

LANDSCAPE DESIGN OF AN INTEGRATED LOOP, ALAPPUZHA

MASTER OF LANDSCAPE ARCHITECTURE

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2016MLA007



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NEELBAD ROAD, BHOURI, BHOPAL - 462030
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LANDSCAPE DESIGN OF AN INTEGRATED LOOP, ALAPPUZHA

Submitted

*In partial fulfillment of the requirements for the
award of the degree of*

MASTER OF ARCHITECTURE (LANDSCAPE)

By

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2016MLA007



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Declaration

I, NISHA NELSON, Scholar No. 2016MLA007 hereby declare that the thesis entitled LANDSCAPE DESIGN OF AN INTEGRATED LOOP, ALAPPUZHA, submitted by me in partial fulfillment for the award of Master of Landscape Architecture, in School of Planning and Architecture Bhopal, India, is a record of bonafide work carried out by me. The matter embodied in this thesis has not been submitted to any other University or Institute for the award of any degree or diploma.

17.05.2018

NISHA NELSON

Certificate

This is to certify that the declaration of NISHA NELSON is true to the best of my knowledge and that the student has worked for one semester in preparing this thesis.

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ABSTRACT

Alappuzha, better known by the sobriquet 'Venice of the East' is a narrow land strip sandwiched between the Arabian sea and the Vembanad Lake. A network of canals intercept the town and connect it to the hinterlands . The erstwhile port town in the state of Kerala, was a bustling centre of trade during the 18th to 20th centuries. It's a cultural landscape shaped by the trade activities of the 18th century on the natural systems of the region. Traces of the glorious past can be seen in the town as the abandoned ware houses, factories, canals etc. The canals are at the epicenter of that heritage, situated at the heart of the town itself. The cargo that came in to the port from all around the world was transported inland through these navigation corridors envisioned by Raja Kesavadas. Alleppey is a heterogeneous landscape and is also a highly fragmented urban landscape. It is a town that is seemingly stuck in time. The glorious past as a port town is all that it can boast of. Negligence and ignorance has put its heritage in a state of ruin- both the tangible and intangible elements. As the port gradually shifted to Kochi, the associated infrastructure started to become obsolete. And this neglect has led to the present dilapidated condition of the canals that once were the carriers of the economy of the region.

Today, the humble town is known for its natural beauty, backwaters and endless paddy fields, coconut groves, house boats, boat races etc . Tourism has tapped into this potential, becoming the major economic activity of people in Alappuzha, making it an international tourist destination attracting around 50,000 tourists every year. The Government of Kerala has proposed several projects for the boost of tourism sector in Alappuzha and thereby eliminating poverty, unemployment, etc. and uplifting the quality of life of the people. The factors that can generate tourist flow to a place are local attractions, accessibility, facilities etc. Alappuzha is blessed with natural beauty. But, studies show that the average duration of stay for tourists in the town is 3 days. The field in which the town is lacking is the infrastructure available and an environmentally friendly approach to development. It is high time to sustain the quality of environment for future tourism activities of the region. The canals are to be revitalized as they are the backbone of the town. This shall serve as a boost to the tourism sector of Alappuzha inviting many more tourists to understand the culture and heritage of the erstwhile port town, while the canal as an image of the city can be preserved and enhanced in a holistic manner. The problems related to the sustainability of backwaters and the gaps in tourism infrastructure can be addressed. The study shall propose a comprehensive landscape plan for the region in order to preserve and enhance the landscape character of the town, with special attention to integrate the daily lives of the natives and also the activities of the tourists.

Key words: Cultural landscape, Heritage conservation, heterogeneous landscape, revitalization, cultural tourism, aesthetics.

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CHAPTER 1: SYNOPSIS

SYNOPSIS

1.1 INTRODUCTION

Alappuzha, also known by the sobriquet “Venice of the east”, is a small land strip between the Vembanad Lake and the Arabian Sea. Alappuzha District came in to existence on 17th August, 1957 and became the smallest in terms of area with 141011 hectares (IJHSS) in the 14 districts of the state of Kerala in India. It is a widely-acclaimed tourist destination well-known for its endemic beauty, serene backwaters, house boats, crowd-pulling boat races, backwater tourism, pristine beaches, exotic marine products and coir industry. This tiny sandy strip is intercepted by lagoons, rivers and canals. On its west lies the Arabian sea, on the north is Ernakulam district , to the east are Kottayam and Pathanamthitta districts and to its south lies Kollam district. Alleppey is christened as the ‘Rice Bowl of Kerala’. Vembanad lake is the longest lake in India .

