

Urban Development and the Conservation of Cultural and Historical Heritage in the City of Kanchipuram, Tamil Nadu

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Abstract - The intricate relationship between sustainability, urban core development, and heritage conservation, focusing on the case study of Kanchipuram, India. It defines sustainability across environmental, social, and economic dimensions and delves into the significance of applying sustainable practices in urban core development, particularly concerning historical and cultural assets. The impact of urbanization on city centers and historical sites is examined, highlighting both positive and detrimental influences. The case study of Kanchipuram emphasizes the challenges posed by rapid urbanization to its cultural and historical fabric and presents conservation strategies, including the delineation of heritage zones. The paper concludes by emphasizing the need for a collaborative and holistic approach to balance sustainable urbanization and heritage preservation.

Key Words: Sustainability, Urban Core Development, Heritage Conservation, Urbanization, Built Heritage, Cultural Identity, Heritage Zones, Kanchipuram, Conservation Strategies, Delineation, Pedestrianization, Civic Infrastructure, Mitigation Measures

1.INTRODUCTION

Sustainability refers to the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. It encompasses a broad range of practices and principles that aim to minimize the negative impact of human activities on the environment, society, and the economy. The concept of sustainability recognizes the interconnectedness of environmental, social, and economic systems and seeks to create a balance that ensures long-term well-being for both current and future generations.

Key components of sustainability include:

1. **Environmental Sustainability:** This involves responsible resource use, conservation of biodiversity, reduction of pollution and waste, and the overall protection of ecosystems. It aims to maintain the health of the planet and its natural systems.
2. **Social Sustainability:** This focuses on promoting social equity, justice, and inclusion. It involves ensuring that human rights are respected, communities are empowered, and social well-being is prioritized.
3. **Economic Sustainability:** This involves fostering economic systems that are viable in the long term. It includes promoting fair trade, responsible business practices, and the efficient use of resources to

support economic growth without depleting natural or social capital.

2.SIGNIFICANCE OF SUSTAINABILITY IN URBAN CORE DEVELOPMENT AND HERITAGE CONSERVATION

In the context of urban core and heritage conservation, sustainability involves the responsible management and development of urban areas to ensure the preservation of historical and cultural assets while promoting environmentally friendly, socially inclusive, and economically viable practices. The key facets of sustainability in this context involve the preservation of cultural heritage, emphasizing the protection of historic structures, landmarks, and cultural sites. This commitment extends to activities such as adaptive reuse, restoration projects, and the incorporation of modern amenities while upholding the historical significance of the area. Additionally, sustainable urban planning acknowledges and addresses the environmental repercussions of development, striving to minimize carbon emissions, reduce energy consumption, promote green spaces, and integrate eco-friendly infrastructure.

The imperative of community engagement and social inclusion is central to sustainable urban development, emphasizing the involvement of local communities in decision-making processes to understand their needs, preserve community identity, and ensure equitable benefits from development projects. Striking a delicate equilibrium between modernization and preservation is crucial for sustainability in urban cores with historical importance, involving the infusion of contemporary design and infrastructure without compromising the integrity of heritage sites.

Furthermore, economic viability is integral, entailing the fostering of economic activities that bolster local businesses, stimulate job creation, and promote tourism while respecting the heritage and cultural value of the area. Finally, sustainable urban development embraces heritage tourism as a potential avenue for leveraging historical assets while emphasizing the importance of respectful practices that minimize negative impacts and contribute positively to local economies.

3.URBAN CORE

A city center serves as the focal point for a city's commercial, cultural, and frequently historical, political, and geographic significance. It typically constitutes a sizable and densely populated urban area, possibly encompassing multiple independent administrative districts. While characterized by concentrated structures, heavy traffic, and a bustling mix of people and businesses, a city center is more than just a

congested cluster of buildings; it embodies the core essence of a city.

