures, surviving more than two centuries, eventually adopted structural alterations and spatial negotiations to meet the changing needs of the 5th or 6th generation of descendants. The architectural marvels of grand exterior coupled with 'bahirmahal' together make these built forms stand out in the entire neighbourhood, restoring city's identity even in contemporary times. It is primarily this portion of the building, as confirmed by the residents living within these built forms, that earned the structures its 'Heritage Tag' in 2009 (column 4 of table 2 and figure 2). The kind of negotiations that these structures attained over time, in turn, can broadly be divided into two parts, a) structural alterations and b) change in the nature of utilisation of their residential space.

Structural alterations witnessed in each of these 'Rajbaris' as came up in the primary survey, were because of i) successive partitioning to accommodate the increasing number of descendants, ii) prioritisation of privacy and modern amenities that could be easily installed in newly-built portions iii) financial incapability followed by unavailability of old building materials making renovation works costlier. First round of partitioning was witnessed among second or third generation of descendants, resulting complete separation of 'bahirmahal' from that of 'andarmahal'. Exceptions were Roy Mansion and Pal Manion exhibiting compact structures, devoid of separate 'bahirmahal' and 'andarmahal'. Successive partitioning occupying mainly the residential quarters of 'andarmahal' is prominent in case of Jadulal Mullick's Rajbari, Sovabazar Rajbari and Chatu babu Latu Babu's Rajbari. Each of these structures having a separate 'bahirmahal' attached to the grand exterior kept their architectural

Figure 2 : 'Rajbaris' Architectural Grandness that Earned the 'Heritage' Tag

A: The 'Thakurdalan' of Sovabazar Rajbari

B: The 'Thakurdalan' of Dorjipara Mitra Bari

marvels intact, earning 'heritage tag' in recent years. Municipal Corporation, though tagged the buildings in their entirety as 'heritage', but when we relate with the entire spatial extent of the built forms, as it was in the past, the tagged built forms constitute only a part of the entire Rajbaris. For example, in the case of Dorjipara Mitra Bari, the entire portion of Mitra Bari extends over the areas having postal addresses 19A,19B,19C and 19D. But architectural grandness is more explicit in areas occupying 19C and 19B. Hence it is this portion of the building that has been brought within the graded list of heritage. In case of 19C, Dorjipara Mitra Bari, portion of 'bahirmahal' is also utilised as residential quarters. So, tagging the portions of 'bahirmahal' as 'heritage' that stands completely separated from residential quarters, were happily accepted as it did not interfere with the living portion of the residents. 'andarmahals', in turn, have undergone successive formal partitioning, forming separate residential blocks as in the case of Sobhabajar Rajbari, Jadulal Mullicks Rajbari and the rear portion of Dorjipara Mitra Bari. Formal partitioning has resulted in complete structural and architectural alterations of these residential premises, giving rise to ubiquitous multi-storeyed apartments (figures 3a and 3b). Informal partitioning is common in the case of Roy mansion, parts of Pal Mansion and the frontal portion of Darjipara Mitra Bari. Informal partitioning, in turn, facilitated the erection of new floors creating an abrupt mismatch in architectural orientation. Informal partitioning coupled with heritage tag restricts structural alterations and compels to use original

building materials escalating the cost of maintenance, leaving the residents more ignorant towards the structure, while others prefer to settle outside. Such is the case of Roy mansion, where some residents moved out, leaving part of the building vacant and dilapidated (figure 3).

Figure 3 : Intricate Works on the Iron Beams Located within the Courtyard of Jadulal Mullick's House

Source : Photographed during Field Work, 2020

Change in spatial utilisation of built forms paralleled such structural alterations. Shedding gender based norms, official spaces of 'bahirmahal' thus turned into bedrooms or living rooms as seen in Dorjipara Mitra Bari, Pal mansion and Roy Mansion. Where 'bahirmahal' stands completely separate, the commercialisation of heritage is gradually gaining ground. The 'bahirmahal' turns into melting pots of culture mainly during Durga Puja. The adjacent rooms around 'bahirmahal' serves as residential quarters for servants who otherwise used to occupy dark quarters of 'andarmahal' in earlier times, as in case of Sovabajar Rajbari and Jadulal Mullicks Rajbari.

5.0 RESIDENTS' RESPONSE REGARDING 'HERITAGE TAG'

5.1 Heritage Tag-a Boon

Prevention of this vernacular architecture from demolitionhave been unanimously accepted by the residents as the most important outcome of the 'heritage tag'. In most cases, it is the 'Bahirmahal' in comparison to the total spatial extent of 'Rajbaris', that has been tagged as heritage glamorising architectural significance (figure 2). So, Thakurdalanor that of 'Bahirmahal' standing separated from residential portions after successive partitioning as can be seen in Sovabazar Rajbari, Dorjipara Mitra Bari, Jadulal Mullick's Rajbariand Chatu Babu Latu Babu Rajbari, residents have welcomed the 'heritage tag.' The tag enriched the historical significance of these buildings, making them important landmarks of the cityscape. Beside heritage tourism, residents are also looking for avenues to facilitate heritage commercialisation. For example, the courtyard of Chatubabu Latu Babu Thakurbati or that of Sovabazar Rajbari is rented out for shooting purposes or for holding community occasions, especially marriages, earning revenue from the same. During the time of Durga Puja, West Bengal tourism also organised 'Puja Porikrama.'. These 'Rajbaris' then constitute must-visit points, thereby promoting the idea of heritage tourism.

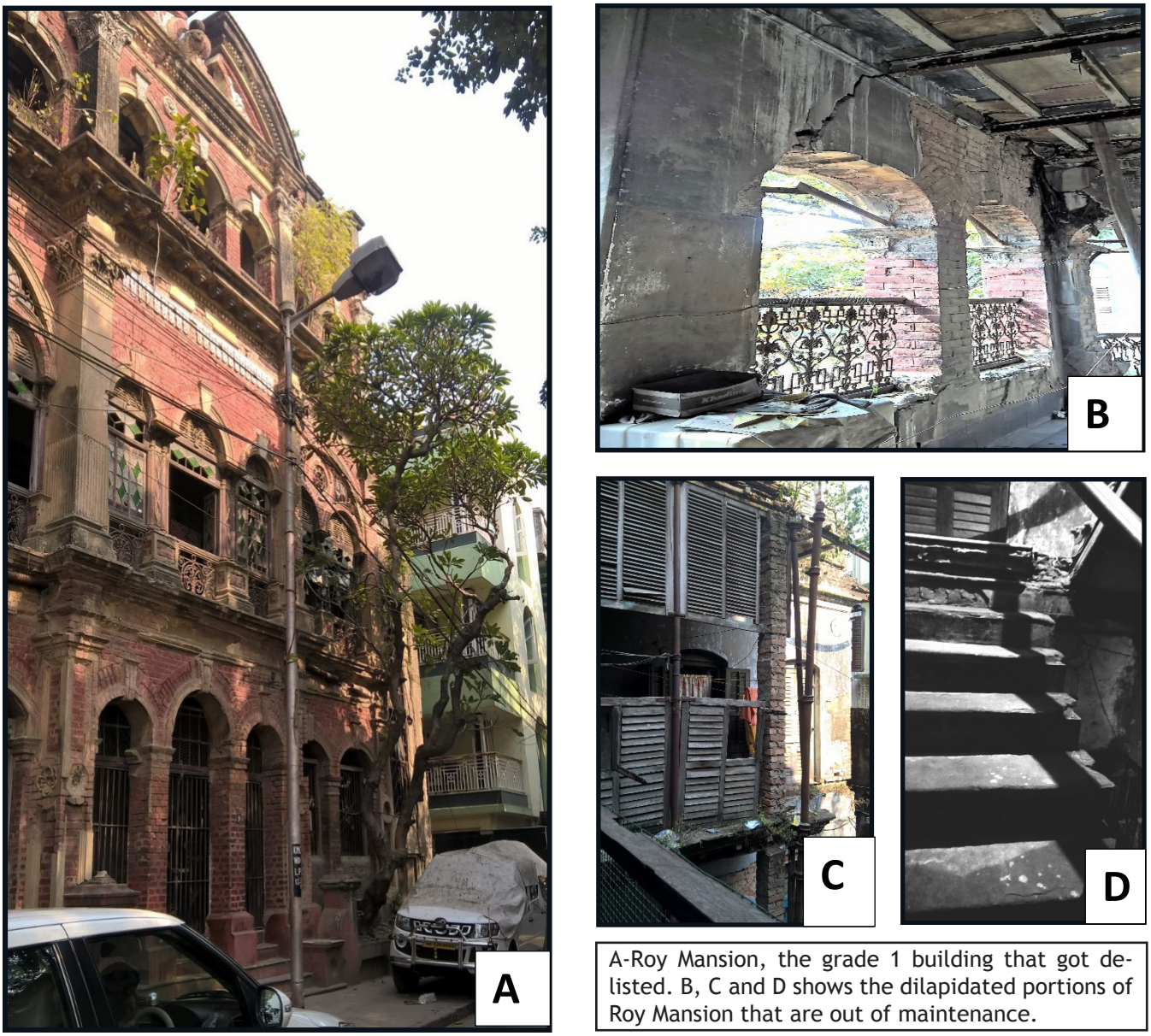
5.2 Heritage Tag- a Bane

As a bane, it can be concluded that the newly added restrictions have largely out numbered the benefits that these buildings enjoy due to heritage tag. It altogether added a new layer of financial and legal burden on the part of the residents who are already negotiating within the crumbling walls and suffering from an acute lack of finance to maintain their residences. Instead of enjoying tax exemption,the large expanse of land that each of the six buildings occupy, eventually increased the property tax over time. Legal restrictions on structural alterations or their reuse, particularly those falling under grade I, have compelled the residents tosubmit to unfair means like bribingmunicipal officials or local leaders to get the development permission. Imposing heritage regulations on private properties not only compromised the privacy of the residents as tourists can come to visit the property at any time of the day; resident's decision wasnot even considered before bringing the properties under heritage. Continuous financial tussle forced residents to move to court for getting their property delisted. As such, a long court case for seven yearsfinally bought relief for Roy Mansion (figure 4), that got delisted from heritage list in 2018.

Besides such legal tension, restriction on the use of alternate building materials in case of repair or structural addition has made the renovation work even more costly. While the present market price of those traditional materials often seem too expensive, the old 'mistris' also claim exorbitant charges as they are aware of their demand while the work in itself is labour intensive. Regarding giving access to visit the Heritage building, all the residents also raised their concern against such arbitrary norms that serves as a forceful breach of their privacy, living in these age-old mansions.

Thus, the heritage tag in reality, could hardly prove beneficial when private properties are taken into consideration, creating a new layer of financial burden. In fact, the only group that benefited from these newly constituted rules is the corporation that provided them with an option to earn money from the backdoors.

Figure 4 : Pictures of Roy Mansion



A-Roy Mansion, the grade 1 building that got de-listed. B, C and D shows the dilapidated portions of Roy Mansion that are out of maintenance.

Source: Photographed during field work, 2020

6.0 EMBEDDED POLICY VERSUS EXECUTION IN REALITY

The heritage management process in Kolkata has thereby progressed mainly on pen and paper whilein reality, enlisting the buildings as heritage is all that has been achieved. Uniform regulations both for public and private heritage structures, without considering ownership rights of the properties, their functional characteror financial background of the owner, are bound to create a problem. Ignoring residents' views in decision-making has made the process more bureaucratic. Formulation of rules by the bureaucrats could bring little change in the attitude of the locals regarding these heritage properties. Conservation of age-old property is still considered to be an elitist idea that could hardly be maintained, particularly when families have acute financial problems. The entire scenario treats this architecture as an individual specimen of the past, standing alone, to be preserved intact, forbidding reuse and therefore lacking planning perspective. Though policies have been formulated and rules are being made, discrepancies stand in their execution. Corruption has already crept in, earning the conservation process a bad name. Previously it was claimed that prevention of these structures from demolition serves as the most important outcome of 'Heritage Tag.' But in reality, such claims are questionable. This is because residents are selling out residential portions of the 'Rajbaris' that do not come under the norms. Such is the case of Sovabajar Rajbari, where residents have sold out their residential portions to the developers for newer construction or that of Dorjipara Mitra Bari, where the rear portion of the premise has newly-built high-rise apartments (figure 5).

Figure 4 : New Constructions within the Residential Portions of these Age-old Buildings, creating a Miss-match in Architecture.

Source : Photographed During Field Work, 2020

A : Construction of New Flats within Residential Portion of Sovabazar Rajbari.

B : The Apartment on the Rear Portion of Dorjipara Mitra Bari.

Delisting of structure from 'heritage list' is also witnessed in case of Roy Mansion (by 2018, delisting was already done), one among six buildings surveyed, raising serious concern about Kolkata's heritage management process. In this regard, mention needs to be made about the PIL filed in High Court by the joint effort of CAL and INTACH against Kolkata Municipal Corporation for delisting or downgrading buildings from 'heritage list', submitted in 2019. The high court forbidding KMC from further delisting/down-grading of structures also claimed justification for the buildings that have already been delisted or downgraded (as per the decision of the High Court on 06/12/2021). Such positive move though, once again rescued the structure from demolition but cannot ensure their sustenance in long run. Moreover, the argument made by a senior government official, as reported by Telegraph India, says, "what can we do if their owners request us to delist the buildings saying those would collapse because they could not afford their upkeep?" reveals the unpreparedness and ignorance on the part of government who is otherwise the custodian of these heritage properties (Telegraph India, July 2019).

However, stating the shortcomings of policy formulations, besides blaming the opaqueness of the administration as the only cause why Kolkata lags in heritage concerns, makes the argument one-sided. The apathy of the residents and their lack of concern for restoring the old structures are equally to be blamed. Lack of entrepreneurial initiative to put the structures to reuse, followed by lack of cooperation and negligence among the co-owners also contributes immensely to the rapid decline of these age-old structures.

7.0 HERITAGE COMMERCIALISATION- AN ALTERNATIVE

Neo-liberal urbanism validated the idea of heritage commercialisation, integrating heritage into tourism industry. Glamorising community's uniqueness and city's identity, creative utilisation of heritage thereby channelise the city to earn revenue instead of treating heritage as a mere burden. Global discourse recognised such ideas under the notion of 'Alternative Heritage Discourse' (Florida, 2019). Thus, it is the gaining popularity of this vernacular architecture, their creative restoration beside revitalisation of the traditional urban core that earned the Walled City of Ahmedabad and Haveli's of Jaipur a place on World Heritage List.

Kolkata, though stands far behind in adopting such a landscape approach in heritage management process but definitely holds the potential unless these structures are allowed to worsen further. Few successful initiatives, despite these lacunae, highlights the potential of heritage restorations while commercialising city's identity. Given below are four such cases (table 3).

Arranging initial investments for the restoration of age-old residential buildings always constituted the main hindrance for the residents, forbidding them from even thinking of any creative reuse. Convincing private investors in heritage management is equally arduous as such initiatives do not turn lucrative in their initial phase. However, few successful private projects that managed initial investment are serving

Case 1: Calcutta Walk Started in 2007, it is a theme-based heritage walk that aims to explore the city on foot witnessing the beauty of the built heritage. It is working in collaboration with ICOMOS, Bengal tourism, INTACH and tripadvisor.com and earning profits by making use of city's history and identity
Case 2: Calcutta Bungalow The house ofMajumdar's (built in 1926)was a three storeyed building that got restored and presently running as a classic heritage guest house. It sets forward an outstanding example in the old neighbourhood, showcasing that even the dilapidated crumbling walls do carry the potential to hold modern facilities.
Case 3: Laha Bari Two hundred years old, Laha Bari was the house of Raja Kristo Dass Law, a great patron of art and has been declared a grade 1 heritage building. The co-owners of this house have agreed to rent out portions of 'bahirmahal' for commercial photography, shooting for films etc. Rooms on the ground floor, as well as a portion of the first floor, have been decorated accordingly with antique furniture and pianos, allowed for photoshoots and charged separately. For photoshoots Rs 2000 is being charged per hour, while for films, it increases according to negotiations made.
Case 4: Government-sponsored Heritage Walk in Kolkata On the occasion of World Heritage Week, Government of West Bengal, in association with West Bengal Heritage Commission, conducted heritage walks in Kolkata for two consecutive years 2018 and 2019 respectively but got disrupted due to the upsurge of Coronavirus from 2020 onwards. Joined by many eminent personalities of Bengal, the aim was to create awareness among the masses about Kolkata's rich culture, tradition and architectural heritage and it turned out to be a successful event.

as game changers within Kolkata, turning profitable in recent days. Both Calcutta Walk and Calcutta Bungalow are examples of such private initiatives undertaken by Iftekhar Ahsan and have gained popularity and acceptance both among tourists and fellow residents. Though the Bungalow was not a heritage property, it nevertheless showed how a building could be restored, make space for modern amenities, stands cheaper than complete reconstruction, besides making it economically lucrative for the owner himself. Calcutta Walk and Calcutta Bungalow have been given special emphasis because both initiatives were experienced by the author during primary survey. There are many such private 'heritage' theme-based restaurants/ marriage banquets/guest houses that are gradually cropping up within the cityscape in recent days. Such includes 6 Ballygaunge Place, 85 Landsdowne or that of Corner Courtyard. Heritage walks are also conducted by various private organisations like Calcutta Heritage Collective and India Heritage Walks (Kolkata), to name a few. Thus, flagging the cause of the market economy, when the state is shying away from its role and responsibilities of safeguarding the city's heritage, private players have come forward as torch bearers, instilling hope among fellow residents who feel for these structures but lack required means to protect them.

Residents' efforts to utilise the available spaces for heritage commercialisation are also gaining acceptance. As such, Chatu Babu Latu Babu charges Rs. 7000/- to Rs. 8000/- approx. for one day commercial photoshoot and more than lakhs for renting 'bahirmahal' as a marriage banquet, Jadulal Mullick's house still prefers to keep the space restricted to family occasions. However, the cost so incurred covers only a minuscule of the total amount required for the maintenance of these structures.

While the change is slow, it equally fails to initiate a community-level change. Given below are some recommendations that seem suitable to revive the urban core and to prevent any further destruction of city's unique inherited architecture.

a) Bringing together the stakeholders viz., the property owners, the government as well as the private players as Revitalization process do require an initial investment and cannot be done single-handedly.
b) Initiations from public sector – The foremost requirement is to increase the transparency in governance and to stop the corruption that has already crept in. As a facilitator, the government may create a market for the private players providing land, subsidy, constructional allowance to those who promise to un-alter the basic themes of the historic urban landscape while discouraging those who want to demolish the structures. As a policy maker, the government can then move with a strategic planning approach that involves demarcating the old urban core in the Master Plan of Kolkata as a separate 'Historic Urban Landscape'. The specific zone, over time, can then turn into a separate place for the tourists who want to feel the essence of 'Bengali traditions, culture and architectural ethos, promoting heritage tourism while glamorising city's uniqueness.

c) Initiatives of the property owners and common residents who inhabit the space. The entire process of restoration should be made much more participatory in nature. Exemption of taxes, small aids in maintenance should be granted while creative reuse of these structures should be encouraged.

d) The role of the private players- The private players can then take the stage for the creation of an economically healthy, historically and architecturally unique, vibrant urban core.

8.0 CONCLUSION

The study, therefore, brings in view the new layer of legal problems and restrictions that each of these buildings has to face in the twenty-first century after being tagged as 'Heritage'. At the local level Heritage Conservation Committee has been envisaged with the task of making rules and regulations for the heritage buildings while corporation has been made responsible for execution of these regulations. Based on the resident's perception it can be concluded that apart from preventing the structures from being torn down by the developers, the tag could not bring much change. While the regulations themselves have imbibed preventive measures, making the structures stand alone in the surrounding community, no constructive planning process has yet been adopted by the corporation that would take the landscape approach into consideration.

However, a few successful restorations of age-old architecture have started setting an example in the neighbourhood, but these alone cannot make a city-level change. Hence, the need is to adopt the 'Historic Landscape Approach' to revive the old core back to its glory while creative reuse of these dilapidated structures can altogether provide them with a new meaning and life. Moreover, value judgement of these old properties should be done in terms of architectural significance instead of land value, raising the market price of these structures to many folds. A proper conservation plan can then impart Kolkata the ability to contend for itsname in World Heritage list, capable of receiving global funds for the restoration process, besides serving as an important tourist destination which in turn will boost the city's economy.

Restoration is an arduous task in the initial years whose fruits can be enjoyed only in the long run. But it is high time for Kolkata to start with that initiative and to think differently before the urban core is damaged any further. Supporting the words of Kamalika Bose, the conservationist architect and the curator of Heritage Synergies India, "Trees will grow, but we must sow the seeds first." (India News, July 2018).

REFERENCES

Rajbarisused synonymous to 'Rajas Bari' generally refers to the large mansions of the Zamindars built in Colonial Calcutta from early 1750s. Built to poorly imitate the residential structures of European houses, the Zamindari mansions eventually ended up in adopting a hybrid architectural style.

Guidelines for the owner ofHeritageBuildingshttps://www.kmcgov.in/KMCPortal/jsp/HeritageBuildingHome.jsp

Babus- locally term used to refer to Bengal aristocrats/gentlemen,occupying the upper section of Hindu society.

News report published in 2016 highlights how AKTC's initiative regarding the revitalization of Nizamuddin Basti has positively impacted the lives of the Basti members, providing employment while ensuring socio-economic and cultural development within the Basti.

Guidelines addressing to the owners of buildings having heritage tag, published by Kolkata Municipal Corporations.

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The Architectural Splendor of Saadat Ali Complex : A Conservation Perspective

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ABSTRACT

Saadat Ali Complex, a cultural heritage site in 1814, is a remarkable architectural marvel with rich historical significance. Its intricate designs and craftsmanship are captivating visitors, showcasing the artistic prowess of the craftsmen who meticulously crafted each detail. The preservation of this complex is not just about maintaining the physical integrity of the structures but also an active endeavor to safeguard the soul and essence of a bygone era. The conservation initiatives involve rigorous documentation, restoration, and maintenance of the architectural elements that define this historical gem. A multidisciplinary approach combines architectural expertise, historical research, and scientific analysis to ensure the authenticity and integrity of the complex. The conservation efforts extend beyond the physical aspects of the complex, involving educational programs, community engagement, and awareness campaigns to foster a sense of pride and appreciation for the cultural heritage. By involving local communities and stakeholders, these initiatives empower individuals to take an active role in safeguarding and cherishing their shared heritage. Despite facing challenges such as aging infrastructure and climate-related issues, preservationists, historians, architects, and supporting organizations continue to meet these challenges with innovative solutions and sustainable practices. Saadat Ali Complex stands as a testament to the rich cultural heritage and architectural brilliance of its time, preserving the collective memory and identity of a region.

