PLANNING STRATEGIES FOR MUZIRIS HERITAGE SITE: HISTORIC URBAN LANDSCAPE (HUL) APPROACH

THESIS REPORT

Submitted by

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M. Plan (2021-2023) BATCH

to

the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Post Graduate Degree

in

Urban Planning

DEPARTMENT OF ARCHITECTURE
THANGAL KUNJU MUSALIAR COLLEGE OF ENGINEERING
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DECLARATION

I hereby declare that the Project entitled **"Planning strategies for Muziris Hritage Site: Historic Urban Landsape (HUL) approach"** is a bonafide record of mine carried out under the supervision of **Dr Santhosh Kumar K.G,** Associate Professor of Department of Architecture. I declare that the work reported herein does not form any part of any other project report or thesis on the basis of which a degree or award was conferred on an earlier occasion to any other candidate. This study is done as a part of the third semester M. Plan (Urban Planning), Post Graduate Degree Course in the Department of Architecture, Thangal Kunju Musaliar College of Engineering, Kollam.

Place: Kollam

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CERTIFICATE

This is to certify that the Thesis Report **"Planning strategies for Muziris Heritage Site: Historic Urban Landscape(HUL) approach"** submitted by **AJIT H S** (TKM21MUP001) of MUP (2021-2023) Batch, in fulfilment of the requirements for the fourth-semester final examination in PL6401–Planning Thesis, under the **APJ Abdul Kalam Technological University** is a bonafide work carried out under our guidance and supervision.

THESIS GUIDE   **HEAD OF THE DEPARTMENT**

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INTERNAL EXAMINER   **EXTERNAL EXAMINER**

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ABSTRACT

This study aims to highlight the importance of HUL approach in the current urban scenario so that heritage conservation could be integrated as a part of overall development of the region. HUL approach is a comprehensive framework designed to manage and safeguard the cultural heritage of historic cities and urban areas. It recognizes that urban heritage is not limited to individual buildings or sites but encompasses the entire urban fabric, including its physical, social, economic, and cultural dimensions. The HUL approach aims to promote a holistic understanding of urban heritage, encouraging integrated and sustainable urban development. It was developed in response to the challenges faced by historic cities in the face of rapid urbanization, globalization, and modernization. These pressures often lead to the destruction or neglect of historic urban areas, resulting in the loss of their unique character, identity, and sense of place. The HUL approach seeks to address these challenges by shifting the focus from a purely preservation-based approach to a more inclusive and participatory one that considers the dynamic nature of urban areas.

In this study, we will put a special emphasis on the various conservation strategies used over time. Different facets of heritage management that are pertinent to urban heritage sites that are under pressure to expand owing to development will be studied and analyzed. The goal is to develop a plan for our study using the equipment needed for good heritage management. Our study area is a historical and archaeologically significant heritage site called as Muziris Heritage Site. The site is already undertaking a conservation process that is being overseen by the several Kerala government authorities. The ultimate purpose of this project is to evaluate and compare the current conservation process with the best practices like HUL and to propose recommendations that fit into a larger framework for urban development.

Keywords: Historic Urban Landscape (HUL), Muziris Heritage Site, Heritage Management, Urban Conservation

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CHAPTER 1 INTRODUCTION

1.1 BACKGROUND STUDY

Currently, more than 50% of the world's population resides in cities or other metropolitan areas. Cities play a significant part in the larger international development framework in today's globalizing and urbanizing globe since so many metropolises and intermediate cities are growing at a never-before-seen rate. By 2050, 70% of the world's population is expected to reside in cities due to exponential population increase and urbanization. (UN, 2015)

Since 2011, the HUL strategy has been effectively implemented in several cities all over the world and has been incorporated into fresh, worldwide strategies for sustainable cities. However, this is only the beginning. The integration of HUL into interdisciplinary practice and national/regional frameworks, as well as our understanding of its use and the development of cooperative networks for global cities, are all aspects of its future.

1.2 NEED FOR THE STUDY

Cities are hubs of business and diverse industries, as well as center of knowledge and cultural diversity. They serve as incubators for innovation and change, illuminating the manner in which societies are changing. Cities are a result of both natural and human evolution in numerous ways. However, increased urbanization and unsustainable development practices have had a significant negative impact on numerous cities all over the world. Urban quality has declined as a result of poorly planned and carried out urban growth. A few of the problems facing an increasing number of cities around the world include population growth, excessive building density, standardized and monotonous modern developments, a loss of public spaces and facilities, poor infrastructure, social isolation, urban poverty, an unsustainable use of resources, and climate change.

From a systematic, cyclical, and synergistic approach, the Historic Urban Landscape (HUL) idea merges tradition and modernization, the past and present, and the present and future, giving heritage protection a fresh perspective. The HUL approach places a strong emphasis on paying attention to the connections and interdependences between the many parts and the total. It starts by outlining a multidimensional framework for thinking about urban initiatives. It displays a common cultural perspective based on the relational concept The relational principle is reflected in the capacity to investigate and understand complex systems while recognizing interdependences, interconnections, and connections even when they are implicit and assuming a multidimensional point of view. It is a way of looking at the world that is all-encompassing and holistic, incorporating rather than excluding things like economic, aesthetic, and fairness principles. The difficulties that older towns

and urban regions encounter in the modern world give rise to the requirement for the HUL strategy. Rapid urbanization, globalization, population expansion, and development pressures are some of these issues, and they frequently endanger the sustainability and preservation of urban heritage. By offering a thorough framework that acknowledges the complexity and dynamic nature of urban heritage, the HUL method responds to these needs

1.4 RESEARCH QUESTION

Through this study we are aiming to understand the integration of heritage sites in the spatial development of the region. Therefore the important research questions are-

1. What is the importance of conservation strategies in planning policies ?

2. How the process of revitalization could positively influence the spatial transformation?

3. How the heritage identity could become a driver of economic growth and development of the region?

1.5 AIM

To formulate planning strategies) for Muziris Heritage Site through Historic Urban Landscape (HUL .

1.6 OBJECTIVES

- To study and establish the importance of different conservation approaches like HUL in heritage management.
- To assess the existing condition of the heritage area and identify the areas of intervention.
- To analyze any existing proposals in the study area that could supplement the conservation process.
- To find out the possible planning interventions through case studies.
- To formulate planning strategies for study area in wider framework of urban development.

1.7 METHODOLOGY
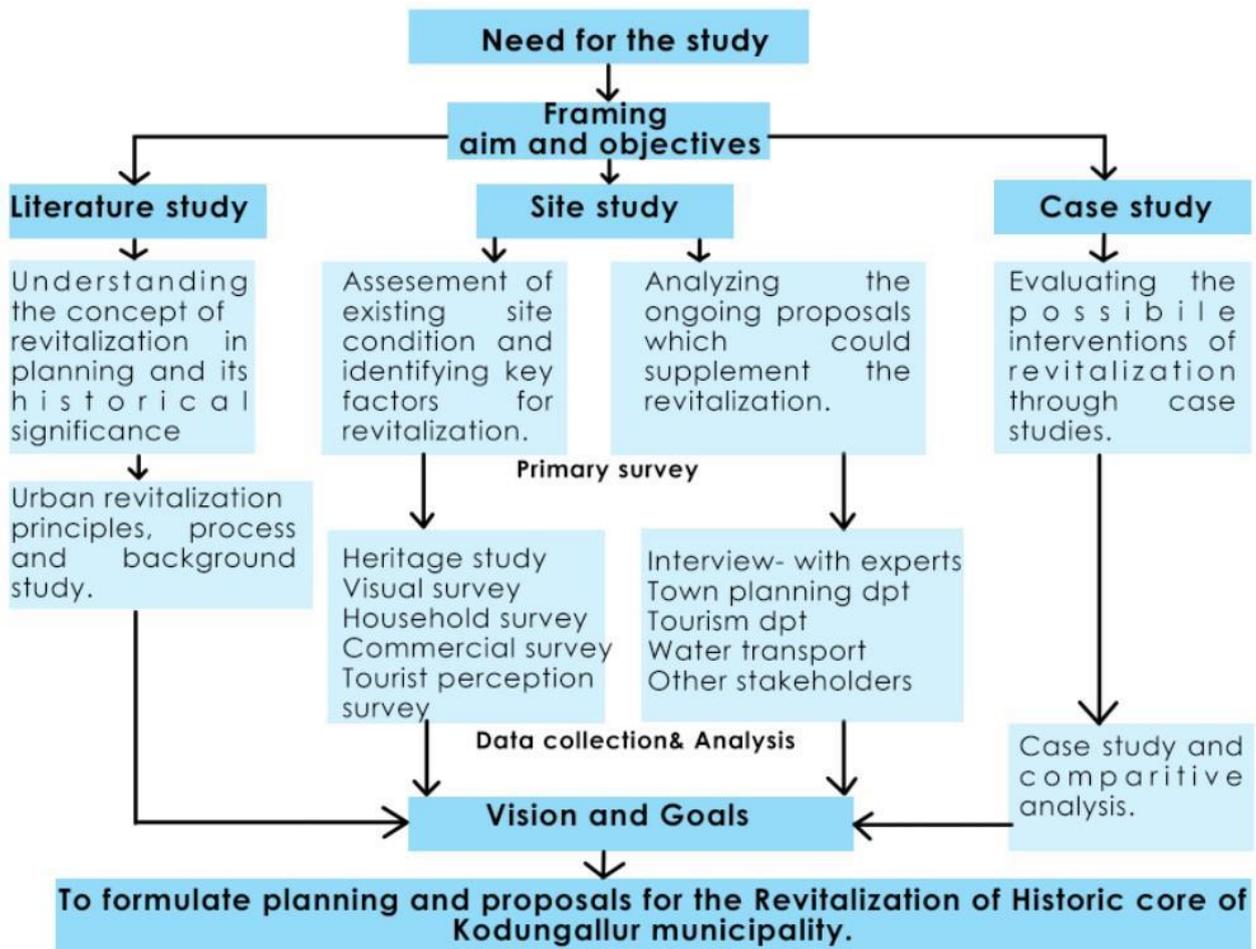
Table 1 Methodology of the study

1.8 SCOPE AND LIMITATIONS

- Scope of this project is to study the possible planning interventions in revitalizing the urban heritage.

- The study could benefit the tourism sector in providing guidance for proper planning and development of Muziris Heritage Site.

- The study could help in providing ways to develop a heritage site which promote proper spatial management without compromising its heritage character.

- The study is limited to regions with of heritage importance.

1.9 STUDY AREA
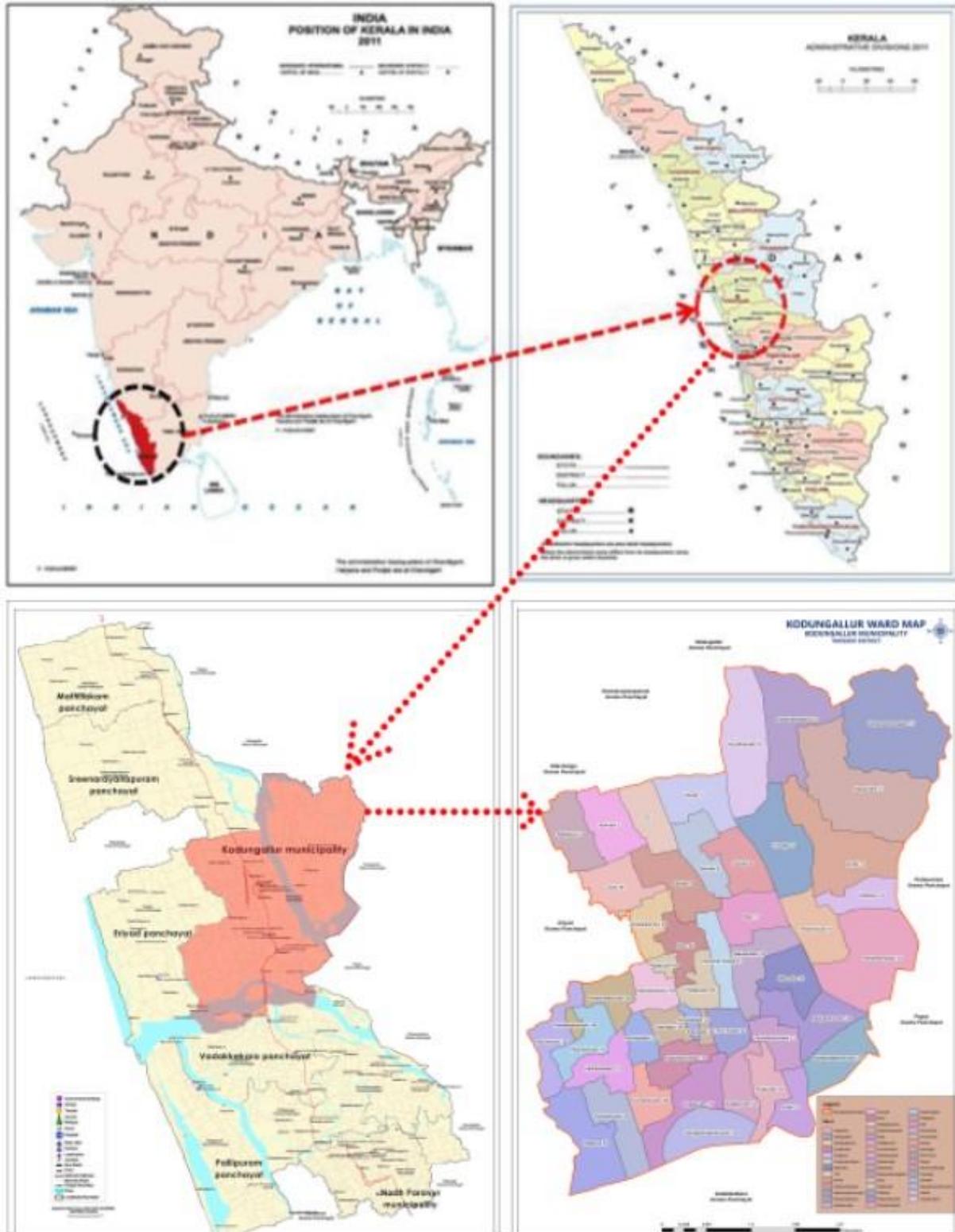
Figure 1 Location of study area

CHAPTER 2 LITERATURE STUDY

2.1 UN RECOMMENDATION ON HISTORIC URBAN LANDSCAPE

HUL approach came into action on 2011 through UNESCO recommendation on Historic Urban Landscape. The Historic Urban Landscape (HUL) Approach integrates various fields of study. In order to influence change in historic cities, it tackles the inclusive management of legacy resources in dynamic and continually changing surroundings. It is based on the awareness and identification of a layering and interconnectedness of natural and cultural elements that are present in every city, as well as tangible and intangible, global and local values. The HUL approach states that in order to manage and develop the city as a whole, these values should be used as a starting point. The Heritage management of today's legacy is substantially wider, which has increased the number of players or stakeholders involved in its management. When a heritage site's boundaries included primarily open-to-the-public structures or monuments, the property manager might have a good amount of latitude. This is not the case right now. Even if the heritage site is publicly owned and administered, the site management will still need to work with the pertinent parties and authorities. The fact that it supports the tourism sector makes this obvious. A place gains a sense of identity that is extremely beneficial to the industry when it is named a global historic site. When we consider the number of global historic sites that UNESCO adds each year, we can understand how crucial branding is for a location and how every nation, including India, is racing to add ever-more cultural monuments to this list. At the 44th session of the World Heritage Committee in 2021, India added two more heritage sites to the list, increasing the total to 40.Making a city appear creative requires public policies that support the creation of habitats for the creative class and the display of creative representations of the city.

2.2 HUL APPROACH IN ACTION

As an approach, it considers cultural diversity and creativity as key assets for human, social and economic development. It is an alternative method to cutting the city up through 'zoning' into separate conservation areas, which thereby become ghettos of historic preservation. To these ends, UNESCO works with cities to support the

integration of environmental, social and cultural concerns into the planning, design and implementation of urban development.

The various approaches are as follows:

• Undertake a full assessment of the city's natural, cultural and human resources.

• Use participatory planning and stakeholder consultations to decide on conservation aims and actions.

• Assess the vulnerability of urban heritage to socio-economic pressures and impacts of climate change.

• Integrate urban heritage values and their vulnerability status into a wider framework of city development.

• Prioritize policies and actions for conservation and development, including good stewardship.

• Establish the appropriate (public-private) partnerships and local management frameworks.

• Develop mechanisms for the coordination of the various activities between different actors.

Figure 2 Timeline showing the development of HUL concept

In many cities this approach has had very positive and encouraging results. For each local situation a balance is reached between preservation and protection of urban heritage, economic development, functionality and livability of a city. Thus the needs of current inhabitants are responded to while sustainably enhancing the city's natural and cultural resources for future generations. The different approaches – heritage, economic, environmental and sociocultural – do not conflict; they are complementary and their long-term success is dependent on them being linked together.

The successful management of urban heritage in complex environments demands a robust and continually evolving toolkit. It should include a range of interdisciplinary and innovative tools, which can be organized into four different categories, each of which will be discussed by presenting a list of established approaches, practices and instruments. It should be emphasized that for urban heritage management to succeed, the policies and actions in these four categories need to be adapted for local application and addressed simultaneously, as they are interdependent.

Community engagement tools should empower a diverse cross-section of stakeholders to identify key values in their urban areas, develop visions, set goals, and agree on actions to safeguard their heritage and promote sustainable development. These tools should facilitate intercultural dialogue by learning from communities about their histories, traditions, values, needs and aspirations and by facilitating mediation and negotiation between conflicting interests and groups.