Alleppey is a town that is seemingly stuck in time. The glorious past as a port town is all that it can boast of. Negligence and ignorance has put that heritage in a state of ruin- both the tangible and intangible elements. The canals are at the epicenter of that heritage, situated at the heart of the town itself. The cargo that came in to the port from all around the world was transported inland through these navigation corridors envisioned by Raja Kesavadas. The genius of old wisdom was used to dig the canal along an already existing water channel. But time changed everything. As the port gradually shifted to Kochi, the associated infrastructure started to become obsolete. And this neglect has led to the present condition of the canals that once were the carriers of the economy of the region. People of Kuttanad region depend upon these canals for irrigation of agricultural lands. It is the rice bowl of India and the only place where agriculture is done below sea level. Bunds were built for the purpose of cultivating two crops annually, consequently affected the canal system and its flow.

Today, tourism is a major sector of revenue generation for the people of Alappuzha. Kerala government has boosted tourism as an engine of economic growth and an able-instrument for eradicating the twin problems of poverty and unemployment, opening up

new horizons and elevating standard of living of the people. The factors that can generate tourist flow to a place are local attractions, accessibility, facilities etc. Alappuzha is blessed with natural beauty and the field in which it is lacking is the facilities available and an environmentally friendly approach to development. Alleppey has become an international tourist destination attracting around 50,000 tourists every year. But, studies show that the average duration of stay for tourists in the town is 3 days. It is high time to sustain the quality of environment for future tourism activities of the region. The canals are to be revitalized as they are the backbone of the town. This shall serve as a boost to the tourism sector of Alappuzha inviting many more tourists to understand the culture and heritage of the erstwhile port town, while the canal as an image of the city can be preserved and enhanced in a holistic manner. The problems related to the sustainability of backwaters and the gaps in tourism infrastructure can be addressed. The study shall propose a comprehensive landscape plan for the destinations in the loop and a landscape management plan for the region in order to preserve the landscape character of the town.



Figure 1: Pallathuruthy river ,Alappuzha

Source: Twitter,Photo taken by Charly K.

1.2 AIM

The aim of this thesis is to study the landscape character of Alappuzha town and enhance the condition of the canals by proposing a comprehensive landscape plan of the area which is proposed for integrated tourist circuit.

1.3 OBJECTIVES

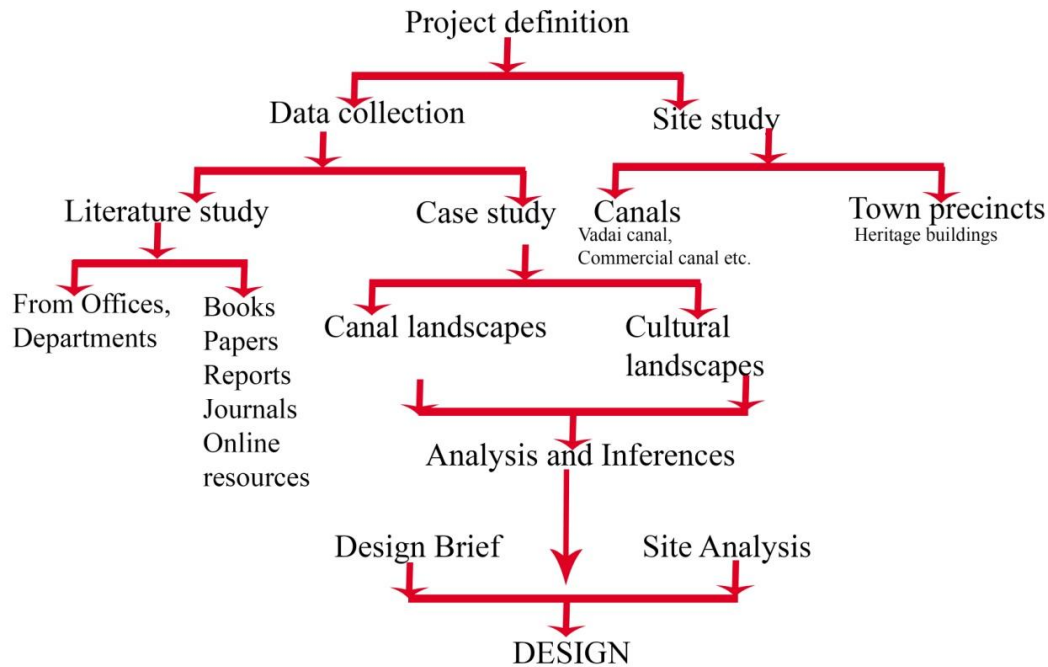
- Study the landscape character of the town of Alappuzha
- Design the canal circuit that is proposed for Alappuzha with proper signages
- Enhance the tourism infrastructure of the town with landscape sensitive design.
- Provide guidelines for preserving the character of the heterogeneous landscape of Alappuzha.
- Revitalize the canals that are in a dilapidated condition and enhance the water transport of the town.
- Water quality improvement by eradication of water hyacinth and floating weeds using proper measures.
- Link the canals with the national waterway3(as proposed) and ensure minimum water depth for navigation.
- Ensure balance of the ecosystem and prevent the fauna from disappearing.
- Desilting and ensuring flow of the canals and natural flushing .
- Conserve the interfaces between the sea, the backwaters and the lake
- Ensuring low salinity level in canal for irrigation and also prevent local flooding during monsoons.
- Boost the tourism of the town and showcase the culture and heritage of Alappuzha.
- Promote small scale industries and handicrafts like coir products by showcasing them as part of the programme.