Keywords : *Historic Buildings, Structures, Cultural Significance, Conservation.*

1.0 HISTORICAL BACKGROUND OF LUCKNOW

Avadh was an ancient Hindu state. Legend says that it was gifted to Lakshman by Ramchandra. Later, it became part of the Mughal Empire. Avadh's capital was Faizabad, which later moved to Lucknow, making it one of the most prosperous cities in India. The British East India Company gradually took control over Avadh, and in 1856, Lord Dalhousie annexed it. This led to the 1857 rebellion led by Begum Hazrat Mahal, who never surrendered and died in Nepal in 1879.

2.0 HISTORICAL BACKGROUNDS TO SAADAT ALI COMPLEX

Saadat Khan established the kingdom of Avadh in 1732 AD, but it was annexed by the British in 1856 A.D. Lucknow has a remarkable range of architecture, including Imambaras, Mosques, Palaces, and Tombs that represent a rich period of architecture in transition. The tombs of Saadat Ail Khan and his wife, Murshed Zadi, were built in 1814 A.D. They are located northeast of Qaiserbagh and provide a unique charm to the Lucknow skyline. Unfortunately, the tombs and surrounding complex were damaged during the mutiny in 1857 A.D., and modern architecture destroyed the traditional style of the area. The current landscape fails to match the elegance of the monuments, and the park layout has lost the charm of the Mughal gardens.

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2.1 KINGS TOMB

The Saadat Ali Khan's mausoleum has a large black and white marble floor with beautiful embower openings on the sides. The central hall is octagonal and adorned with stucco designs in red ochre. The square corners have staircases leading to the terraces above. The monument is capped with an attractive chhatris and a large, fluted dome with a tall spike.

Figure 2 : Tomb View

2.2 QUEENS TOMB

Queen Mushier Zadi's tomb is a square structure with towers bearing kiosks at the center. It is entered through the basement crypt and features a central domed hall with arcaded sides. Galleries run around the upper half of the lower dome, and above it is the crowning upper dome attended by four chhatris. The dome rises above the square base with squinches in each angle to form an octagonal base for the dome. The squinch arches are decorated with stalactite ornamentation, a hallmark of Muslim Architecture.

3.0 REASONS FOR PRESERVATION

A heritage/conservation area, with its rich cultural and historical significance, not only requires preservation but also calls for constant enhancement in order to safeguard its unique identity and maintain its allure for generations to come. One such iconic landmark in Lucknow that exemplifies this need for conservation is the Saadat Ali tomb complex. This complex holds immense emotional value for the people of Lucknow, acting as a reminder of their shared heritage and serving as a symbol of pride and identity. Moreover, the ethical dimension of preserving the Saadat Ali tomb complex lies in the responsibility of protecting and honoring the legacy and memory of the past, paying homage to the contributions and achievements of those who came before us. Additionally, the historical significance of this intricate tomb complex cannot be overstated. It stands as a testament to the rich cultural tapestry of the region, encapsulating the artistic brilliance and architectural marvels of its time. Preserving the Saadat Ali tomb complex becomes imperative not only for the present generation but also for the benefit of future generations, as it offers a unique opportunity to connect with our roots and deepen our understanding of the past. By conserving and safeguarding this historical gem, we can ensure that the essence of Lucknow's cultural and traditional identity endures, creating a vibrant and thriving heritage area that will continue to captivate and inspire visitors from all walks of life for years to come.

4.0 OBJECTIVES

1. The objective is to conserve and preserve the Saadat Ali Complex.
2. The Saadat Ali Complex is of significant importance and needs to be protected.
3. The preservation efforts aim to maintain the historical and cultural value of the complex.
4. The conservation objective involves safeguarding the complex from deterioration or damage.
5. The Saadat Ali Complex is a valuable heritage site that requires careful maintenance and protection.

5.0 METHODOLOGY

The methodology for the conservation of the Saadat Ali Complex and its preservation involves several crucial steps. Firstly, a comprehensive assessment of the complex's current state and the various factors contributing to its degradation is conducted. This includes evaluating its architectural elements, materials used, and any environmental or human-induced threats it may face.

Once the assessment is complete, a detailed preservation plan is developed. This plan outlines the specific actions required to stabilize and repair the complex, while also taking into account the historical significance and cultural value it holds. Efforts are made to strike a balance between conserving the original fabric of the complex and implementing necessary interventions to ensure its long-term sustainability.Collaboration with experts in architecture, archaeology, engineering, and conservation is a crucial aspect of the methodology. These experts contribute their knowledge and expertise to guide the conservation process, ensuring that the best practices and techniques shall be applied. Regular monitoring and assessment of the complex's condition shallalso be carried out to identify any emerging issues and make timely interventions. Additionally, community engagement and public awareness play a vital role in the methodology. Local communities shall be involved in the preservation efforts, fostering a sense of ownership and pride in their cultural heritage. Educational programs, public exhibitions, and guided tours shall be organized to raise awareness about the historical significance of the Saadat Ali Complex and the importance of its preservation.Implementing this comprehensive methodology ensures that the conservation of the Saadat Ali Complex shall becarried out effectively, preserving its historical and cultural significance for future generations to appreciate and enjoy.

6.0 ANALYSIS OF SAADAT ALI COMPLEX

6.1 Architectural Aspects

The building has stucco designs on arches with floral patterns. Above the arches is an entablature with a canopy that caps the cornice. Multifold arches supporting cupolas act as parapets to the terraces. Mughals built monuments with refined taste and technical competence. Nawabs created structures economically with brick and rubble stucco. Workmen showed their knowledge of fine finishes in lime plaster.

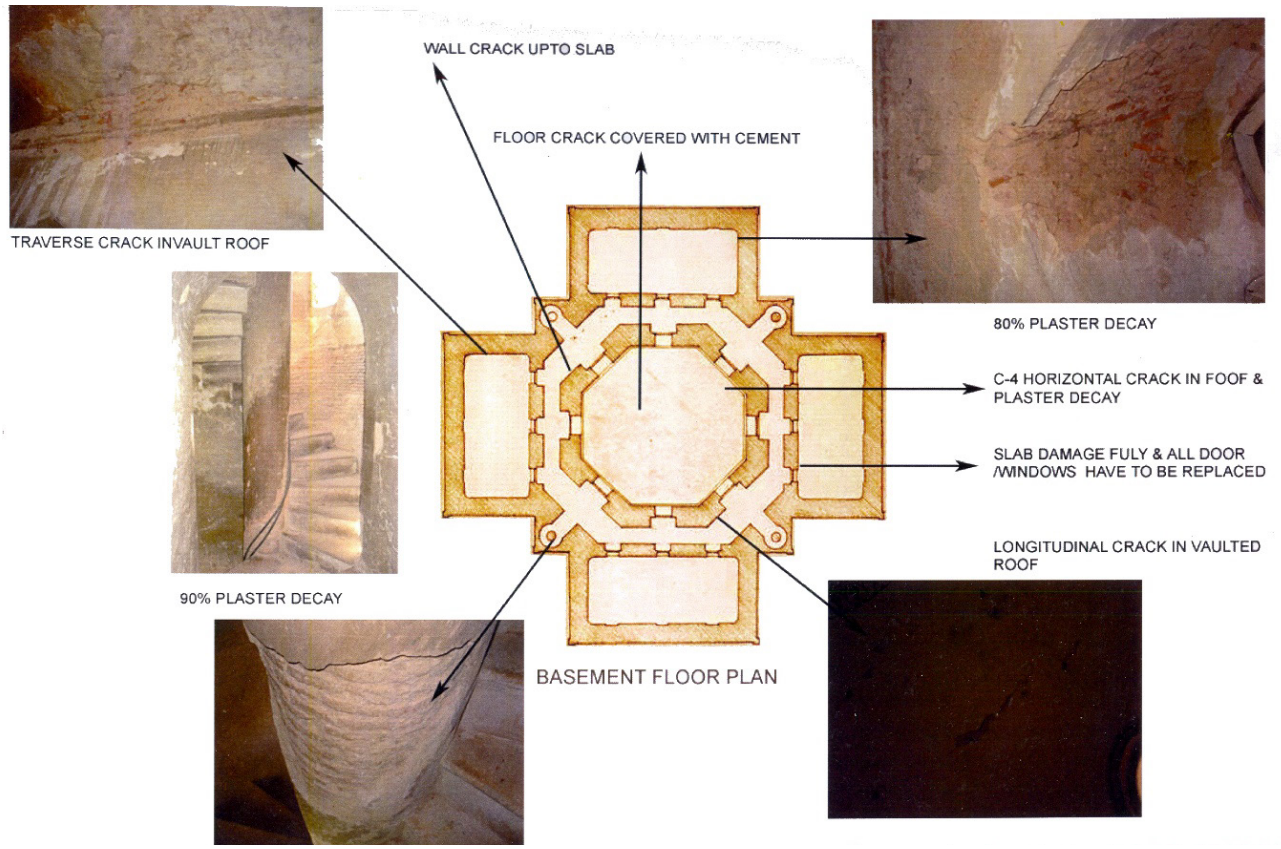
6.2 Material Used

Expensive marble has been used for flooring while sandstone has been used for the foundation, walls, and other structures. The floors and terraces are built on vaulted roofs of brick, finished with lime plaster. Domes are constructed of bricks bonded with lime mortar and topped with a brass finish held in place by steel reinforcement. Marble has been used for flooring and sandstone for construction. Mortise and tongue and groove joints hold the stone slabs together. All floors are built on vaulted roofs except for the first floor. Domes are constructed of bricks bonded with lime mortar and topped with a brass finish held in place by a steel reinforcement.

6.3 Structural Aspects and Construction Techniques

Period	1814 A.D.
Patronage	Ghazi-ud-din Haider
Typology	This is a Tomb
Transformation	No transformation of the building
Ownership	Hussainabad Trust
Usage Pattern	Mausoleum with garden around
State of Protection	Presently it is being protected by the Archeological Survey of India.
Construction Techniques	Doors and windows are made of wood and glass panels. Multi-foil Arches (Mughal Arches) have been used. Mughal parapet wall with Rajasthan influence. The double dome construction technique has been employed The external dome which is raised on a slender podium crowded by an inverted lotus finial. The inner dome is decorated with relief work inside. There are a coupleofdomes. Structural System The structure is standing on thick walls. The double dome construction, the outer one standing on a cylindrical drum. The octagonal base with squinch arches to transfer the load. The vaulted roof construction for the flat terrace.
Material	Lakhori bricks, lime mortar, finished with lime surkhi plaster. Black and white marble for flooring.
Style	Mughal style with influences of Rajasthani style.
Significance	This is the most Historical building in Lucknow.
Visible defects	Although the tomb is well maintained there are still cracks in plaster and peeling of plaster are seen in few places (figure 2)

Figure 2 : Basement Plan Sadat Ali Tomb



7.0 DEFECTS IN BUILDING

7.1 Arches

Arches need stable abutments, deep visors, and thick masonry for strength. Mortar condition must be inspected. Rebuilding should be set up dried and photographed for approval. Specific instructions are needed for ancient arches.

7.2 Bats and Birds

To keep bats away from buildings, metal screens should be fixed in windows or other openings. Doors should be left open at night while sulfur is burnt inside to drive out the bats. If openings are numerous, piano wires or babul thorn bushes can be used to keep bats and birds away. When inspecting beams, rot and termite damage must be checked, and small bore holes must be made to insert chemicals. Precautions like using a copper damp-proof course, anti-termite shields, or copper boxes to enclose beam ends may be necessary to prevent collapse.

7.3 Carvings and Images

Do not replace fallen images unless it is certain they were originally set there. Repairing divine or human figures is never to be attempted and empty niches should remain empty. Broken images should not be mended with new limbs, but old portions may be pieced together. Reproduction of geometric designs is admissible in some cases. Any carved stones or bricks found on old sites should be restored to their former positions if possible.

7.4 Cracks and Fractures

Noting and recording cracks in historic buildings is important. Tracing the extremities of cracks and recording any movement can provide valuable information for future inspections. Diagonal cracks may indicate foundation movement, vertical cracks may indicate poor material strength, and cracks widest at the middle may indicate an earthquake as shown in figure 3.

Figure 3 : Ground Floor Plan Sadat Ali Tomb

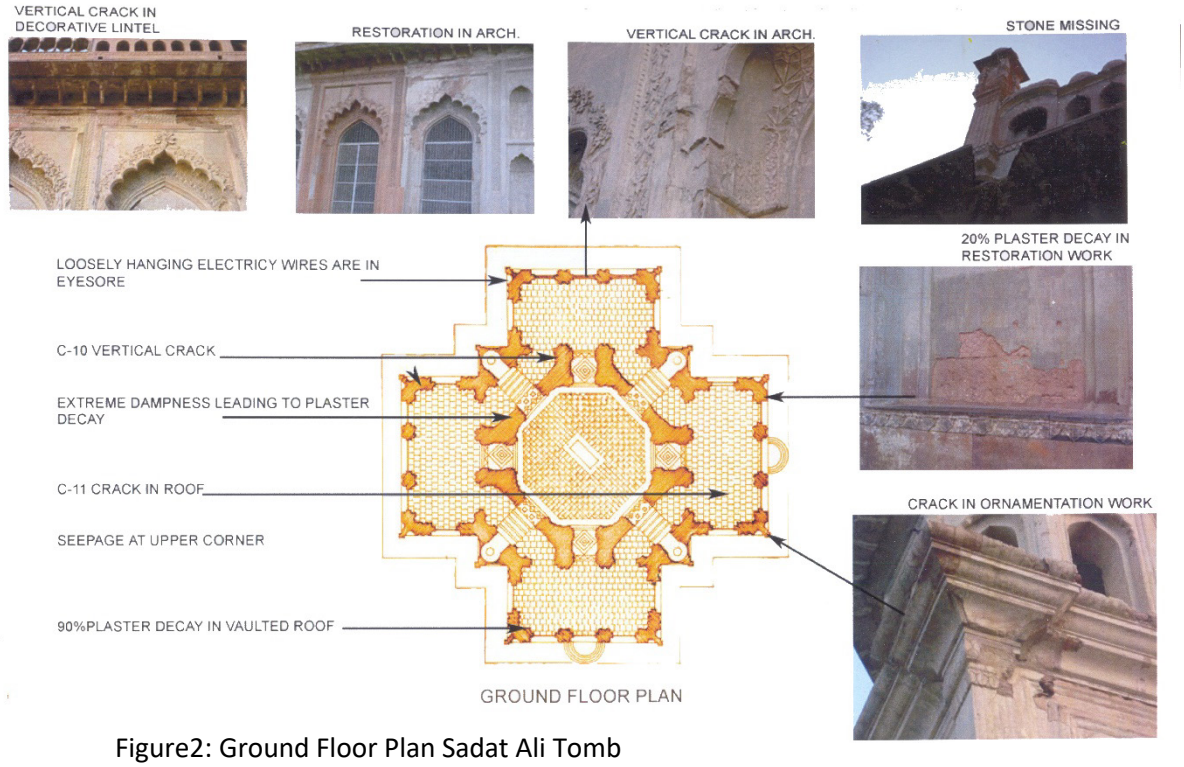


Figure2: Ground Floor Plan Sadat Ali Tomb

7.5 Cutting Out and Cleaning Masonry Joints

When removing modern lime or cement pointing from old joints and stone faces, use a small chisel to cut out the center of the joint. Then, use a steel tool to pick off the sides of the joint where the cement adheres, without using a hammer and taking care not to touch the edges and surfaces of the stones.

7.6 Doors and Windows

Doors, windows, and frames should be made of high-quality teak or shisham wood, free from knots. Frames will be securely fixed with at least two bolts on each side of the frame for every three feet of height.

7.7 Drainage

Proper drainage must be provided for ancient monuments to prevent floodwater damage. Drains should be inconspicuous, strongly built, and on concrete foundations to avoid frequent repairs.

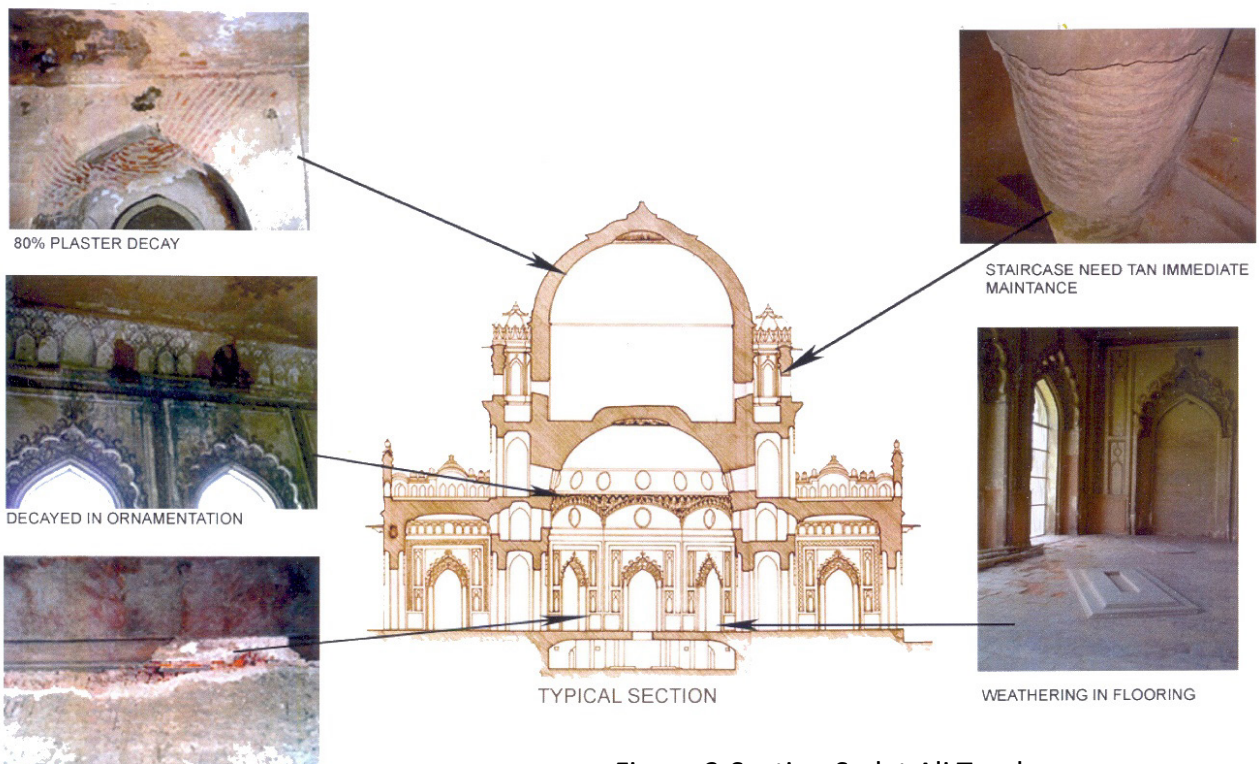
7.8 Fencing and Compound Walls

When using wire fencing, use stone standards, concrete bedded corner posts (6" x 6"), buried intermediate posts (4" x 4") at least 2'6" deep, and taut wires with securely fixed nuts and bolts. Joint cleaning, colored mortar, and no mortar smearing are important when constructing brick or stone walls around ancient monuments. For sunken walls, provide proper weep-holes, adequate draining, and ensure a thickness of not less than one-third of the ground height.

7.9 Floors and Pavements

When repairing old lime concrete flooring, ensure that only new material is used. Instead of restoring ancient stone paving, it's better to use composition blocks or stone slabs. Old broken and spelled flags can be reused by bedding them in lime concrete and grouting the intersticesas shown in figure 4.

Figure 4 : Section Sadat Ali Tomb



8.0 RE-ADAPTIVE/REHABILITATION OF SAADAT ALI COMPLEX

To preserve a building, it's best to keep it in use. Finding a new use that's similar to its historic function can save on costs and preserve its authenticity. Before starting any rehabilitation project, it's advisable to obtain survey plans and record the building's various periods and features. The Central Authority follows Standards for Rehabilitation to determine if a project qualifies as certified rehabilitation.

- Efforts should be made to use a property compatibly and as intended without significant alterations.
- The preservation of historic materials and architectural features is crucial whenever possible.
- All buildings, structures, and sites shall be recognized as products of their own time.
- Buildings, structures, or sites that have unique features should be approached with care and respect. These distinctive features should be treated with sensitivity to preserve their special characteristics.
- Repair deteriorated architectural features with new materials that match the original in composition, design, color, texture, and other visual qualities.
- Clean structures gently, and avoid damaging historic building materials. No sandblasting or harmful cleaning methods.
- Every effort will be made to protect and preserve archaeological resources affected by or adjacent to any project.

- Contemporary alterations and additions to a property are allowed as long as they don't destroy historical or cultural significance and are compatible with the property's size, color, and character.
- Additions or alterations to structures must maintain the essential form and integrity of the structure if removed in the future.

9.0 CONCLUSION

The paper truly brings to light the extraordinary architectural splendor of the Saadat Ali Complex in Lucknow. It places great emphasis on the significance of this complex in preserving the city's rich history and cultural heritage. With its breathtakingly intricate carvings, majestic domes, and splendid arches, the Saadat Ali Complex weaves together an exquisite tapestry of architectural beauty and artistic craftsmanship. It is not just a mere structure but a magnificent testament to the past, a tangible link that connects the present generation to its illustrious past. In fact, the paper goes to great lengths to underscore the complex's role in safeguarding Lucknow's remarkable architectural heritage. By serving as a bridge between the past and the present, the Saadat Ali Complex fosters a deep appreciation among visitors and locals alike for the unparalleled architectural genius that thrived during the reign of Saadat Ali Khan. Through the celebration of this extraordinary complex, Lucknow pays homage to its architectural legacy, ensuring that future generations will have the opportunity to immerse themselves in the grandeur and splendor of this truly mesmerizing landmark. The paper believes that by preserving and promoting the Saadat Ali Complex, Lucknow cherishes its architectural heritage and guarantees that the beauty and historical significance of this awe-inspiring landmark will continue to captivate and inspire generations to come.