Knowledge and Planning tools should help protect the integrity and authenticity of the attributes of urban heritage. They should permit the recognition of cultural significance and diversity, and provide for the monitoring and management of change to improve the quality of life and urban space. Consideration should be given to the mapping of cultural and natural features, while heritage, social and environmental impact assessments should be used to support sustainability and continuity in planning and design.

Regulatory systems could include special ordinances, acts or decrees to manage tangible and intangible components of the urban heritage, including their social and environmental values. Traditional and customary systems should be recognised and reinforced as necessary.

Financial tools should aim to improve urban areas while safeguarding their heritage values. They should aim to build capacity and support innovative income-generating development rooted in tradition. In addition to government and global funds from international agencies, financial tools should be deployed to promote private investment at the local level. Micro-credit and other flexible financing mechanisms to support local enterprise, as well as a variety of models of public-private partnerships, are also central to making the HUL approach financially sustainable.

Figure 3 Different toolkits proposed by HUL

2.3ASSESSING VALUES IN CONSERVATION PLANNING

A methodological evaluation of the heritage values is challenging, full with obstacles. These issues are caused by things like the variety of heritage values (there are many different types of values (cultural, economic, political, aesthetic, and more), that values change over time and are strongly influenced by contextual factors (such as social forces, economic opportunities, and cultural trends), that these values occasionally clash, and that there are many different methodologies and tools for assessing the values (as used by a wide variety of disciplines and professions).

Values is most often used in one of two senses: first, as morals, principles, or other ideas that serve as guides to action (individual and collective); and second, in reference to the qualities and characteristics seen in things, in particular the positive characteristics (actual and potential).This literature is concerned directly with the second definition. The perspective taken here is an anthropological one, and it values the attempt to understand the full range of values and valuing processes attached to heritage— as opposed to the normative, art historical view common in the conservation field, which a priori privileges artistic and historical values over others.
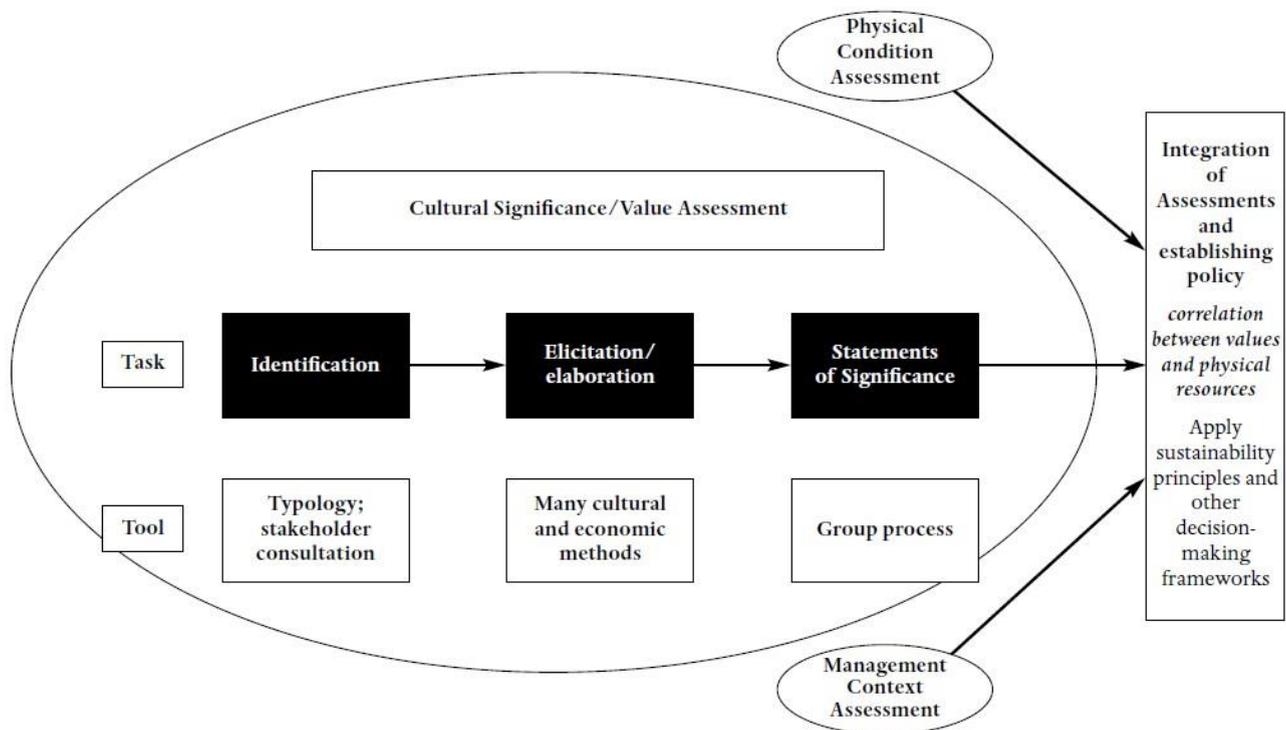
Figure 4 Criteria for value assessment

CHAPTER 3 CASE STUDIES

3.1CUENCA, ECUADOR

BACKGROUND

The designation as a World Cultural Heritage Site emphasizes the connection between Cuenca's historic center and its social and intangible elements. The layout and townscape serve as powerful symbols of Latin America's successful blending of various societies and cultures.

About Cuenca, this equilibrium, however, has been shifting over the past ten years as a result of the influence of the economic activity that tourism is producing. The Municipal Markets in Cuenca's historic district are a blatant example of how vital trade has historically been to the city. Along with Municipal Markets, a significant informal food, art, craft, and clothing market has grown on the streets.

Figure 5 Historical region of Cuenca

On the one side, they represent Cuenca's intangible legacy, while on the other, they serve as the city's principal tourist draw. The concentrated regions of economic activity in Cuenca are places like Simón Bolivar and Mariscal Lamar Street, the Mercados 10 de agosto and 9 de octubre, San Francisco, Flowers, or Rotary Square (intangible assets).

The population of Cuenca has become more diverse as tourism has grown there, impacting both locals and tourists. The influx of foreign retirees has boosted the economy, but it has also raised prices for restaurants, housing, rent, and healthcare, displacing locals and altering their identities. Intangible

aspects of HUL in Cuenca also include celebratory, ceremonial activities including religious celebrations, cuisine, handicrafts, and indigenous customs. The historic center's versatility creates layers from anthropology and economics as immaterial heritage's intangible assets. And finally, details gleaned from photographs of Cuenca and those offered by the locals regarding their individual assessments of the city's landscape's legacy.

HUL APPROACH

Due to the complexity of heritage understanding in the urban area, it has been considered necessary to build an interdisciplinary research team, including experts in environment, economy, anthropology, archaeology, geology, architecture and sociology. The phases include:

a) Phase 1:

Studies are focused on knowing very specific aspects of the city of Cuenca and its context. In this phase sixteen citizen workshops were very important to identify less obvious heritage values for researchers. Also, at a Visionary Conference event developed in May 2015, was an exchange about HUL experiences between the cities of Edinburgh, Zanzíbar, Ballarat and Cuenca. At this event, cities were able to identify the landscape quality objectives of Cuenca from the view of citizens, University of Cuenca researchers and technicians from the Municipality.

b) Phase 2:

Identification of Landscape Units based on the information learnt by cultural mapping. The objective was to study the characteristics that define each subzone and it allowed the research team to establish degrees of protection and to manage activities and uses.

c) Phase 3:

Elaboration of a landscape unit fact sheet and assessment. In this phase, all the information gathered is put in a model sheet where cultural values, heritage resources, recommendations and necessities of each landscape unit is identified. This information enabled the research team to define the intervention criteria and the landscape quality objectives which shape the Action Proposal of a Visionary Strategic Plan. This plan is used to manage the evolution of Cuenca, not only for the city center, but also for the rest of the city.

RESULTS

One of the most important results of the research project PUH_C has been the Agreement signed in 2015 between the Municipality of Cuenca, the University and WHITRAP. The main objective of this agreement is joint research about the HUL approach in Cuenca. Thanks to this agreement it was possible to develop the Visionary Conference event with the objective of raising awareness about the

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diverse and complex heritage values of Cuenca. The research team is managing an addendum to the Agreement to embed cooperation and information gathered from the research Project PUH_C The Protection Plan of the Historic Center of Cuenca. Finally, other results like papers, participation in international conferences and the publication of part of the project has been achieved thanks to Netherlands Funds-in-Trust at the World Heritage Centre for 2017.
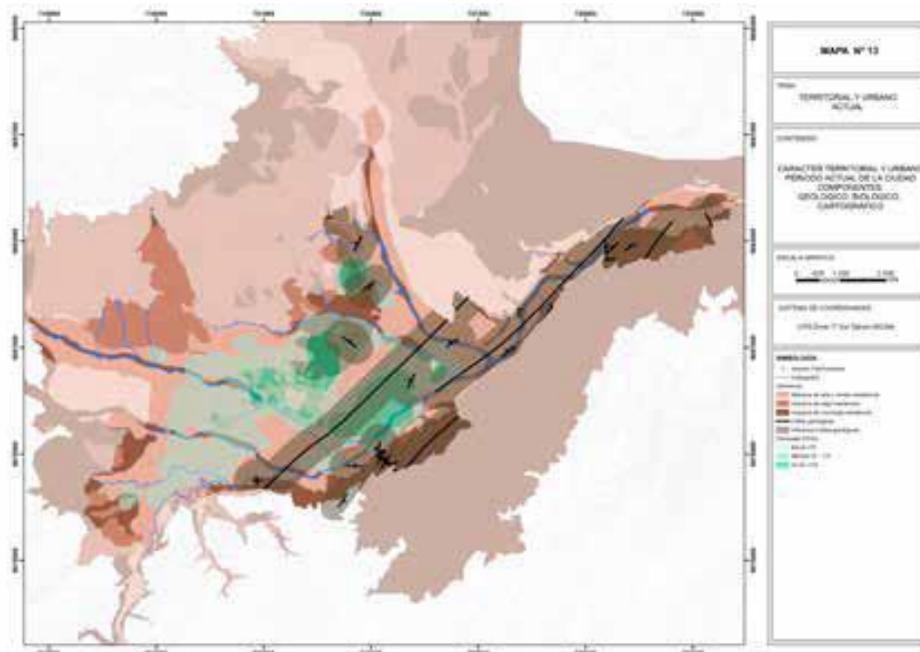

Figure 6 Map showing overlaying od heritage assets

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3.2 VARANASI, INDIA

BACKGROUND

Varanasi is located in the middle of the Ganga plains. Historically it was part of an important water trade route that connected Patliputra (Patna) to Taxila (presently in Pakistan). Varanasi became the microcosm of India's traditional classic culture: a city glorified by myth and sanctified by religion. From time immemorial, its temples, shrines and ashrams have attracted uncounted worshippers searching for the rays of the dawn shimmering across the Ganges, the temples and shrines along its banks stirring hymns and mantras, along with the fragrance of incense filling the air and the refreshing dip in the holy waters gently splashing at its ghats.

Archaeological evidence suggests that the city was populated from 800 BCE to 1000 BCE. Most of the remaining monuments, networks of residences, market streets, and secular buildings were constructed in the 18th and 19th centuries. The 82 ghats and palaces along its seven kilometers of riverbank were constructed by most princely states of India. Varanasi's intangible heritage and rich tapestry of music, arts, crafts and education, have given life and meaning to this material heritage for centuries. The products of its artful silk weaving have also been cherished as collectors' items worldwide. In its 3000 years of existence, Varanasi has experienced periods of growth, prosperity and change. In the last forty years, however, it has witnessed unprecedented urban growth pressures, which are irreversibly threatening the city's heritage and sociocultural landscape in a scale and intensity never faced before.

Figure 7 Archival image of Varanasi ghat

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MORPHOLOGY

Varanasi neighborhoods represent different periods in history. Presently, the city can be divided into three areas:

•The Old City located along the ghats, within 200m from the riverbank, is characterized by high densities and narrow streets lined with ancient houses on both sides. An area of high religious significance, the old city retains most of Varanasi's heritage and is the center of its cultural activities. It also has a high concentration of commercial activities, both formal and informal.

•The Central area bounds the Old City up to the National Highway 2 at the western and northern edge of the city. It is characterized by lower density and less congested streets with relatively wider roads as compared to the Old City. Development pressure is high and is likely to impose additional stress on the already strained existing infrastructure and Old City.

•The Peripheral area along the Trans Varuna has experienced a different development pattern (sprawl) than the rest of the city, driven by the construction of a new ring road in the north part of the city, and of connections to the national highway in the south.
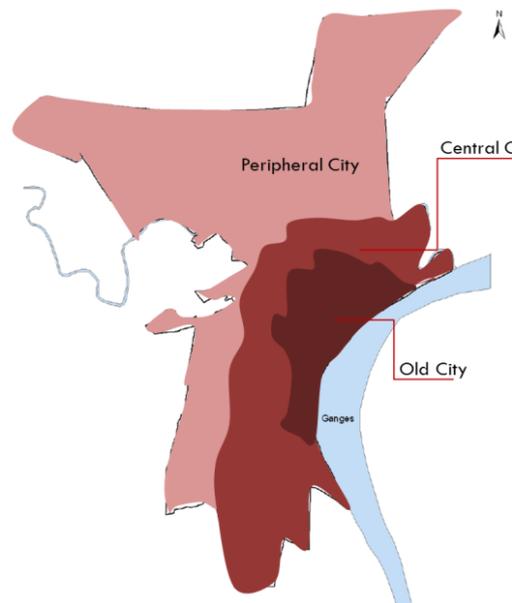

Figure 8 Morphology of Varanasi

PROFILE

The city population has undergone significant growth, with a seven-fold increase in the last century (from 157 people/ha in 2001 to 179 people/ha in 2011). It is ranked 32nd amongst India's 53 large cities. Its literacy rate was 79.39% in 2011.

Varanasi has 228 slums spread all over the city, housing about 57,055 households or 453,222 people

(37.69% of the total population). The slums cover approximately 1372.6 ha (about 17%) of the city. The average density in slum areas is 330 per ha, with 10 people per household as compared to the city's 7.3 average. Income of a slum household is about Rs.100-150 per day.

In 2011, the Varanasi work participation rate was 28.7%, a low rate compared to both state (32.5%) and national (39.9%) levels as per the census. Micro, small and household businesses account for 73.52% of workers, with 10.69% engaged in manufacturing and 6.80% in the tertiary sector. Spinning and weaving is the oldest and most important economic activity in Varanasi and employs more than half of the workers, followed by textiles. The city-wide mapping of Varanasi's tangible and intangible heritage was conducted in about six months. It was carried out in a participatory manner and involved not only the local authorities and communities, but also renowned scholars and experts from the city to ensure accuracy. It entailed desk reviews, a series of workshops, one-to-one interviews and reconnaissance visits to the ghats and other heritage areas of the city.
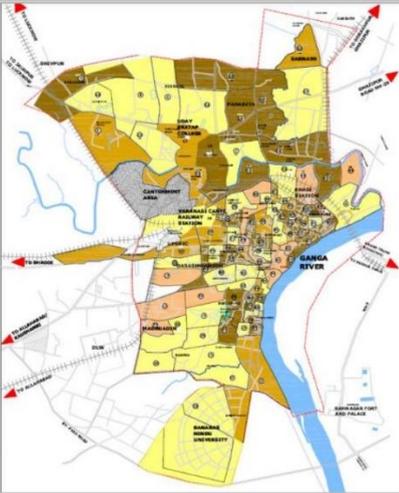
"To develop Varanasi as an "Economically Vibrant, Culturally Rich, and Livable Tourist City".

2001: 1,100,748
2011: 1,201,815

- Number of slums: 228
- Slum population: 453,000 (37.69%)
- Total BPL Population: 96,344
- Whether poverty survey, listing etc conducted: Yes. SUDA has conducted Surveys.

- People living in core city area: 14,000 (approx)
- List of heritage initiatives:
- Cultural resource mapping and inventory/listing
- Heritage zoning and formulation of regulations in the HDP
- Cleanliness drive and Preparation of CSP
- Preparation and implementation of management plan of Ghats

- 10 DPR's under BSUP prepared and 6 implemented by HUDCO AND BMTPC
- No project for heritage conservation under JNNURM
- VDA has prepared "Heritage Development Plan" for the historic area

Number of Project Sanctioned	Total Approved cost (in lakhs)	Total Amount released into project account till 19th Jan, 2012	% of amount utilised against total amount released
6	95,569.73	53,776,89 lakhs	74%

ACA Committed & Availed for States (of revised ACA Allocation):
BSUP- >80% & above of the budgeted ammount
IHSDP- >80% & above of the budgeted ammount
Internal earmarking of funds for the urban poor in Municipal budgets- Funds earmarked but not specified in %.

E-Governance setup	Shift to accrual based double entry accounting	Property Tax (85%coverage)	Property Tax (90% collection efficiency)	100% cost recovery (WS)	100% cost recovery (solid waste)	Internal Earmarking of Funds for Services to Urban Poor
3/Achieved	4/ Achieved	5/ Achieved	5/ Achieved	5	-	3/Achieved

Budget Supple	Account	TG & S to C&AG	C&AG Report toLeg	LFA Report to Leg	Ombuds	Electro transfer	SFC	PT by ULB's	PT Board	Benchmar king	Fire Plan
Process Initiated	Process Initiated	Process Initiated	Process Initiated	Process Initiated	Process Initiated	Process Initiated	Compiled	Compiled	Compi led	Process Initiated	Process Initiated

Table 2 Current profile of Varansi

HUL PROGRAM COMPONENTS

The HUL approach in Varanasi was classified into five major components which were:

- **Institutional Setup**-

The institutional setup entailed four main steps:

1.Governance arrangements for Inclusive Urban Revitalization Through institutional mapping, stakeholder analysis and consultations at national, state and city levels, and expert discussions, the Program supported the establishment of the governance arrangements for Inclusive Urban Revitalization. At the central level, the Program supported the establishment of an Inter-Ministerial Program Steering Committee, bringing together ministries involved in city planning and development as well as heritage conservation.