1.4 SCOPE AND LIMITATION

- The increasing influx of tourists and the demand of well designed infrastructure adds to the scope of the project.

- Only the manmade canals(Commercial and Vadai canals) and their precincts are considered for landscape design.

1.5 METHODOLOGY



1.6 OUTCOMES

The systematic study of the region and design proposal for the town will be the final outcome from this thesis. But the interim goals are as important as the final outcome.

- Identify Typological features of the landscape such as canals, streets and paths, paddy fields, etc.
- Comprehensive landscape plan and design of specific identified stretches
- The study shall also propose a landscape management plan for the region in order to preserve the landscape character of the town.

CHAPTER 2: LITERATURE REVIEW

2.1 LANDSCAPE

According to the Council of Europe, 2000 landscape is “An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”. The different notions of landscape can be located along a spectrum with a visual and painterly view at one end, where a framed scene with selectively foregrounded features is captured for an admiring gaze, and a more inhabited concept of landscape at the other, where people, land and history combine to create a sense of belonging associated with a region. The extremes overlap extensively(Fig 2).



OVERLAPS

The multifaceted nature of the landscape comprising a varied spectrum of interconnected seen and unseen relationships, practices and processes is summarised in Fig.3.

Figure 2 Landscape spectrum. Adapted from Selman, Paul 2012

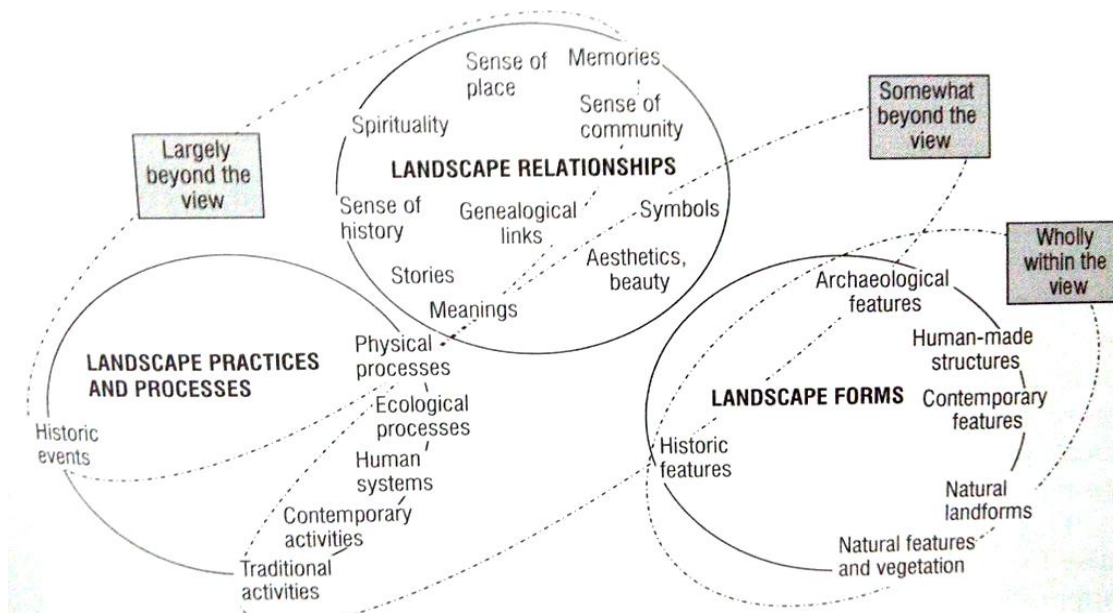


Figure 3 Cultural landscape: seen and unseen forms, relationships, practices and processes.

Source: Paul Selman, Sustainable landscape planning

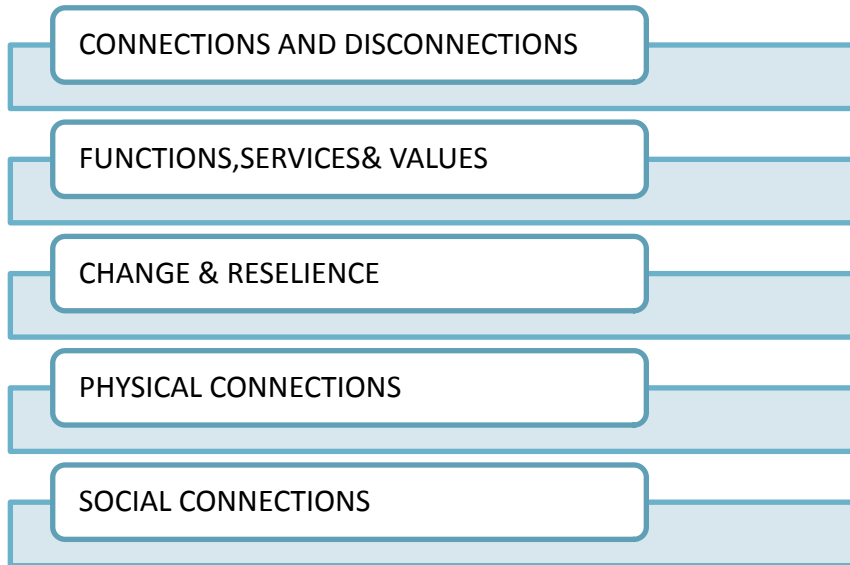


Figure 4 : The landscape

Source: Paul Selman

CONNECTIONS AND DISCONNECTIONS

A core challenge facing contemporary cultural landscapes is disconnection. The landscape is more than just a scenery- it is a complex system comprising of natural and social subsystems.