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Reviewing Intangible Heritage of Amritsar, Punjab

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Abstract

The paper presents the intangible elements present in Amritsar city. Amritsar includes sites of tremendous cultural and historical significance. Amritsar has a rich heritage and is the best example of the complex and composite culture of India. Amritsar heritage includes both Tangible heritage and Intangible heritage (City Hriday Plan, 2016). But till now, the major focus has been kept on tangible heritage, which includes the fortification of forts and gates of walled city, assessment of the health of existing museums or providing or upgrading the facilities around historic sites etc. As a result, very few efforts were put to conserve the intangible heritage of Amritsar which includes the folk dance, folk song, folk instruments, pottery making, phulkari, paranda etc. As a result, of which artist who performs these cultural traditions are facing many problems. The intangible heritage is getting lost or disappearing with the increasing urbanization and globalization. Hence, the paper will be focusing on how the Intangible Heritage of Amritsar city can be conserved. This article briefly analyses the ways to revive the lost heritage of a city.

Keywords : *Amritsar, Culture, Dance, Folk art, Food, Heritage, Intangible, Music, Tangible*

1.0 INTRODUCTION

Culture constitutes both material and non-material values and is transferred from one generation to other and this is what is called heritage (Ozlem, 2018). Kuban (1975) expresses that in people lives the transformation of concepts and goods into symbols for various reasons constitute a phenomenon called 'culture'. Both tangible and intangible heritage are included in cultural heritage. Cultural heritage has an impact on one's identity and also helps in the development of social groups (Buckland, 2013). The specification of culture is formed from the assets. Individual as well as class needs are met by the cultural heritage. Cultural heritage is not limited to monuments; historic buildings etc. but also includes other traditions such as oral expressions, folk art, dances, music and festivals (Labrador, 2008). Cultural heritage can be considered as a broad and indistinct concept in order to express its diversity. Also, it can be considered as a concept that provides a link between the past and the future and nurture the present and benefit the future. It evolved as a result of regular historical process. Different ideas and values are being acknowledged and accepted by different classes of people. Objects that make up cultural heritage are illustrative/representative and these objects create a sense of community (Studies,n.d.). The concept of heritage can also be understood as an object which was devised from the past. Heritage assets provide the people with the feeling of continuity with previous generations. Heritage plays important role in cultural identification and conservation of cultural diversity.

Cultural heritage also increases belongingness and helps in conserving history and culture. Cultural heritage has direct link with past and individual progenitor. The idea about cultural heritage is generous and its main motive is to preserve for the future generation (California, n.d.). Due to previous generation's idea of preserving cultural heritage development can be made to benefit all sections of the society. Tweed and Sutherland (2007) states that "Heritage is an important part of societal and community well-being" (Monteiro, 2015). In order to promote inter cultural heritage. The United Nations, Educational, Scientific, and Cultural Organization i.e. UNESCO which was founded in 1954 adopted international conventions on the protection of cultural heritage. From the above explanation it can be stated that cultural heritage includes both built and natural heritage in form of buildings, historic areas and also includes folk art, dance, languages etc.

The heritage cycle states that whenever the cultural heritage will be valued enjoyed and will be understood by ethnic group than it can be transfer from one generation to other. The heritage cycle created by Simon Thurley forms fundamental section of cultural heritage. This cycle mainly states that heritage should be understood, cared, enjoyed and valued in order for transferring from one generation to other generation (California, n.d.).

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2.0 LITERATURE REVIEW

2.1 Tangible Heritage

The term tangible heritage means traces of archaeological sites, historical monuments, artifacts, objects which are important to a community or nation (Hassan, 2014). Tangible heritage may also refer to artifacts that are produced, maintained and transmitted in society (Riches Resources, 2011). Tangible heritage includes monuments, buildings, artistic creations that have significant importance. All the monuments, historic places, artifacts are considered for the prevention for the future. It is important to study these aspects as they provide basis for ideas, the stories behind them also help people in way to touch past. But the unfortunate exchanges that are taking place include the damage of the objects by tourist. So, what is needed to be preserved is now changing due to these damages caused by the people (UNESCO, 2020).

In case of Amritsar city, it can be said that it is the best example of mixed culture having developed market and manufacturing centers. The tangible heritage of Amritsar includes the famous gurudwaras, temples, traditional markets/katras, museums, forts, libraries etc. The walled city of Amritsar is the commercial hub and includes the most famous traditional markets such as paprawala bazar, bazaar misri, guru bazar, bazaar dualo, quila bhangia, bartanawala bazar, choora bazar etc... The famous twelve gates of Amritsar includes: Hall gate, Rambagh gate, Mahan Singh gate, Sherawala gate, Ahluwalia Sultanwind gate, Ramgarhia Chattiwind gate, Gilwali gate, Bhagtan gate, Hakima gate, Khazana gate, Lahori gate, Lohgarh gate, Hatti gate. Some of the famous existing museums in the city are: Central Sikh Museum, Golden Temple, Rambagh Palace, Maharaja Ranjit Singh Panorama, Gobindgarh Fort, Jalianwala Bagh Memorial, Bhai Guru Das Central Library, and Guru Nanak Dev University etc. efforts are being made in order to conserve the tangible heritage of the city (CityHriday Plan, 2016).

2.2 Intangible Heritage

UNESCO (2003) states that the cultural heritage is process wherein communities, groups and individual recognize the practices, expression, knowledge, instruments, objects which are related to them. Transferring of the intangible cultural heritage from one generation to other gives the community, groups and individuals an identity. Intangible heritage is considered as traditional heritage which reflect the identity of country or class. Traditional cultures are different and are transmitted. The arts that are considered to be preserved as various organization mainly gives the specification of country or group (Sheenagh, 2009). Intangible heritage not only includes the old traditions but also exercises urban and rural customs. It mainly includes stories, songs, dances, art etc. (Labrador, 2008). With increasing globalization intangible heritage is important element in maintaining cultural diversity. Intangible heritage is very important because it helps in transmitting the knowledge, skills of various art forms from one generation to other. With the passage of time the intangible heritage is changing and also some of the expressions of intangible heritage are under threat due to rapid globalization and lack of support (Norwegian). Improvement in the quality of life of communities, groups and individual is possible through study of oral expressions, rituals, festivals and skills to produce tradition. (Niyati, 2018).

The intangible heritage is categorized into five components:

- Oral traditions and expressions including language
- Performing arts
- Social practices, rituals and festive events
- Knowledge and practices concern signature and the universe
- Traditional Craftsmanship.

2.2.a Oral Traditions and Axpressions Including Language

In the category of oral traditions and phrases, one may find proverbs, riddles, stories, myths, songs, poetry, plays, and more. The transmission of information, cultural values, and social customs is the primary goal of oral traditions and expressions. They are essential to the survival of cultures. Certain oral expressions are specific to a group of people, whereas others are shared by members of all communities. Since oral traditions are transmitted verbally, they differ in expression (Norwegian). The environment, mass migration, industrialization, and fast urbanization all pose threats to oral traditions. By upholding oral traditions in society on a daily basis, they may be protected. A significant component of festive and cultural festivities is oral tradition, thus it may be necessary to promote these occasions and create new settings, like storytelling festivals, to allow traditional creativity to find new outlets. (ICH-Israel, 2019).

2.2.b Performing Arts

The cultural expressions that show the human creativity can be referred to as performing arts. The performing arts include music, dance and theatre, and many more. Music is the most common and important

part of performing arts that is found in every society and also found in other intangible cultural heritage such as festivals, dance, oral traditions etc. Theatre also incorporates acting, singing, dance and music, dialogue, etc. These arts (such as theatre, dance, and music) are simply performances for an audience but play important role in culture and society (Norwegian). Performing arts can also be defined as art that range from music, dance, theatre performed in front of audience which can help the present generation know about their various art performs (ICH-Thailand, 2020).

2.2.c Social Practices, Rituals and Festivals

It takes many forms, including worship, rites associated with birth, marriage, and death, swearing, customs surrounding traditional sports and games, kinship rites and ceremonies, various settlement patterns, food customs, gender-specific practices, and hunting, fishing, and gathering customs. They also have physical components like music, dancing, recitation, and unique gestures and phrases (UNESCO, 1992).

Knowledge and practice about nature and the universe: It incorporates information on abilities, practices and portrayals that are created by networks with the assistance of association with the indigenous habitat. The techniques for pondering universe incorporate language, oral customs, and sensations of connection with spot, recollections and so on... It unequivocally impacts values and convictions of social practices and social customs. The area additionally incorporates native information, information about neighborhood fauna and verdure, ceremonies, convictions, ownership customs, social associations, celebrations, dialects and visual expressions (Norwegian). Customary information and practices lie in the core of a local area's way of life yet are under serious danger from globalization (United Nations Educational, Intangible Cultural Heritage, 2017).

2.2.d Traditional Craftsmanship

It includes clothing, jewelry, costumes for festivals arts, musical instruments, household utensils, toys. Most of the objects above are used for a short period of time. Different type of skills is used in creating these craft objects (Norwegian). Just like other domains are in danger in the same way this domain is also in danger of being vanished due to globalization. The space can be defend by guaranteeing that the information and abilities related with conventional craftsmanship are given to people in the future so that artworks can keep on being created inside their networks, giving vocations to their creators (United Nations Educational, Intangible Cultural Heritage, 2017).

3.0 METHODOLOGY

Methodology of the study is divided into following parts (figure 1) :

3.1 Introduction

In introduction part meaning of cultural heritage along with brief introduction to Amritsar city is studied further the need for studying the intangible heritage, the scope of the work is discussed and the objectives are set up.

3.2 Theoretical Framework

The next step is theoretical framework which covers the definition of tangible, intangible heritage, domains of intangible heritage, characteristics of intangible heritage and case studies. After doing case studies of various places such as Tamil Nadu, Punjab, Pakistan and Nepal the parameters were selected for which the study would be conducted and those parameters are: art and craft, food, folk theatre, musical instrument, dance. In the case study each selected parameter for every above-mentioned place has been described in detail. All the famous art and craft, food, musical instruments, etc. for each mentioned places are described in detail.

3.3 Data Identification Kit

In this kit all the aspects and their sub aspects are identified which are to be collected and their relevance is written i.e. what is the need to collect the data of the given aspect and from where the data for these aspects will be collected i.e. what are their sources?

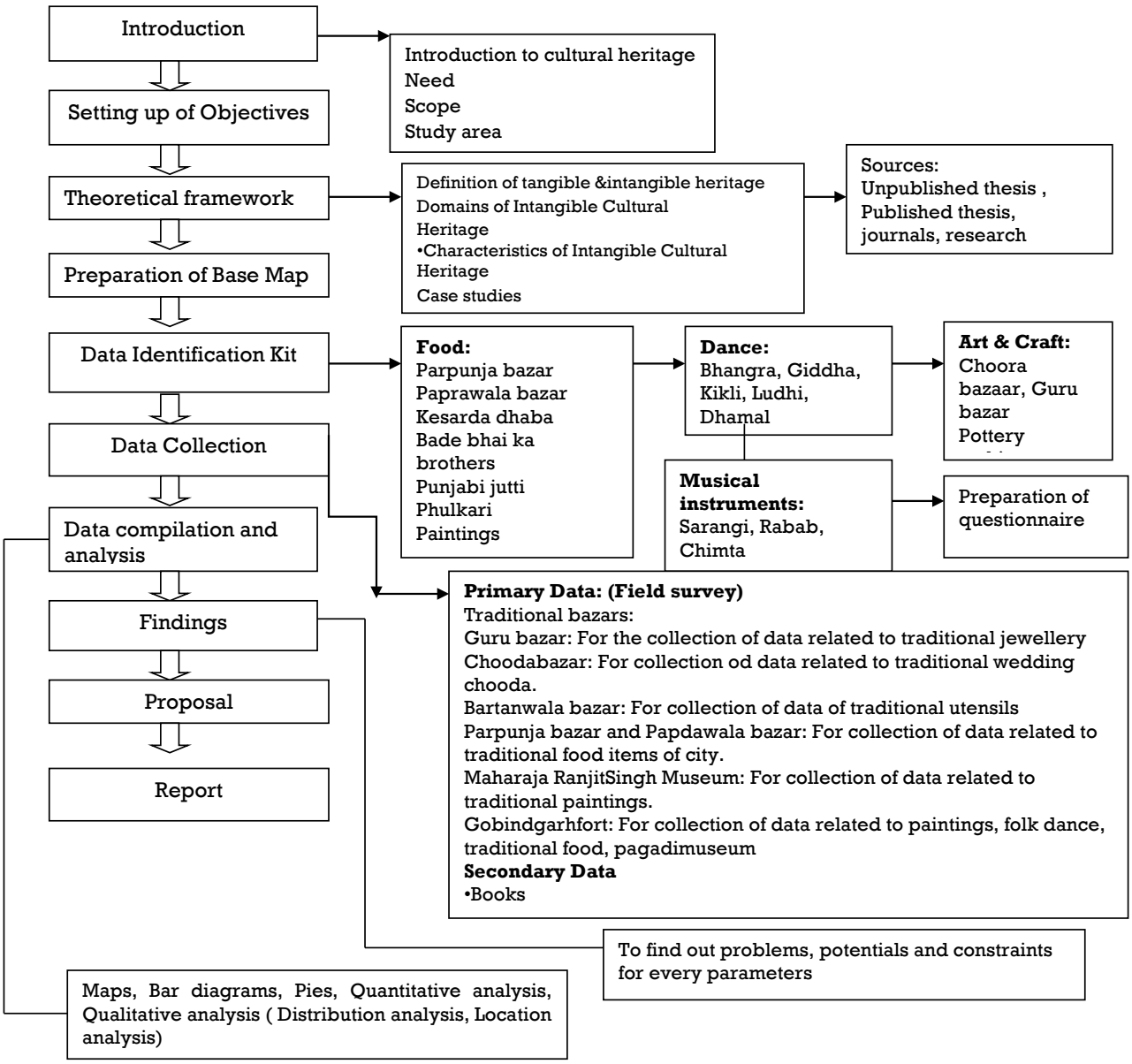
3.4 Data Collection

The data was collected through both primary and secondary survey method. The data was collected from all the tr0aditional bazaars located around Golden Temple as they represent the true intangible heritage of the city and all these bazaars were there from last 60-100 years. Other than the primary survey of these bazaars secondary sources were also referred for the data. Published thesis was referred for more details regarding intangible heritage. For collection of data interviews were taken from various stakeholders who included shopkeepers, tourists, and local residents. Other than these questionnaires from dance group of Gobindgarh Fort, Punjab and Naatshala group.

3.5 Data Compilation and Analysis

In this stage the data which was collected from different soures is compiled in excel and accordingly pie, bar diagrams, and figures are prepared.

Figure 1 : Methodology



3.6 Findings

In this section, problem, potentials and constraints will be worked out after analysis of the data.

3.7 Proposals

The next stage is the proposal. Once data analysis and problems potentials are worked out then accordingly solutions are given so that gaps which are there can be filled and in this part only projections are worked out for various aspects.

3.8 Case Study

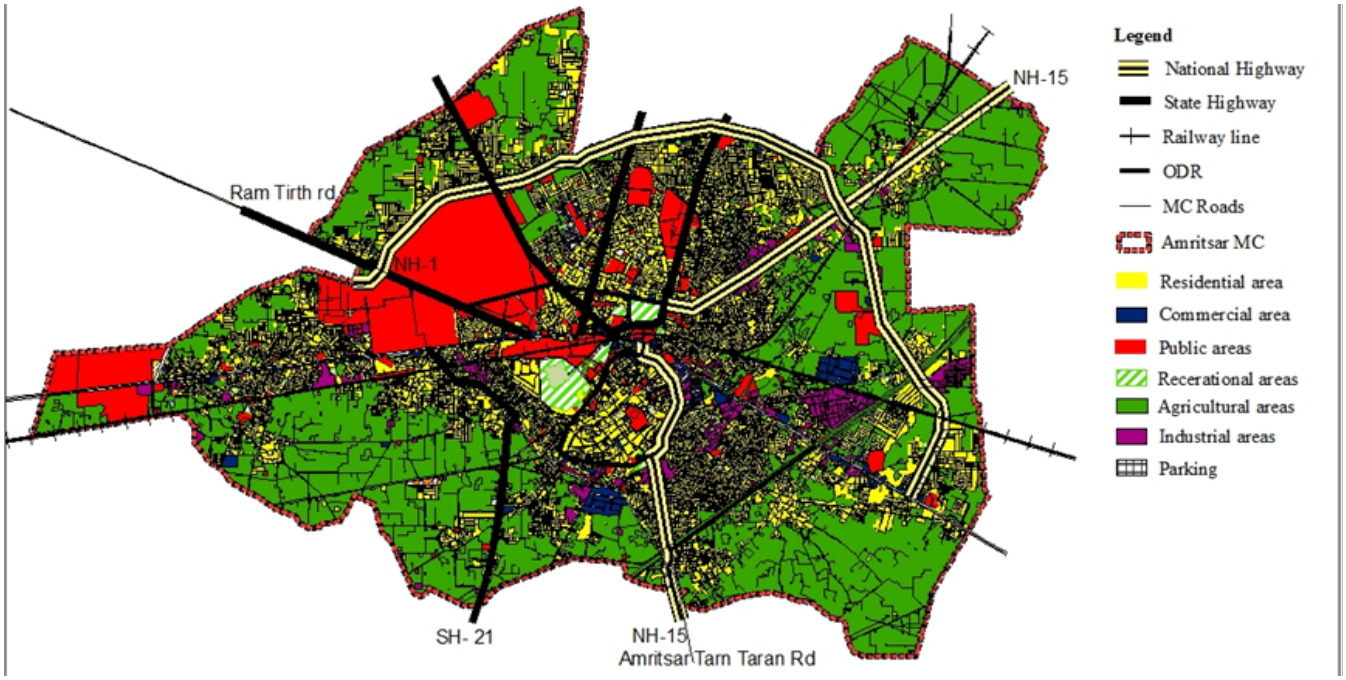
Some case studies (both national and international) were referred to decide the parameters on which further research work was conducted. The first case study that was referred was of Nepal. In this case study Nepal's famous food, dance, art and craft, musical instrument were studied. In case of dance their famous dance which are Sorathi dance, Ghantu, Mani Rimdu and Bhairav dance were studied. Nepal's famous art craft such as metal crafts, filigree products, handmade paper products, terra cotta etc. were studied. The second case study taken was of Tamil Nadu. In this case study Tamil Nadu's famous foods were studied. The different food that were studied included side dishes, second course, third course, breakfast and afternoon snacks and desserts. Other than the food Tamil Nadu's famous dance-

Chakkai Attam, Bogavathanandanam, Karagattam, Paampu Attam, Bharathanatyam, Kummi, MayilAttam, Oyil Kummi Poikkal Kudhirai Attam were studied. Art and craft was the other sub aspect that was considered. The third case study taken was of Punjab. The sub aspects for this state that were studied include food, dance, traditional sports, art and craft, fairs and festivals, folk musical instrument, folk music, and ornaments. In case of Pakistan which was also considered as one of the case study to select the parameter the sub aspects that were taken,from these case studies some common parameters were derived which were further used in the research work. The parameters that were selected were: Dance, Food, Musical instrument, Art and Craft, Folk Theatre.

4.0 AMRITSAR - A CASE STUDY

Amritsar, casually referred to as Ambarsar and generally known as Ramdaspur, is situated in the Punjab territory of India. It gets its name from Amrit Sarovar which was worked by Master Ram Das in the town of Tung. He accepted that the waters of the lake had mending abilities. Amritsar is the Amritsar is the second largest city of Punjab and is a critical business, social, and transportation centre (figure 2). The continuous assessment people of Amritsar city in 2024 is 1,607,000, while Amritsar metro people is surveyed at 1,679,000. Outright literates in Amritsar city are 855,415 of which 466,838 are folks while 388,577 are females. Ordinary capability speed of Amritsar city is 84.19 percent of which male and female schooling was 86.90 and 81.16 percent. The sex extent of Amritsar city is 884 for every 1000 male.

Figure 2 : Land Use of Amritsar City



5.0 ANALYSIS AND RESULTS

5.1 Intangible Heritage of Amritsar

Amritsar is the most important part of intangible cultural heritage of Punjab. Amritsar's intangible heritage includes songs, dances, musical instrument, theatres, paintings, crafts, games, festivals. These different heritages are developed due to location of the city. AlsoAmritsar is the place where there is exchange of languages, ideas, rituals between variouscultures. The following table 1 & 2 gives the glimpse of the oral expressions, art forms and folk cultural modes of Amritsar:

5.1.1 Traditional Food Bazars in Amritsar

Cuisine of Punjab is one of the most popular cuisines of India. It includes wide variety of delicious vegetarian and non-vegetarian dishes which are prepared through traditional styles, mainly tandoori style. In villages of Punjab the traditional style of cooking is still used by the villagers such as Punjabi Bhatti, traditional chulla. There are various bazaars in Amritsar which offer traditional foods and tastes of Amritsar.