2. Technical criteria for pilot cities selection To inform learning and institutionalization of tested approaches, technical criteria were defined, including:

i)% of the city's population living in the heritage area; % of the city's population living in slums

ii)heritage relevance of the city

iii)level of state government's support to vision

iv)city-level entrepreneurship

v)socioeconomic status (poverty, stress)

vi)JnNURM performance in the city

vii)state government's leadership

3. Pilot Cities Selection Through the Program, a rapid appraisal of JnNURM 45 heritage cities was carried out; six cities shortlisted by Program Steering Committee. An initial profiling and technical rating of the shortlisted cities was prepared by the implementing agency and four cities were selected, including: Ajmer, Rajasthan (medium size city), Pushkar, Rajasthan (small size city) Varanasi, Uttar Pradesh (metropolitan city), Hyderabad, Andhra Pradesh (mega city). Pilot cities were also selected based on their geographic distribution and distinct sizes to ensure the Program captured India's diverse urban context.

4. Heritage Cells at city level

The selected ULBs were mobilized by the respective state Urban Development Departments to coordinate the Program activities. The Program provided city officials with hands-on support and knowledge sharing. They also received guidance from the Steering Committee, and advisory support from local experts, the World Bank, Cities Alliance and the implementing agency. Heritage Cells were established in Varanasi, Ajmer and Pushkar, and the existing Hyderabad Heritage Cell supported as the

loci for Program implementation. The Heritage Cells operated under the chairmanship of the respective Municipal Commissioners, and guided by a City Heritage Committee comprising state and local officials, distinguished scholars, experts from the city and concerned residents.

- **State level assessment-**

By assessing the existing urbanistic approach, financial mechanisms and regulatory frameworks, Component 2 aimed to understand:

1.The role of heritage in city planning at the state level

2.The extent of collaboration between the state and city levels in decision making for city planning

3.Capacities of government and private sector organizations

4.Development and regulatory conflicts

5.Local resource mobilization, budgeting mechanisms and funding systems

6.Wealth distribution

- **City profiling-**

The city profiling entailed 3 major steps

1.Heritage Listing

City-wide inventory, categorization, and mapping of tangible and intangible heritage assets in each city, performed by Heritage Cells with technical support from the implementing agency.

2. Heritage Zone

Mapping Mapping of heritage zones (areas containing a high density of heritage assets) and linkages between built heritage and surrounding community livelihoods. Assessment of any current heritage-based initiatives and/or funding.

3. Socioeconomic and services assessment

Information gathered on cities' morphology and existing land use practices; typology of neighborhoods; poverty geography; service delivery in heritage zones compared to the city level; economic clusters and employment; city and neighborhood aspirations; livelihoods, lifestyles and local stories; gentrification; and decision-making processes and capacities.

- **Investment plans-**

Based on the state assessment and city profiling, the respective Heritage Cell conducted participatory consultations, workshops and focus groups with scholars, experts and local stakeholders to select potential heritage areas for the preparation of a demonstration Detailed Project Report (DPR) or investment plan in the pilot city to test out the approaches and tools promoted by the Program. Through a rapid appraisal, demonstration areas in each city were selected according to their:

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1.Land uses – Area that has a representative mixed land use, with cultural, commercial, and residential areas.

2.Socioeconomic status – Area with a highly diverse socioeconomic group and poverty pockets.

3.Heritage at risk – Area with lower living standards and degraded heritage assets.

4.Heritage significance – Area that covers most of the city's monuments and vernacular heritage as well as significant intangible assets.

- **Knowledge management-**

Given the nature of the Program as an instrument for testing methodologies and disseminating experiences, ongoing knowledge management was central to all phases.
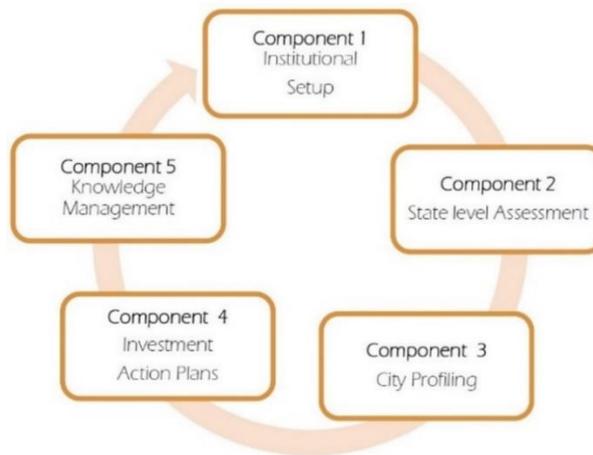
Figure 9 Major components of HUL program

DISABILITY INCLUSION THROUGH HUL APPROACH

Two pilot sites have been identified to propose a strategy for disability inclusion after considering various factors The methodology adopted for the city audit study involved a series of secondary research, consultative discussion with city officials, data collection, collation and analysis. The broad steps of the study adopted to formalize its implementation at the city included the following broad steps:
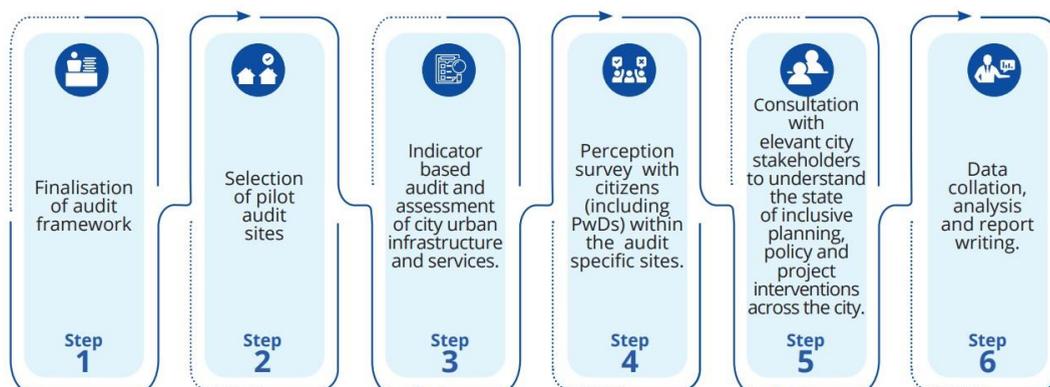
Site-specific pilot audits have been conducted within two sites in Varanasi to identify the gaps and barriers in the planning, design, and implementation process adopted for inclusive policy and projects in the city. The audit was piloted within two specific sites of the city. The sites were selected considering the unique urban characteristics of the Varanasi city and in consultation with the city stakeholders. The following criteria have been considered for the site selection:

• Building typology and

•Pattern of development

• Existing activities

• Land use

• Urban characteristics

• Density

•Tourism and heritage importance

•Ongoing projects related to urban development within the sites

•Proposed interventions for disabled-friendly structure

• Tourist footfall

•Location of major tourist's sites
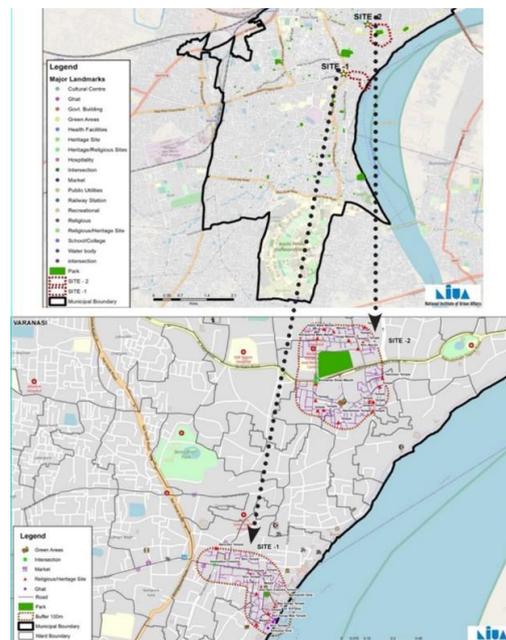
Figure 10 Location of pilot sites for disability inclusion

Site 1- Godolia to Dashaswamedh Ghat:

The site stretches between Godowlia chowk to Dashaswamedh ghat with an offset of 0.5 - 1 km along both sides of the road. It comprises of historical monuments, museum, commercial and hospitality

establishment, including major landmarks such as, Dashaswamedh Ghat, Kashi Vishwanath temple.
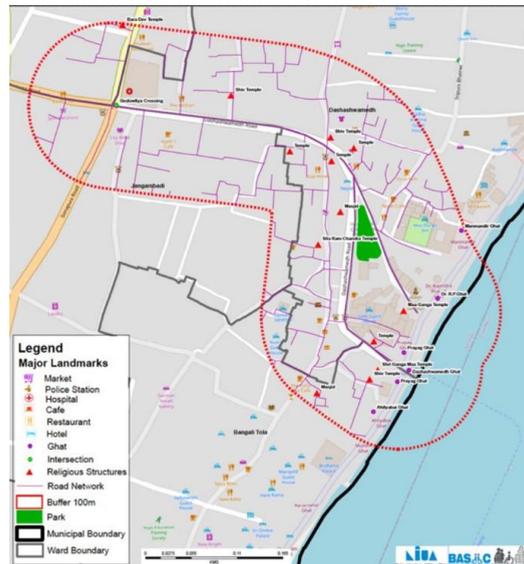
Figure 11 Area between Godowlia chowk to Dashaswamedh ghat

Site 2- Town Hall Centre along Maidagin Road:

The site covers the area surrounding the town hall and Maidagin crossing road. A few of the major landmarks of the sites include Town Hall, company garden, heritage structures, Kaal Bhairav temple, major city intersections, commercial areas, educational institutes, government buildings etc. The area holds importance as a city center and includes places of historical and heritage value. The Townhall center was built during the British era and is now being used as an administrative building.

Figure 12 Area between Town Hall Centre along Maidagin Road

OBSERVATIONS AND IMPROVEMENT

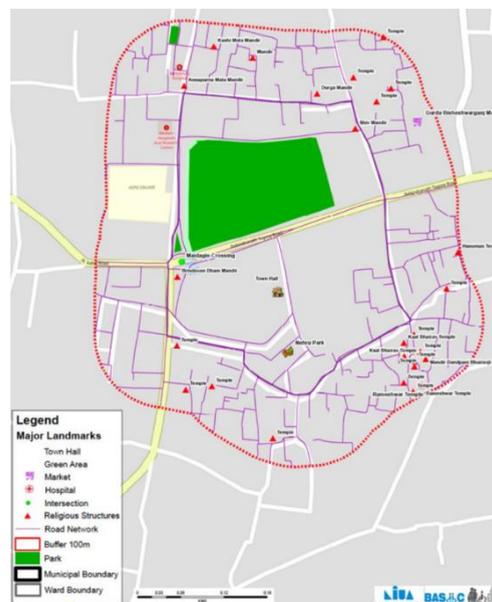| Mobility	Observations		Scope for Improvement
	Site 1	Site 2	
Pedestrian Infrastructure	• The width and surface of the walkways are inappropriate for pedestrians and wheelchair users. • Poor maintenance of street furniture e.g., seating spaces, dustbins, etc. • Accessibility features such as kerb ramps, directional signages, tactile indicators, etc partially compliant with the standards. • Availability of a multilevel car parking space with accessibility features. • Encroachment of pedestrian walkways by two-wheelers and street vendors. • High level of noise and congestions in the streets.	• Lack of appropriate and designated walkways for pedestrians and wheelchair users. • Existing walkways having narrow widths and uneven surfaces. • Accessibility features such as kerb ramps, directional signages, tactile indicators, etc. are non-existent. • Non-availability of designated parking spaces leading to the encroachment of RoW.	• Provision of designated walkways for pedestrian movement (to be segregated from vehicular movement). • Existing street furniture and amenities such as seating spaces, street lighting, signages, accessible toilets, drinking water booth, information centres, etc., to be maintained/ repaired. • Kerb ramps to be constructed at crossings as per standards. • Tactile indicators are to be installed all along the walkways for visually impaired persons. • Streets with high pedestrian footfall to be designated as walkways. • Restriction in the movement of two-three wheelers on pedestrian walkways. • Strict enforcement of traffic rules • 'No horn' zones to be enforced to control noise pollution. • Provision for alighting and boarding points to be created along with reserved parking for Persons with Disabilities. • Provision of battery-operated accessible vehicles to be made available from the parking area to the major heritage sites and Ghats. • Provision of appropriate signages and wayfinding strategy to indicate the availability of assistive amenities.

Wide pedestrian path, conducive surface, no tactile indicators

Ramp with no kerb

Benches with backrest but no arm rest

Image showing recommendation for accessible streets

Reserved Parking For Persons

Accessible Public Toilets

Tactile marking along walkway

Segregated vending Zones

Table 3 Findings and improvement in mobility sector

Tourism	Key Findings		Scope for Improvement
	Site 1	Site 2	
Signages	• Lack of directional signages • Information board/ maps with historical information were installed • Non-availability of tactile indicators that leads to guide persons with visual impairment towards the information board/maps • Lack of braille signage	• Lack of appropriate signages with poor colour contrast, small font sizes, etc. • No tactile indicators leading to the information boards/maps	• Existing information boards/maps can be improved in terms of colour contrast, font, placement at appropriate heights, etc. • Tactile and audio maps to be installed for persons with visual impairments. • Creation of signage and wayfinding plan for the heritage sites and monuments.

Table showing the findings and scope of improvement in tourism sector

Step steps connecting the Ghat

Handrail provided on specific ghat

Signage Installation along the Ghats - non legible from distance

Access the river and boat ride through connecting ramps

Table 4 Findings and improvement in tourism sector

Public Services	Key Findings		Scope for Improvement
	Site 1	Site 2	
Banking	• The ATM at one of the crossings has no provision of ramps. • ATM near the Ghat has no landing space. • The height of the ATM and emergency alarm is at an inaccessible height.	• No provision of lifts to access the banks (if located on higher floors). • Unavailability of TGSI and skid nosing strips. • Most of the ATMs are at least at a height of 100-200 mm above the road level with no provision of ramps, handrails, anti-skid nosing strips. • No provision of voice over facility in the ATM machine.	• Ramps to be constructed with gradients not less than 1:12 mm. • The width of the ramp to be not less than 1200mm. • Vertical platform lifts to be provided to cater to the level changes/floors of the building. • Staircase to be modified with the provision of TGSI and anti-skid nosing strips. • Level difference at the entries to be addressed by the construction of ramps with adequate landing space • ATMs and emergency alarms are to be placed at a height that is accessible to wheelchair users. • Talking ATM with voice over the facility with higher decibels to be installed.

Table 5 Findings and improvement in public services

Health Cen-tres	Key Findings		Scope for Improvement
	Site 1	Site 2	
Parking and entry gate	• No provision for specific parking for persons with disabilities. • Steps act as barriers at the entrance of the hospital. • No provision of ramps to connect the building with the road level. • The steps don't have railings, TGSI and anti-skid nosing strips. • No tactile indicators present to aid in navigation • Prevalence of drainage grating at the entry steps • Steps are not provided with railings	• The dispensary is signposted by means of a banner and visual signage. • Availability of seating spaces near the entrance. • Level difference at the door to the dispensary. • Availability of drinking water facility near the entrance which is inaccessible.	• Provision of kerb ramps to connect the building with the road level. • Tactile indicators to be installed along the floor from the entry gate and within the hospital building. • Steps to be provided with railings, TGSI and anti-skid nosing strips as per standards • Wheelchair and crutches friendly draining grating to be installed along the pathways to provide obstruction-free pathways.

Table 6 Findings and improvement in health sector

CHAPTER 4 SITE STUDY AND ANALYSIS

4.1HERITAGE MAPPING

The port city of Muziris, which is located in Kodungallur, is well-known. It was previously connected to the trade route between the Chera kingdom and the Roman Empire. This harbour city was completely destroyed in 1341 by the Periyar River's massive flood.The tangible and intangible aspects of heritage coexist in Kodungallur. The Government of Kerala has been considering the development of the Muzris history Project since 2006. The Archaeological Survey of India is responsible for the protection and preservation of history in Kodungallur for roughly 3 sites. But realising its potential effects, the government launched an ambitious effort to cover a wide region, including North Pravur and Kodungallur Taluk, which includes a number of protected sites and other NGO's have also been involved in maintenance and protection.