FUNCTIONS, SERVICES & VALUES

The cultural landscape is a system of structures, functions, services and values.

CHANGE & RESELIENCE

Landscape is a dynamic system. Some landscapes are 'fast change' some are 'slow change'. Even though the basic landform is essentially fixed, the cultural landscape is in constant flux.

PHYSICAL CONNECTIONS

Three physical systems viz. air, water and land have been the focus of reconnection programmes

SOCIAL CONNECTIONS

People connect with landscapes in various ways. There are links between landscape quality and economic sustainability, people's health and well being, etc.

Catherine Dee(2005) says that landscapes are dynamic, 'bio-cultural' systems and at the same time complex, spatial 'structures'. It has to function differently for different

people. We should create places that meet social, environmental, cultural, aesthetic and practical requirements. Landscape architecture should conceive spatial organization of outdoor places for human needs while protecting and enhancing the natural environments and processes. ‘Fabric’ refers to the integrated spatial structure of whole landscapes (as well as the context for design), while ‘form’ refers to the components or parts that make up this fabric. Together form and fabric create a morphology of landscape that is useful for visual–spatial design thinking and awareness. Landscape architects learn to design primarily through visual–spatial information(Dee 2005)

SCALE CONSIDERATIONS IN LANDSCAPE APPROACHES

As per The Millennium Ecosystem Assessment (MEA; 2003), “scale is the physical dimension of a process or a phenomenon in space or time and it is expressed in physical units”. It refers mainly to grain (resolution) and extent in space or time in landscape ecology. (Wu & Qi, 2000). Scale can be absolute (time or spatial units) or relative (expressed as a ratio). Cash et al. (2006) also recognize management, institutional, network, knowledge and jurisdictional scales in human-environment interactions (this is in addition to temporal and spatial scales).