5.1.2 Famous Food Spots

There are various trademarks of food associated with Amritsar like Amritsari Kulcha which is not only famous in India and now has registered trademark abroad. These kulchas are made using white flour (maida) and stuffing of potato, cheese, cauliflower or mixed vegetable s. There are many shops serving these but the oldest one is Pehalwan ka Kulcha at Namak Mandi. There are certain shops named as Kulchaland and serve these traditional kulchas. The walled city

Table 1 : Oralexpression, Artforms, and Folk Theatres

Category	Type	Element
Oral Expressions	Lok Geet	Suhag, Ghorhian, Bolian, Tappe, Sithnian, Chhand, Heara, Lorian, Tumbe-Algozekigayek, Bazigarsongs
	Devotional Songs	Dhadhi, Gurshabad Kirtan
	Ballads	Kavishri, Kissa
Folk Dance	Male Dance	Bhangra, Jhummar, Nachar, Luddi
	Female Dance	Sammi, Giddha
Folk Instruments	Percussion	Dhol, Dholki, Dhadd, Chimta, Sap
	Wind Instruments	Algoza, Been
	String Instruments	Tumbi,Tumba,Rabab,Sarangi,DhaddSarangi,Sarinda,Iktara
Folk Theatre	Folk Theatre	NaqalShaili, Bhand
Traditional Sports	Combat Sports	Gatka, Pahalwani Kushtee (wrestling)
Festivals	Religious	Holi, Dusshera, RamNavami, Janmashtami, Diwali, Ram Tirath, Gurupurab,Kukka
	Seasonal	Baisakhi, Lohri, Maghi, BasantPanchami
	Local	Masya, Sangranth

Source : City Hriday Plan-Amritsar

Table 2 : Traditionalart Forms in Amritsar

Craft Category	Craft Type
Needlework	Phulkari, Bagh, TillaJutti
Metalwork	Thatera, Sikligar, Judau
Woodwork	Chess, Woodand Lacturnery
Claywork	Potteryand Terracotta
Weaving	Durrie, Galeecha, Woolen Handloom
Accessories	Paranda,Nada/Nala
NaturalFibre	Straw and Bamboo

Source : City Hriday Plan-Amritsar

of Amritsar and in the vicinity of Golden Temple, one will find numerous shops making these baked Kulchas in Tandoor table 3).

Table 3 : Famous Food Spots

1.	Phelwan Kulchawala
2.	Kesar Da Dhaba
3.	Bharawan Da Dhaba
4.	Ahuja Lassi
5.	Gian Lassi
6.	Gurdasram Jalebiwala
7.	Beera Samosa
8.	Aam Papad Lubhaya Ram

Source : City Hriday Plan- Amritsar

Another famous Dhaba is Kesar da Dhaba in walled city which offers traditional food cuisine like Black Daal, Chana, LachaParantha all dipped in desi ghee and the delicacy known as phirni which is grinded rice pudding served in earthen traditional utensils. Another famous dhaba is the Bharawan da dhaba which offers traditional Punjabi cuisine and is famous among tourists being in the vicinity of Golden temple (table 3).

There are two lassi spots which are old and traditional in the walled city and are famous among the pilgrims and locals. One is Ahuja milk Bhandaar at DhabKhatikan and the other at Hall Bazar known as Giani di Lassi (table 3).

Another famous sweet shop is Gurdas Ram Jalebi wala who has famous jalebis and Gulab Jamun. Surprisingly, this shop is located near a well and the node/ chowk is known as Jalebi Chowk because of the jalebis that are sold here (table 3).

Another landmark is Beera Samosa wala located in Atta Mandi near Gurudwara Mata Kaulan which offer chana and mouth watering samosas and satpuras which are seven layered traditional patty served with chana and potato gravy (table 3).

Aam Papar Lubhaya Ram is located in Lawrence Road, Amritsar which offers various 15 varieties as well as other types of churan and peras. Although, Aam papar is available in the vicinity of Golden temple, this one is old and famous one and is also popular among tourists and locals (table 3).

There are many traditional food bazars as mentioned in table 4 located in Amritsar. These are places for shopping of tourists and also serve the traditional food items of Amritsar or Majha Region. The first in list is Paprawala Bazar which offers variety of papars, wariyan, spicy pickles and sweet murabbas. It is located in the walled city.

Table 4 : Traditional Food Bazar in Amritsar

S.No.	Food Bazars
1.	Paprawala Bazar
2.	Parpunja Bazar
3.	Mishri Bazar
4.	Majith Mandi

Source : Primary survey, 2020

Parpunja Bazar serves the traditional roasted black chana, rice flakes etc and is famous spot for both locals and tourists.

Mishri Bazar is famous for sugar toys known as khand de khilaune which are mostly sold during Diwali, rice flakes (sugar coated) etc. Majith mandi is famous for spices which are exported across the globe. There is also dry fruits that are traded with Afghanistan and sold across South East Asia.

5.1.7 Traditional Art and Craft Bazar in Amritsar

Art and Craft of Punjab are applauded all over the world. The Art and Crafts of Punjab includewide variety of handworks. Every artist of Punjab is skilled. Women in the villages are main lyinvolvedin carryingout the Punjab Arts & Crafts (table 5).

Table 5 : Traditional Art and Craft Bazar

S.No.	Art and Craft
1	Guru Bazar
2	Pandayawala/Bartanwala Bazar
3	Choora Bazar (Bangles of the Newly Wed)
4	Phulkari & Punjabi Jutti (Katra Jaimal Singh)
5	Shastri Market (wholesale Cloth Market)
6	Gobindgarh Fort
7	Pottery Making (Khazana Gate)
8	Maharaja Ranjit Singh Museum
9	Kathiawala Bazar (Horse Saddle)

Source : Primary Survey, 2020

5.1.8 Folk Theatre

The roots of the folk drama can be felt since past. This has been handed from generation togeneration. Punjab's folk drama is categorized into two types: one is religious and other is secular. The religious folk drama includes events of religious importance like the Ram Lila or the Krishna Lila. Thesecular folk drama comprises mostly Swang, Naqaland Nautanki. Its performances are meantonly for entertainment (table 6).

Table 6 : Folk Music, Art and Dance of Amritsar

S.No.	Music, Drama, Dance
1	Folk Theatre (Punjab Naatshala)
2	Folk Musical instrument
3	Folk Dance (Dance Group at Gobindgarh Fort)

Source : Primary Survey, 2020

5.1.9 Folk Musical Instrument

The folk instruments used to go along with Punjabi folk music which would reflect a culture. Research, indicates that out of 87instrumentsusedbyPunjab's folkmusiciansduringthepastcentury, 55 are stillintact, 13are on the verge of vanishing and 19 are lost long way back. Some of these instruments can be seen in thefolk orchestras, whereasothersare used at the time when needed (table 6).

5.1.10 Folk Dance

The live lines of individuals of Punjab are shown in their society moves.With the beat of drum or tune of another instrument of society music, the lively feet of individuals of Punjab consequently put into high gear to bring forth a people dance (table 6).

6.0 CHALLENGES AND DISCUSSION

Amritsar has a history dating back to about 570 years. The city has gone through various struggles like partition of India 1947 and Operation Blue star in 1984 but still it has retained its legacy and made a mark on traditional food of Majha region in Punjab. As a manifestation of Punjabi culture, it is important to retain the intangible heritage of Amritsar through traditional food and craft which is getting lost in history with the coming of new western culture influencing across India. The traditional Punjabi food is getting replaced by the Italian Pizza and junk food by the young generation thereby decline in the traditional food cuisines and handicraft. The new restaurants that are opening are on western style as it has quite a good response from the customers and tourists. People are ignorant of various handicrafts, folk dance forms, folk musical instruments, traditional bazars of Amritsar located in walled city.

The Indian markets have been captured by Chinese products which are cheap as compared to traditional

thread and needle work. Therefore, juttis and Punjabi handicrafts like phulkaris and other items have taken a backseat due to their cost involving skilled manpower doing needle work and hand work. Hence, it is important to preserve not only for livelihood of artist but also for preserving theheritageofAmritsar.

The performers who perform folk dance have pathetic life condition as they have to do odd jobs because now people are more interested in seeing the modern style dance. They sometimes have to perform in wedding functions etc. for their livelihood.

There can be a walkthrough from these bazars by various tourist guides showing and displaying the various kinds of activities being held here since decades. These bazars can be promoted by Tourism Department and upliftment can be seen in these areas as well apart from Heritage Street that is developed recently.

7.0 CONCLUSION

After analysing the collected data at last it can be concluded that there are some traditional items that are getting lost in this world whereas some still exist. Today's generation has mixed reaction for traditional items like they are fond of eating fast food instead of traditional food. Some of them even don't know about the traditional markets that are present in the walled city. For example, paprawala bazar, parpunja bazar, petha bazar, mishri bazar etc. tourist come to visit Golden Temple, Jallianwala bagh very few of them visit these bazars because of lack of knowledge. They don't know that these traditional bazars also exist in the city which are pride of Amritsar. These bazars lost their shine because government didn't take any steps to upgrade these bazars. Government only upgrade one side i.e. Golden Temple. The localsalsodo not visit these bazars frequently because the lanes of the Bazars are very narrow due to which there are traffic jams, and the area becomes very crowded. The famous Choora Bazar has lost its shine due to Gallaira Project. According to one of the shopkeepers they said they remain free almost all time as noone comes here to buy the Chooras. The people mostly buy from the shops that are located in surrounding areas. According to them the Galliara Project has finished their business. In case of Guru Bazar as the name suggests Guru means God this area is the dirtiest and foul-smelling area. Ironically it is the costliest bazar and there are heap of garbage on the road. According to one of the shopkeeper of this bazar tourist comes to this bazar more as compare to local. While visiting Golden Temple tourist do visit this bazar also and local avoid because of dirtiness and problem of parking. They said today's generation is more interested in traditional type of jewellery as compared to modern ones. The famous Gurdasram jalebi walaat jalebi chowk says whether it is tourist or local people are very fond of jalebi and no other fast food item can replace this. Many tourist not only from India but outside India when comes to Amritsar do visit this jalebiwala. One of the foreigner tourist who came to this jalebi shop said it is very important to conserve the intangible heritage of Amritsar city because people in the city started selling the fake traditional products which could harm the intangible heritage of the city. The famous Katra Jaimal Singh market famous for Punjabi phulkaris and Punjabi juttis witness large number of tourist as compared to locals. While interviewing some of tourist it was seen that they have done shopping mainly of phulakris and juttis and interviewing shopkeepers they said handmade phulkaris are more popular among the tourist while locals are more interested in buying machine made phulkaris.

The phulkaris are very much in trend and this trend cannot be decreased in any period of time. The shastri market is also the oldest market for quilts and shawls. Tourist visit this bazar more. According to the shopkeeper because of the government and their negligence they are facing many problems while doing the business. Also the shops in the shahstri markets donot have proper infrastructure. Most of them have kept the items on the roads which creates traffic congestion and jams. The famous Kesar Da Dhaba and Bade Bhai Ka Brothers dhaba serves authentic Punjabi food. They are very much famous among both tourist and locals. Whosoever comes to visit Golden Temple do visit one of these restaurants. They showcase the traditional food items of Punjab and are contributing to preserve the heritageand keep it alive both among tourist and local. Both the dhabas are not only famous among older people but very famous among younger generation also. Ahuja Lassi famous for different types of lassi is also of view that no other kind of food can replace the lassi in life of Punjabis. He said both tourist and local come to have lassi. Gobindgarh fort which has become major tourist spot also helping in keeping the intangible heritage of the city preserve. There is Pagadi Museum which shows the importance of pagadi in a Sikh's life. In this museum different types of pagadis and how to style it differently are depicted. Then there is Silkhi musueum where traditional paintings are shown. To preserve the folk dance and folk music of Punjab Gobindgarh fort also shows the performance where Bhangra, Gidha and Gatka are performed. They have also kept the performers permanently so that they don't need to perform in other places for their survival because with coming of new types of dances these folk dance and music are getting lost. The other

intangible heritage which is getting lost is the pottery making. Earlier people used items made of clay only but now its importance has decreased. Government is not taking any responsibility for the ones that are making these items. Only 1 percent tourist come because they don't have any knowledge about it even most of the locals do not have idea about. Today's generation has no knowledge about clay related items because they didn't see their use.Punjab Naatshala is also helping in preserving the folk theatre of the artist and also helping the artist so that they can get platform where they can show their talent and they don't need to do odd jobs for their survival. It is more famousamong locals. Beera samosa wala is very old and famous shop for samosas and satpuras. The shop is more famous among locals as compared to tourist as tourist don't know much about this shop as they don't come here at katra Dal Singh where this shop is located. But according to them the intangible heritage of Amritsar is not getting depleted as people still have craze about the traditional items whether it is food, art, craft etc. but the only problem regarding this old shop is that they did not have any type of infrastructure. No seating arrangement available for customers. They stand and eat the food and even they prepare their food outside the shop. No parking available for the customers. Amritsar's famous food Amritsari kulcha has very famous shop 'Phelwan kucha wala'. According to them the heritage of the city is getting depleted in this modernization world but the craze for kulchas among people has not decreased instead it is increasing. The only negative thing about this famous kucha shop is its poor infrastructure. Very less arrangements of chairs and table s for the customers and no availability of parking because of which people park the vehicles on roads which cause traffic problems as it creates traffic congestion and jams sometimes. So,at last it can be concluded that in order to safeguard the intangible heritage of Amritsar both government and people have to work together. Government can help the artisans who are in different fields and elder people should tell their children about their heritage and the importance of the traditional items in their lives. They should tell the children that they need both traditional and technological items.

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Historic Water Structure and its Relevance to the Sustainable Urban Form : Case of Badami

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Abstract

Water availability has been the prime reason for establishing human settlements since time immemorial. A perennial water source in the near vicinity provides water sustenance and improves the microclimate. However, there are several examples in India's history wherein a city rose to prominence and catered to a large population. Still, these cities were far from rivers or any such perineal source. Under these circumstances, one must understand how water was available to the general public. Whether the technological advancements of that particular period and time were utilized for providing water to the general public or water and rainwater harvesting techniques were used is a matter of detailed analysis. What is essential to understand is how these water systems interplay with the overall fabric and structure of the settlement. How does this water system as an element of sustainable urban form stand amongst other landmark and built forms in the historical landscape and are the historical water structures relevant even today and affect the sustainability of the built form? This research attempts to assess the built form of landmark heritage assets in the historical town on sustainability parameters like visual connectivity, accessibility, etc. It will further evaluate the status and relevance of the historic water structure in the overall sustainability of the built environment, understanding that if a thing is relevant and of use, it will be utilized by the users and protected for the benefit of future generations. This study has been attempted using documentary analysis and visual surveys.

***Key words** : Sustainable Urban form, Historic Water Structure, Visual Connectivity, Accessibility*

1.0 INTRODUCTION

It is a known fact that perennial water sources led to the development of the earliest urban societies. The river valley civilizations in the Indian subcontinent, Mesopotamia, Egypt and China developed on the banks of rivers in these areas thousands of years ago. Water provided the much-needed daily requirement of drinking water and sanitation, supported various activities like agriculture and other trades, and provided economic opportunity by acting as the mode of transportation. Access to water for their daily needs mirrors the wellness and financial well-being of the population living in urban settings. It is the most tangible factor in assessing the quality of life. India is a land of historicity, with several cities having their origin dating back thousands of years. Many such towns established themselves on the banks of various rivers. Still, there are many such examples wherein the cities rose to prominence far away from the natural source or rivers. The urban settlement has been an object of curiosity for a long time.

On the other hand, the city is a social, political, and economic system. Correspondingly, there have been many approaches to its planning and design. The urban form has emerged, and its impacts depend on its location, topography, transportation and regional connectivity and linkage, climatic conditions and micro-environment. Traditionally, towns were established and settled next to rivers or water sources, which further determines the overall form of the settlement. Understanding the concept of sustainability in urban settlements begins with assessing the site conditions to provide occurring natural resources, such as light, air, and water, and the extent to which the existing natural systems will be required to support the new development. This interrelationship encompasses the natural system interlinked with geological, hydrological, topographical, ecological, climatological, and cultural attributes (Darin,1998).

How was water made available for use by the general public in such cases? Were technological advancements used, or were water and rainwater harvesting techniques utilized? How did these systems play on the overall fabric and structure of the settlement? Did these structures lead to reorganizing the spatial organization of the built form? Are these historical water structures relevant even today and affecting the

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built environment? This research attempts to assess the built form of landmark heritage assets in the historical town on sustainability parameters like visual connectivity, accessibility, etc. It will further evaluate the status and relevance of the historic water structure in the overall sustainability of the built environment, understanding that if a thing is relevant and of use, it will be utilized by the users and protected for the benefit of future generations. This research attempts to answer these questions using documentary analysis and visual surveys by taking the examples of a case study of Badami town in Karnataka State.

2.0 LITERATURE REVIEW

The emerging focus on planning for sustainable cities and neighbourhoods reflects the contemporary requirements for highly connected and accessible built environments (Burton 2000). Boeing (2018) creates a typology of metrics and indicators to evaluate the built environment's physical complexity at the urban design level for understanding various sustainability parameters. This study applies quantitative methods to studying urban form and the qualitative aspects of human experience found in network science, information theory, fractal geometry, ecosystem studies, statistical physics, and city planning. Numerous bodies of literature contain metrics of various sizes, which help examine the adaptive complexity that develops and emerges from local design processes. Consequently, they provide an improved framework for urban practitioners to evaluate liveability, resilience, adaptation, and connection. It contains measurements of the urban environment's various factors like accessibility,visual connectivity, and physical conditional and temporal aspects like footfall to understand the resilience and sustainability of built form. Accessibility in urban form depends on the spatial distribution of land uses and activities and the transport systems that connect them.Accessibility is considered by several scholars who have researched the aspect of urban form as a vital variable for achieving sustainable Urban development (Jabareen 2006).

Accessibility in urban form is the degree to which a city's physical layout and design enables or hinders people's access to various destinations for functions such as jobs, services, amenities, and social interactions. It can significantly impactcities' economic, social, and environmental performance and their inhabitants' well-being and quality of life. The visibility and accessibility of people, activities, and amenities can facilitate social and cultural interactions. This type of visibility and accessibility is termed as visual connectivity. It is the degree to which different elements or spaces in a design are visually linked or related (Natapov et al., 2018).It can enhance the sense of place and identity by creating a coherent and distinctive urban image and character. Visual connectivity can affect the perception, experience, and behaviour of urban dwellers, as well as the performance and resilience of the urban system. It can be influenced by various factors, such as the layout, density, diversity, and design of the urban form, as well as the availability and quality of the transport modes. It can increase environmental and economic sustainability by reducing travel and energy consumption and supporting the vitality and diversity of urban functions (Boeing, 2018).The built environment's physical condition influences people's perception and experience in a given area. Higher design quality and physical well-being of the built form can increase accessibility by improving the safety and comfort of navigating it andenhancing the attractiveness and livability of urban spaces. However, design quality alone is not sufficient to ensure accessibility, as it also depends on the functionality and suitability of the built environment for different users and purposes and the responsiveness and adaptability of the built environment to changing needs and conditions.It is also important to understand how well the built form can attract users towards it, as footfall in a built environment is an important indicator for ensuring the relevance and continuity of the urban built environment. Thus, to understand the complex relations of various heritage structures and assets, it is important to evaluate the built space on the parameters of sustainable urban form', viz. 'accessibility', 'visual connectivity', 'physical conditions', and 'footfall'. Another aspect that will also be important to understand is if the built space is dominated by various heritage assets to understand the aspect of the legal protection provided to such built form. Hence, 'legal status' is also considereda parameter for analysis.

3.0 METHODOLOGY

The current study evaluates the literature available to assess the sustainable urban form attempted by various researchers; as an outcome of this theoretical foundation, various analysis parameters are listed. An important aspect of analyzing is that various heritage assets are documented in detail. The documentation follows the visual survey technique for assessing the condition of the heritage asset and documenting the same on a Linkert scale ranging from one to four (one being the least suitable and four being the most suitable). The outcome of this is a numeric matrix created for the various parameters of the study. These parameters are then assessed, and a multi-criteria analysis is done. After this, the total value of all the parameters is combined to arrive at the highest

score of the heritage asset to explain the importance of the heritage assets, which helps derivethe outcome of the study.

4.0 CASE STUDY-BADAMI

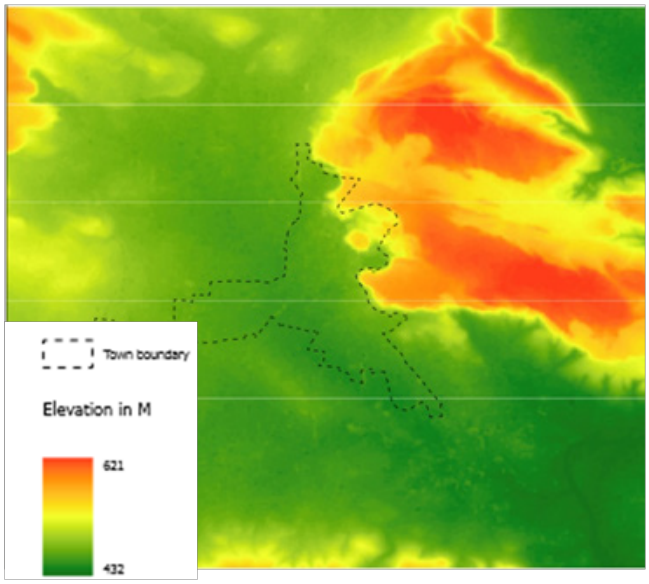
Badami is a renowned tourist destination in the Bagalkote district of Karnataka (figure 1). Town Municipal Corporation administers it, and the jurisdiction of the Town Municipal Council (TMC) covers an area of 4.23 sq. km. The population of the town is about 30943 as per the 2011 census. The topography of Badami is rugged and undulating. The Ghataprabha River flows and joins the Krishna River in Chikkasangama village in Bilgi taluk in the Bagalkot district. The Malaprabha River flows and joins the Krishna River at Kudal Sangama in Hungund Taluk. However, no river system passes through the Town of Badami (Yadav,2017). The annual average rainfall is approx. 600mm of heavy rain is experienced between August and September.

Figure 1 : Satellite Image of Badami

The city slopes gently towards the southern and eastern sides, converting into a valley running along a natural landscape with rocky terrain. Intricate carvings in cave temples and vibrant. The older part of the settlement's historic core lends the place a unique character. It was the capital city of thefamous Chalukyas (Kamath,1983).