CATEGORIZATION OF HERITAGE ASSESTS

The heritage assets of Kodungallur can be categorized in the following manner:
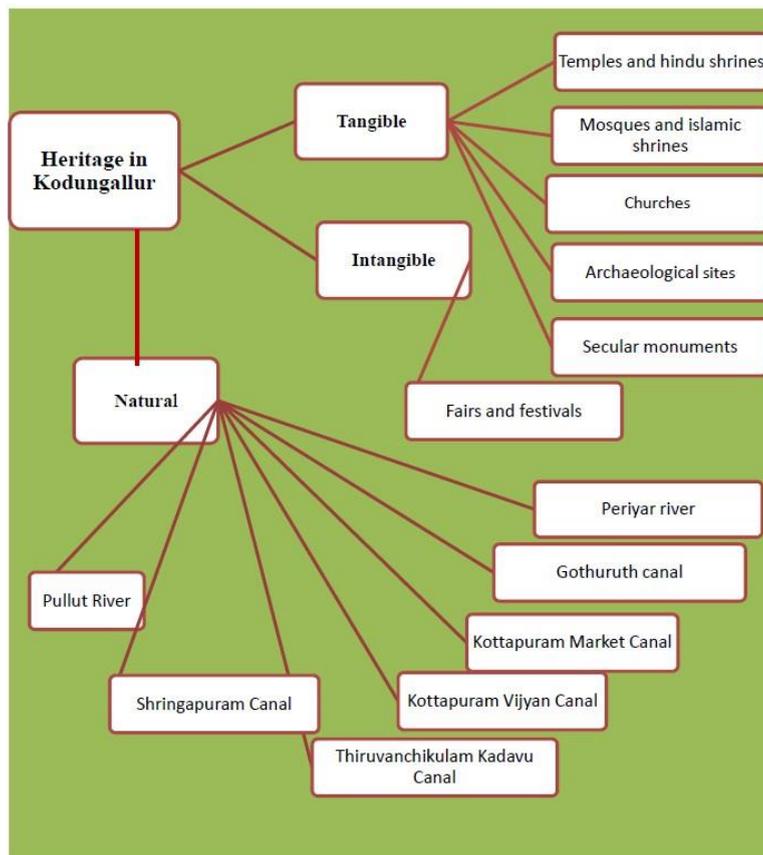

Figure 13 Classification of heritage assets in study area

TANGIBLE HERITAGE IN MUZIRS HERITAGE SITE

- **Kottapuram Fort**: Built by the Portuguese in 1523 was referred to popularly as Cranganore Fort and is now known as Kodungallur Fort. It was captured and destroyed by Dutch in 1663. The Fort had a strategic position, on the mouth of the river Periyar, before it joins the Arabian Sea, which gave it the advantage of controlling the ships and boats that passed to form the interior of Malabar. The town developed from just this fort. A church and many traditional houses in the nearby area, built by the Europeans still remain today. Kottappuram Fort played a significant role in many wars between the Zamorin and the rulers of Kochi. In 1662 the Dutch fleet had made an attempt to capture it from the Portuguese, but that invasion was successful only in 1663. It was a heavy fight, in which the Kottappuram Fort was severely damaged. After taking over the Fort, the Dutch demolished it to the minimum and used it as an out- house to guard their ships. The ruins of the original Fort how that its walls were 18 feet thick and were made of laterite.

  When the interest of the rulers of Mysore turned towards Malabar, Haider Ali negotiated with the Dutch for the purchase of the Kottappuram Fort and the one at Pllippuram. During Tipu Sultan's possession of the Malabar coast, the Travancore rulers felt it was imperative for them to possess these fort, to safeguard their kingdom against invasion by the Mysore rulers. So, the Travanocre King, RamavarmaDarmaraja (1758- 1798), purchased these two fort. The agreement was executed in 1909, by Raja KesavaDasa, the Dutch Governor. Later, findings it in a ruined state, the Department of Archeology of Travancore erected a memorial pillar inside the Fort and decided to preserve it as a public property.

- **Cherman Parambu**: The CheramanParambu spreads over an area of about 5 acres is generally regarded as the royal seat of CheramanPerumal, the king of the Chera dynasty who ruled Kerala during the 9th, 10th and 11th centuries AD. Traditionally, the Chera dynasty of the Sangam Age had its head quarters at Kodungallur. In 1936, the Department of Archeology, of the erstwhile State of Cochin declared the site a protected monument. As the famous temples of Thiruvanchikulam and Kizthali are nearby and the Archeology Department of Kochi, during its exploration had noticed some old laterite foundations and remains of wall in this area, the department with the

help of the Archaeological Survey of India excavated the site between 1944- 1945. At depth of 1.5meters, various kinds of potsherds, copper and iron implements, bangles and beads and small lead balls were found. And loose sand found below the occupation layer. The majority of the potsherds, copper and iron implements, bangles and beads and small lead balls were found. And loose sand was found below the occupation layer. The majority of the potsherds belonged to a group called Celadon ware, a pottery made in China during the Sung period, between the 10th and 12th centuries AD. Later, 1960, when the Archeological Survey of India excavated in different area of the same site, no serious archeological evidences were found. However these explorations unearthed a number of Shivalinga which are now exhibited in a corner of the site.

- **Kizthali Shiva Temple**: According to Keralolpathi, Kizthali Shiva temple existed during the Perumal region(BC 113- AD 343). During the time of Chera dynasty, who were shiva believers, the king had many advisors and they were usually nambuthiries. These ministers or advisors habitually gathered at a Shiva temple called Thali. Among the many shiva temples in and around this main temple were Methali, Nediyathali and ChingapuramThali. This temple was first destroyed by the Portuguese and, the Dutch. Then Tipu' s army destroyed it further, raising most of the temple to the ground, except the garbagiham, which still stands. In its original glory, the temple boasted of KoothuParambu, a KalariParambu and a KalapuraParambu. Archeological Survey of India has included this site under its conservation activities recently.

- **Thiruvanchikulam Mahadeva temple**: Temple is said to be more than 2,000 years old and is remarkable for its number of representations of Shiva. There is a Namaskara Mandapam, with 16 pillars, which is in front of the Shrikovil. The Utsavam is held in the Malayalam month of Kumbham(Feb- Mar), during which the festival of Shivaratri is celebrated in a grant manner. Aanayottam is conducted as part of the festival. Devotees attend the Plliyara pujas, held just before the temple closes in the evening, for a happy married life and to be blessed with children.

- **CheramanJumaMajsid** : The significance of CheramanJumaMajsid is that it is the first mosque in India. It was built in 629 AD by Malik Ibn Dinar. KunjikuttanThampuran who is known as Kerala Vyasa has expressed the view that this was an ancient Buddhavihar that was gifted to the Muslims for the construction of a

mosque. The oral tradition is that CheramanPerumal, the Chera king, went to Arabia where he met the Prophet and embraced Islam. From there he had sent letters with Malik Ibn Dinar to his relatives in Kerala, asking them to be courteous to the latter. The masjid is believed to have been renovated in the 11th century and also 300 years ago. The front portion was expanded in 1974 and further expanded in 1984. The older part of the mosque including the Sanctum Sanctorum is left untouched and is still preserved. Its grandeur is still kept alive by the wooden steps and ceiling .People of all religions come to this mosque and many non-Muslims conduct vidhyarambham (initiation ceremony to the world of letters) of their children here.

INTANGIBLE CULTURAL HERITAGE

These include the local religious and cultural life of the city and related activities like religious rituals, traditional schools of music, dance and folk theatre, monastery and ashram life, religious teachings, etc. and the art and craft heritage consisting of paintings, silk weaving, wood, metal crafts, etc. The KodungalloorBharani festival is held during the Malayalam month of Meenam, on the Bharani day. But the festivities start with the hoisting of the festival flag on the Bharani day of the previous month, Kumbhom,

Figure 14 Kodungallur Bharani festival

NATURAL HERITAGE

Periyar River

Pullut River

Gothuruth Canal

Kottapuram Market Canal

Kottapuram – Vijayan Canal
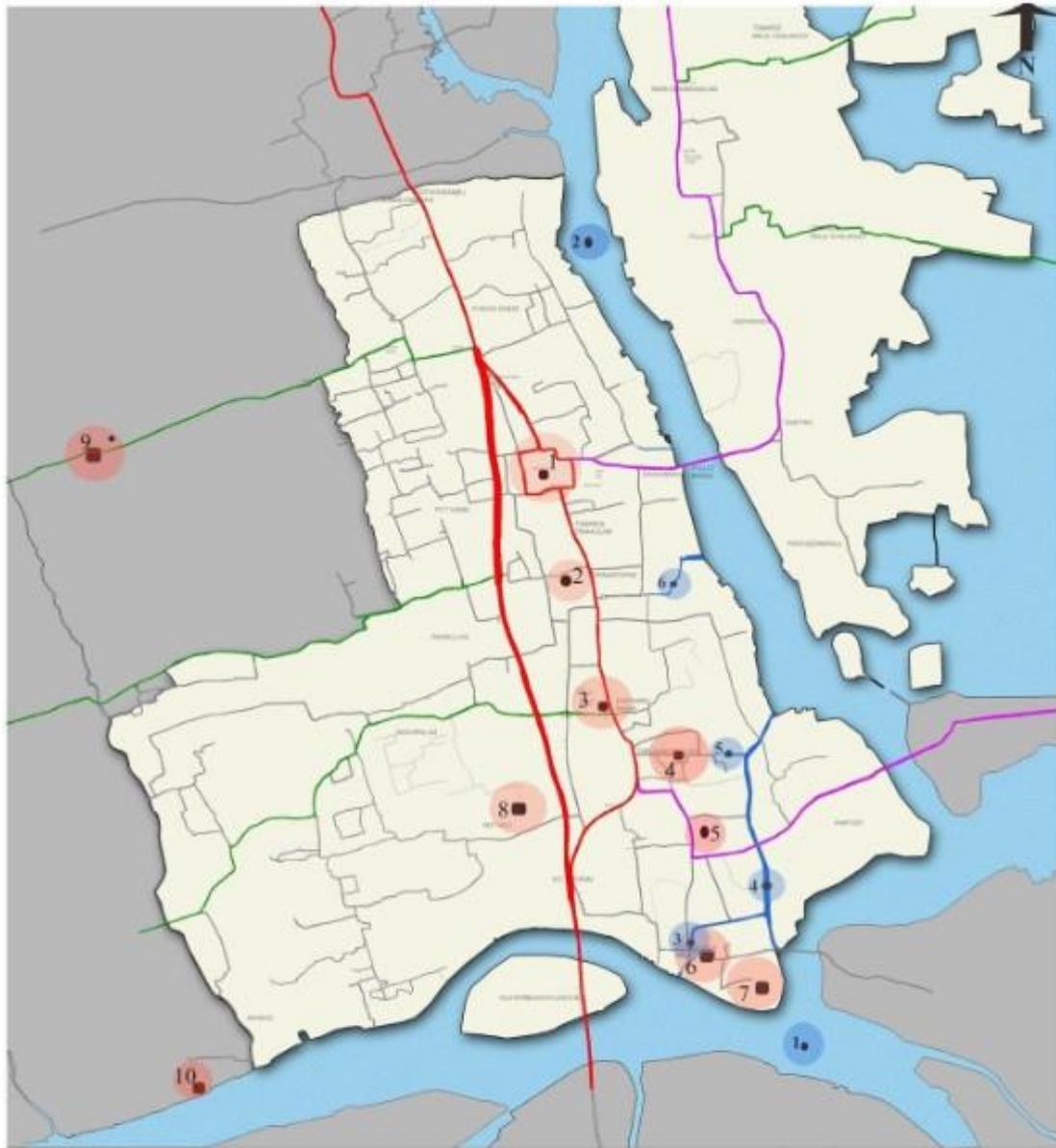
LEGEND

Built heritage in study area	
1.Kodungallur Bagavathi Themple	6.Kottappuram Market
2.Kunjikuttan Tampurans House	7.Kottapuram Fort
3.CheramanJuma Masjid	8.Kizthali Temple
4.Thruvanchikulam Mahadeva Temple	9.Abdul Rahman Sahibs house
5.Cheraman Parambu	10.St. Thomas Apostel

Natural heritage in study area	
1.Periyar river	4.Kottapuram vijayan canal
2.Pullut river	5.Thiruvanchikulam kadavu canal
3.Kottappuram market canal	6.Sringapuram canal

Figure 15 Map showing built and natural heritage

4.2 DEMOGRAPHY

As per the 2011 census, the population of Kodungallur Municipality is a total of 71,440 persons, i.e, 33,935 total persons from the Municipality wards and 37,505 total persons from the wards of Methala Census Town (excluding the outgrowth from Eriyad wards). Out of the total 71,440 persons, there are 34,042 males and 37,398 females. The child population (aged between 0-6years), total to a population of 6,404 persons, consisting of 3,265 male and 3,139 female children.
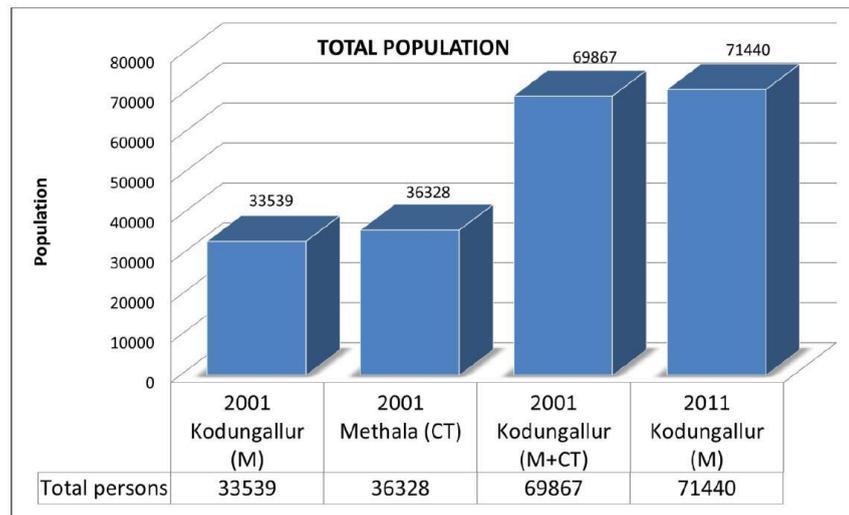
Table 7 Population of study area compared to Trissur

In 2001, as per the census conducted then, the total population of Kodungallur Municipality was 33539, i.e, in comparison to the population of Thrissur, its share of population accounted to a total of 1.13% only. With the addition of Methala Panchayat to this in 2010, the share of population has increased subsequently.

POPULATION

The population of Thrissur district sums up to a total of 3,121,200 persons which includes 1,480,763 males and 1,640,437 females as per census 2011. As per the same census, the population of Kerala is 33,406,061 persons which included 16,027,412 males and 17,378,649 females. Although Thrissur accounts for 9.34% of the total population of Kerala; Kodungallur municipality accounts for a share of 2.29% of the total population of Thrissur only. As per the population count of census 2011, population density of Kodungallur Municipality region is estimated to be about 2443 persons per square kilometers. As per the census records of MethalaPanchayatare 1939 and 3043 persons per square kilometers.   The population density

gives us a tool for rightful judgments towards the judicious division of resources among the populace. When the population density of Thrissur district increased from 981 to 1031 population per unit sq.km against the state density of 860 over the 10 years from 2001-2011, it can be observed that the density of population reached by Kodungallur is very high. Hence, it can be rightly said that the region of Kodungallur municipality is densely populated and this trend may lead to more serious problems like formation of more and more slums in the near future.

HOUSEHOLD

A household is a group of persons living together under a common roof and sharing common facilities. House density is calculated as the number of households per hectare. Due to the change in household size; population density and household density may vary. As per the 2011 census, there are 17950 total households in Kodungallur (M) which was 7350 in the municipality wards and 8101 in MethalaPanchayat wards in 2001. The average household size in the Kodungallur Municipality limits is 3.98. This average size has reduced from its 4.61 of ten years ago.

TOTAL NO: OF HOUSEHOLDS

	Kodungallur (M)	Thrissur	Ernakulam	Kerala
Households	17950	759210	814011	7853754
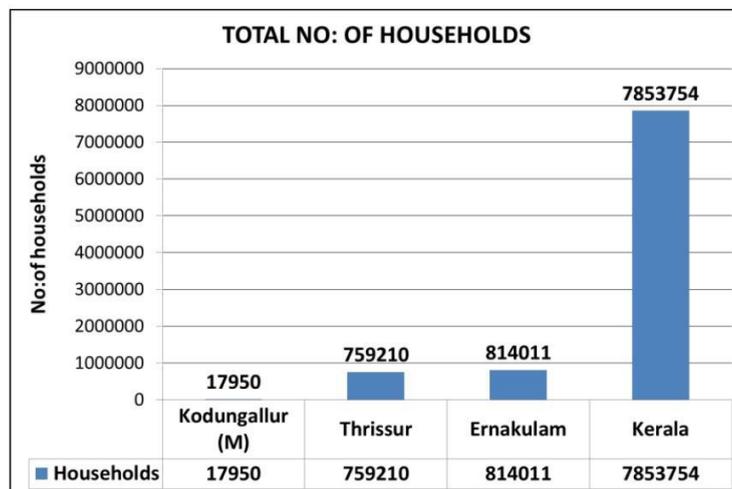
Table 8 N.o of household in study area compared with nearby dist

SEX RATIO

Gender equality is a core development objective for any developing country. It contributes to smart socio-economic base. Greater gender equality can enhance productivity, improve development outcomes for the next generation, and make institutions more representative. The sex ratio gives the total number of females in a region per thousand males.

The decline in child sex ratio (0-6 years) of India from 945 in 1991 to 927 in 2001 and further to 914 females per 1000 males in 2011—the lowest since independence—is a cause for alarm,

but also an occasion for serious policy re-think. The overall sex ratio had increased, but still there is concern at the decline in the child sex ratio.