In landscapes, scale matters for several reasons. To begin with, landscape phenomena unravel differently and that too at different scales. This unravelling process is very domain and phenomena specific. As a rule, in ecosystems, at local scales, some phenomena might unravel in more familiar but complex ways and become less complex at the global level (Wu & Qi, 2000; Wilbanks, 2006). This gradient of complexity might be less clear in political and human systems. The scale of agency is the second reason as to why scale matters and this is the direct causation of actions. Potential scale mismatches is another reason for considering scale is potential scale mismatches.

A. Ecological scales (Hein et al., 2006)	Dimension (km ²)	B. Scale domains (Wilbanks, 2006)		C. Jurisdictional scales (Cash et al., 2006)
Global	>1,000,000	Global		Intercontinental
Biome/landscape	10,000-100,000	Regional	<ul style="list-style-type: none"> • Continental • Sub-continental • Economic/Political unions • Large nations 	National
Ecosystems	1-10,000	Large area	<ul style="list-style-type: none"> • Small nations/states/provinces • Large basins • 5-10⁰ grid 	Provincial
Plot/Plant	<1	Local	<ul style="list-style-type: none"> • Small basins • 1⁰ grid • Firms • Households 	Local

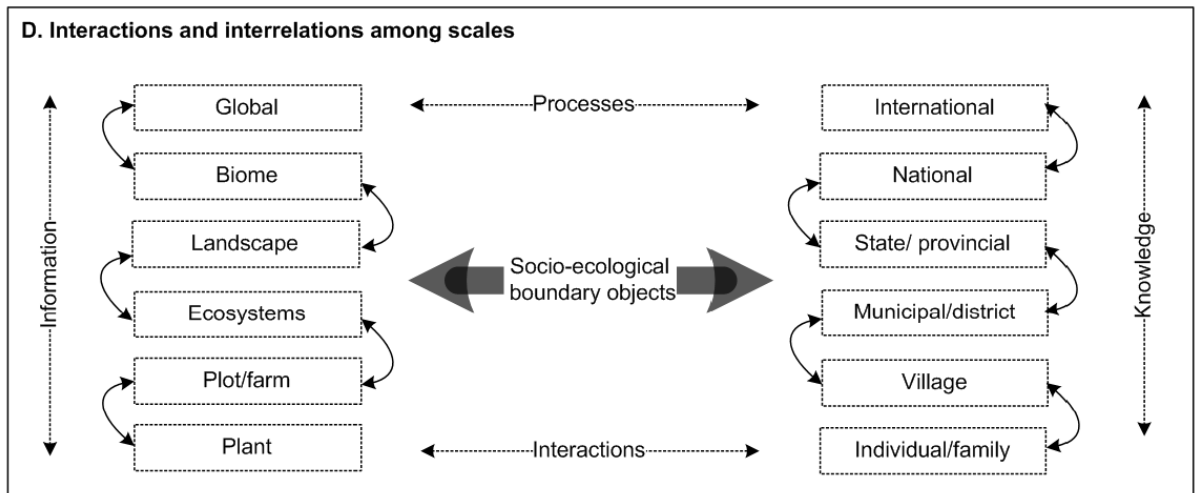


Figure 5: Hierarchical representations of scale and scale interactions.

Source: Minang et.al.2015

Landscape and its scale considerations

The extent of landscape spatially lies between 100 and 10000 square kilometres according to Forman (1995). In order to fix a scale to analyse a phenomenon, the following three concepts should be considered:

1. 'Hierarchy in scale'- It shows the extent to which the phenomena become manifested in different scales.
2. 'Scale effects'- The changes that are manifested in patterns and processes due to change in the scale considered for analysis.
3. 'scaling'- The theories or models that can be applied during translation or interpolation of information from one scale to another (Wu & Qi, 2000).