3.1 CHARACTERISTICS OF URBAN CORE/CENTRE

The urban core constitutes a vital and intrinsic element in the city's ongoing development and evolution. With a resilient historical character, it serves as a tangible link to the city's past, reflecting a rich heritage. Operating as multiple activity centers, it seamlessly accommodates various functions and services, becoming a dynamic hub for diverse urban activities. Positioned strategically as the geographical center of the city, the urban core holds a central and pivotal location.

Embodying a "work and live" culture, it seamlessly integrates professional and residential spaces, fostering a vibrant urban lifestyle. Enriched with cultural and heritage assets, the urban core stands as a repository of the community's identity. Functioning as a bustling hub for trade and commerce, the urban core drives economic activities and business endeavours.

Marked by mixed land-use, the urban core accommodates a diverse range of functions and purposes, contributing to its dynamic and multifaceted character. Characterized by high population density, it emerges as a lively and densely populated urban space.

4. BUILT HERITAGE

Heritage typically refers to the tangible inheritance passed down from ancestors, encompassing customs, conventions, practices, and traditions transmitted from one generation to the next. There exists a close and intricate connection between heritage and sustainable development. Sustainable development goals consistently contribute to the international efforts in heritage conservation. As sustainable development gains momentum, it plays a crucial role in fostering awareness about the preservation of heritage, particularly in upholding cultural identities, with a special focus on indigenous nations.

4.1 CHARACTERISTICS OF BUILT HERITAGE

Built heritage means a structure or structure of historical, cultural, architectural or social importance. The characteristics of the built heritage include:

1. **Architectural Design:** Built heritage often features distinctive architectural designs that reflect the styles and techniques prevalent during the time of construction.
2. **Historical Significance:** These structures have historical importance, representing specific periods, events, or cultural movements.
3. **Cultural Identity:** Built heritage contributes to the identity of a community or region, reflecting its cultural heritage and traditions.
4. **Artistic Elements:** Many built heritage sites showcase artistic elements, including sculptures, paintings, or intricate detailing, showcasing the craftsmanship of the era.
5. **Materials Used:** The choice of materials in built heritage, such as stone, wood, or specific construction techniques, often reflects the technological capabilities of the time.

6. **Functional Purpose:** Built heritage may have served specific functions in the past, such as religious, residential, or commercial purposes, contributing to the overall character of the area.
7. **Age and Authenticity:** The age of built heritage adds to its value, and maintaining authenticity through preservation efforts is crucial for retaining historical accuracy.
8. **Community Value:** Many built heritage sites hold sentimental value for local communities, serving as gathering places or landmarks that residents identify with.
9. **Preservation Challenges:** Built heritage often faces preservation challenges due to factors like weathering, urban development, or neglect, requiring conservation efforts to maintain their integrity.
10. **Touristic Appeal:** Some built heritage sites become popular tourist attractions, drawing visitors interested in history, culture, and architecture.

5. IMPACT OF URBANIZATION ON CITY CENTERS

Urbanization has significant impacts on city centers, leading to a variety of changes and transformations. Below are some noteworthy trends and outcomes linked with urbanization within city centers:

1. **Population Growth:** Urbanization often leads to a substantial increase in population density within city centers. The influx of people seeking employment, education, and better living conditions contributes to the growth and diversification of urban populations.
2. **Infrastructure Development:** Rapid urbanization necessitates the development and expansion of infrastructure in city centers. This includes transportation networks, utilities, and public amenities to accommodate the rising population.
3. **Vertical Growth:** City centers experience vertical growth as demand for space intensifies. High-rise buildings and skyscrapers become more prevalent, maximizing the use of available land and addressing the challenges of limited space.
4. **Increased Commercial Activity:** Urbanization tends to stimulate economic activities in city centers, leading to the growth of commercial districts. This can include the establishment of business centers, shopping districts, and entertainment hubs.
5. **Housing Challenges:** The demand for housing in city centers often outstrips the supply, resulting in increased property prices and challenges in providing affordable housing. This can lead to issues of housing affordability and homelessness.
6. **Cultural and Social Changes:** City centers become hubs for cultural exchange and social interactions. The diversity of people, businesses, and activities contributes to a dynamic urban culture, but it may also lead to social challenges and gentrification.
7. **Environmental Impact:** The concentration of people and activities in city centers can have significant environmental implications, including increased traffic congestion, pollution, and challenges in waste management.