SEX RATIO

	Kodungallur (M)	Thrissur	Ernakulam	Kerala
■ Sex Ratio	1099	1108	1028	1084
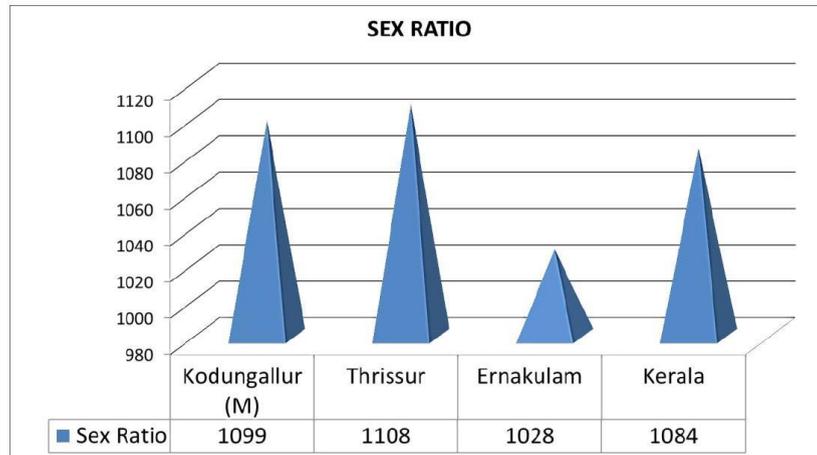
Table 9 Sex ratio of study area

DEMOGRAPHIC ANALYSIS

In the Municipality wards, out of the 27 various wards, those like ward 01,02, 03,07,08, 09,10,11,13, 15, 16, 19 and 20 are highly populated. Of the total population of 60,190 persons, ward 03 has the maximum number of males, followed by ward 11. The maximum number of female population comes from ward 01; closely followed by ward 03. Among these, wards 03 and 19 have the highest male child population. The ward 15 has the highest female child population, closely followed by wards 03 and 11.

S.I.No.	CATEGORY	TITLES OF CATEGORY	Census 2001 Kodungallur (M) + Methala (CT)	Census 2011 Kodungallur (M)	KODUNGALLUR Decadal growth percentage (2001-2011)	THRISSUR DISTRICT Decadal growth percentage (2001-2011)	REMARKS
1	HOUSEHOLDS	Number of Households	15451	17950	1.62	1.87	- No.of households has increased slightly but the average household size has decreased from 4.61 to 3.98 over the decade. - This might be due to the prevailing system
2	TOTAL POPULATION	Total Population	69867	71440	0.23	0.49	- Slight increase in population. - Population density:
		Total Males	33452	34042	0.18	0.41	
		Total Females	36415	37398	0.27	0.57	

Population Density (per sq.km)			2490.6	2443.2	-0.2	0.5	2443 persons /sq.km. - Though density has shown a most minute decrease over time, still the density is very high when compared to the district density of 1031 persons/sq.km and state density of 860 persons/sq.km. - This density might also be the reason for the 24% of slum population within the study area. (Refer Table 3.5). Except for two, most of these Municipality wards are densely populated.
Sex Ratio			1088	1098.6	0.1	0.15	- Sex ratio of Kerala: 1084, Thrissur district: 1107.8, Kodungallur(M): 1098.6. - Not fluctuating in rate.
3	CHILD POPULATION	Population in the Age group 0-6	7282	6404	-1.21	-0.86	- The child population rate of Kodungallur (M) has dropped over an annual rate of 12%, with the female child population dropping over 13.5% annually. -Drop at Municipal level is less than the district level.
		Male Population in the Age group 0-6	3653	3265	-1.06	-0.82	
		Female Population in the Age group 0-6	3629	3139	-1.35	-0.90	
	Child Sex Ratio		993.4	946	-0.5	-0.09	- Over the decade the child sex ratio of Kerala increased (from 960), but of Thrissur and Kodungallur (M) decreased. -In 2011, Child sex ratio of Kerala:964, Thrissur district: 950, Kodungallur (M): 946.
4	SCHEDULED CASTE POPULATION	Population Scheduled Caste	5355	5421	0.12	-0.84	- Drop at district level, still the area spots a

#							
		Male Population Scheduled Caste	2587	2639	0.20	-0.87	negligible increase in the SC population.
		Female Population Scheduled Caste	2768	2782	0.05	-0.82	
5	SCHEDULED TRIBE POPULATION	Population Scheduled Tribe	0	157	10	9.54	- Considerable increase in ST population over the decade. Nearly 10% increase in both the Municipality as well as the district.
		Male Population Scheduled Tribe	0	75	10	9.02	
							- The 0 person index has risen to 157 persons. This could be accounted to the change in administration boundary.
		Female Population Scheduled Tribe	0	82	10	10.01	- More in the Methala area: 117 persons.\n\n- Proximity toMethala coastal areas boosts chances of livelihood. It might be one reason for the addition.
6	LITERATES POPULATION	Literates	58551	62399	0.66	0.99	- Literacy rate of Kodungallur is 95.94%.
		Male literates	28729	29998	0.44	0.77	- A promising trend, with the higher female literacy rate. Increase in sex ratio and female literacy rate is almost the same.
		Female literates	29822	32401	0.86	1.20	
7	ILLITERATES POPULATION	Illiterates	11316	9041	-2.01	-1.75	- Decrease in the illiterate count, especially in the female literate count at both the levels, due to the diverse literacy drives.
		Male Illiterates	4723	4044	-1.44	-1.41	
		Female Illiterates	6593	4997	-2.42	-2.01	
8	WORKING POPULATION	Total Workers	22895	27230	1.89	1.47	- Higher sex ratio, higher female literacy rate and higher female work
		Total Male Workers	17720	19321	0.90	0.98	

		Total Female Workers	5175	7909	5.28	2.97	- Female work participation increased by 5% over the 10 years.
9	MAIN WORKING POPULATION	Main Workers	18966	22820	2.03	1.49	
		Male Main Workers	15242	17449	1.45	1.19	
		Female Main Workers	3724	5371	4.42	2.54	
9.1	MAIN CULTIVATOR POPULATION	Main Cultivators	104	150	4.42	-1.78	- Female main work participation increased by 4%,over the 10 years.
		Male Main Cultivators	93	128	3.76	-2.09	
		Female Main Cultivators	11	22	10.00	0.05	
9.2	MAIN AGRICULTURE LABOURERS POPULATION	Main Agricultural Labourers	199	344	7.29	-2.53	- But in the case of Cultivators, where the main cultivators show no promising rate of growth, the rate of female cultivators has shown a 10% growth in rate.
		Male Main Agricultural Labourers	178	276	5.51	-2.03	
		Female Main Agricultural Labourers	21	68	22.38	-3.32	-In the case of Agriculture sector too, female populace show high involvement. When in the district the rate declines, the study area can boast of a 22.4% of decadal growth.
9.3	MAIN HOUSEHOLD INDUSTRY LABOURERS	Main Workers in Household Industries	781	479	-3.87	-4.52	
		Male Main Workers in Household Industries	362	321	-1.13	-3.60	- However, in the main household industry the rates have gone done and the decrement is at par with the district rate.
		Female Main Workers in Household Industries	419	158	-6.23	-5.99	
9.4	MAIN OTHER WORKING POPULATION	Main Other Workers	17882	21847	2.22	2.52	- The household industry of Kodungallur is facing a pull down the line.
		Male Main Other Workers	14609	16724	1.45	1.92	
		Female Main Other Workers	3273	5123	5.65	4.95	
10	MARGINAL WORKING	Marginal Workers	3929	4410	1.22	1.36	

		Marginal Workers	2478	1872	-2.45	-0.58	- Unlike in main working population, there is a steady decadal decline of 2.4% in the male marginal workers in the marginal working population.
		Female Marginal Workers	1451	2538	7.49	4.32	
10.1	MARGINAL CULTIVATOR POPULATION	Marginal Cultivators	26	89	24.23	-1.62	
		Male Marginal Cultivators	12	33	17.50	-2.05	
		Female Marginal Cultivators	14	56	30.00	-1.00	- However, more female workers are taking up marginal occupations; because, the decadal growth is almost double the rate w.r.t the district increment rate.
10.2	MARGINAL AGRICULTURE LABOURERS	Marginal Agricultural Labourers	128	109	-1.48	-4.60	
		Male Marginal Agricultural Labourers	93	46	-5.05	-4.39	- But in the case of Cultivators alone, the male and cultivators show promising rate of growth, the rate of female cultivators has shown a 30%, which is a good sign in the wake of things because, the district percentage in itself has gone down.
		Female Marginal Agricultural Labourers	35	63	8.00	-4.79	
10.3	MAIN HOUSEHOLD INDUSTRY LABOURERS	Marginal Workers in Household Industries	297	277	-0.67	-3.26	
		Male Marginal Workers in Household Industries	52	77	4.81	-2.45	- The rate of marginal workers in agriculture shows no promising trend. There is a declining district percentage too.
		Female Marginal Workers in Household Industries	245	200	-1.84	-3.70	
10.4	MARGINAL OTHER WORKING POPULATION	Marginal Other Workers	3478	3935	1.31	4.37	-However, in the household industry, male workers have shown an ascending rate by 4.81% decadal growth. This may be due to the influence of the working class of MethalaPanchayat too.
		Male Marginal Other Workers	2321	1716	-2.61	0.65	
		Female Marginal Other Workers	1157	2219	9.18	12.26	
11	NON WORKING POPULATION	Non-Workers	46972	44210	-0.59	0.03	- The non-working population has been decreasing by a
		Male Non-Workers	15732	14721	0.64	0.16	

		Female Non-Workers	31240	29489	-0.56	0.14	negligible percentage. The effect will not be detrimental.

*Note: Ward nos. as per Census 2011

LEGEND

Decrement in decadal growth percentage	
More than 10% increase in decadal growth	

Table 10 Demographical analysis

4.3 LANDUSE PATTERN

The land use survey from 2012 is the foundation of the study. Here, it is described in detail how each and every piece of land is used. The research sheds light on the composition of the land.

Figure 16 Land use pattern of study area

LANDUSE BREAK-UP

The land use survey from 2012 is the foundation of the study. Here, it is described in detail how each and every piece of land is used. The research sheds light on the composition of the
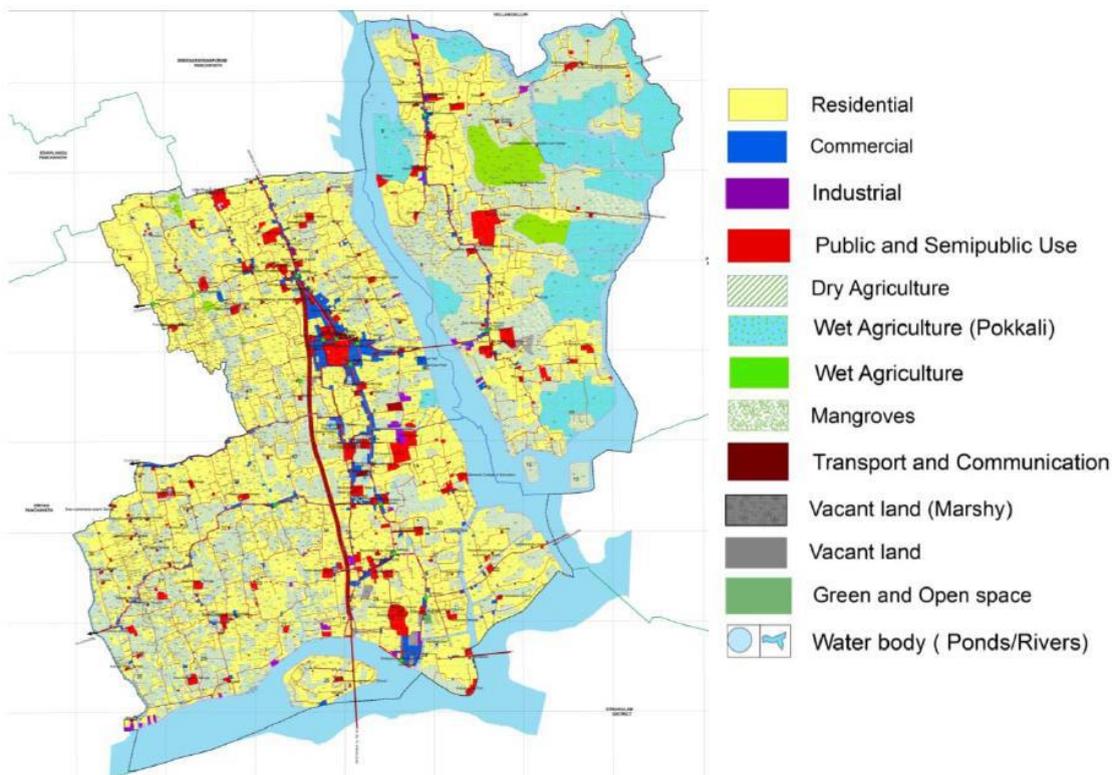
land. About 41.36% of the land is occupied for residential purposes. The next highest single land use is dry agriculture which comes to about 23.44% of the area. Third biggest land use is Waterbody constituting around 14.31% of the land use. Wet agriculture constitutes 9.74% of the land use which comprises of Paddy and fish culture. Marshy lands and Mangroves occupy a big share of land. Commercial, Industrial and Public land uses are also present in the municipality. Land used for Transport and communication purpose occupies about 4.32 %. The western part of the Kodungallur, that lies to the west of Canoli canal is very densely occupied and the eastern portions has lower residential intensity with majority of land area being low lying and marshy.
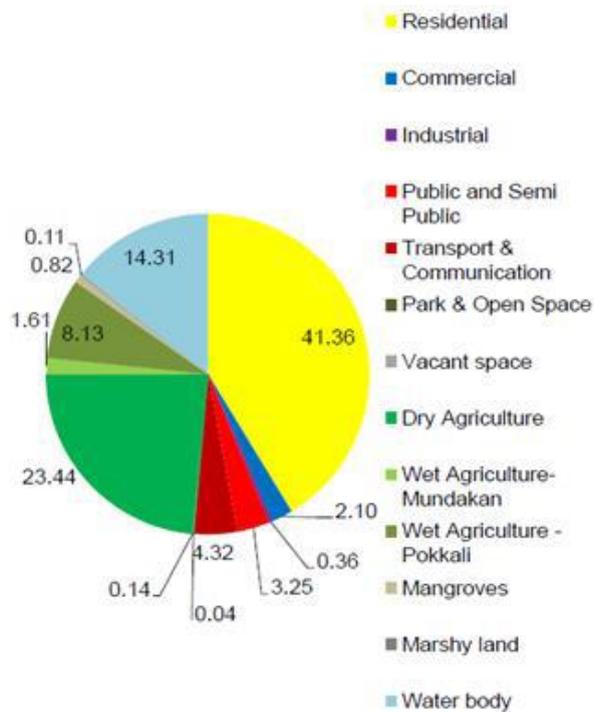
Figure 17 Land use split- up of study area

4.4 SOCIO-ECONOMIC ASPECTS

To comprehend the current character in many regions, it is essential to study the socio-economic characteristics of Kodungallur. The workforce in diverse sectors and literacy are examples of socioeconomic activity. To support the current system of operations, socioeconomic analysis is conducted. In order to stimulate local commerce, increase foreign investment, and achieve sustainable development in the region's economic activities, it is necessary to build a solid economic foundation in this band with a globally competitive environment and cutting-edge infrastructure.

LITERACY

The literacy rate of a region gives dynamics of social and economic structure of the place. The power of literacy lies not just in the ability to read and write, but rather in the people's capacity to apply these skills for effective connection, interpretation and development of the life they live. Kodungallur lies in the Thrissur district, which in 2001, with a literacy rate of 92.3 % bagged the sixth position in the state of Kerala. In 2011, with a rate of 95.08%, the district occupied the seventh position.

The Kodungallur municipality region consists of a total of 62399 literates, of which 29998 are males and 32401 are females. The region sports a higher female literacy ratio. The total literacy rate of Kodungallur(M) is 95.94 %. The illiterate population amount to a 12.6 % of the total population, i.e., 9041 persons is illiterate of which 4044 are males and 4997 are females. It is not an alarming rate and this disparity is negligible.

LITERATES

	2001 Kodungallur (M)	2001 Methala (CT)	2001 Kodungallur (M+CT)	2011 Kodungallur (M)
Male	13573	15156	28729	29998
Female	14223	15599	29822	32401
Total no: of literates	27796	30755	58551	62399
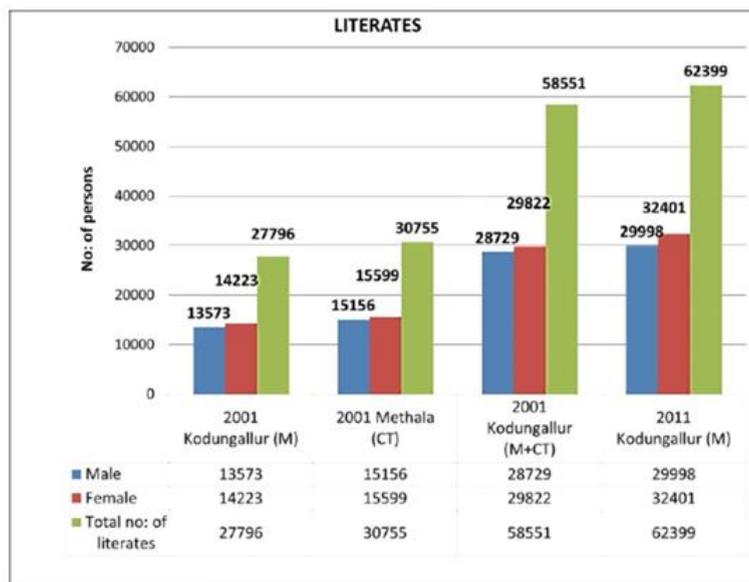
Table 11 Literacy rate of study area

TOTAL LITERACY RATE

Kerala has a literacy rate of 90.86%, making it the most literate state in India according to the 2001 Census. The Thrissur District was ranked eighth in the 1991 Census. Thrissur's literacy rate in 2001 was 92.27%, which is higher than the state average. Kodungallur's literacy rate in 2001 was 92.70 percent. It is higher above the state and national averages as well as the Thrissur District's literacy rate of 92.27 percent. Kodungallur has total literacy rates above the state and district averages in the corresponding census years of 90.64% in 1991, 92.70% in 2001, and 95.32% in 2011.