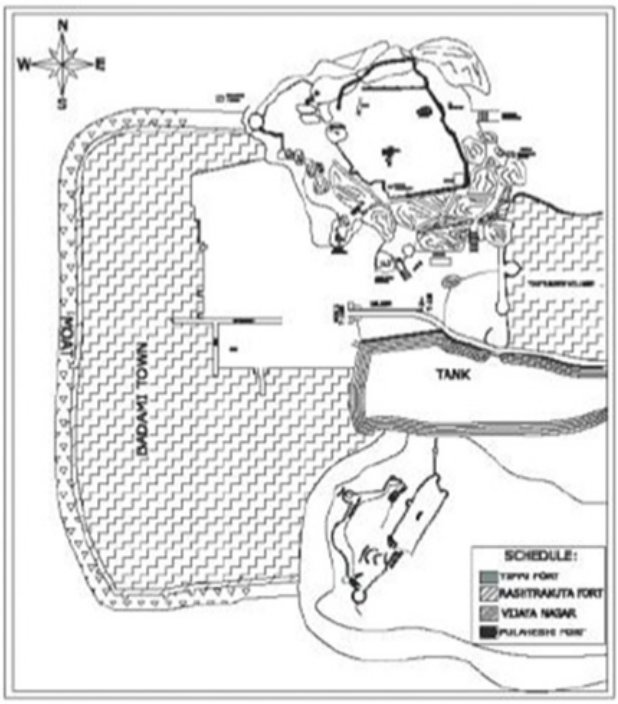
Based on the elevation model developed for Badami (figure 2), it is clear that the city lies within the elevation of 432m to 621m. The town isencompassed within a high-elevation landform and gradually slopes down to a reasonably flat elevation.The historic town of Badami's overall urban form is divided into three distinct districts.First is the fortification atop the hills, which housed the citadel. The second district is the historic temples and cave shrines around the Agasthya teerath tank; inside the lower fortification is the current historic core (figure 3). Thirdly, there

Figure 2 : Digital Elevation Model of Badam



Source : Current Study

Figure 3 : Historic Badami Town



Source : Unpublished Thesis, Pattar, 2014

are extension areas beyond the historicalcentre. The citadel area still sees some areas of depressions created on its ravine surface to store rainwater. But the best and the earliest examples of how rainwater can be harvested to a scale that can feed an entire town can be seen in the Agasthya Teerath tank (Pattar, 2014).

Two distinct built formsare observed in the Badami: (i) Compact traditional housing to the east of the highway, using traditional building material and having

traditional vernacular features, and (ii) Modern RCC structures in the newer layouts/extensions growing westwards. The shape of the town lookshalf radial, where paths radiate out from the heritage core.The heritage core of Badami presents a distinct identity, with Agastaya Teerath at its core (figure 4).

Figure 4 : Aerial View of Agasthya Teerath

Source : Tourism Dept. GoK

The Agasthya Teerath tank is a man-madestructure constructed in the 7th century by the Chalukyas to provide water for their capital. It is about 12 acres in area. During monsoon, rain falling over this area flows down to the tank from the surrounding hillocks (SUI, 2013). Inplaces where the water would flow off to another valley, barriers have been created to redirect the flow into the tank. The system's efficien cyis evident when yousee the water levelin this large tank going up nearly by a foot in just an hour's good rain. The tank holds sufficient water and usually doesn't run dry, even in summer. Perhaps the creation of Agasthya Teerath enabled past dynasties to survive even in this arid landscape. Agasthya Lake overflows in heavy and prolonged rains, flooding some parts of the historic precinct (SUI, 2013). There are no proper outlets from the lake, and floodwater flows through one of the streets, running into the Adda Nala, the historic moat.Over the years, the town's population has steadily increased; from a population of 9168 in 1961, the population rose to 30943 in 2011, as per the Census of India. With thisrise in population, the requirement for water also increases.

Traditionally, the Agasthya tank was the primarywater source, provided a public access space, and facilitated several living traditions around it. It is said that each bank of the tank is for the use of a specific community residing in the town. But now, the tank has become unhygienic and cannot cater to the town's drinking water standards and requirements. But, still, about 3 percent of the water supply is from this tank. The current primary water supply system within the TMC area is by borewells. Thirty-eight such points cover the town's water supply system. An extensive network of 4.23 km water supply lines provides drinking water (IHCN-F,2015). These lines supply water collection points on streets and household connections. Under the sector-specific programof the Government of India called Heritage City Development and Augmentation Yojana (HRIDAY) scheme, a treatment plant is proposed to clean the water available in the tank to ensure the sustenance of the Agasthya Teerath tank continues (IHCN-F,2015).

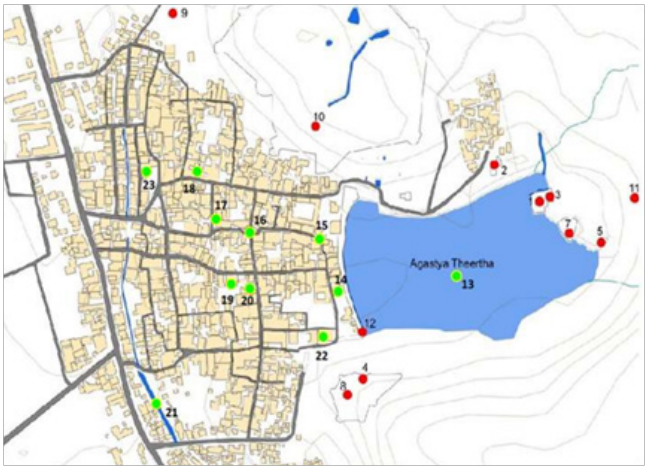
5.0 SITE SURVEY AND ASSESSMENT

As mentioned earlier, the overall urban form of Badami can be divided into three distinct districts. To understand the general built form of the town, a developed area analysis is done to understand the overall built fabric of the historic town.The details are in table 1. This analysis helped further assess the town's overall fabric, spatial structure, and quality of various heritage assets.

The table provides the visual segregation evident in the three distinct built fabrics of the town. Predominantly, the heritage assets in the form of monuments, vernacular houses and other structures and areas culturally and historically significant are in the old town area, which is flanked by hills on three sides and the expansion of the new town on the fourth side.

During the site survey, it was observed that there are about 23 heritage monuments in the town, out of which only 12 are under Archeological Survey of India (ASI) protection; see table 2 and figure 5. All these monuments are the elements of the built form that provide a point reference to the inhabitants and help deliver legibility to the overall urban form. The continuous survival of these elements, called landmarks as per the definition propagated by Lynch

Figure 5 : Location of Heritage Assets in Badami



Source : CHP, Badami

Table 1 : Developed Area Analysis

Zone	Height	Form	Material Used	Covered Area	Wall Window Ratio	Facade Treatment
North hill South hill	Around 2.5m (The fort rises about 90 m above the town)	Irregularly polygonal	Locally available red sandstone for North Hill mud fort for South Hill	The fortification length is nearly 1 km (937 meters), and the wall thickness is 1.20 meters.	Very few openings	Different types of stone masonry used during various phases of development
Fort Gates (5 different types)	Varying-10 feet (gate no.1) to 4 feet (gate no. 5)	Different types of uses for different gateways reflect the various phases of development	Locally available red sandstone	Varying	—	Different types of stone masonry used during various phases of development
Caves	varying	Different styles	Rock cut	Pillared	Very less	Locally available sandstone masonry represents the phase of development
Monuments	Varying	Different style-	Red sandstone	Structural temples having pillars	Very less	Locally available sandstone masonry represents the phase of development

Source : Current Study

Table 2 : List of Heritage Assets in Badami

S.No.	Name of Heritage Assets in Badami	S.No.	Name of Heritage Assets in Badami
1	Bhuthanatha group of temples on the east of the tank	12	Hermitage in the natural cavern to the east of the tank
2	Group of temples -north side of the tank	`13	Agasthya Teerath
3	LakulishaTemple behind Bhutanatha group	14	Yellamma Temple
4	Jaina & Vaishnava caves	15	Remains of Fort Wall
5	Large seated remains in a natural cavern to the south-east of the Bhutanatha Temples (Kostharaya cave)	16	Fort Gateway
6	Rock shelter (Shidlapadi cave)	17	Remains of unknown temple
7	Relief sculptures behind Bhutanatha group of temples	18	Remains of Fort Wall
8	Southern fort & the old gun	19	Jambulinga Temple
9	Temple on the knoll under the northern fort	20	VeerupakshaTemple
10	Northern fort and Temple	21	Moat remains
11	Remains of the ancient Chalukyan fortification walls, including moat walls, gates and dam forming the western boundary of Bhutanatha tank	22	Shahana Bibi's Tomb
		23	Local Temple

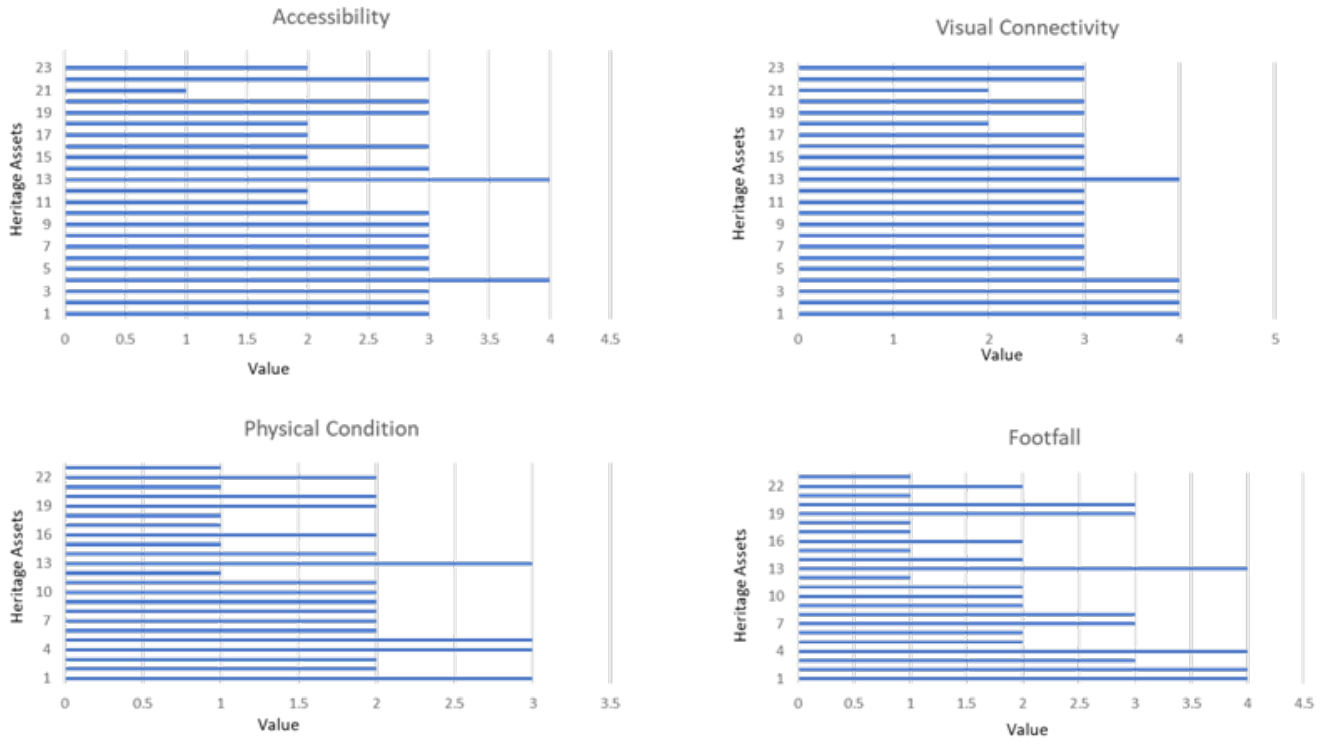
Source: Current Study

in 1961, through various town development phases is related to the sustainability and resilience of these elements. Almost all of the landmarks, whether protected or not, are around the Agasthya Teerath tank, as this historic water structure is the fulcrum of the town. Even though the AgasthyaTeerath tank is an unprotected site, its relevance has not decreased, and it still binds to the historic core of Badami.

To understand the overall urban form of this historic settlement in terms of sustainability parameters, the heritage assets in the town, including the water structure, were evaluated on the parameters of sustainable urban form, viz accessibility, visual connectivity, physical conditions, footfall, and legal status. A numeric matrix was created, ranging from 0 to 4 across all the parameters. Accordingly, all the heritage assets were ranked, and the following results were drawn, as shown in figure 6. On the parameters of accessibility, only four assets were able to garner maximum values. Similarly, only five assets were visually connected, four had good physical conditions, and 4 had high footfall. When the value of all parameters was taken up, only two heritage assets could get maximum marks, one of which was the Agasthya Teerath tank.

Agasthya teerath, the historic water tank, has not been provided legal protection under the Archeological Survey of India (ASI). However, it still had the highest overall value due to its intrinsicheritage and cultural and social value. This outcome further collaborated with a perception survey among the respondents, both residents and tourists. When the survey was undertaken, only about 35 samples were collected; 12 were from residents only. The small sample size was due to covid restrictions and lockdown. However, this being qualitative research, the absolute numbers matter little as the additional data may not yield new insights. Further, the respondents who were residents were primarily staying in the old core area, and a significantnumber very rarely visitedAgasthya Teerath. Most respondents (tourists and residents) showed a clear likeliness of cave shrines, followed by Agasthya Teerath. In determining Badami's Unique Selling Point (USP), apart from the cave shrines, theAgasthyaTeerath and its surrounding topography were chosen. On specific questions on Agasthya Teerath, like whether they knew it was an artificial tank where rainwater was being stored, 68.6 percent of the respondents replied in affirmation. About 65.7 percent of the respondents believed that the Chalukyas utilized the natural setting to the fullest while constructing the tank. Further, about the use of Agasthya Teerath, 57.1 percent of the respondents correctly pointed out that it is essential for its religious significance due to its temples; along with this, it provides water for drinking and other daily requirements and also helps cool the town.

Figure 6 : Result of Evaluation of Sustainability Parameters



Source : Current Study

6.0 CONCLUSIONS

In the historic town of Badami, the water was made available for use by the general public by way of constructing a man-made tank way back in the 7th century. The tank was built taking into account, as well as utilizing, the topography of the area. Efforts were made to harvest the rainwater by ensuring that rainwater falling on the hills was diverted and channelled into the lakes. From the study of this historic town, the following could safely be concluded:water harvesting techniques were used to fill the capacity of the tank. Continuous habitation of this town, as evident from different historical layers present, leads to the presumption that the water from the AgaystaTeereth was sufficient for the supporting population. The relevance of this tank was also captured during the perception survey when the tank was found to be significant for drinking water and other daily needs and for religious and micro-environments. By sheer location and interplay of topography, the tank became a visual treat, and it is because of its visual continuity and context that it provides a definite structure and form to the settlement. The presence of living quarters still in the vicinity and the interdependence for daily chores ensures that the Agasthya Teerath is still relevant to the town as was bought out during site surveys. However, residents are slowly losing relevance to the historic core and Agasthya Teerath from a utility point of view.

Urbanization has taken its toll; various tank outlets are infringed on, and water quality has deteriorated. However, the design of Agasthya Teerth is such that it efficiently captures and collects rainfall. The efficiency of the proposed treatment mechanism undertaken under the HRIDAY scheme may improve the quality of water in the Agastya Teerath. It may lead to increased utilization of the water for potable uses. Further, the tank continues to bring the spatial organization of the built form, at least in the historic core.

Under these circumstances, it can be safely concluded that the historic water structure in Badami is relevant to its sustainable urban form. The understanding from this body of research would further be tested on other historical towns to relate this interrelationship further.

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Unveiling the Architectural Marvels of the Vijayanagar Empire: A Comprehensive Study of Vijayanagar Architecture

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Abstract

One of the peculiarities of modern Indian historiography is that the Deccan remains relatively unstudied: little significant work has been done on any of the Dravidian art and architecture, particularly that of the Vijayanagar Empire. This large gap is all the more astounding at an age when every minute shape of history looked to be meticulously plotted out. Few historians, Indian or foreign, have written substantially on the Deccan, which remains infrequently visited and unexpectedly unexplored. The Vijayanagar Empire, which flourished in South India from the 14th to the 17th century, left a lasting impression on the area's architectural landscape. The empire's architectural wonders, especially in its capital city of Hampi, demonstrate an amazing fusion of creative genius and cutting-edge technological prowess. The highly advanced and inventive architectural technology used during the Vijayanagar era allowed for the construction of numerous temples and secular buildings that still stand as reminders of the majesty of the empire. The Vijayanagar Empire may not have used the word "sustainability" explicitly, but many of their architectural practises are in line with current sustainability ideals. The architects and builders of the empire exhibited a profound understanding of local resources, climate, and community needs, which unintentionally resulted in the construction of buildings that were well-suited to their surroundings and that have withstood the test of time. Some features like Passive cooling and ventilation, water management, durable constructions are evidently seen in the architecture of this period.

Keywords : Dravindian Art and Architecture, Medieval Architecture, Vijayanagar Architecture, Vijayanagar Architectural Innovations

1.0 INTRODUCTION

The art and architecture of the kingdom were a dynamic mix of the Chalukya, Chola, Pandya, and Hoysala traditions that later developed into the renowned Vijayanagar architectural style. Percy Brown has called "Vijayanagar art as the supremely passionate flowering of the Dravidian style". The SpiritualInstitution of Vijayanagar comprised of four major temple complexes set in the steep canyon of the Tungabhadra. Each served as the core of a separate urban area, complete with priests' dwellings and feeding-houses, colonnaded market lanes, wells, and tanks. As in the past, businesses and visitors are jammed along the colonnaded bazar street that leads up to the entrance gopuram of the Shiva-dedicated VirupakshaTemple in Hampi Village. According to George Michell, the Royal Centre was of the utmost importance since it housed the Vijayanagar monarchs, their families, military commanders, ministers, and other close supporters. There is no other area of the site with these many meeting halls, lookout tower, stables, and pavilions. These rather robust courtly constructions are all designed in a distinct elegance that combines holders, canopy or ceilings and other structures including watch towers which is a common characteristic of temple architecture with arches, domes, and foundation inherited from Deccan sultanate court architecture. The outcome is an inventive idiom that combines Hindu and Muslim cultures - a characteristic reflection of the Vijayanagar court's cosmopolitan ethos.

Hampi, the major city of the empire was strategically positioned amid a chain of enormous granite hills that served as natural fortifications, on the banks of the river Tungabhadra. The empire built magnificent structures by making use of the plentiful local resources, particularly the hard stones quarried from the nearby hills. During the Vijayanagar period, local tough granite was selected over schist, which was previously used by Hoysalas; however, soapstone was utilised for a few relief carvings and sculptures. While using granite reduced the density of sculptured works, it was also a more durable material for the temple structure. These stones, prized for their resilience and aesthetic appeal, were crucial in determining the Vijayanagar Empire's architectural style. The architects and engineers of the Vijayanagar dynasty were experts at carving intricate details into the

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stone surfaces to produce beautiful sculptures and adornments. The temples in particular, with their elaborate facades, ornate pillars, and majestic gopurams (gateway towers), represent the pinnacle of architectural excellence. The technology used to carve these structures demonstrated an in-depth knowledge of stone-cutting methods and the deft application of chisels, hammers, and other tools. The meticulous planning and construction of the structures to withstand the test of time was one notable feature of Vijayanagar architecture. Large-scale structures that have survived centuries of weathering and natural disasters were made possible by the advanced construction methods. Modern architects and engineers are still in awe of how the empire's architects cleverly used interlocking stone blocks and gravity to provide structural stability to their creations.

The architectural expertise of the Vijayanagar Empire also included a wide variety of non-religious buildings in addition to temples. With meticulous precision, palaces, markets, pavilions, irrigation tanks, and defensive fortifications were all built, displaying the empire's all-encompassing approach to urban planning and infrastructure development. The temples and secular buildings in Hampi are the main focus of this research article on the architectural technology of the Vijayanagar Empire. The study seeks to reveal the mechanisms underlying the enduring legacy of Vijayanagar architecture by investigating the engineering principles employed, the materials employed, and the construction techniques. It is expected to learn more about the empire's technological achievements and the cultural significance of their architectural accomplishments through this investigation.

2.0 OBJECTIVE

The purpose of this study is to visually inspect the architectural developments that occurred during the Vijayanagar Empire in order to clarify the design concepts, structural inventions, and aesthetic qualities that were common in the empire's constructed surroundings.

3.0 METHODOLOGY

In addition to reading through literary sources, on-site observation, materials, and layouts have all been studied in order to explore the architectural aspects of the Vijayanagar Empire and the impact it makes to the architectural technological advancement of South India. Sources for the information have been gathered from both primary and secondary sources. The approach used is the visual inspection and analysis of architectural shapes, ornamentation, and design principles.For this research paper, important Vijayanagar Empire architectural examples are chosen according to their historical importance and architectural diversity. The study intends to analyse the structural components, decorative motifs, and substance compositions of these structures through in-depth visual inspection and records using excellent quality photos and videos. We will acknowledge the limitations of visual inspection, including subjective assessment and accessibility issues, and carefully observe ethical considerations surrounding recording and maintenance of cultural heritage.

4.0 SOME INNOVATIONS ACHIEVED IN ARCHITECTURE BY VIJAYANAGAR EMPIRE

Following are the key observations.

(i) The Dravidian architectural practices have a strong influence on Vijayanagar architecture, which is distinguished by its pyramid-shaped vimanas (soaring frameworks over the sanctum), carved monolithic pillars, and ornate decoration. To further add to the empire's unique style, Vijayanagar architects also blended Islamic architectural elements with regional variations.

(ii) The utilisation of tough granite rock for the construction of massive architectural structures.

(iii) The distinctive features of Vijayanagar architecture are carved stone reliefs and sculptures, which display superb artistry and craftsmanship. A vast variety of subjects are shown in the carvings, such as gods and goddesses, scenes from Ramayana and Mahabharata, celestial beings, mythical animals, courtly scenes, processions and ordinary life.