Concentration of buildings with no green cover



High vehicular congestion leading to emission of CO₂ into the air.

8. Gentrification: Urbanization may lead to gentrification, where previously rundown or neglected areas of city centers are revitalized. While this can improve living conditions, it may also displace existing communities and alter the cultural fabric of the area.
9. Technological Integration: City centers often serve as hubs for technological advancements. Smart city initiatives, digital infrastructure, and the integration of technology into various aspects of urban life become more pronounced.
10. Cultural Heritage Preservation: As city centers undergo development, there is a growing awareness of the need to preserve and protect cultural heritage. Efforts are made to balance modernization with the conservation of historical landmarks and structures.



Development and urbanization leading to changing settlement context

5.1.EFFECT OF URBANIZATION ON HISTORIC SITES IN CITY CENTRES

Urbanization in city centers can bring both positive and negative effects on historic sites. On the positive side, there's often increased attention and resources directed toward preserving and restoring these sites due to growing awareness of their cultural and economic value. Additionally, urbanization can attract more tourists to city centers, contributing to the recognition and economic sustainability of historic sites. The adaptive reuse of historic buildings for contemporary purposes is also encouraged, giving new life to these structures.

However, negative impacts include physical threats from construction activities, potential damage, or destruction. Rising property values may lead to the demolition of historic structures for more lucrative developments, resulting in the loss of heritage sites. Urbanization-driven gentrification can alter the socioeconomic landscape and displace communities with historical ties. Moreover, increased traffic and pollution associated with urbanization may negatively affect the physical integrity and aesthetics of historic sites.



Char Minar with urbanised congested areas



Jami Masjid with the current developed Urban context

5.2.DETRIMENTAL INFLUENCES ON HISTORICAL STRUCTURES

Historic monuments can undergo deterioration due to a variety of factors, which can be categorized as follows:

1. Natural Disasters: Instant Natural Factors: Events like earthquakes, lightning, fires, floods, and ground movement can cause immediate damage.
2. Gradual Natural Factors: Long-term impacts from wind, sunlight, moisture changes, temperature variations, acid rain, and air pollutants contribute to gradual deterioration.
3. Chemical and Electrochemical Factors: Natural chemical reactions and electrochemical processes, often accelerated by environmental conditions, can lead to the decay of materials in historic monuments.
4. Biological and Microbiological Factors: Plant growth, microbial activity, and biological agents can contribute to the physical and chemical breakdown of monument materials.
5. Physical Factors: Wind, sunlight, and temperature changes can lead to erosion, weathering, and structural fatigue over time.
6. Complex Factors: Interactions between different elements, including a combination of natural, chemical, and physical factors, can result in complex deterioration patterns.
7. Social Factors: Human activities, such as exploitation, neglect, mismanagement, and vandalism, can significantly impact the condition of historic monuments, particularly in societies facing economic challenges or social unrest.

8. Inherent and Internal Factors: Weaknesses in construction techniques or a lack of knowledge about the local climate and available materials can contribute to the inherent deterioration of historic structures.