Literacy Rate (Total) in %			
Place/Date	1991	2001	2011
India	52.21	65.38	74.04
Kerala	89.81	90.86	93.91
Thrissur	90.18	92.27	95.32
Kodungallur (M)	-	92.68	95.94

Table 12 Total literacy rate comparison

OCCUPATION PATTERN

In 2001, Kodungallur's major workforce distribution was 24%; by 2011, it had risen to 32%. The growth is 8%, but when compared to the district of Thrissur and the state of Kerala, it is just 3% overall and only 2%. But from 2001 to 2011, Kodungallur's distribution of marginal workers decreased by 1%. In terms of marginal employees, the trend in Thrissur is unchanged, whereas it increased by 1% overall in the state. In comparison to Thrissur and district and Kerala State, which is just 3%, the nonworkers population group in Kodungallur significantly fell by 7%, which is a good indicator from an occupation-oriented perspective.

Place	3 Fold Classification					
	2001			2011		
	Main	Marginal	Non	Main	Marginal	Non
	Total Workers		Worker	Total Workers		Worker
Kerala	8236973	2046914	21557487	9,329,747	2,289,316	21,786,998
	10283887			11,619,063		
Thrissur	808965	146335	2018932	929,506	166,221	2,025,473
	955300			1095727		
Kodungallur (M)	8194	2327	23018	22820	4410	44210
	10521			27230		

Table 13 Comparison of occupation factor

WORK PARTICIPATION RATE (WPR)

The Kodungallur municipality's work participation rate was 31.37% in the 2001 Census. It was just behind the State average of 32.29% and the District average of 32.12%. The primary workers made up 24.43% of the workforce, which was slightly less than the district average of 27.19% and the state average of 25.86%.

In the Kodungallur area, the work participation rate was 38.11% according to the 2011 Census. It is raised and higher than the 35.10% district average and the 34.78% state average.

The rate of employment has increased by 6.74%, which is a positive trend that will advance the profession sector. In 2011, the primary workers made up 31.94% of the workforce.

TRADITIONAL WORKERS

The Kodungallur cluster is able to develop 534 plus artisans and 28 SHGs (Self Help Groups), supporting the robust work force, in the textile industry. The Indian Space Research Organisation (ISRO) identified brackish water sites in Kodungallur during a 1995 socioeconomic survey for the Development and Educational Communication Unit (DECU) of the Space Application Centre (SAC), Ahmadabad, to investigate the viability of establishing aquaculture farms on a cooperative basis. The high literacy rate of 85%–90% in the study area was observed. About 90% of the sample respondents in Kodungallur possessed land that was less than 25 cents in size.62% of the fishermen's households in Kodungallur had an annual income of less than Rs. 25000.

Place	3 Fold Classification					
	2001			2011		
	Main	Marginal	Non	Main	Marginal	Non
	Total Workers		Worker	Total Workers		Worker
Kerala	8236973	2046914	21557487	9,329,747	2,289,316	21,786,998
	10283887			11,619,063		
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	955300			1095727		
Kodungallur (M)	8194	2327	23018	22820	4410	44210
	10521			27230		

Table 14 Comparison of traditional workers

4.5 PHYSICAL INFRASRTRCTURE

4.5.1 WATER SUPPLY

Municipality having so many water bodies, but drinking water problem is there. The main reason of scarcity of drinking water is mainly due to the salt content in the water. It is mainly because of the presence of sea in the nearby areas and the other problem is the dumping of waste in water bodies. The out let of drains are mainly open to the water bodies. Kerala water authority is the one agency which concerning with the drinking water facility. In Kodungallur, the water authority serves the whole system of water supply. Even though there are Periyar river and other small water bodies, Kerala water authority take water from Chalakkudy River,

at vyanthala, which is nearly 14 km from the main tank situated at Narayanamangalam. In Vyanthala there exist water treatment plant also, and from there the water supply of Mala, EdavilanguPoyya and the nearby areas are carried out.

Figure 18 Chalakkudy river

There are two schemes which serve the water supply in the entire area of municipality.

1. KMWSS (Kodungallur Municipality Water Supply Scheme).

2. CWSS (Comprehensive Water Supply Scheme).

These two schemes together connect entire area of municipality. Peoples depend on these systems due to lack of availability of clean water. In these system K.M.W.S.S is the oldest scheme it serves in the Kodungallur municipality area and Pullut, and it is established in 1979. Due to the insufficient supply and the increased number of connections The Kerala Water Authority introduce new scheme for water supply. The new system is C.W.S.S. which is established in 2011. It was a project named as SPANWSS and the supply is carried out to Methala, Eriyadu, Edavilangu and Kadukuttypanchayaths. The funding of C.W.S.S. was done by NABARD (National Bank for Agriculture and Rural Development). Source of supply is same as that of K.M.W.S.S. as Chalakudy River and the intake is from Vyanthala. Water treatment is carried out in 3 no. of filter bed and has a 15MLD capacity water tank. Type of treatment is by filter bed. Two treatment plants are there located in Vynthala and having capacity of 18.7 MLD and 15 MLD. Sedimentation with coagulation, filtration and chlorination are the main process carried out in the plant. For K.M.W.S.S. there are 6 bed systems and for C.W.S.S. there are 3 bed systems. The demand of water supply is 88 MLD and the supply is 13.5 MLD. The treated water from Vayanthala is stored in PullutNarayanamangalam tank and Eriyad tank. Then it is distributed to the other tanks. The

quantity of water is reduced from a total of 33.7MLD to 13.5MLD due to physical losses.

Figure 19 Treatment plant for KWMSS

4.5.2 SOLID WASTE MANAGEMENT

Solid waste management is a challenging issue in any area. One of the severe problem in which kodungallur municipality faces today is the solid waste management. The problem is assuming serious proportions due to increasing population, urbanization, changing lifestyles and consumption patterns. Management of solid waste involves waste generation, segregation and storage; waste collection; waste transfer/ transportation; treatment, recycle, reuse, recovery; and disposal. For effective waste management, its segregation at the community and neighborhood level is imperative. Considering the nature of solid waste and the economic aspects of its disposal, major part of solid waste especially silt has to be disposed off in sanitary landfills. But wherever recycling is possible, it should be preferred than disposing off the waste in sanitary landfill sites. More viable alternatives to landfills are vermiculture, fossilization, composting etc. Waste Minimization Circles (WMCs) should be constituted and made effective.

a. Generation, Collection and Composition of Waste Kodungallur municipality has arrangement to door to door segregated collection of waste by engaging Kudumbasree units. The waste consist of domestic, street sweepings, commercial, markets, schools and institutions etc.Waste collected by them are transported by corporation vehicles and treated at plant in Chappara. The waste is then separated in to biodegradable and non biodegradable. Then the biodegradable wastes are grind or crushed in to small pieces and then it is used as fertilizer. The non-biodegradable waste like plastic is collected by Clean Kerala Company. The metal and paper waste like newspaper and magazines are collected by informal rag pickers from households and institutions. But now there is no proper system for the disposal of waste.

4.5.3 POWER SUPPLY

All area of municipality is well electrified and adequate numbers of street lights are provided. In Kodungallur municipality two electrical sections are there. Kodungallur 1 and Kodungallur 2. The substation is in chappara, in there 66 KV(from Madakkathara) current is step down in to 11 KV and it is supplied.
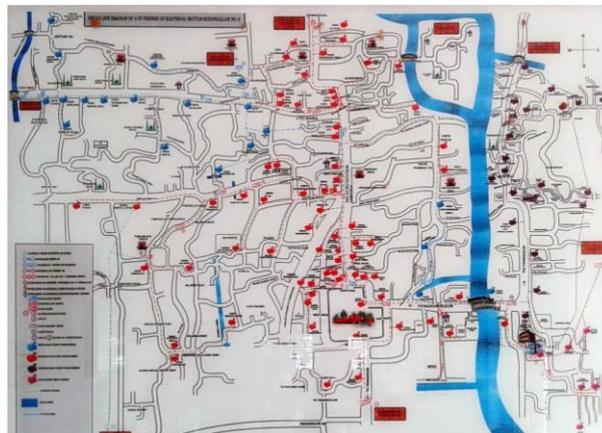

Figure 20 Kodungallur section 1

Figure 21 Kodungallur section 2

4.6 SOCIAL INFRASTRUCTURE

4.6.1 EDUCATION

Kodungallur municipality is one of the major educational hubs in the Thrissur District. The various streams of education in Kodungallur municipality include the following.

1 school education

2 higher secondary educations

3arts and Science College

4 professional educations

The municipality is endowed with educational facilities of all level. Both public and private sectors have contributed such facilities. The area has a variety of schools affiliated to Kerala state education board, central board of secondary education (CBSE), these schools are classified as aided unaided or government schools. The governments schools are run directly by the state government and follow the syllabus prescribed by state government aided schools also follow the state syllabus. Private schools are run by educational trusts which follow, state, CBSE or ICSE syllabus. There are 3 Arts and Science Colleges exist in the municipality. It is KunjikuttanThampuran Memorial College of arts and science, Dr. Palpu Memorial SNDP Yogam College and Co- operative college, also there is one nursing college is there and is Modern College of nursing. Higher and professional education includes arts and science colleges and professional educational institutions. There are 3 Arts and Science Colleges exist in the municipality. It is Kunjikuttan Thampuran Memorial College of arts and science, Dr. Palpu Memorial SNDP Yogam College and Co- operative college, also there is one nursing college is there and is Modern College of nursing.
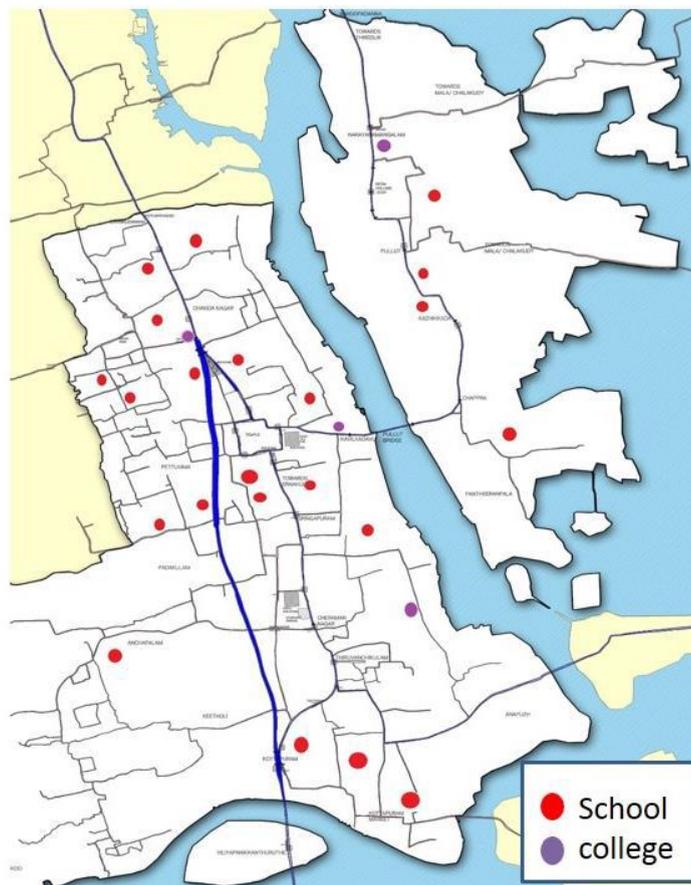

Figure 22 Location of educational institutes

4.6.2 HEALTH

There are sufficient health facilities in the municipality area. The municipality takes care of the palliatives also; there is a center for palliative care in the Thaluk hospital. Medical camps also done by talk hospital and there exist a pulse polio unit for children. Due to high number of water bodies the number of diseases related to water is high, mainly in monsoon. They are dungy fever, malaria; leprosy and chicken pox are seen in the area. T.B. is seen in the workers from other states. At present there are 11 allopathic hospitals and 3 Ayurveda hospitals.

Table 15 Taluk hospital Kodungallur

sl.no.	Hospitals
Primary Health Centre	
1	Primary Health Centre Metathala
2	Primary Health Centre Anapuzha
Hospitals	
3	Thaluk hospital
4	M.I.T
5	Craft hospital
6	Modern hospital
7	P.G.M. Hospital
8	Medicare hospital
9	Shanthi hospital
10	Ok hospital.
11	Goury Shankar hospital

Table 16 List of Allopathic hospitals

Sl. no.	Name
12	Ayurveda hospital
13	Panikkers hospital
14	SreeRadhaGovindayurvedhachikilsalayam.

Table 17 List of Ayurveda hospitals

4.6.3 HOUSING

The rapid growth of population in urban centers ,since independence has lead to a great extent to the emergence and growth of urban slums in the country. The development activities in urban centers provide employment to the rural migrants as well as the local urban population. The low income groups in the absence of proper shelter settled in pickets of the slum areas, which are characterized by overcrowding ,lack of sanitation and civic amenities, dilapidated dwellings etc. The problem is not merely the existing slums but also the growth of new ones. To solve the problem of existing slum, adequate steps are to be taken in advance to prevent formations of new ones. According to 2011 census the total percentage of slum population in kodungallur municipality was 24%.

Integrated housing and slum development program aims at combining the existing schemes of VAMBAY and NSDP under new IHSDP scheme for having an integrated approach in ameliorating the conditions of the urban slum dwellers, which do not posses adequate shelter and resides in dilapidated conditions. The scheme is applicable for to all cities and towns as per 2001 census except cities/towns covered under Jawaharlal Nehru National Urban Renewal Mission(JNNURM).The scheme seeks to enhance public and private investments in housing and infrastructure development in urban areas. The objective of the scheme is to strive for slum less cities with a healthy and sound urban environment, by providing adequate shelter and basic infrastructure facilities to the slum dwellers of the identified urban areas.

They are as follows,

1. Kulaparambu colony

2. Narayanamangalamlakshamveedu colony

3. Chaparalakshamveedu colony

4. Aalechumparambulakshamveedu colony

5. Panterampala

6. SC colony

7. Kavukadavu landing place colony

8. Kudumbi colony

9. Ratupura colony

10. Sringapuram SNDP colony

11. Uzhavatthukadavukayaloram colony

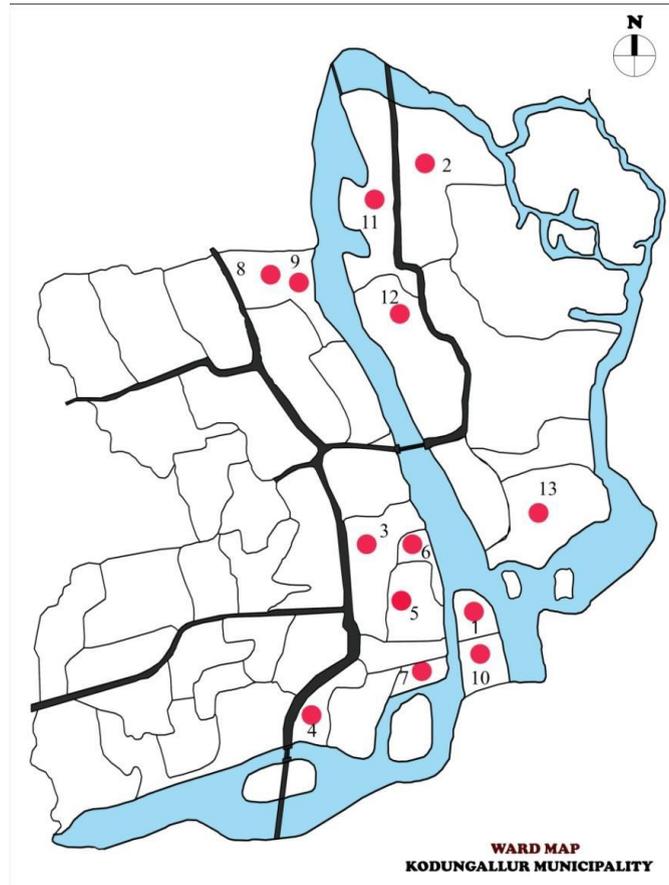12. Vayalar colony

13. Narayanamangalamthekkekunnu

Figure 23 Location of colonies

4.7 TRANSPOTATION

Kodungallur Municipality is well connected with the surrounding areas by road ,railways,air way and inland waterways. One national highway and state highway each passes through the study area. There is no railway line passing through Kodungallur. The transportation system of the municipality is predominantly depends on Road way system. The vehicular growth has been rapid and there is a strong need to control the increasing traffic congession. Kodungallur is one of the district boundaries. Kodungallur town is 38 km away from Thrissur,50 km away from Guruvayoor,30 km away from Cochin,24 km away from Chalakudy,14 km away from Irinjalakuda,58 km away from Wadakkanchery.