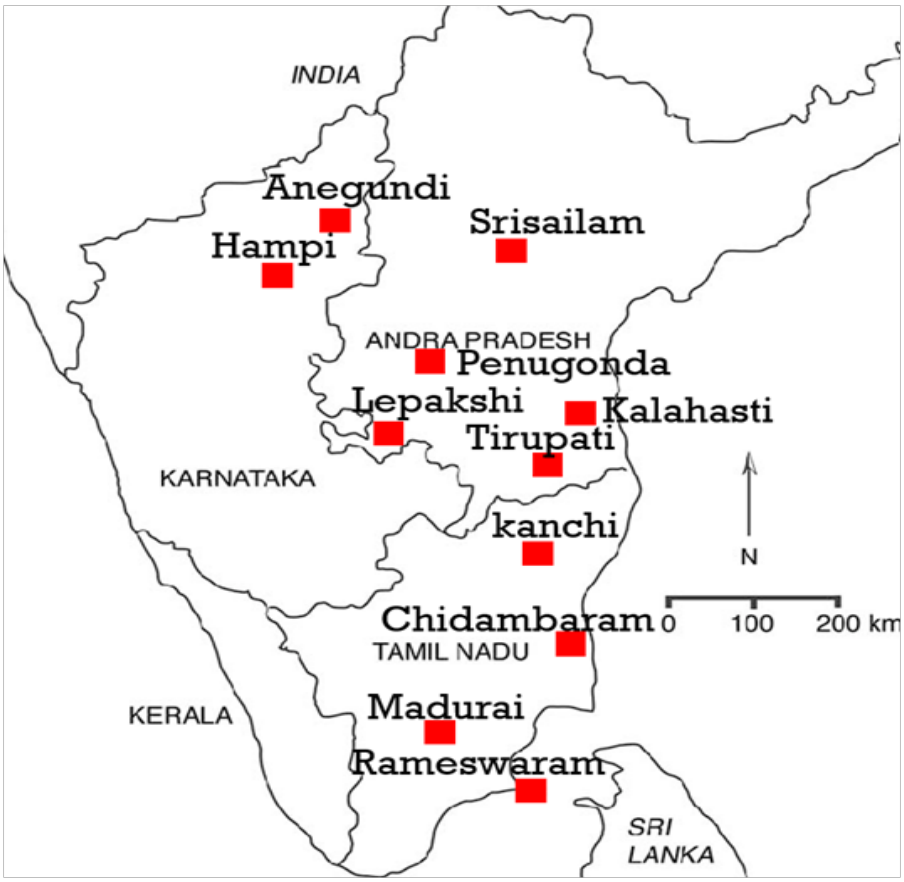
(iv) One distinctive aspect of Vijayanagar architecture is the introduction of Kalyana Mandapa to the temple complexes. The Kalyana Mandapa is a large hall that has a flat roof and is supported by several pillars. It is used for the yearly celebrations of the god's marriage to his consort, who is usually Pampa or Virupaksha.

(v) Cities such as Hampi, Penukonda, Vellore, Chandragiri, and Gingee were also fortified during this time, serving as the foundation for subsequent Maratha and Mysore kingdoms.

5.0 TEMPLE ARCHITECTURE

The Kings of Vijayanagar built many magnificent temples throughout Andhra Pradesh, Karnataka, and Tamil Nadu. Anegundi, Hampi, Lepakshi, Srirangam, Srisailam, Tirumala, Tirupati, Penugonda, Tadapatri, Chidambaram, Chandragiri, Kalahasti, Kanchi, Ramesvaram, Madurai, (figure 1) and other places were famous for their architecture techniques during Vijayanagar rule. The typical Vijayanagar temples are

Figure 1 : Architectural Sites in Andhra Pradesh, Karnataka, and Tamil Nadu.



surrounded by tall stone enclosures with tall gopuras at the entrance. It was made of granite, and the Gopura's construction included stucco, wood, and bricks. Most of the temples during this period were made in Dravid style of temple architecture.

5.1 Vidyashankara Temple, Sringeri, Karnataka

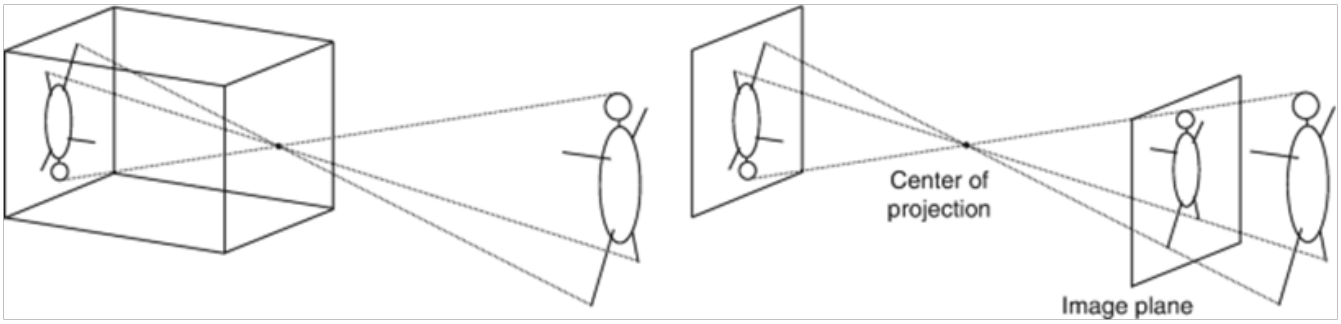
Sringeri is situated in northwest region of modern-day Karnataka. The Vidyasankara Temple was constructed on the other side of the TungabhadraRiver by Sri Bharati Tirtha and Sri Vidyaranya, pontiffs of the Matha, between 1338 A.D. and 1350 A.D. as a tribute to their forerunner, Sri Vidyasankara Tirtha (A.D. 1228-1333). The temple's design serves as an illustration of the South Indian temple builders' proficiency with astronomy. The navaranga is of particular interest from an astronomical perspective. Navaranga, a building made up of twelve Dravidian-style, highly ornate pillars. This building has 12 pillars specified for the 12 signs of the zodiac, with the sun's rays falling on each of them in the order of the twelve solar months. A sizable circle has been drawn on the ground, with convergent lines indicating the path of the shadows. The Ram pillar is said to receive sunlight in the month of Aries, and the Bull pillar receives it during the month of Taurus. All the 12 months of the solar year are said to have their own Rashi (zodiac) pillar that receives morning sunlight. Although it is clear that the arrangement of the celestial pillars in the Vidyasankara Temple was purposefully planned, some archaeologists claim that the early-morning sunrays hitting an exactastrological post does not designate the constellation in which the Sun is sited, neither today nor at the time the temple was built. The physical attributes of the column setup in the Vidyasankara Temple as well as the amount of time it took for a ray of morning light to pass from one pillar to another (almost a month) closely aligned with the positions of the zodiacal star formations in 2000 BCE. They correspond to the zodiacal sky between 1700 and 2300 B.C., not the Sun's location in the celestial bodies of today. Despite the temple's purported construction date of around A.D. 1350, some speculate that the zodiacpillar layout originated from a Vedic altar or an earlier holy calendrical device from 2000 B.C.

Nevertheless, constructed in the fourteenth century, it demonstrates the technological achievement in which the light of the sun strikes twelve zodiac pillars, each designating a month of the year. This design, which reflects sophisticated astronomical knowledge of the time, enables accurate clockwork and calendar estimatesincorporating solar movements in a templearchitecture.

5.2 Virupaksha Temple, Hampi

ThetempleisdevotedtoLordVirupaksha,amanifestation of Lord Shiva and located between Tungabhadra River and Hemkut hill at Hampi in Karnataka. The Hampi village is centred on a wide street and market district, which is dominated at its western end by the gigantic tower of the gopuram temple entrance. Although the majority of the temple structures can be ascribed to the Vijayanagar era, evidence suggests that some of the temple structures underwent additions in the late Chalukyan and Hoysala era. Lakkana Dandesha, an officer serving in Vijayanagar Empire during the time period of Deva Raya II, constructed enormous temple structure.A phenomenon observed in the temple structure which serves as an illustration of a modern-day camera. The small, inverted image of the tall gopuram is one feature of this temple that attracts visitors. There is a tiny pinhole in the wall somewhere at the back of the temple that reflects an upside-down version of the gopuram on the interior wall. The only bright light coming in from that tiny hole is the only source of illumination in this tiny room-like space, making it quite obvious. The large gopuram is projected onto the wall across from it. The architecture of the temple is such that the Raja Gopuram's inverted shadow can be seen falling more than 300 feet away on the Saalu Mandapa wall at the opposite end of the Virupaksha temple. This occurs through a tiny aperture that serves as the passageway. This effect in physics is call a "Camera Obscura Effect using a Pinhole". As the name suggests, a pinhole camera is a basic device which is lens-less with a miniature; it is essentially a box that is light-proof with a hole cut out of one side. The camera obscura result takes place when light from an object passes through the aperture and shows an inverted image on the opposite side of the box (figure 2).The size of the aperture should be 1/100th of the distance between the aperture and image. The distance between the object and the pinhole determines the size of the pictures whereas the distance between the pinhole and the opposite wall which acts as a sensor determines the quality and sharpness of the image. A pinhole camera produces an image that is reversed because light moves in a straight line. We can take images with the same quality as a digital SLR camera by using the proper pinhole camera proportions and the size of the tiny hole through which light enters. The absence of a lens sets pinhole cameras apart from other kinds of cameras. All these concepts of physics can be seen practically on the wall of Saalu Mandapa inside Virupaksha Temple (figure 3). Was it created intentionally to achieve the inverted image or has happened accidently is still a matter of debate because same phenomenon is not seen in any other contemporary temples. Nevertheless, the temple attracts the tourist to this spot and is a matter of more research.

Figure 2 : Camera Obscura Effect using a Pinhole



Source : Sturm, P. (2021). Pinhole Camera Model. In: Ikeuchi, K. (eds) Computer Vision. Springer, Cham. https://doi.org/10.1007/978-3-030-63416-2_472

The temple's imposing gopuram (gateway) and elaborate carvings precisely narrate storiesfrom Hindu mythology. Its design, which makes use of intricately carved pillars and connected areas, demonstrates the engineering expertise in seismic stability and long-lasting structural integrity. The Manmatha tank, a sacred tank in the temple, was designed with advanced water management systems integrated into the architecture to support communal life within the complex and facilitate ritualistic practices.

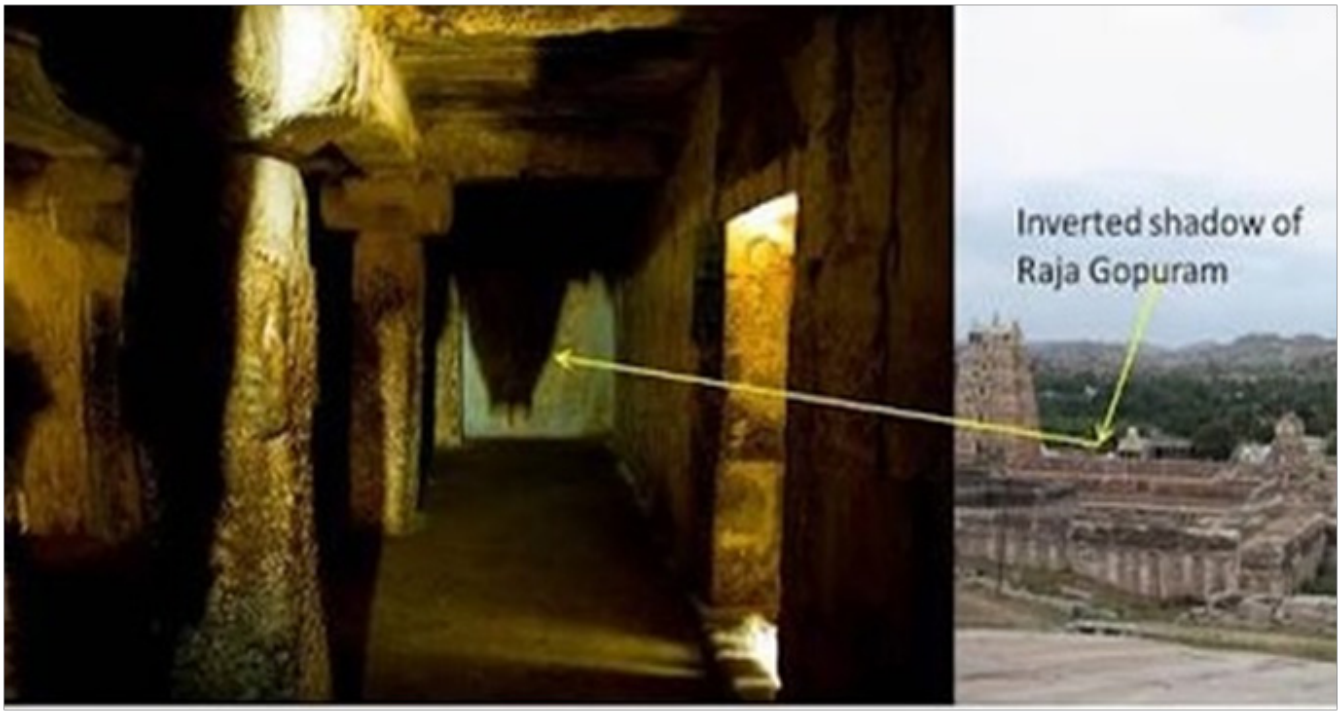
5.3 VITTHAL SWAMI TEMPLE, HAMPI

The Vitthala Temple in Hampi, is a magnificent illustration of the Vijayanagar Empire's highly developed engineering and architectural abilities. This temple is devoted to Lord Vitthal, a manifestation of Lord Vishnu. It is renowned for its exquisite stone carvings, musical pillars, and the iconic stone chariot. It is one of the most well-known and well-preserved temples in the area. Here are a few of the Vitthala Temple's architectural wonders and features:

- **Musical Pillars**

  The Ranga Mandapa, a pavilion within the Vitthala Temple complex, houses the musical pillars, also referred to as the "SAREGAMA pillars," a

Figure 3 : Raja Gopuram's inverted shadow on Saalu Mandap dark room.



Source : https://world2talkabout.wordpress.com/2014/10/29/temple-tales-2-mystery-unsolved

group of stone columns. "The pillars were found to have larger dimension at the bottommost portion and it decreased almost continuously to the minimum at the uppermost portion" (Kumar, Jayakumar, Rao, Sharma, & Raj, 2008). When gently tapped, these pillars sound like musical notes. According to legend, when tapped, each pillar emits a distinct sound akin to the notes of the seven fundamental musical tones: Sa, Re, Ga, Ma, Pa, Dha, and Ni. The sound recorded from a pillar is found to produce bell-like sound (Patil & Gaj bhar). Although the precise engineering and acoustic methods used to build the musical pillars are not fully understood, it is thought that the ancient Hampi builders and architects used some cunning techniques. According to one theory, the pillars' different stone compositions and densities during construction led to a range of sound frequencies when they were struck. A collection of musical pillars can be transformed into an electromechanical instrument, like an electronic guitar, by using a contact microphone and an amplifier-loudspeaker system. There are no side walls in the rooms where musical pillars have been installed. so that the acoustics of the room won't affect the sounds coming from the pillars. We discover two or three pillars with the same frequency in some clusters. When any of these pillars is struck, the other pillarsbegin to vibrate at the same frequencydue to resonance. However, the Archaeological Survey of India (ASI) has now prohibited entry to the musical pillars in order to maintain their integrity and protect them from further destruction as a result of the large number of tourists exploring the site and the possibility of damage caused by continuous tapping. The pillars' musical tones can no longer be heard by touching or tapping them.

- **Stone Chariot**

  It is a shrine in the form of a chariot carved out of a single granite block. The chariot is highly detailed and rests on large stone wheels that were once believed to be rotatable, though they are now fixed to preserve the structure (figure 4). The chariot's intricate carvings and other details, which are meant to resemble processional chariots, show off the exceptional craftsmanship of the period's artisans. The chariot is remarkably strong and long-lasting due to its monolithic design. It has endured the test of time and continues to stand as one of the enduring representations of the Vijayanagar Empire's superior architectural achievements.

- **Advanced Water Management**

  The empire's architects and engineers designed a sophisticated water management system to ensure a steady water supply and efficient drainage within the temple complex. A system of aqueducts and canals that bring water from nearby sources like the Tungabhadra River feed the temple complex. The gardens and tanks, as well as other areas of the temple complex, are effectively supplied with water thanks to these water channels. Pushkarini,

Figure 4 : Stone Chariot in Vitthal Swami Temple

also referred to as the stepped well, is a stunning stepped tank that is part of the temple complex. It had ceremonial uses in addition to acting as a reservoir for rainwater. Even during dry seasons, easy access to water was made possible by the step design. To effectively manage rainwater and avoid waterlogging inside the temple complex, Hampi's engineers created a complex underground drainage system. The system would direct extra water away from the buildings, protecting them. The Laxmi Pushkarini is a sizable temple tank located within the Vitthala Temple Complex in addition to the Pushkarini. The purpose of this tank is to gather and store water for the various temple activities. The water management system in Hampi focused on water conservation. Rainwater harvesting techniques were likely employed to recharge groundwater and maintain a sustainable water supply. Today, these water management features are not only an important part of the site's history, but also evidence to India's ancient hydraulic engineering achievements.

- **Seismic Stability**

  Because of the region's seismic activity, the seismic stability of the Vitthala Temple in Hampi, as well as other historical structures in the area, is a major concern. Because Hampi is located in a seismically active zone, any restoration or conservation efforts for these ancient structures must consider the risk of earthquakes and their potential impact on the monuments' stability. The architects and engineers who built the Vitthala Temple and other structures during the Vijayanagar Empire in the 15th century may not have had access to modern seismic design principles. They did, however, use certain architectural and engineering features that helped the structures withstand seismic forces to some extent. The foundations of temples are typically designed to spread the weight of the building over a larger area, which can improve stability during earthquakes. Certain architectural elements, such as heavy stone construction and the use of large stone blocks, may act as a dampener, reducing the intensity of vibrations during seismic events. Structures with symmetrical design and uniform mass distribution may be more resistant to seismic forces. Some temple elements, such as tall columns and long corridors, could give the structure flexibility, allowing it to sway and absorb seismic energy. While these factors may have contributed to some level of seismic stability, it is important to note that the Vitthala Temple and other Hampi structures were not explicitly designed to withstand modern seismic forces.As a result, regular assessments, monitoring, and conservation efforts are critical to the preservation and safety of these historical monuments.

The Vijayanagar Empire's cutting-edge techniques, such as precisely placed stone joints and masterful sculpture that has withstood centuries of weathering, are incorporated into the design of the temple. The musical pillars at the Vitthal Swami Temple in Hampi are a notable technological accomplishment. When these pillars are struck, they produce notes that sound

like drums, tablas, and flutes. The advanced acoustic knowledge and stone craftsmanship of the ancient Indian builders and designers are reflected in this acoustic marvel.

5.4 Virabhadra Swamy Temple, Lepakshi, Andhra Pradesh

The temple was built in the 16th century during the heyday of the Vijayanagar Empire, with patronage from the brothers Virupanna Nayaka and Viranna who were the officers of king Achyutraya.The most widely recognised sculpture in this temple is the "Lepakshi Nandi," a gigantic monolithic Nandi (Lord Shiva's sacred bull) located at a short distance from the main temple.The temple complex consists of an extensive mandapa (hall), a shrine devoted to Lord Veerabhadra (a manifestation of Lord Shiva), and an unusual hanging pillar that does not fully touch the ground.(Sasidhar, 2020)"Although the temple has seventy pillars, one pillar that hangs on the temple grounds is the true wonder. As a result, many visitors to the temple pass a piece of cloth or paper under the bottom of the pillar to see if it is true. The secret behind how the pillar remains afloat without any support is a mystery until today." Stone working and structural stability is the outstanding technical achievement of this temple.

6.0 NON-RELIGIOUS ARCHITECTURE

Unfortunately, the empire declined following invasions from Bahamani kingdom in the battle of Talikota in 1565, resulting in the destruction of many architectural marvels. Several significant structures, however, have survived, offering valuable insights into the grandeur and sophistication of Vijayanagar architecture. The non-religious architecture during the time includes forts, palaces, royal enclosures, water structures like stepwells, market area and many public buildings and structures. The empire constructed various public buildings, including hospitals, schools, community centres, and administrative offices, to cater to the welfare and needs of the people.

6.1 Stepwells, Tanks and Aqueducts

Stepwells, also known as pushkarinis or kalyanis, were a crucial component of the Vijayanagar Empire's water management and engineering. These stepwells served as vital water reservoirs, providing a consistent source of water for a variety of purposes such as domestic use, irrigation, and religious rituals. The Vijayanagar Empire's stepwell engineering demonstrated a remarkable understanding of hydrology and hydraulic principles. During the monsoon season, Vijayanagar stepwells were cleverly designed to collect and store rainwater. The stepwells of this area are distinguished for their unusual architecture, in contrast when compared to other stepwells seen in the western part of India that are prized for their visual appeal and ornamental designs. These stepwells were typically built with a series of descending steps leading to the water level. Due to the Vijayanagar empire's war, the square-form stepwell was planned and built in a prefabricated manner. This type of building technique had been popular since the nineteenth century, so it is remarkable that it emerged in the early 13th century. "Because the prefabricated building method takes less time than the conventional method, it was found that the stepwell dressing of blocks had been eliminated from the location and that the other parts of the stepwells had been built concurrently."(Selvaraj, Devadas, Perumal, Zabaniotou, & Ganesapillai, 2022). The stones were progressively numbered in an unusual way during outfitting to identify their place in the stepwell. During the monsoon, as the water level rose, the steps would be submerged, allowing the water to be safely stored underground. Stepwells were frequently built near hills or elevated regions with a large catchment area to ensure an adequate supply of water. Rainwater was able to flow into the catchment area, maximising water collection during the rainy season. The well structure of stepwells was constructed with long-lasting materials such as stone or brick, ensuring longevity and stability. To withstand the weight of the stored water, the walls were frequently thick and reinforced. The inlets in the stepwells were designed to allow rainwater to flow into the well. The inlets were placed strategically to maximise water collection. Additionally, outlets were built to manage water levels and control the flow of water during heavy rainfall. The steps that led to the water level were designed in such a way that people could easily draw water from them. The steps were frequently broad and provided resting platforms, making it easy for users to access water even when water levels were low. These structures collected, stored, and distributed water efficiently, ensuring a consistent water supply for residents and agricultural activities. The Vijayanagar Empire's stepwells not only served practical purposes, but also showcased the empire's architectural and engineering prowess. These stepwells were critical components in ensuring the people's well-being and sustenance, demonstrating the empire's commitment to efficient water management and utilisation. Aside from stepwells and tanks, they also built dams and aqueducts. To divert water and create artificial reservoirs, dams and weirs were built across rivers and streams. These structures were typically made of stone or earthen materials and were intended to withstand water flow pressure. The dams aided in water level regulation, preventing flooding during heavy rains and ensuring a controlled release of water for irrigation and other uses. The Vijayanagarengineers-built aqueducts and canals to efficiently distribute water from reservoirs and tanks

to farmlands and other areas. These channels were built with a gentle slope to ensure a consistent flow of water while preventing excessive erosion. Aqueducts were frequently built with stone blocks, and canals were lined with clay to reduce seepage (figure 5). Sloped embankments were built alongside dams to manage water flow. These embankments helped guide water into the canals while preventing excess water from escaping, ensuring that water resources were used to their full potential. Some of these historic water management systems can still be seen today in the ruins of Hampi and other empire-era areas.