6.CASE STUDY:CONSERVATION OF URBAN FABRIC OF KANCHIPURAM

6.1INTRODUCTION



Geographical location of Kanchipuram

Kanchipuram, renowned as one of the seven holiest cities in India, is witnessing a decline in its cultural and historical significance. While the town showcases a multitude of values and the distinctive Dravidian architectural style evident in its temples, it has undergone significant transformations. The encroachment of urbanization and the influence of metropolitan trends have gradually eroded the cultural fabric of the city. Despite these challenges, Kanchipuram remains home to several iconic temples, such as the Kailashanathar Temple, Vaikunta Perumal Temple, Varadharaja Perumal Temple, Ekambareswarar Temple, Kamakshi Temple, Ulagalanda Perumal Temple, and Kachabeswarar Temple. Notably, Kanchipuram has retained its authenticity and continues to boast a rich cultural heritage. The city's planning legacy, extending over 2500 years, stands as a testament to its resilience, featuring well-designed institutional buildings, temples, tanks, and a history influenced by rulers from various dynasties.



Kailasanatha temple, Kanchipuram

Town planning Patrick Geddes during his visit in 1914-15 said “Here is not simply a city made monumental by great temples and rich and varied innumerable minor ones, what rejoices me is to find the realization of an exceptionally well grouped and comprehensive town plan, and this upon a scale of spacious dignity combined with individual and artistic freedom, which cannot name any summing parallel, whether in India or else where, from St. Andrews to Durham, Lincoln to York, Oxford to Salisbury, Aix-la-Chapelle to Cologne, one finds too readily the contrast of deterioration, even to slum and squalor which is comparatively absent here”.

Studies have indicated that Kanchipuram has evolved a distinctive pattern in comparison to other temple towns in the southern region. Notable features include broader Mada Veedi designed to accommodate temple cars, the arrangement of Brahmin settlements along temple streets, the provision of open verandas in front of houses for the comfort of travelers, and the incorporation of central courtyards to facilitate the lighting of interior spaces. These unique characteristics contribute to the town's architectural and urban planning identity, setting it apart in the cultural landscape of temple towns in the southern part of India.

6.2 CURRENT DEVELOPMENTS IN KANCHIPURAM

Following Independence, the town's geometry has undergone transformations, marked by expansion and an influx of migrants. Kanchipuram's emergence as an industrial hub in Tamil Nadu poses a considerable challenge in preserving its cultural heritage.

The city has experienced a decline in the quality of its indigenous culture and settlements around the temple core due to rapid development. The unique characteristics and renowned heritage structures that have defined the city's core for decades are losing their significance and facing neglect. Additionally, heritage zones lack proper demarcation. Commercial development along roads is negatively impacting the city's heritage value and contributing to haphazard growth at the planning level. These trends highlight the challenges Kanchipuram faces in balancing urban development with the preservation of its rich cultural and historical identity.

6.3 CONSERVATION OF URBAN FABRIC OF KANCHIPURAM

The town is being considered within the framework of the City Hriday Plan (Heritage City Development & Augmentation Yojana). The Town and Country Planning department of the Government of Tamil Nadu, in

collaboration with the Archaeological Survey of India, has devised heritage plans aimed at identifying and preserving heritage buildings. Although there are initiatives to conserve specific sections of the heritage, there is a notable absence of a comprehensive perspective on conservation management. The Department of Archaeology in Kanchi District has identified 11 temples for conservation efforts. Regulations have been implemented to assess the heights of newly constructed structures, with sanctioned funds allocated for planned management. The heritage plan also encompasses provisions for tourist facilities and associated infrastructure. Furthermore, there are initiatives to draft development plans that incorporate an inventory of the city's natural elements, cultural living heritage, and built heritage, including temple tanks, drainage systems, and other water bodies.

The delineation of heritage zones in Kanchipuram is undertaken as a strategic measure to conserve and safeguard the urban fabric of the city. This initiative aims to identify, protect, and manage specific areas that hold cultural, historical, and architectural significance, ensuring the preservation of Kanchipuram's unique identity and heritage.

6.4 DELINEATION OF HERITAGE ZONES

the delineation of heritage zones is a multifaceted strategy aimed at preserving, managing, and enhancing the cultural and historical legacy of a given area.

The delineation of heritage zones involves the demarcation and identification of specific areas with cultural, historical, and architectural significance. This strategic process serves as a crucial tool for the preservation and management of these valued assets.