Two important components of landscapes are social and human systems (agency) and these components are the main recipients of ecosystem services. Hence they interact highly with ecosystems. These interactions can affect them positively (enabling and stabilizing), or negatively (destabilizing) based on the context (cultural , economic , political). Hence, behavioural as well as policy changes are required to produce desired effects due to these interactions that can add to multifunctional and sustainable landscapes. Having a good knowledge on scale dynamics and the influences it can have on processes is important because it can facilitate stakeholders to draw solutions to challenges in ecological and social systems by enhancing the performance . These

processes can be decision-making by participatory method, prioritization, planning, conflict resolution, benefit sharing, building of consensus in identifying a solution, resolution of conflicts, etc.(Minang et.al.2015).

Nested scales

In landscape analysis and its related processes, in order to attain a complete picture, one scale is not enough. A standard framework is required to analyse sustainability across these social and ecological systems that work at multiple levels, as illustrated by Ostrom (2009). The following are the four sub-systems in the core level presented by her:

- 1.Resource systems – an area with wildlife which is designated and protected .
- 2.Water systems resource units- shrubs, wildlife, trees, plants in forests
- 3.Governance systems - institutions for rules and management
- 4.Users - people who uses the park

In short, the choice of scale depends upon dominating phenomena like watershed, jurisdictional boundaries, protected area etc. in practices like integrated watershed management, conservation, spatial planning, etc. In a multifunctional landscape, we need to consider several factors. The three main criteria related to scale which we can consider in the sustainable landscapes are as follows:

- i) Landscape analysis
- ii) Landscape facilitation
- iii) Nested scales (Minang et.al.2015).

2.2 LANDSCAPE PLANNING

Landscape diversity, which is based on the differences in physiographic and ecological character of a region ,affects the way in which its terrestrial environment functions. Hence, the development and landuse should also be according to these differences inorder for it to be environment responsive. This is also the most important objective of landscape planning – development based on environmentally responsive planning, design schemes to match landuse and environment, and make sustainable landscapes in the long run (Marsh 2010).

The loss of our traditional knowledge on landscape has weakened the relationship between landscape and people's lives. The core values to building that relationship, like membership in a community of people, a sense of morality about the land and its community of organisms, and a spiritual attachment to place as part of our personal sense of meaning and well being, are not discovered or understood by many people

today. As stewards of the landscape, it is important to know this sense of place and values attached to it. Otherwise, we end up living in landscapes created by developers or real estate agents, for whom place is merely a location on a map (Marsh 2010).



Figure 6 :Landuse detached from the landscape. A manufactured community that shows little sensitivity towards local landscape. Source:Pricelessrealty.org

Landscape analysis is “a systematic process of describing landscape attributes, their spatial pattern and their importance to people”(Ode et.al.2008). The landscape change is effected by direct and indirect drivers.

Indirect Drivers

- Habitat change
- Nutrient Enrichment
- Over exploitation
- Variability and change in climate
- Invasive species

Direct Drivers

- Demographic Changes
- Economic Growth
- Sociopolitical changes
- Cultural and behavioural changes
- Advances in science and technology

Figure 7: Key Drives of landscape change.

Adapted from: Paul Selman

The concept of conditional stability

The stability of a landscape under stresses depend not only upon the forces applied on it, but also the resisting strength of the landscape provided by gravity, chemical cementing agents, vegetation etc. The most effective among these are living plants.

- **DISTINCTIVENESS OF A LANDSCAPE**

- A landscape perceived by natives or tourists is said to be distinct if the area's visual character and physical features are the result of specific natural and cultural factors .
- It reflects the fact that the landscape has been shaped by natural forces and human beings through time.
- Hence, the natural and cultural elements of a landscape should not be seen as separate entities, but perceived together.
- Presence or absence of such components makes one landscape distinct from other.
- The distinctiveness of a landscape is assessed or analyzed on the basis of such elements – of various scale - that compose a landscape in total.

- **CHARACTERIZATION** – a way of identifying the areas of distinct character, classifying them and mapping them and describing and/or explaining their character, yielding :-

- **LANDSCAPE CHARACTER TYPES** – These are areas that are similar in nature and may occur in different parts of the landscape. Despite the location, they have similar attributes like topography, geology, hydrology, vegetation, historical land use and settlement pattern(Selman 2012).

- **LANDSCAPE CHARACTER AREA** – These are unique and discrete geographical areas of a particular landscape type. Every LCA has its own individual character and identity although it shares broad characteristics with other areas of the same type(Selman 2012). .