FIGURE 5 : Aqueducts Made of Stone Blocks with Slope Embankments for Water Flow

6.2 Royal Enclosures and Palace area

The royal enclosures served as the capital city's administrative and ceremonial centres, providing a grand setting for the ruling monarch and the nobility. The royal enclosures housed the ruling monarch and the royal family's opulent palaces and residences. These structures were designed to provide the royals with comfort, security, and privacy. The palaces reflected the empire's wealth and sophistication with well-planned layouts, courtyards, and ornate interiors. The royal enclosures housed grand audience halls and administrative buildings where the king held official meetings, received foreign dignitaries, and ran the empire's affairs. These structures were designed to hold large crowds while also exuding majesty. The layout of the royal enclosures was part of a larger urban planning scheme, where the capital city was carefully organized with well-laid-out streets, marketplaces, and residential areas. The structures here incorporated many Islamic features arches and tombs. Examples are elephant stable and queen's bath. The queen's bath is a large, rectangular structure with elaborate archways, balconies, and verandas surrounding a sunken bath in the centre. Their sophisticated knowledge of hydrology and hydraulic design is demonstrated by the elaborate lotus-shaped fountains and networks that formerly distributed water to maintain a cool environment inside the submerged bath. The elaborate stucco work and engraved motifs on the walls and ceilings of the structure demonstrate the empire's meticulous attention to detail and skill. One of the main characteristics of Islamic architecture is the widespread utilisation of pointed arches, which are frequently observed in the windows and doorways of buildings with an Islamic architectural influence. The arched windows and doorways in the Queen's Bath are evocative of Islamic architectural designs. This urban planning ensured efficient movement and order within the city.

6.3 Market Places

The markets of the Vijayanagar Empire were thriving economic hubs, attracting traders from all over. They were critical to the empire's prosperity and cultural exchange. Today, the archaeological remains of these ancient marketplaces in places like Hampi provide insights into the Vijayanagar period's thriving trade and commerce. Each temple complex had its own market, and remnants of these can still be seen today, such as a horse market next to the Vitthala Temple in Hampi. The markets were thoughtfully designed, with straight and wide streets that allowed for the free flow of people and goods. The well-organized layout made it simple for both traders and customers

to navigate. Some Vijayanagar Empire marketplaces had covered structures with large halls or pavilions. These covered marketplaces shielded traders and goods from the elements, providing shelter during inclement weather. The markets had rows of stalls and shops where vendors could sell their wares. These stalls were typically made of stone or brick, making them strong and long-lasting. Many marketplaces had central squares or open spaces for larger trade transactions. These squares also served as public gathering places and meeting places. Rest areas, benches, and seating arrangements for visitors were frequently included in market architecture. These conveniences added to the comfort of those who visited the markets. Security measures were put in place in larger markets and busy trade centres to prevent theft and ensure a safe trading environment. This could have included watchtowers and security guards. Specialised markets catered to specific trades and industries in the Vijayanagar Empire. Textiles, spices, precious metals, and other commodities, for example, had their own markets. Market architecture was an essential component of Vijayanagar city planning. Markets were strategically placed to allow for efficient trade and commerce.

6.4 Military Architecture

Massive fortifications, including high stone or brick walls, surrounded the empire's cities and strategic locations. These walls were frequently reinforced with bastions and watchtowers placed at regular intervals to provide vantage points for archers and guards to monitor their surroundings. The Vijayanagar Empire's prominent forts had multiple concentric walls, forming a multi-layered defence system. This strategy increased the fort's overall resilience by making it difficult for attackers to penetrate the innermost defensive structures. Gatehouses, which were heavily guarded and outfitted with defensive devices like drawbridges, were used to fortify the entrances to the forts. The gatehouses served as strong points for soldiers and archers to fend off attackers, and the drawbridges could be raised to restrict access. In order to allow archers and marksmen to engage attackers from all sides, the fortifications had bastions that extended outward from the walls. According to folklore, some forts had underground tunnels that the rulers and their families could use to flee during emergencies. In case of a siege, these tunnels offered a covert way to leave the fort. The empire strategically placed its forts by utilising topographic features like hills, rivers, and cliffs to increase the forts' capacity for defence. The Vijayanagar Empire's military structure was crucial to defending its holdings and upholding its hegemony in Southern India. As evidence of the Vijayanagar Empire's technological prowess in building fortifications, many of these impressive fortifications can still be found in numerous areas that were once a part of it.

7.0 CONCLUSION

Vijayanagar architecture is a distinct chapter in the history of Indian art and architecture. Its unique features, creative constructions, technical achievements and cultural significance continue to attract historians, archaeologists, and visitors alike, revealing the Vijayanagar Empire's rich heritage. The mastery of stone employed in Vijayanagar architecture was fundamental to its technological achievements. Massive granite blocks could be mined, transported, and carved with great skill by the architects and craftsmen of the empire to build elaborate temple complexes, imposing gateways, and imposing gopurams (gateway towers). The temples discussed before, are examples of the empire's mastery of large-scale stone construction due to their sheer size and accuracy. One notable achievement is their use of a technique known as "plinth isolation." This method entailed building structures on raised platforms (plinths), with gaps or flexible joints connecting the foundation and superstructure. These gaps enabled the structure to absorb seismic shocks and vibrations, lowering the possibility of damage during earthquakes. Further more, the architects of Vijayanagar used resilient materials like granite and laterite stone, which offered structural integrity and resistance to seismic forces. To increase stability, they also made use of advanced load distribution strategies and well-planned structural element placement. These seismic-resistant design concepts are best shown by the enormous variety of temples, palaces, and public buildings found in Hampi, the capital of the empire. Many of these structures have endured for centuries despite being in an earthquake-prone area, demonstrating the viability of Vijayanagar engineering in reducing earthquake damage.

In addition, the Vijayanagar architects invented methods for managing water and hydrology. With its sophisticated network of aqueducts, tanks, and canals that not only provided water to the city's citizens but also promoted agriculture and helped to feed the expanding population, Vijayanagar itself was a marvel of city planning. They demonstrate their grasp of hydraulics and their capacity to use ecological assets for urban development through their elaborate network of tanks, like the Pushkarani near the Vitthala Temple. The inventive structural layout of Vijayanagar architecture was another remarkable aspect. Known as "dry stone" construction, temples and palaces were built with an interconnected framework of stone blocks that did not require mortar. This approach demonstrated their engineering anticipation

and grasp of architectural physics by ensuring the buildings' structural integrity while also allowing for adaptation and endurance in the face of activity from earthquakes.Furthermore, religious buildings were not the only architectural accomplishments of the Vijayanagar Empire. The capital city's royal residences and government buildings serve as prime examples of their mastery of palace architecture and urban design. An example of their advanced awareness of ventilation and cooling techniques is the queen's bath, which was built with both architectural practicability and aesthetic sensibility to provide relief in a hot climate.

Unfortunately, as the Vijayanagar Empire declined, many of its architectural marvels fell into disrepair and neglect. Preservation efforts are ongoing, but several structures are at risk due to weathering, vandalism, and insufficient conservation measures. A comprehensive approach that includes historical research, community engagement, sustainable tourism practices, and strong conservation strategies is essential for preserving these cultural treasures for future generations.

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Smart Heritage Planning in Indian Heritage Cities

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Abstract

Urbanisation is rapidly taking over the original fabric of the cities. Regarding heritage cities, the distinction between the historical character and rapid developments gets even more pronounced. On the other hand, Information and Communication Technology (ICT) has crept into the day-to-day lives of everyone. India being a developing country, various ICT initiatives are ongoing to make cities of India 'smart'. The Ministry of Urban Development (MoUD, GoI) has undertaken one such initiative, the Smart City Mission (SCM). There are 100 cities selected to be developed as 'smart cities' and several heritage cities are also included. Major cities in which smart city applications are being accomplished are Nashik, Ahmedabad, Bhubaneshwar, Dehradun, Pune, Bhopal, Agra, Jaipur etc. It is pertinent to study how the projects have been executed in these cities to understand in detail the issues and challenges of heritage preservation. The paper examines the smart city mission. Further three cities have been analysed to know the status and way forward for remaining cities of heritage value. The study endeavours to find solutions to seek heritage preservation, heritage interpretation and tourist infrastructure development that seem to be missing.

Keywords *: Heritage City, Smart Heritage Planning, Smart City Mission, Retrofitting, Redevelopment*

1.0 INTRODUCTION

It is a known fact that Urbanization is rapidly taking over the original fabric of the cities. Regarding heritage cities, the distinction between the historical character and rapid developments gets even more pronounced. On the other hand, Information Communication Technology (ICT) has crept into the day-to-day lives of everyone. ICT has been instrumental in providing better services and public benefits to the dwellers of the city. One important aspect of maintaining and disseminating cultural assets is the use of web-based apps and digital tools. Inspired by smart mobility, smart infrastructure, and other smart discourses, technology-led innovations can be worked out by converging the smart city discipline with other disciplines. ICT solutions have been incorporated in various sectors. The heritage discipline is probably the next area of significant convergence, leading to the creation of the 'Smart Heritage' discourse. The exploration of India's digital past has only recently commenced, but it marks a significant turning point that brings together experts in the fields of culture studies, technology, and art history. Therefore, it is high time that the ICT and cultural heritage meet with innovative techniques and mechanisms bringing together a multi-disciplinary team of heritage experts and information technology (IT) experts.

India being a developing country, various initiatives are ongoing to provide ICT solutions for making cities of India 'smart'. The Smart City Management (SCM) is one such initiative of MoUD, GoI. The SCM is thought to be the answer, along with new planning techniques, to address and lessen the city's existing problems with unchecked expansion and rapid urbanization and to achieve the goals of a sustainable future. The SCM encourages extensive planned urbanization to foster an environment that will support faster growth and development. However, the smart city mechanism in India is defined in an overarchingly including components ranging from provision of basic infrastructure elements to providing robust IT solutions. The application of smart city solutions in cultural heritage cities of India is an overlooked component and needs to be explored. The link for arriving at solutions to seek heritage preservation, heritage interpretation and tourist infrastructure development is missing. These days, technology permeates every aspect of our lives and offers answers to issues facing society. They are brought closer to decision-making by issues like transportation, infrastructure, and the management of natural resources, or simply by raising citizen participation in governance. These days, technology permeates every aspect of our lives and offers answers to issues facing society. They are brought closer to decision-making by issues like transportation, infrastructure, and the management of natural resources, or simply by raising citizen participation in governance. The dynamics of tourism are changed forever as metropolitan areas grow more responsive, integrated, and environmentally

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concerned. Investigating how these changes affect traveller experiences, tourism practices, and the allure of the area as a whole becomes essential. Unfortunately, tourism is rarely regarded as a key component in smart city development plans, although being cited occasionally as one of many services that may be improved utilizing smart city concepts. The research endeavours to examine how SCM has been implemented still in the selected cities of heritage value. The application of this study shall provide support for tourism development through innovative IT solutions.

2.0 LITERATURE REVIEW

The literature reviewed globally reveals that research on cultural heritage often includes case studies utilizing smart platforms and visualization technologies. Some studies identify the challenges of applying smart technologies in the heritage sector, while others propose solutions. The concept of "smart cultural heritage" is well-defined in both national and international research. Nationally, many studies focus on what the SCM entails, including evaluating smart projects, the influence of city size on smart city development, and incorporating socio-cultural and historical indicators in the smart city development process. A few studies examine how sustainable development goals align with the smart city vision, with heritage development as a central focus. Numerous studies offer recommendations for smart heritage conservation, often involving local authorities. Additionally, many studies link smart cities with the Internet of Things (IoT), driven by technological companies like IBM, Intel, CISCO, and Google.

3.0 REVIEW : SMART CITY MISSION, INDIA

In India, smart city concepts are relatively new. One popular solution to the problems associated with urbanization in the twenty-first century is smart city development. The Mission statement and guidelines were formulated in June 2015 by MoUD. It included 100 cities for a period of five years i.e. 2015 - 2019. As per the mission statement of the smart city released by the government, the mission's main objective is to promote cities that provide core infrastructure, a clean and sustainable environment, provide a decent quality of life with the application of 'smart solutions'. The core infrastructure of the smart city are; assured electricity supply, adequate water supply, sanitation and solid waste management, affordable housing, robust IT and digitalisation, good governance, sustainable environment, efficient urban mobility, health and education as per the smart city mission and guidelines, June 2015. Smart cities are cutting-edge urban ideas that are necessary for people to have fulfilling lives. This mission aims to improve quality of life, enhance economic growth, and provide employment opportunities with smart solution-based technologies. It also talks about developing slums into planned communities and creating inclusive cities.

It is noticed that typical features of the mission are to promote mixed land use, housing for all, create walkable environments, preserve open spaces, provide multi-modal transport facilities, make the governance reach to the citizens easily, provide smart infrastructure etc. It gives an identity to the city based on traditional and local arts and cuisine. There are four strategic components for area developments of the city i.e. retrofitting, redevelopment, greenfield and pan-city. Each of these components has a specific strategy. The strategy of retrofitting intervenes in the city in a manner that the area under consideration remains intact. An area of more than 500 acres is selected in consultation with citizens. Large amounts of smart applications are proposed with more intensive infrastructure. The strategy is to be implemented in the short term since most of the fabric remains intact. In the strategy of redevelopment, approximately more than 50 acres of area are selected by Urban Local Bodies (ULBs). A new layout of the designated area with mixed land use, higher FSI and high ground is selected. In Greenfield Development, an area of more than 250 acres is selected. Such developments occur on the outskirts of the city. The involvement of local bodies is most important in such kinds of developments. In pan-city development, the existing city infrastructure is enhanced with the application of smart solutions. It may include projects about traffic management, waste management, recycling or providing sustainable environments.

To implement the Mission, the government bodies of cities are required to prepare Smart City Proposals (SCP). The SCP should contain primarily the vision that has been identified for the city. The proposal should include strategies for the mobilisation of revenue and the proposed resultant for the upgradation and inclusion of smart applications. During implementation of the proposals, it is expected that the matching grant be donated by the State and Central Government. This amount may not be able to cover the project cost therefore, other resources from the government can also be utilised for the generating remaining funds required for the project. A special purpose vehicle (SPV) is constituted at the city level once the proposal is selected. The SPV is to be a limited company incorporated under the Companies Act, of 2013. It is required to plan, implement, operate, gather funds, and assess the city development project.

The monitoring in the Mission occurs at three levels i.e. Central level, the State level and the City level. The secretary of MoUD heads the apex committee.

The committee also includes video representatives from different departments. A High Power Steering Committee is set up at the state level chaired by the Chief Secretary. At the City level, a Smart City Advisory Forum is established comprising representations from Resident Welfare Associations included along with the members of the government and non-government organisations. It is expected that the projects or also converge with other governmental schemes such as Swachh Bharat Abhiyan, AMRUT, HRIDAY, Skill India Development, etc.

4.0 IMPLICATION OF CULTURAL HERITAGE

Cultural heritage is the irreplaceable social, economic, and spiritual capital. Heritage is what has been left behind from the past, what is used in our daily lives, and what we provide to the next generation. The natural and cultural heritage treasures are priceless sources of inspiration and life. Cultural heritage preservation seems to be a major component of economic policies that promote the growth of the tourism industry. Therefore, it is pertinent to analyse how SCM works in line with the Cultural heritage.

The SCM document does not have any separate section on heritage as such but some of the guidelines can be implied on heritage. All the main infrastructure components of a smart city such as the provision of basic facilities like water, electricity, sanitation, mobility, IT services, etc. could be applied to the heritage cities. But the question is how it should be done. The central theme of the smart city is to boost economic development and enhance people's quality of life through technological advancements. The heritage cities also need to be developed in a manner that the quality of life is improved. The citizens get opportunities to enhance their economic conditions. In doing this, the heritage cities can also use technology and information. The point number 3.1.VII regarding the smart features - giving recognition to the city based on intangible features such as local arts and crafts. Also, the next point to make the area less vulnerable to disasters and provide cheaper solutions holds even for heritage cities. But the question remains what could be done to implement the smart city mission in heritage cities?

Out of the four strategies described in the Mission; three strategies can be adopted for heritage cities; retrofitting, greenfield and pan-city development. The heritage cities can formulate SCPs in a manner that the tangible and intangible aspects are encapsulated in the proposal. Since the heritage cities were not designed in a manner to suit the contemporary needs of society, the SCP should include proposals in a manner that the present needs of the ever-growing cities and requirements of the people are catered to. Due to the increase of population in the heritage cities, the water, electricity, sanitation, solid waste management, rainwater harvesting system et cetera also need to be upgraded as per the growing demands. The improvement of the area and environment in terms of making the public spaces encroachment-free can also be included in the proposals. Safety of citizens, especially when it comes to the elderly population women and children the city needs to include smart solutions with information and technology so that instant actions can be taken. Therefore, the SCP regarding the heritage city includes all the above aspects.

5.0 METHOD

To understand how the historical and cultural objectives are included in the existing smart city initiatives in India, the study of current initiatives under SCM of heritage cities needs to be done. Amongst the cities selected for smart city development by the government, several heritage cities are included for redevelopment. Major cities in which smart city applications are being accomplished are Nashik, Ahmedabad, Bhubaneswar, Dehradun, Pune, Bhopal, Agra, Jaipur etc. It is pertinent to study how the projects have been executed in these cities to understand the issues and challenges of heritage preservation.

Therefore, three heritage cities that are a part of 100 SCM are selected for the study. The heritage cities selected are from three different states and are considered representative examples of respective states. Thus, initiatives taken by three different states are covered in the study. Also, these heritage cities have a long historical past and therefore are apt to be studied to understand the approach taken by the Government in the case of heritage areas. The research is conducted based on secondary resources data available, especially from government websites and documents. The SCPs of these cities have been studied along with their vision document.

6.0 RESEARCH

Three heritage cities selected are Nashik Heritage City, Maharashtra State; Bhubaneswar, the Capital of Odisha and Ahmedabad, the Capital of Gujarat on account of the historic and heritage characteristics. Cities were chosen based on the availability and comprehensiveness of their Smart City Proposals (SCPs). This allows for a detailed analysis of proposed smart initiatives specific to cultural heritage preservation and enhancement. The selection criteria ensure that the chosen cities comprehensively understand how the SCM addresses the unique challenges and opportunities of preserving cultural heritage in rapidly urbanizing environments. This approach allows for nuanced

insights into the integration of smart technologies with heritage conservation strategies, contributing to both academic research and policy formulation. Cities were also selected based on their potential to provide insights into how the SCM addresses heritage conservation, tourism development, and community engagement through technological interventions. The selection criteria ensured that the chosen cities could effectively answer the research questions regarding the impact and implementation of smart city solutions in heritage-rich environments. The selection aimed to cover diverse geographical regions across India to capture varied approaches and challenges in integrating smart city initiatives with cultural heritage preservation. Each city selected represents a different state to ensure a broad representation and avoid bias towards specific regional characteristics or governance models. The major parameters of the study are heritage conservation initiatives, Tourism Development and Promotion, Community Engagement and Participation, technological Integration and Innovation, Sustainability and Resilience and Policy and Governance Framework. Following is a detailed description of each city based on government publications on the vision and status of the implementation of SCM.

5.1. Nashik Heritage City

In India, Nasik is a well-known heritage city of the State of Maharashtra. The prominence of Nashik includes tourist, religious, science and historical-related places. Nashik and Trimbakeshwar are well known for Kumbhmela (mass gathering). Every 12 years, Trimbakeshwar town hosts celebrations that draw crowds of over a million people from Kumbhmela. In the Nashik district, we can see that the social, economic, historical and cultural heritage has been preserved to a large extent, due to which historical centres or various forts can be found in this area. Hence, it is worthwhile to assess the integration of SCM in the process.

5.1.1. Salient Features of SCM

Smart City Mission Nashik Municipal Smart City Development Corporation Limited (NMSCDL) is the SPV created by the central government for SCM. The NMSCDL was incorporated on 26 August 2016. Two components of the SCM strategy taken into consideration are Area Based Development (ABD) and Pan-City initiative. ABD includes both retrofitting and greenfield projects. Being a heritage city, it is pertinent that the historicity of the city is maintained in the process. The NMSCDL is implementing the Godavari rejuvenation project to retain the heritage value. About 17 ghats have been identified for rejuvenation purposes. The NMSCDL has included Urban Local Bodies (ULBs) services for the execution of the projects. Recreation packages with basic amenities projects, river rejuvenation projects, area-based development projects and IT initiatives are created.

- Four projects within the recreation package have been successfully implemented. Within this package a state-of-the-art infrastructure to be used by the citizens was proposed; Nehru Garden, Mahatma Phule Kaladalan, Kalamandir Auditorium and Pandit Paluskar Auditorium. In providing basic amenities NMSCDL envisions that a certain pilot project may be successfully implemented and then replicated at a large scale in the entire city.
- In its river rejuvenation package, five projects were taken up about the riverfronts like Goda civil works, Goda beautification, desilting of the river, provision of trash skimmers and installing mechanical gates. The major rejuvenation project of Godavari Riverfront includes about 50 small projects for manifesting the physical heritage into beautified ghats. Funding of this project is through SCF and the approximate project cost is about INR 400 Crore. The major components covered in the project are upgrading the civil infrastructure, improving existing road connectivity, providing smart road services for footpaths, provisioning street lighting, streetscaping, and street furniture proper signage to improve the aesthetic appearance of the city. Utility conduits with future expansion are proposed. Heritage walks, providing jetties for experiencing the river and constructing a floating fountain river. The vision is to boost tourism and increase the local economy by providing occupational solutions to the natives of the city. The vision is to have Nashik as the Spiritual Centre in the heritage map of India.
- In the ABD component, major and minor roads were selected for providing water storm utility services. 500 acres of area was selected to improve the basic infrastructure. Provision of underground utility ducts for including futuristic utilities, streetscaping and making footpaths universally friendly were some of the major components covered in the project. There were water sewer storm utilities provided, the capacity of water treatment plants was enhanced, and connections were provided to the non-residential areas. GIS mapping of all infrastructure was undertaken.
- Talking about the IT initiatives, Nashik Smart City has undertaken the utilisation of SCADA and automation of water infrastructure. Smart LED and auto-dimmable streetlights with powerful control systems were provided.
- The projects implemented are primarily based on a PPP model. This has provided opportunities

for private stakeholders to fund public projects. Thus both public and private get included for the betterment of the city. Various projects like the provision of smart parking facilities, the provision of solar rooftop facilities in public buildings and the improvement of bus services along with allied services have been undertaken successfully under the model of PPP.