4.7.1 EXISTING TRAFFIC SYSTEM

Kodungallur has a ring road system within the Central Bussinessdistrict.The roads which brings traffic in the case of kodungallur town are the NH 66,Kodungallur –Shornur state highway, Azhikod road and Kara road , with the completion of Kottapuram – Thuruthipuram Bridge another entry point from Angamaly and the International airport area will open up. Whithin the central areaof the town there are several junctions .The ring –radial pattern of road here ,results in the formation of 7 junctions within the aerea which is confined to 0.09km².the temple Peripheral road circumscribes the outer boundary of Kodungallur temple .The traffic entering/departing from the temple aggravates the problem faced here. A one way traffic system is in force on temple peripheral road. The traffic flow pattern is in the clock-wise direction .Auto-rickshaw stands are located on the carriage way of the northern section of the temple peripheral road ,facing the hospital,and also on the eastern section of the road,in the vicinity of IndraprastaHotel.The auto stand facing the hospital on the temple peripheral road adds an element of constraint to the smooth flow of traffic.The stand here is meant for the convenience of patients arriving at the hospital.
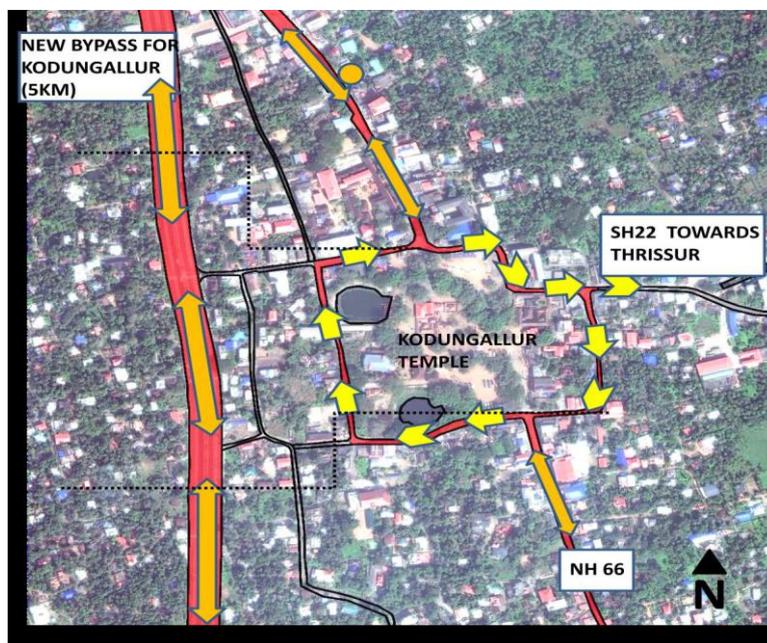

Figure 24 Existing traffic system of Kodungallur

The radial roads emerging from the Ring- Road are the NH-66 southern section ,NH-66 northern section ,Thrissurroad,Hospital-Chanthapuraroad,Temple-palace road, Hospital-Punchapadam road, and south west corner link road.The last 3 roads serves local traffic.All other roads are arterial roads in nature and carries heavy traffic.One-way traffic regulation is

in force on the Hospital-chanthapura road ,which takes off from north west corner of the temple peripheral road .A stand for private buses is located here.Buses originating from the southern part of the kodungallur town through the south Nada arrives at the private bus stand making use of the hospital –chanthapura road. The Hospital –Chanthapura road passes through the Private bus stand and moving further north it joins the NH-66 .A Three arm´Y' junction isformed here (Bypass junction) The Thrissur road junction is formed on the eastern section of the temple peripheral road.With the one-way traffic system in operation ,two left turn movements and one straight ahead movement exists at all the junction on the temple peripheral road. The Keezhtholy junction which is formed by NH-66 and the krishnsnkottaroad.the junction takes place a 'Y' configuration . Vehicles from NH-66 destined towards Mala, and also those destined to the Kottapuram Market and Ferry via Cheramanparambu makes use of this road.This junction at present is required to handle a comparatively low volume of vehicular traffic. The NH -66 toll junction is made up by NH-66 and the Kottapuram Market raod. The junction has a 'y' configuration.The junction at present is required to carry al ow volume of traffic.

4.7.2 WATER TRANSPORTATION

The study area is gifted with a number of navigable waterways. The same could be exploited for recreation and mobility demands of tourists. The section of the Periyar river and its tributaries constitute the principal waterways corridors of the study region. The identified ones are:-

1. Periyar River

The Periyar River may be divided into two sections.

- Stretch between Azhikode and IWA1 Terminal at Kottapuram
- Stretch between IWA1 Treminal and KottayilKovilakam Jetty

The stretch 1 mentioned above forms asection of Kollam-Kottapuram national waterway III.The end point of NW III is the IWA1 Terminal at Kottapuram.This section 2.6 kms long, has been developed in accordance to National waterway standards.The stretch 2has a length of 6 km this section of the Periyar river makes up the principle waterway corridoor for the Muzris Heritage Project.

2. Tattapalli River

The Thattapalli River extends northwards from Vembanad Lake and Merges with Periyar River at Azhikode.thiswaterbody forms a section of NW-III.The Thattapalli River stretch

between its confluence point with Paravurcanal,in the south and Azhikode in the north .The stretch measures 6.25 kms.This stretch of waterway being a section.

3. Kottapuramfort-Padyur Jetty At Mathilakam Pullut River emerges from the Periyar and is inclined in the northern direction towards Chettuva.this waterway is a section of the West Coast Canal.This waterway is 13 km long.There are 5 bridges across this waterway,namelyKottapuram-ThuruthipuramBridge,Krishnankotta Bridge, pullut Bridge, Poovathumkadavu Bridge S N Puram and Mathilakam Bridge.

4. Kottapuram Market Canal

This canal has a length of 0.900kms.It links The Periyarriver on one end and Kottapuramvijayanthodu on the other. vegetables and other agricultural products are brought to the Kottapuram market through this canal. The eastern part of the Kottabpuram market is bound by the market canal.

5. KottapuramVijayan Canal

The K V canal has a length of 1.5kms.It links the Periyar and PullutRiver.It runs through KakapadamThuruth, Anapuzha ,Mundukadu and Paliyamthuruth and finaly joining the Pullutrver.

6. ThiruvanchikulamKadavu Canal

This canal has a length of 0.410 kms .It is a branch of K V canal .Thiruvanchikulam Kadavu canal takes off from the K V canal and aligned in east-west direction and leads to Thiruvanchikulam temple.

7. Sringapuram Canal

This canal has a length of 0.800kmsb,takes off from pullut river and terminates at Sringapuram50 m short of NH-66 ,within the urban limits of Kodungallur town.it has a width ranging from 7m to 10m.This canal is silted and available depth at present does not allow movement of watercrafts.till recently large country crafts with merchandise and supplies from eramakulam market meant for business establishment in Kodungallur wbere brought in through this canal.

8. Kavilkadavu canal

This is an artificial canal of blength 0.550 kms linking the Pullut river and terminating on the northern side of Kodungallur- Thrissur state highway.bbthe canal in the distant past was meant for the divotees who arrived here for Worship at the Kodungallur temple.at present the canal is bdegenerated into a stagnant pool.

9. Anapuzha Canal

The Anapuzha Canal is takes off in a perpendicular manner from the K V canal. It has a length of 0.900 kms. In the past large country crafts made use of this canal for navigation between Kottapuram market and other parts of neighborhood. Two culverts have been constructed across this canal. Small size country boats still make use of this canal across certain sections.

4.7.3 TRAFFIC VOLUME AT MAJOR INTERSECTIONS

Based on the reconnaissance survey, turning movement surveys at 10 major intersections in the study area were conducted to ascertain the peak hour demands. Major intersections selected for volume count survey are given in The summarized traffic flow in PCU at these intersections is given in Table12.5. It could be seen that the Chanthapura Junction witnessed the maximum peak hour traffic flow of by 3,179 PCU . For the other intersections, the peak hour traffic flow varied between 1,000 to 3,000 PCU.

Sl. No.	Name of Intersection	Peak Hour	Peak Hour Volume (PCU)
1	Chanthapura	5:15 PM to 6:15 PM	3179
2	Bus Stand Junction	5:15 PM to 6:15 PM	3079
3	Vadakenada Junction	10:45 AM to 11:45 AM	2824
4	Pump Junction	10:45 AM to 11:45 AM	2616
5	Thekkenada Junction	10:15 AM to 11:15 AM	3252
6	Padinjarenada Junction	10:00 AM to 11:00 AM	1031
7	Modern Hospital Junction	5:45 PM to 6:45 PM	1090
8	Cheraman Junction	4:30 PM to 5:30 PM	1965
9	Keethali Junction	9:45 AM to 10:45 AM	2355
10	Narayanamangalam	4:15 PM to 5:15 PM	1574

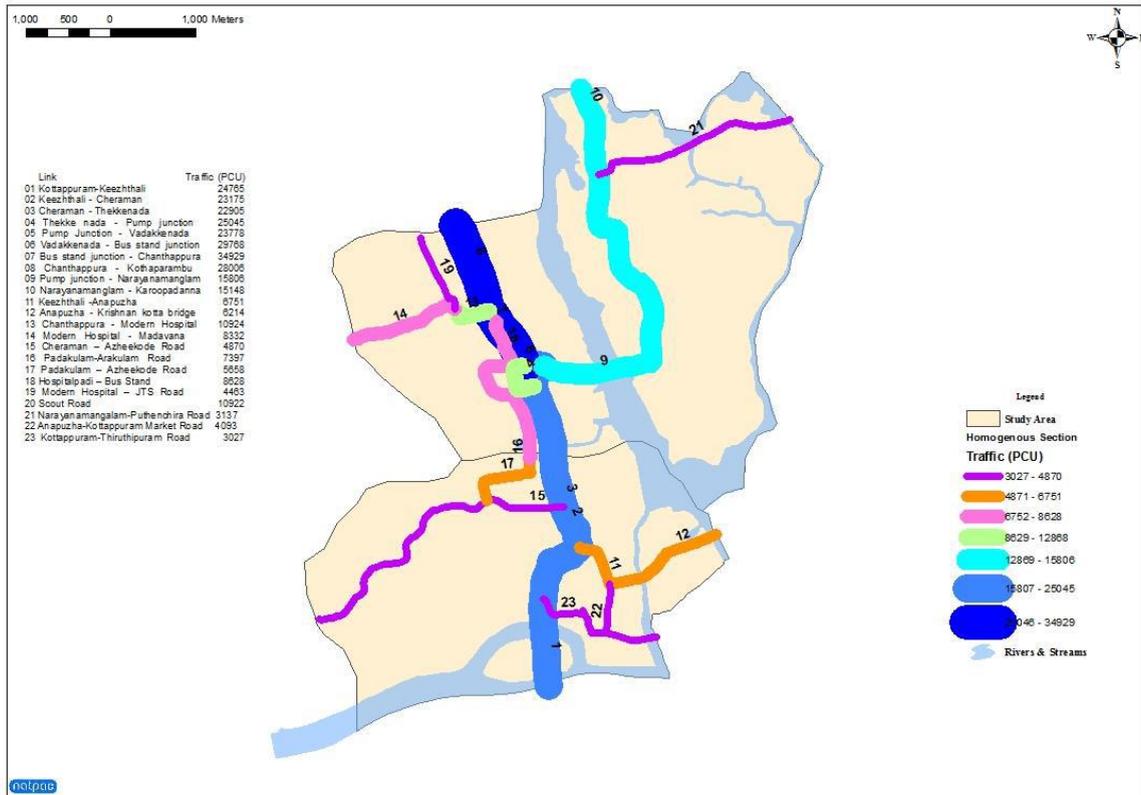Figure 25 Hour Traffic Flow at Major Intersections in Kodungallur

Figure 26 Map showing Traffic Volumes in Major roads In Kodungallur

4.8 INFERENCE

4.5.1 BASED ON SECTOR- WISE ANALYSIS

The study area has under gone substantial change in the land use, which is the outcome of social, economic, religious and cultural factors. The physical environment and the socio-economic environment, which are highly influenced or dependent on the presence of water bodies, are analysed here to understand the present scenario of the town. As per the various land uses in the town, water body constitute the third biggest use constituting around 14.31% after residential and dry agriculture (23.44%). The eastern part of Kodungallur is less densely populated as it is dominated by low lying areas, marshy land and wet lands. This area is largely used for prawn cultivation and is called 'pokkali' lands. Sea water inundation is the major feature of this area and paddy cultivation is feasible only by the end of monsoon rains, when the salinity will be washed away to a great extent. Paddy cultivation is alternated with prawn culture.

4.5.2 BASED ON HERITAGE VALUE ASSESSMENT

The existing conservation project was started on the basis of material based and value-based approach where major priorities are given to the authenticity of the heritage assets and as the emphasis of value-based approach increased the community started to get involved in the

conservation practise but in a limited way. In order to promote the practise of HUL the study area need to integrate the historic structures with urban management by considering the land use structure, economic aspects, social, cultural and intangible values.

Ideas for improvement from the visitors	Respondents	
	Built Assests	Natural Assests
Physical improvement (building conservation/ renovation/ maintenance, add public space/ shades, cleanliness/ avoid vandalism, accessibility (road/ route improvement), add/ improve public facility, add Tourism Information Center, add pedestrian, add parking lot/ street ornaments, add museum, add/ improve public facility)	9	11
Cultural improvement (add art performance)	1	1
IT-based improvement (add information board/ signage/ map/ IT based information, promotion in social media)	26	36
Regulatory improvement (regulate the street vendors/ street performers)	5	2
Others (add tour guide, improve the flood risk, add child playing ground, provide shuttle bus/ brochures, improve the safety of the area, utilise old buildings for tourism/ educational purposes, involve local people in formulating a plan, add tourism spot, e.g. statue/ activity, e.g. Horse riding tour)	9	7
Satisfied	10	3
Total	**60**	**60**

Table 18 Random sampling survey showing the priorities of respondents on different values of heritage

CHAPTER 5 PROPOSALS

5.1 FORM BASED CODES (FBC) ZONING

Form Based Codes (FBC) is a planning and zoning tool that is used for regulating development using physical form rather than land use segregation as the organizing principle for the code. It aims at contributing to better quality of life by fostering a high-quality public realm. In the Indian context FBC can be adopted and applied as mandatory code, hybrid code or parallel code. The scale of application can be at the city level, area/neighborhood level or project/ site level.

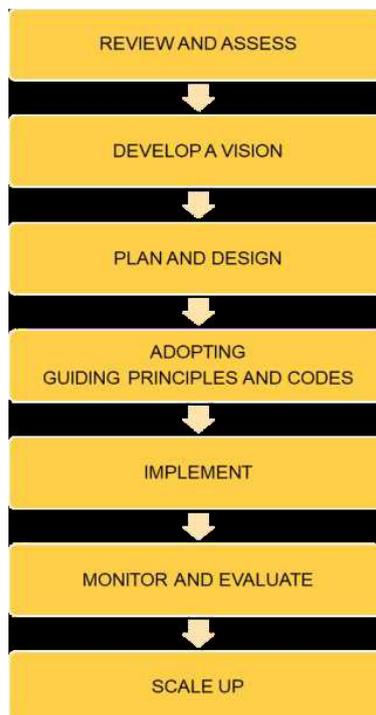## 5.1.1 METHODOLOGY AND ORGANISING PRINCIPLE

Figure 27 Methodology of form based code

The principles are derived from the research and best practices of FBC around the world and are contextualized for application in Indian cities. Once the city creates a vision for the chosen FBC area, it can pick and choose principles to be adopted which can help in realizing the vision and determine the design components. The overall methodology for form-based codes essentially have seven broad stages of work including scaling up. FBC is a bottom-up development approach which aims to achieve economic, social and environmental sustainability while ensuring contextual planning that is functional and in accordance with the development goals of the city. The keystone of FBC is community involvement in not only determining community needs and priorities but also in its development and implementation.

5.1.2 INDENTIFYING FBC AREAS

Once the city takes a decision to go ahead with FBC process and creates the FBC team, the next stage to identify the FBC areas/ zone for the project. The FBC codes can be identified as a combination of two aspects, development typology and area characteristics.

Area typology ↓ → Development typology	Heritage Area	Transit zone	Ecological zone	Function specific areas	Other context specific area
Central Business Districts (CBD)					
Corridors					
Wedges					
Peripheries					

Table 19 Identification matric format for FBC

Development Typology

This is determined based on the current need for the project and state of growth and development influence in the city. These geographies could be categorized under 4 sections.

- Central Business Districts (CBD):

The city areas that are dense and have typical character to its existence often due to historical importance or robust trade centers/ economic activity agglomeration.

- Corridors:

Well-connected and diverse in character, these are areas along mass transit lines that extend from the center of the city to its periphery.

- Wedges:

Low-density/intensity areas between corridors where the neighborhoods are growing, evolving and stabilizing in terms of use and character

- Peripheries:

Under-served areas typically outside municipal boundaries where unplanned growth is occurring

Area Typology

This is determined based on significant characteristics of the area based on nature of built form, functional activities, economy, culture, history etc. If the area doesn't have a significant feature (particularly in green field projects) the typology can be determined based on the significant land use. A set of constants could be identified and benchmarked, which could then be adapted into the FBC guideline. The list of typologies are-

- Type 1 - Heritage precinct

These are areas of significant heritage character and generally seen in old cores of the cities and can be determined in two ways.

Case 1 - Area which consists of an important monument or monuments and the surrounding development complementing the same. E.g.- axis street, market, built form etc.

Case 2 - The entire precinct is of historical significance both in terms of heritage value as well as architectural character.

- Type 2 – Transit area

These are areas which have mass transits (public or private) as the main anchor of the area. This in turn influences the land use and activities in the area. The surrounding streets and built form compliment to the transit mode type.

- Type 3 – Ecological zone

These could be areas around important ecological areas of the city like city parks, urban forests etc. The development around these zones is sensitive and pedestrian friendly in nature.

- Type 4 - Function specific zones

These areas are determined by the function/ activities in the area. Here the development and streets are shaped based on the dominant 14 use or activity. E.g. – Industrial towns, housing, Central business districts, market streets etc.