2.3 CULTURAL LANDSCAPES

Conservation of Cultural landscapes- Amita Sinha

Cultural landscapes are an essential, but often overlooked part of a heritage site. They are rarely the subject of listing and documentation and seldom the focus of conservation efforts(A.Sinha 2000). The reasons are as follows:

- Overemphasis on monuments
- Lack of understanding and
- Lack of precise definition of the concept.
- Diversity and dynamic character of landscapes
- Difficulties in precisely determining their extent
- Degraded landscapes appear to have little value
- Absence in history texts
- Conflicting claims of ownership
- Presence of too many stakeholders
- Lack of financial resources
- Absence of a clear framework
- Absence of an established methodology to assess and document

Salient features of cultural landscapes:

- Historic structures are located in the landscape
- Land and nature have been reshaped by human communities
- Used for worship, production and habitation
- Iconic
- Represent the identity of a city
- Widely used

Urban precincts, districts and neighborhoods, streetscapes, historic routes, archaeological sites, pilgrim towns, sacred sites, riverfronts, historic forts and their settlements, gardens and parks, and other open spaces are cultural landscapes (A.Sinha 2000).

They are **iconic** and represent the identity of a city or a larger regional landscape. They are widely visited urban landscapes. Eg:

Dalhousie Square in Calcutta
Charminar precinct in Hyderabad
Chandni Chowk in Delhi
Crawford Market in Mumbai

Similarly **neighbourhoods** with a distinct housing typology and ornamental features represent traditional ways of life and culture of a region.eg:

Havelis of Shahajanabad
Pols of Ahmedabad
Katras and *ganjes* of Northern Indian cities
Wadis and *chawls* of Mumbai
Colonial bungalows in cantonments
Agrahram in Chettinad



Figure 8: Charminar precinct, Hyderabad.

Source: Tripsavvy.com

Sacred landscapes are public spaces revered and visited by large numbers of faithful on a regular or episodic basis. Natural features, either singly or in combination, are the main draw with temples and shrines dotting the landscape. Pilgrim sites include:

Ghats of rivers
Sacred groves and tanks
Shakti-pithas on hills.

Archeological sites that contain significant number of ruins are a kind of cultural landscape, spread over a much larger area than their highly visible monumental structures:

Buddhist sites of ancient India
Hill forts of the medieval era

Benefits of landscape conservation

1. Authenticity of the site is retained. Because the visual and physical relationships between buildings, their context and ancillary structures (gateways, walls, pavilions, arcades, water bodies) were crucial to their functioning as livable entities.
2. It can aid in the success of heritage tourism by becoming a meeting ground of tourist and local cultures. Instead of a single monument or a number of scattered monuments with no easy connection between them, the visitor has an immersive experience and an encounter with not just relics but everyday life. Local cultural heritage including intangible but living heritage of oral traditions, arts and crafts, building and other placemaking skills can be explored.

2.4 URBAN AND URBANISING LANDSCAPES

For studying human dominated systems, the model by Zipperer et.al. can be used.

The most striking consequence of human activity on natural systems is the changes in land cover (Vitousek 1994). With the rapidly increasing trends of urbanization the changing of land-cover for urban use is increasing too. Hence, to maintain the sustainability of ecosystems and its services, benefits and resources, it is necessary that we use an ecological approach to land-use planning (US Environment Protection Agency 2001).



Figure 9: Ahilya Ghat at Varanasi

Credits :Ken Wieland, Wikimedia Commons

Causes of land use change (Dale 2001):

- Population and social structure
- Economic factors
- Political systems, institutions, technological capacity and policies
- Socio-cultural factors to the likes of values, attitudes and preferences (D. Weiss 2001)

(Dale 2001) wrote that patterns and trends in land-use change

- Increase in land area dedicated for human use
- Use and control of land intensified due to increase in production of goods and services

ECOLOGICAL FRAME WORK

One approach cannot necessarily facilitate the understanding and management of urban and urbanizing ecosystems (Zipperer et al. 2000) :

- **Classical ecosystem approach** : focuses on the transfer of matter, energy and species.
- **Patch-dynamic approach**: focuses on the spatial heterogeneity within the landscape. It also deals with how this heterogeneity influences the flow of species, matter and energy and information throughout the landscape (Zipperer et al. 2000)