By clearly defining the boundaries of heritage zones, authorities establish a framework for targeted conservation efforts, ensuring the protection of culturally significant structures, sites, and landscapes. This intentional approach aims to maintain the unique identity and character of a given region. Furthermore, delineating heritage zones provides a foundation for sustainable urban planning, guiding development to harmonize with the existing historical context and preventing haphazard growth that could compromise the integrity of cultural assets. The process often involves community engagement, fostering a sense of ownership and pride among residents, and encouraging their active participation in the conservation of their cultural heritage.

Legal protections established within delineated heritage zones help prevent unauthorized alterations or inappropriate developments, ensuring the long-term safeguarding of these valuable areas. Additionally, heritage zones contribute to cultural tourism and economic benefits, attracting visitors and supporting the local economy through increased spending on accommodations, dining, and local products.

6.5 DETERMINANTS OF HERITAGE ZONE DELINEATION WITHIN THE PRECINCT

Considerations for delineating Heritage Zones include various significant elements within the precinct:

1. Temples: Notable temples such as Ekambareswarar Temple, Kachapeshwar Temple, Surakeshwar Temple, Vellai Pillayar Temple, Pandavaperumal Temple, and Hanuman Temple are integral to the heritage fabric.

2. Shrines, Mandapams, Madams, and Mutts: The precinct houses important cultural and religious structures, including the Kanchi Mutt associated with the Kamatchi Amman Temple.
3. Architectural Assets: Prominent heritage assets like the Thousand Pillared Hall and the pillared mandapas on Sannathi Street contribute to the historical significance of the area.
4. Residences/Mixed-Use Buildings: Vernacular-style residences and mixed-use buildings, remnants of past architectural styles, are prevalent throughout the chosen precincts.
5. Historic Water Systems: Features like Mandapam Kulam, Mangala Theertham, and other smaller Kulams and Kuttais are integral parts of the city's historic water system.
6. Intangible Heritage: The precinct holds intangible heritage assets, particularly the idol-making industry, which has provided additional income options for locals for over 400 years. This tradition is deeply associated with the area.
7. Craftsmanship: Thriving crafts in the area include the production of large umbrellas known as Kovil Kodai, representing another vibrant aspect of the local cultural heritage.

The influx of vehicular movement exacerbates congestion issues, primarily stemming from paths and roads that were not originally planned to accommodate automobiles. This highlights the need for strategic urban planning that addresses the challenges posed by increased vehicular traffic.

Recognizing the need for improvement, revitalization plans are essential, focusing on enhancing basic physical infrastructure. This may involve upgrading roads, utilities, and other essential amenities to alleviate the strain on the existing urban fabric.

To mitigate congestion and promote sustainable urban living, there is a notable emphasis on pedestrianization initiatives. Encouraging cycling as an alternative mode of transport further aligns with efforts to create more environmentally friendly and people-centric urban spaces.