5.1.3 TYPOLOGY ANALYSIS OF STUDY AREA

- The parameters used to delineate the types were age of the buildings which could show the transformation of the buildings from the old character to the new, these types are the majorly repeating ones.
- Buildings in the older market region are replaced by new concrete structures.
- New infills emerging which are completely different in form cause degradation to the existing cultural and contextual characteristics.
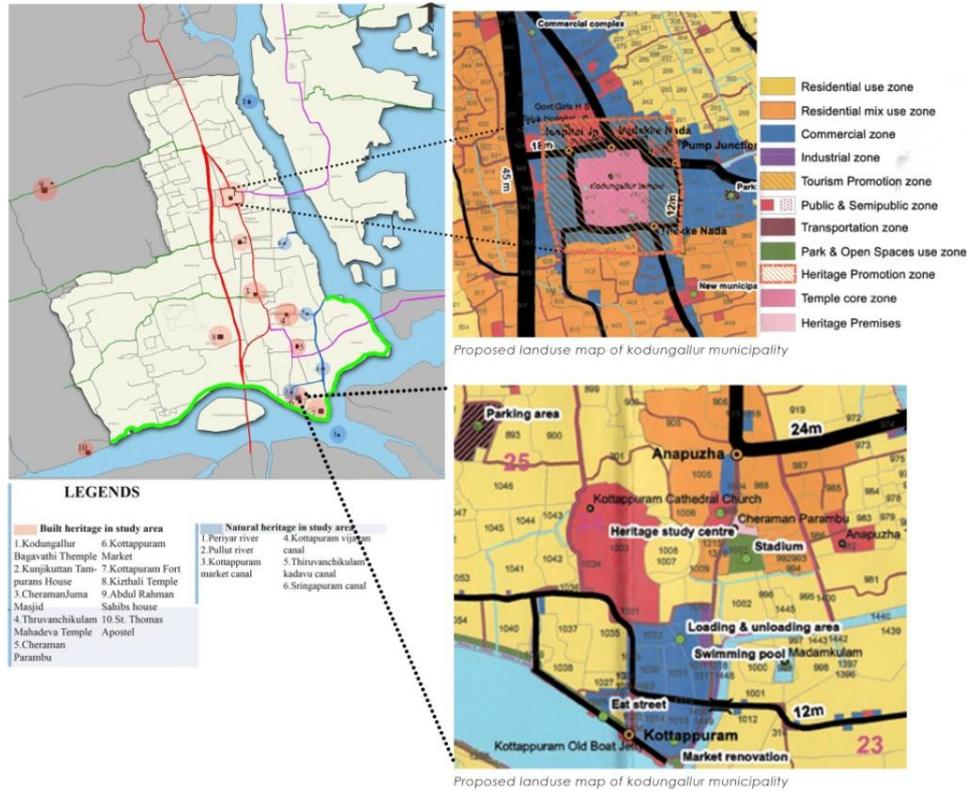
5.1.4 IMPLEMENTING FORM BASED ZONING

Figure 28 Identified areas for FBC

The first region identified for FBC comes under heritage promotion zone in the proposed master plan of Kodungallur municipality. The presence of important historical monument make this and region acting as Central Business District make this region of primary importance.

Figure 29 Form Based Zoning around the heritage site

The second region identified for FBC is has a commercial character since it is located near the famous Kottapuram market. This region is a riverfront area where boat jetties have been set up to facilitate water transportation connecting different heritage sites. Major heritage sites located in this region includes Kottapuram Fort, Cheraman paramb and Muziris lakeshore park.

Figure 30 Form Based Zoning near the heritage sites and waterfront area

5.2 IMPROVING THE ECONOMIC VALUE

5.2.1 ROLE OF ECONOMIC VALUE IN HERITAGE MANAGEMENT

An important factor in the maintenance of heritage sites is economic value. Recognizing the economic potential that these sites hold is equally crucial to the preservation of cultural and historical resources, which is of utmost importance. Heritage management may promote economic growth, community development, and cultural pride in addition to ensuring the sustainability of these places by recognizing and maximizing their economic value. The importance of increasing economic value in heritage management is examined in this introduction, which also emphasizes how closely preservation, commerce, and societal advantages are linked. Heritage sites can thrive and continue to add to our cultural heritage for many generations by finding a balance between protection and economic sustainability.

Improving the economic value in heritage management is of significant importance for several reasons:

- Sustainable Preservation: Economic value creation at heritage sites can help with long-term upkeep and preservation. To save, restore, and maintain heritage assets, significant financial resources are frequently needed. Enhancing their economic value makes investing in their maintenance and ensuring their sustainability for future generations financially feasible.

- Economic growth and job creation: Heritage sites have the power to spur economic expansion and generate job opportunities. Activities centered on tourism and cultural heritage can draw both local and foreign tourists, who then spend money on lodging, food, transportation, souvenirs, and other services. This flood of tourists boosts local businesses' revenue and encourages the creation of jobs, which helps the local economy.

- Community Development: Local communities may benefit from heritage management that prioritizes economic value. Heritage sites can facilitate the growth of regional enterprises including handicrafts, traditional arts, and cultural events through boosting tourist and cultural activities. They can also encourage entrepreneurship and microbusiness prospects. This not only improves the neighborhood's economic health but also aids in the retention of regional customs and expertise.

- Cultural Identity and Pride: Communities can become more aware of and appreciative of their cultural identity by using the economic benefit obtained from heritage management. Communities gain a sense of pride and ownership by presenting their distinctive heritage assets, which increases community engagement and involvement in preservation initiatives. This improves social cohesiveness and boosts the neighborhood's general wellbeing.

- Educational and Research Opportunities: The financial benefits of heritage management can fund educational programs and research endeavors. Tourism- or partnership-related revenue might be utilized to fund educational initiatives, scholarships, and grants for study in archaeology, history, and related subjects. This facilitates the sharing of knowledge, promotes the investigation of cultural legacy, and advances our understanding of human history.

5.2.2 TOTAL ECONOMIC VALUE (TEV) APPROACH

Total economic value is the thorough evaluation and calculation of all the financial gains and values connected to historic places. It includes both the direct and indirect economic benefits that heritage assets bring to particular people, groups of people, and society at large. This idea encompasses a broader understanding of the economic importance of legacy in addition to the conventional focus on financial transactions.

The framework of this value approach system is divided into different components which are-

- Direct Economic Value: Included in this are the observable and quantifiable economic advantages that immediately flow from heritage management operations. Tourism-related income, ticket sales, guided tours, retail and souvenir sales, lodging, and food and beverage services are all included. Additionally, income from jobs directly related to heritage sites, such as tour guides, museum employees, artists, and hospitality personnel, is taken into account when determining direct economic value.

- Indirect Economic Value: This is a reference to the financial gains that come about as a result of heritage management. The multiplier effects, which occur when money spent by visitors and businesses connected to heritage sites circulates within the local economy and spurs further economic activity and support for diverse industries, are an example of indirect economic benefit. This can include the revenue produced by vendors, transport services, construction and maintenance projects, and neighborhood businesses that serve the demands of the tourism and historic sectors.

- Induced Economic Value: The term "induced economic value" describes the wider economic effects that result from the income and jobs produced by the direct and indirect economic activity connected to historic places. These implications include how much money workers in the cultural sector make, what they spend on goods and services, and how the local and regional economies are subsequently affected. The multiplier effects, additional employment, and revenue generation along the supply chain are all included in the concept of induced economic value.

- Non-Use / Existence Value: Even if they are not used or visited, heritage places have importance for both individuals and society. The inherent value and appreciation that people feel for their legacy, which can be expressed in cultural identity, a sense of belonging, and the preservation of historical and cultural heritage for future generations, is referred to as non-use value or existence value. Although non-use value is frequently difficult to measure financially, it is a significant component of the overall economic value of historic places.
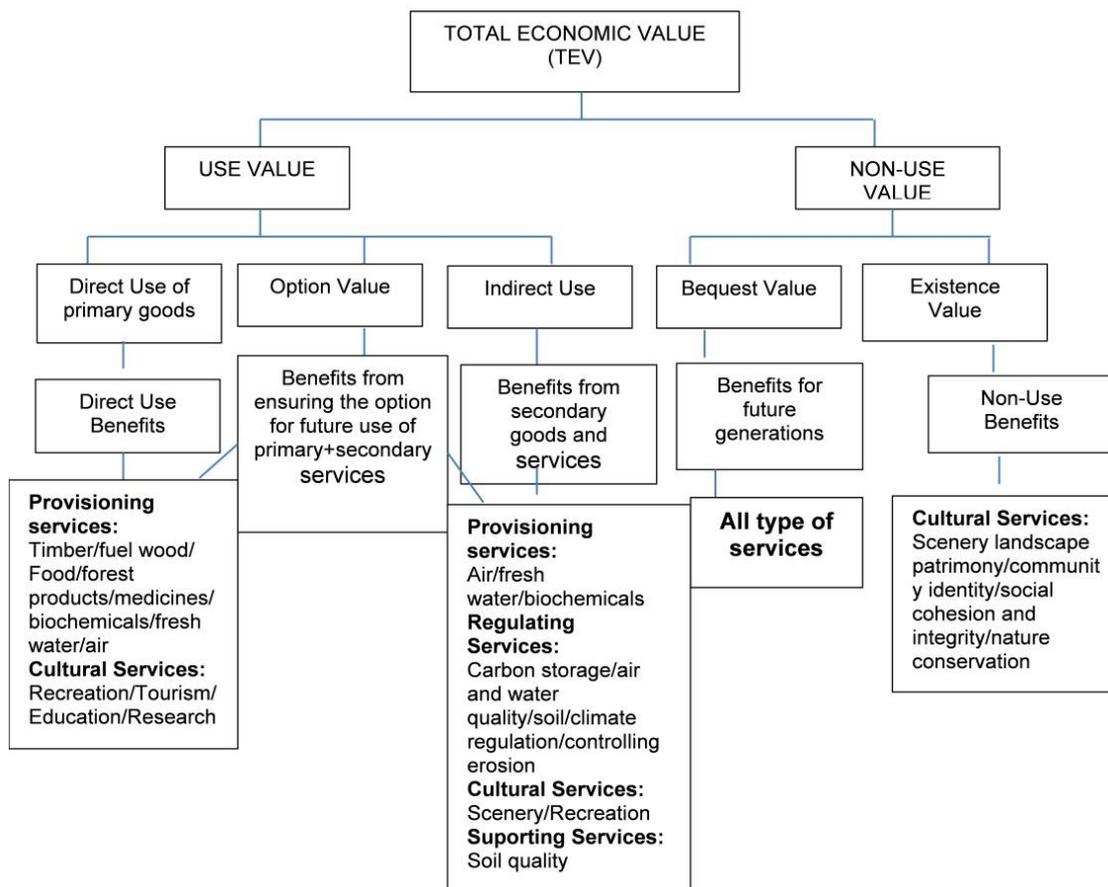

Figure 31 Components of Total Economic Value

Types of Values	Indicators	Measures	Expected economic impact	Values
Non-use	Residents' awareness of heritage	Survey among residents	Existence value	Existence
	Will to finance heritage conservation projects	Stated preferences survey among residents	Increased fiscal income	
	Desire of visiting the town in the future	Survey among potential visitors	Increase in the option value	Option
	Commitment of local authorities to heritage conservation	Survey among town representatives concerning their personal involvement	Heritage-oriented policies	
	Status of the urban heritage in the country or worldwide	Survey among residents and non-residents	Increased value of the legacy	Bequest
	Average time passed in town	Visitor survey on time passed	High expenditures in town	
	Average daily expenditures per visitor	Visitor survey on expenditures	High expenditures in town	
	Local jobs related to visitor spending	Ratio between patrimonial and local jobs	Local job creation	
Indirect use values	Sales related to visits	Survey among shopkeepers	High expenditures in town	
	Events associated with heritage	Number of events associated with heritage	High expenditures in town	
	Non-patrimonial real estate value	Higher value of patrimonial than of non-patrimonial real estate	High real estate prices	

Figure 32 Indicators and measures in TEV approach

5.2.3 TEV FRAMEWORK

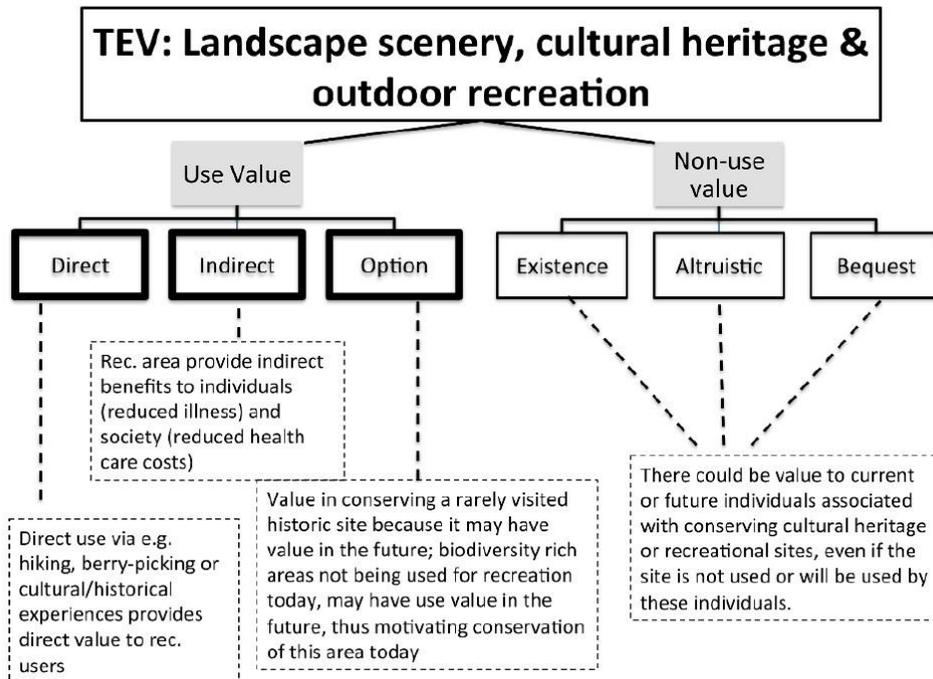## FRAMEWORK FOR CULTURAL HERITAGE

Figure 33 TEV framework for cultural heritage
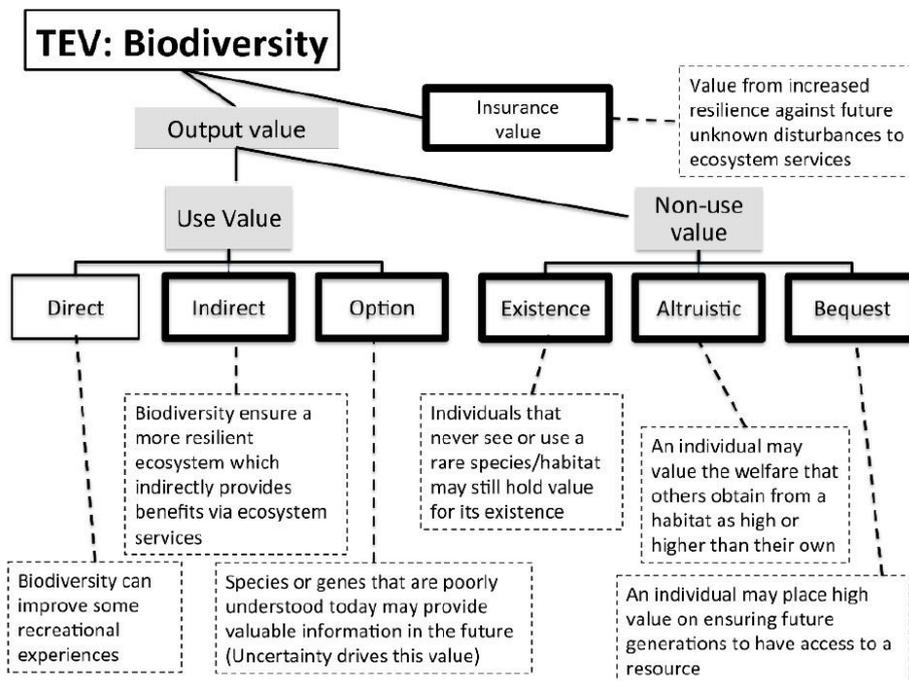
FRAMEWORK FOR NATURAL HERITAGE

Figure 34TEV framework for natural heritage

CHAPTER 6 CONCLUSION

The purpose of this study is to demonstrate the value of the Historic Urban Landscape (HUL) approach to heritage management. Numerous advantages of this concept, such as its integration potential, recognition of intangible aspects of heritage, and values of contemporary architecture, were revealed by an analysis of the foundational and recent literature on the theoretical underpinnings and applications of HUL. However, several challenges and conflicts were also identified, including the difficulty of finding important historical patterns and the questions of how much change historic environments have undergone. The expansion of the approach to HUL should take into account additional factors related to the managerial, economic, and sociological scope of the topic, especially those related to the need to view the approach to Historic Urban Landscape from a very broad perspective, where HUL is not seen as a new town plan but rather as a general management tool, which should integrate with the other planning, management, and control tools already in use and which necessitates the use of other planning, management, and control tools. The Historic Urban Landscape (HUL) approach holds immense importance for the management and preservation of historic urban areas. By adopting a holistic perspective that considers the physical, social, economic, and cultural dimensions of urban heritage, the HUL approach ensures the safeguarding of the unique character and identity of historic cities. Moreover, its emphasis on community involvement fosters a sense of ownership and empowers local stakeholders, promoting social cohesion and inclusive urban environments.

In conclusion the recommended plans for the study area were developed with consideration for both the context of the local urban growth and the heritage value of the area. The Kodungallur municipality's land use pattern is changing drastically, which will have an effect on the tangible heritage assets. Form Based Zoning has been used to guarantee the survival and longevity of various heritage qualities without any negative effects of urban expansion. The Total Economic Value (TEV) plan has been established in order to promote economic development in the area through heritage management. To investigate various strategies for highlighting and promoting heritage tourism activities, it is crucial to conduct an economic appraisal of each tangible and intangible historical asset.

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