- NMSDCL has a vision to complete all the projects and hand them over to the ULB for its regular operational purposes. Projects like Smart schools and smart bridges are in the pipeline.

5.2 Bhubaneswar Heritage City

Bhubaneswar, the capital city of Odisha, India is the next heritage city undertaken for research. An important religious and historical destination in India, the old Bhubaneswar precinct welcomes millions of pilgrims and other tourists each year. The city was planned in 1948 and the master plan was prepared by a German architect and planner Dr. Otto H Königsberger. It is included on the preliminary UNESCO Heritage Cities list. Due to the city's existence of historically significant locations, there is a likelihood that visitor numbers may rise, which could lead to improved municipal development in the future.

5.2.1. Salient Features of SCM

It has set up Bhubaneswar Smart City Limited (BSCL) as the SPV under the guidelines of the Central government on 23 February, 2016. Two major components of SCM shortlisted for implementation are area-based development and pan-city development. The vision of BSCL is that responsible governance is offered to people with the use of information technology and includes a decision-making participatory approach.

- The infrastructure components that have been recognised for the major development of the city by providing transit-oriented development (TOD), a liveable city, a child-friendly city, eco-city and developing it as a regional economic centre. The ABD includes models for retrofitting and redevelopment. The vision for the development is to create a Bhubaneswar Town Centre District (BTCD). The proposals included for BTCD are multi-mobility, physical development and social development oriented. In mobility, multimodal integration of bus terminus and railway stations is proposed. Pedestrian-friendly roadways and the creation of NMT zones, providing complete street solutions with streetscaping and street furniture etc, dedicated NMT network is also proposed. In physical development LED street lighting, provision of solar rooftops, waste recycling materials, water recycling system, sewerage treatment system, and water management projects along with city fibre ducting are included.
- In the social development project, there are four slum development projects proposed. Public art installations are accomplished at significant locations. Modern educational facilities, special care for women and child health care and provision of general health care centres are included.
- For providing pan-city solutions, there are several mobility-related proposals in the scheme. Proposals for conducting traffic management through appropriate surveillance, traffic signalling, simulation and modelling. Further electronic parking systems with parking mobile apps and details data regarding parking availability etc are proposed to be implemented in various significant locations. There will be depot management bus scheduling and fleet tracking Search James proposed for better transit operations. An integrated common payment system through integrated fare card prepaid and card facilities shall be provided. The development of a management system for taking emergency responses shall also be executed.
- Regarding the heritage area of Bhubaneswar, various proposals for conserving heritage and further promoting sustainable tourism. Heritage was launched by the government in 2019. The major zone identified for the conservation of heritage is Ekamara Kshetra Heritage Area. It was proposed in the year 2015 that in the Ekamara heritage area, a conceptual plan for the preservation be prepared and further signage guidelines for the area be implemented. This area consists of the historical part of Bhubaneswar city where there are the highest number of temples, sacred water bodies, traditional communities, and processional roads which are an example of cultural activities and practises followed in Bhubaneswar. An area of about 600 acres has been selected with a vision for the city to revitalise the heritage and subsequently promote tourism. It foresees to create an aesthetic environment, increase accessibility, and give sustainable solutions with the help of smart services. Presently, tenders have been floated to invite tenders to implement the above.
- In the first phase of the road development project, a 2.8 km four-lane road connecting Badhaai Banka Chowk to Rath Road is proposed as an outer access for the inner core heritage area. There will be construction of an entry plaza at Lingaraja Temple and Anant Vasudev Plaza. Kedar Gouri Plaza and Bhajan Mandap projects shall be implemented with the help of private partners. Proposals for complete pedestrianisation in the core heritage

area have also been planned. An estimate of Rs.1000 crore is prepared for implementation.

- The National Monuments Authority (NMA) of the Ministry of Culture (MoC) has approved the construction of Heritage Park in place of the Cultural Plaza. The NMA has also granted permission for the construction of a foot-over bridge with escalators and disabled-friendly facilities in the regulated area of the 13th-century World Heritage Site. There are proposals for creating rain gardens, landscape plazas and smart facilities for picking up and dropping off in the prohibited area of the Sun Temple. These public amenities are permitted to be undertaken as per the AMASR Act of 1958.

5.3 Ahmedabad Heritage City

Ahmedabad the capital of Gujarat was among the first 20 Smart cities selected in 2016. The walled city of Ahmedabad was founded in 1411 A.D. by Sultan Ahmed Shah. Like many organically developed communities on a riverbank, the city is fairly semi-circular, with a core in the centre and radiating streets connecting the centre to the edge. The city, which is surrounded by a sturdy fort wall, has a varied street plan and activity pattern. Ahmedabad's walled city is home to numerous historic structures, including gates, fort walls, temples, mosques, and pols with their traditional homes. Ahmedabad, the first World Heritage City in India, offers opportunities to investigate tourism. Being a smart city entails having accountability not just to the residents who live there but also to those who come to visit. A smart city attracts more tourists because people want to visit places that are hassle-free, safe, and easy to get about.

5.3.1. Salient Features of SCM

Smart City Ahmedabad Development Limited (SCADL), the SPV for implementation of the projects under the SCM. Various projects that have been proposed range from providing e-governance, digital centres, urban mobility, urban infrastructure, education, citizen safety etc. Two components of SCM considered are pan-city projects and ABD projects. The major vision for the city to be converted into a smart city is to impart efficient affordable, equitable and customised governance for the citizens of Ahmedabad. The principles formulated to achieve the vision are sustainable development, collaborative governance, urban resilience, intelligent infrastructure and efficient implementation.

- Within the pan-city projects, various proposals are to create smart toilets, smart anganwadi, e-Library, smart streetscaping, smart parking and smart heritage. Primarily their two initiatives play a major role; the first one is the Integrated Transit Platform with a common card payment system while the second initiative is regarding providing a Common Control Centre (CCC) and Optical Fibre Cable (OFC) network. This initiative has a goal of providing access to public transport to each household within 400m. An integration of multimodal transport systems including BRTS, AMTS, metro, taxi, and auto to empower commuters is proposed. The common card payment system will ensure seamless mobility of the use of the cards for utilisation at various public places. The second initiative through its common control centre and OFC network will create a platform for surveillance and Smart traffic control systems.
- The area selected for the location of the project under the ABD is 600 acres of the area of Wadaj Old City. Two major components to be developed in Wadaj are transit transit-oriented zone (TOZ) and the slum redevelopment project. Several proposals are created for the upgradation of existing anganwadis, slum rehabilitation, providing smart water services, uplifting intermodal hub, providing green spaces and retrofitting of utilities in the selected ABD area. A major component of SCM is also providing affordable housing. 75 acres of land have been identified for the construction of housing.
- Other infrastructure components cover projects about road, water and sewerage. The component of TOZ covers retrofitting of the existing infrastructure. There are proposals to improve major infrastructure components, improvement of internal hubs, utility networks, pedestrian facilities and green spaces. Common smart features are incorporated for converting the area into a smart network, energy-efficient street lighting, pedestrian-friendly development, wastewater recycling, green spaces, intelligent traffic management, smart water, public TOZ and robust IT connectivity.
- Regarding the smart heritage projects within the pan-city development, the aim is to increase the number of visitors to the Heritage city. The state of art information is provided to the tourist. The heritage area is to be provided with Bluetooth speakers and an interactive kiosk with quick responses. A mobile application is also proposed to generate interest among visitors by providing digital information at their fingertips. There will be integration of of augmented reality (AR) and virtual reality (VR) in the services to provide realistic experiences to the tourists.
- Ahmedabad has won awards in various categories, water management, transport, water and sanitation, and mobility under the intelligent transit management system.

- Provision of a BRTS system with advanced techniques to know the exact position of the buses and bus stations. Special provisions for generating solar power and creating green rooftops in the walled city are undertaken. Various initiatives to adopt sustainable methods and technologies are also been undertaken in the city. Provisions of LED lights and wind power projects have been commissioned in the city.

6.0 DISCUSSION AND ANALYSIS

As per the above description, it can be assessed that SCM is an ongoing process in Indian cities. Each city faces the challenge of balancing the preservation of its cultural and historical heritage with the need for modernization and development. The importance of community engagement and participatory decision-making in the SCM is realised. Exploring the role of citizens in the planning and implementation process, as well as any challenges or successes in community involvement can be insightful while implementing the projects. Reflecting the SCM experiences of Nashik, Bhubaneswar, and Ahmedabad various lessons were learned for implementing best practices of future urban development in other cities facing similar challenges. Smart city initiatives in all three cities have a major impact on urban life, sustainability and economic development. These heritage cities rely on tourism for economic growth. Smart City initiatives should aim directly towards enhancing tourism experiences through heritage preservation, digital innovations, and infrastructure improvements leading to sustainable tourism and local economic development. The analysis (table 1) demonstrates significant strides in integrating smart city solutions with cultural heritage preservation across Nashik, Ahmedabad, and Bhubaneswar. While challenges such as data privacy concerns and financial sustainability persist, adopting innovative technologies and community engagement strategies underscores the potential for sustainable urban development. Future research and policy interventions should focus on enhancing scalability, inclusivity, and adaptive management practices to ensure long-term resilience and preservation of India's cultural heritage.

Table 1 : Comparative Analysis of Initiatives in Three Smart Heritage City

Case	Strategy	Smart Initiatives	Heritage Initiative
Nashik, Maharashtra SPV-NMSCDL	1. ABD - Retrofit-ting and Green-field 2. Pan-City	• Smart school • Smart bridges • Electric crematorium • Trash skimmers • Underground utility ducts • Universal footpaths • GIS mapping of infrastruc-ture • Smart LED • SCADA • Auto-dimmable lighting system • Power control system • Stormwater • WTPs	• Rejuvenation Godavari Riverfront • 17 ghats beautification • State of Art facilities proposed • Heritage Walks • Smart road, street-scaping, street furniture, signage, utility ducts, jet-ties, floating river fountain, im-proving connectivity • Spiritual Centre on Heritage Map of India
Bhubaneswar, Odisha SPV- BSCL	1. ABD - Retrofit-ting and Rede-velopment 2. Pan-City	• Pedestrian friendly roadways • Creation of NMT zones • Solar initiatives • Water recycling system • Sewerage system • Traffic Mgmt. with Surveil-lance • Modern education • Integrated payment systems • Public art installations • Street-scaping, street lighting, street furniture	• Conserving heritage and promoting tourism by Conservation of Ekmara Khestra Heritage Area • 600 acres • Improve the area connectivity, 2.8km four-lane road • Provide aesthetical environments • Creation of entry plazas • Pedestrianisation • Disabled friendly • Smart picking and drop-off facilities • Heritage Park

Case	Strategy	Smart Initiatives	Heritage Initiative
Ahmad-bad, Guja-rat SPV-SCADL	1. ABD 2. Pan-City-Smart heritage project	• Integration of multi-modal transport • Smart traffic control system • Common control centre • Common payment system • Waste water recycling • Utility ducts • Pedestrian facilities • Green spaces • Robust IT connectivity • Intelligent traffic management system • Public Transport oriented	• Conserving heritage and promoting tourism by Conservation of EkmaraKhestra Heritage Area • 600 acres • Improve the area connectivity, 2.8km four-lane road • Provide aesthetical environments • Creation of entry plazas • Pedestrianisation • Disabled friendly • Smart picking and drop-off facilities • Heritage Park

7.0 CONCLUSIONS

From the above research, it may be concluded that Smart heritage planning is of prime importance when it comes to historic cities. Three cases of three well-known historic cities were conducted to examine how the heritage core has been dealt with while providing smart technological solutions. Since the major vision for the development of heritage cities is to increase tourism and provide economic opportunities, it is not possible to achieve it without integrating ICT solutions. A rigorous and systematic exploration of the heritage cities needs to be incorporated to achieve the vision expeditiously. Although there is the inclusion of heritage areas of the city in the over-arching goals of a smart city, a significant gap is still observed. This is probably due to the consideration of incomplete historical resources into consideration. This may be because both the areas, smart city initiatives and historic preservation are still in a nascent stage.

Smart tools like GIS mapping, laser scanning, BIM, and digitalization should be used in historic cities' documentation and interpretation. These tools are to be added to the Smart applications proposed for historic cities. However, it is evident from the study that Heritage Core can contribute significantly towards promoting and achieving Smart City objectives. The policy-makers, researchers and citizens should include strategies and tools of ICT to achieve the objectives of the mission. Regarding funding of such initiatives, it is evident the SCF will not be able to cover it completely hence other government initiatives that have common goals need to be integrated. Schemes like HRIDAY, AMRUT, SWADES, PRASAD, Niti Aayog guidelines etc need to be explored to find complete solutions. Planning of appropriate infrastructure remains an instrumental criterion for implementing the Smart City Model.

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BOOK REVIEW

Reinventing Amritsar- A City of Great Virtues, Myths and Realities

Prof. Bhupinder Singh[1]

Globally all human settlements are known to be different and distinction terms of their morphology, physical growth, economic development, natural and manmade heritage, social, economic fabric. Ranked holist among cities in the state of Punjab and following the global analogy, Amritsar as an urban settlement, also remains different, distinct, unique and universal.

Book on, 'Reinventing Amritsar' A City of Great Virtues, Myths and Realities' Amritsar, makes an attempt in the direction of defining and detailing the holy city of Amritsar in terms of; origin, growth, festivals, heritage, sacrifices and celebrations, by unwrapping numerous layers of history and discovering large number of untold stories besides unraveling numerous myths and realities of the historic city, during its journey, spanning over 450 years. In addition, book critically and objectively tries to reveal the historicity, culture, art, architecture, heritage, ambience, cuisine, human values of the Amritsar metropolis, which has been globally recognized as the religious and commercial capital of the state of Punjab.

Unwrapping and peeling the layers of origin, growth and development of the city of joy, book makes an attempt to describe and define the unique structure and fabric of the walled city, valued as the heart and soul of the Amritsar, besides detailing the narrative of Holy Darbar Sahib, and Jallianwala Bagh, as the most valuable and vibrant space of the wall city. Known for historicity, public spaces, narrow streets, bustling bazaars, numerous chowks, historical Katras and tall Bungas, book tries to bring out the great experience. glory, vibrancy and wonderful traditions, which city offers to both visitors and residents.

Book also includes brief narrative of uniqueness of old city, in terms of its different aromas; narrow/ winding streets; bustling bazaars; distinct culture and unique way of living and eating; human relationship and human bondage. Built with Nanakshahi bricks and lime; book lists , defines and details various historic, cultural and religious buildings located in walled city of Amritsar, which makes the city unique and storehouse of great built heritage.

Narratives explaining valuable contributions made by Revered Sikh Gurus, Guru Ram Das ji, founder of the great city and the visionary Guru Arjan Dev ji ,in shaping the city, provide most wonderful experience, lessons and learning in the art and science of siting, planning, designing, developing and managing the new cities to the professional planners.

Textably explores the contributions made by Sikh Missals and Maharaja Ranjit Singh in defining the city, reshaping the revered Darbar Sahib, bringing openness, developing gardens and parks, protecting city against the repeated invasions of Afghans and constructing numerous gates for defining entries/exits to the walled city, make great learning for providing distinct vocabulary to the rational growth and orderly development of any city and making cities safe against manmade disasters.

Contribution made by the great legendary architect Ram Singh, in designing and constructing Khalsa College, and value addition made by the Guru Nanak Dev Universityto the legendary city has been ably brought out. Labelled as a Khandani City, Amritsar has rightly been described, for its wonderful places, wonder people, wonderful cousins and wonderful hospitality.

Book amply provides insight about how second most populated city of the state, suffered in its glory, during the partition of India and division of the state

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of Punjab in the year 1947, making Amritsar a sensitive border city and a city of crisis besides showcasing its enormous capacity and capability to overcome and managing crisis

Book also tries to portrays and links the past with current pattern of development of the city Organic development, zigzag streets of the medieval past and post-independence planned colonies, having wide straight roads, present diverse features of inclusiveness and exclusiveness of city's spatial structure.

The book remains a compilation of various articles written over a span of more than three decade. It includes in all 10 articles; written about the city by Prof Sarup Singh former Head, GRPG School Planning, GND University, Amritsar, Dr. Ashwani Luthra, Professor, GRPG School of Planning, GND University, Amritsar and Jit Kumar Gupta. former Advisor, Town Planning , Punjab Urban Planning and Development Authority. Book amply reflects the understanding on the part of authors, related to the basic structure of the city, its growth journey , challenges and issues faced due to rapid growth and development .

Accordingly, articles in the Book covers broad spectrum of issues and options related to planned growth and sustainable development of the Amritsar metropolis; rationalizing traffic and transportation; conserving & preserving built heritage; development of walled city; managing pollution; vision for future growth and development. In addition, book contains a timeline of Amritsar growth and development- chartering a roadmap of major events, impacting city right from its inception.

It is hoped that the book on Amritsar will help professionals, researchers and readers to learn, understand, appreciate, analyze and evaluate the strength, weaknesses, opportunities, complexities and intricacies of the growth and development of historic and dynamic city of Amritsar and will go a long way in promoting research in evolving rational and realistic strategies for making the holy city of Amritsar as a great place to visit, live and work. Looking at the length, breadth and depth of the historic and cultural city, book offers enough food for thought for researchers to go into finer details of the urban morphology, unique heritage and vibrant culture, to make value addition to the vocabulary of the historic city. However, book has its limitation in scope and contents and may be missing number of vital contexts. Defining historic cities remains both complex, challenging and difficult task, generally beyond the scope of a single book. Considering the ever evolving, devolving nature of cities; there exist numerous opportunities/options to make value addition to the written text of any book, to make it more focused and self-contained. It is hoped, planners will critically and objectively look at basic fabric, structure, culture etc. of historic cities, and will make more addition to the limited vocabulary of urban growth and development by writing such books on specific cities.

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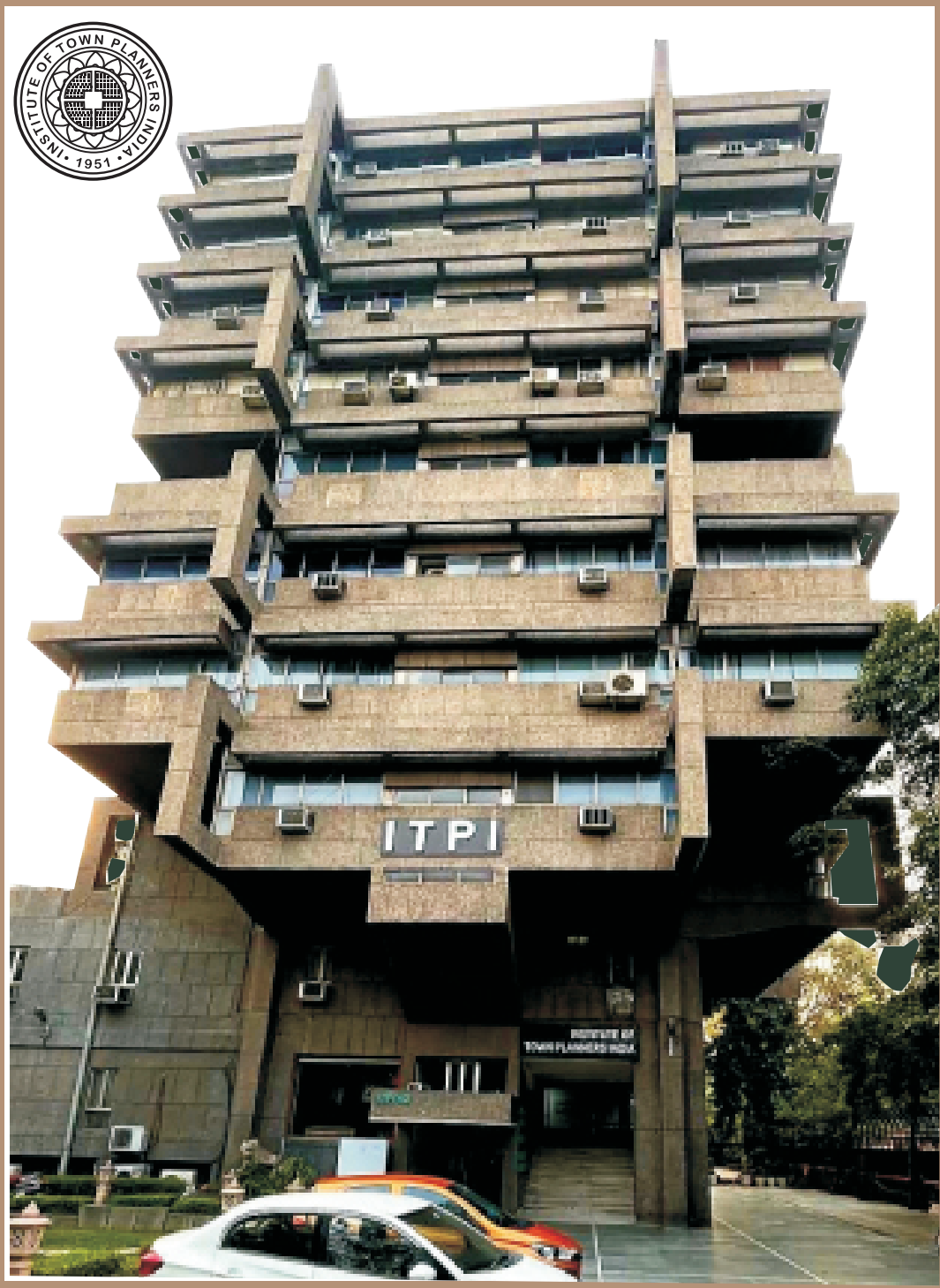

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