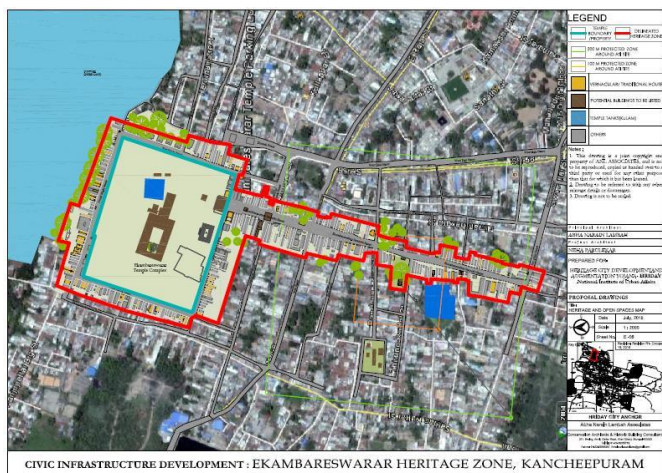
6.7 SUSTAINABLE URBANIZATION STRATEGIES

6.7.1 Mitigation Measures:

1. Heritage Zoning: Implementation of heritage zoning regulations is proposed to protect historic sites. This involves restricting certain types of development and ensuring that new construction aligns with the historic character of the area.
2. Public Awareness: Initiatives to engage the public in heritage conservation efforts are crucial. Fostering awareness about the importance of historic sites can garner support for their preservation.
3. Collaborative Planning: Involving various stakeholders, including communities, local authorities, and developers, in collaborative planning processes can strike a balance between urbanization and heritage conservation.

6.7.2 Sustainable Urban Development Initiatives:

1. Increasing Pedestrianization and Cycling: Aiming to reduce vehicular congestion and pollution, there is a proposal to enhance pedestrianization and encourage cycling as sustainable modes of transport within the urban landscape.
2. Increasing Green Cover and Open Space: To counter the Urban Heat Island Effect, a sustainable approach involves increasing green cover and open spaces. This not only contributes to environmental conservation but also enhances the overall well-being of the urban population.
3. Promoting Public Transport: Encouraging the use of public transport is identified as a sustainable solution. This not only reduces individual carbon footprints but also addresses issues related to vehicular congestion and pollution, fostering a more sustainable urban transportation system.

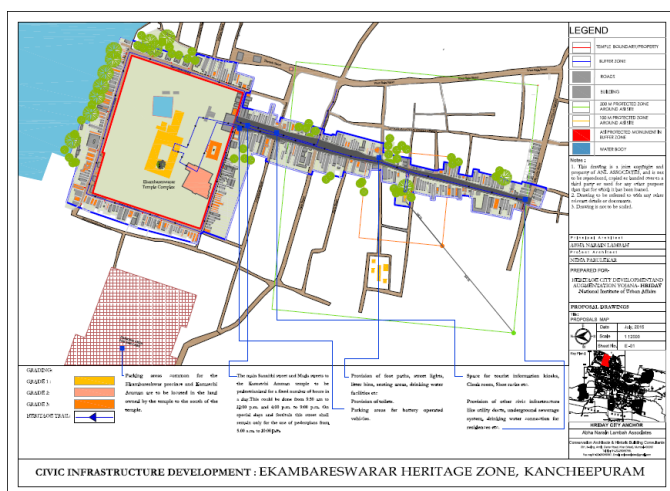


Several aspects are considered in the delineation of heritage zones, encompassing historical evidence, local livelihood dependencies, settlement patterns, footfall, congestion levels, building height and use, accessibility, disaster management, and the physical conditions of the surroundings. These factors collectively contribute to the comprehensive understanding and preservation of the cultural and historical fabric within the designated heritage zones.

6.6 KEY OBSERVATIONS FROM THE CASE STUDY

The cities under consideration exhibit a rich historic background, yet the built heritage and cultural aspects face neglect due to the swift pace of urbanization. Consequently, there is a pressing need for revitalization efforts to preserve and promote these invaluable assets.

The urban core of these cities has become excessively congested, rendering it challenging to accommodate further development. This congestion is a direct consequence of unplanned and unregulated growth within the core areas.



Creation of new infrastructure in the proposed Heritage Zone

6.7.3 Civic infrastructure - recommendations for traffic planning and pedestrianization:

To tackle traffic congestion effectively, the following recommendations are proposed:

1. Decongestion on Approach Roads:
 - Propose the pedestrianization of approach roads during specific time slots, such as 5:30 am to 12 pm and 4:00 pm to 9:00 pm.
 - Advocate for the use of non-polluting battery-operated vehicles and cycle rickshaws to enhance accessibility.
 - Designate parking spaces for buses and visitor vehicles to the south of the temple.
2. Pedestrianizing Mada Streets: Identify Mada Streets, facing heavy tourist and vehicular traffic near the temple boundary wall, for pedestrianization during peak hours.
3. Addressing Parking Challenges:
 - Recognize that the delineated Heritage Zone experiences congestion with limited open space and vacant plots for parking.
 - Suggest allocating parking spaces for buses and visitor vehicles to the west of the temple, conveniently accessible via Lingappan Street. These recommendations aim to enhance traffic flow, reduce congestion, and ensure efficient parking solutions within the Heritage Zone.
4. Utility Ducts:
 - The provision of utility ducts along the immediate surroundings of the temple aims to address issues related to haphazard cabling around the temple.
 - These utility ducts may be strategically laid to carry power and telephone lines on either side of the road along the Mada streets.
5. Drainage System: Implementing a drainage system with surface drains along the main streets is essential for effective water management within the precinct.

6. Solid Waste Management: Dustbins have been sparsely placed along the periphery of the temple to facilitate solid waste management.

7. Street Lighting: Street lights should be strategically placed at intervals of about 30 meters from one another to ensure adequate illumination.

8. Shops and Hawkers:

- Recognizing the reliance of locals on hawking for their livelihood, it is proposed to re-locate many of these hawkers to strategic areas, considering their stalls abutting the temple wall.
- Establishing a designated hawking/shopping zone along the main street during proposed pedestrianization hours can accommodate these commercial activities without hindering their business.

9. Pavements:

- Implementing pavements along all main roads and vehicular paths is crucial for pedestrian safety.
- Specifically, the Main Street and the stretch along the State highway within the precinct, facing high vehicular movement, should be equipped with pavements.
- Developing pedestrian paths throughout green belts provides a safe and healthy means for pilgrims and residents to walk or cycle to their destination.
- Walkways with trees along the proposed walk to the temple and all exits can significantly enhance the overall visitor experience.

6.7.4 Visitor Facilities:

1. Provision of Public Toilets and Water Stations: Public toilets are proposed to be strategically designed and placed at regular intervals throughout the Delineated Heritage Zone (DHZ). This ensures convenient and accessible facilities for visitors.
2. Provision of Information Kiosk and Help Desk: Establishing information kiosks and help desks aims to enhance the visitor experience. These facilities provide valuable information, guidance, and assistance to visitors, contributing to a more informed and enjoyable exploration of the heritage zone.
3. Provision of Information Kiosks: Information kiosks serve as valuable resources for international and non-local visitors eager to delve into the history of the temple and the city. These kiosks provide detailed insights, historical context, and other relevant information, enhancing the overall experience of exploring the heritage site.
4. Shoe Racks and Cloak Room: Recognizing the practical needs of visitors, the provision of shoe racks and a cloakroom is suggested. This facilitates a convenient and organized arrangement for visitors to store their shoes and personal belongings while exploring the temple and its surroundings.

7.CONCLUSION

In conclusion, the complex interplay among sustainability, urbanization, and heritage conservation stands as a testament to the evolving dynamics of contemporary urban landscapes. Kanchipuram, with its rich cultural legacy and architectural treasures, encapsulates the delicate challenge of preserving heritage in the face of rapid urbanization. The delineation of heritage zones in Kanchipuram serves as a positive step forward, illustrating a strategic commitment to safeguarding temples, architectural assets, and intangible heritage. This proactive approach not only acknowledges the historical significance but also fosters community involvement, aligning with the principles of sustainable urban development.

The preservation of built heritage emerges not merely as an architectural endeavor but as a vital thread in the fabric of community identity. Characteristics such as architectural design, historical importance, and cultural symbolism weave a narrative that connects the past with the present. As city centers undergo transformation, the positive impacts of urbanization, like increased tourism and adaptive reuse, must be harnessed while navigating the challenges of physical threats and gentrification. Ultimately, a holistic and collaborative approach that integrates sustainable urbanization strategies with heritage conservation efforts is essential to ensure the resilience and longevity of our cultural legacy amidst the ever-changing urban landscape.

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