PATCH: In its broad sense, patch refers to a spatial unit that differs from its surroundings in nature or appearance (Wiens, 1976; Kotliar and Wiens, 1990). It is different in different scales. Like a patch can be a continent surrounded by oceans, a forest tract in between agricultural lands, a tree-gap found in a forest, a plant community's fire-burnt area with no vegetation, or even a group of planktons in an aquatic system. These can be described by their content, duration, size, shape, structural complexity and boundary characteristics. So, we can define spatial patchiness and also quantify it both in terms of patch composition (patch types and relative abundance) and spatial configuration (patch contrast, boundary characteristics, size, shape, juxtaposition).

LAND-USE DECISIONS IN URBAN AND URBANIZING LANDSCAPES

Both ecological and social structure and processes are affected by the land-use decisions. We need to incorporate a human component in the basic concept of ecosystem to account for the human influence. We can characterize for a landscape a

social structure and communities, just like ecological structure and communities. By expressing these organizations at different spatial scales , we can interpret the functionally-rich spatial heterogeneity of urban landscapes.

In an urban landscape, we can find bio-physical patches that form a mosaic within the infrastructure, various cycles, social institutions and order matrix (see Machlis et al. 1997). Its spatial heterogeneity has natural as well as human sources. The former includes the physical environment, biological agents, and the disturbance regime, and stresses (Pickett and Rogers 1997).The latter includes human sources of heterogeneity include the introduction of exotic species, modification of landforms and drainage networks, control or modification of natural disturbance agents, and the construction of massive and extensive infrastructure (Pickett et al. 1997). One way it is useful is that patchiness can be applied to various spatial scales (Wu and Loucks 1995, Wu 1999). For example, the urban continuum can be divided into different urban contexts: city, inner suburbs, suburbs, exurban, and hinterlands. Each of these contexts can be divided further into land-use types, neighborhoods, blocks and so on. Similarly, an urban landscape’s vegetation can be delineated by structural characteristics to form tree-covered patches, ruderal communities, and managed lawns (e.g., Zipperer et al. 1997). These nested patch hierarchies are more than just convenient ways to organize spatial heterogeneity. They are a great way to organise spatial heterogeneity and allows researchers to understand the factors that influence the patterns and processes at each nested scale. It also helps understand the functional relationships, both within and between different scales(Zipperer et.al.2000)

TABLE 1. Definition of key ecological principles applicable to ecological research and land-use decisions in urban landscapes (adapted from Forman [1995], Flores et al. [1998], and Wu [1999]).

Principle	Definition
Content	the structural and functional attributes of a patch where “structure” is the physical arrangement of ecological, physical, and social components, and “function” refers to the way the components interact
Context	the patch’s location relative to the rest of the landscape as well as the adjacent and nearby land units that are in direct contact or linked to a patch by active interactions
Connectivity	how spatially or functionally continuous a patch, corridor, network or matrix of concern is
Dynamics	how a patch or patch mosaic changes structurally and functionally through time
Heterogeneity	the spatial and temporal distribution of patches across a landscape. Heterogeneity creates the barriers or pathways to the flow of energy, matter, species, and information
Hierarchy	a system of discrete functional units that are linked but operate at two or more scales. Proper coupling of spatial and temporal hierarchies provides a key to simplifying and understanding the complexity of urban landscapes

Pertaining to the above mentioned issue of land use, the paper published on the changing land use pattern of Alappuzha provide site specific information.

2.5 LANDSCAPE ECOLOGY

“Ecosystem”-Tansly(1935)

A spatially explicit unit of earth that includes all the organisms, along with all components of the abiotic environment within its boundaries.(Likens,1995).

Ecosystem ecology

Flow of energy and matter through organisms and the environment.eg:P,N cycles

Spatial heterogeneity in ecosystem processes

Factors:

- Temperature gradients
- Precipitation
- Topography&soil

<input type="checkbox"/> SPATIAL
<input type="checkbox"/> TEMPORAL

Effects on:

- Productivity
- Decomposition
- Nitrogen cycle

Land-water interactions

- LAND USE
- SPATIAL ARRANGEMENT



- WATER QUALITY

Ecosystem adjacencies



Nutrient transformation and movement

- Lakes and wetlands are connected spatially and functionally
- Do not treat them as separate entities.

Three main types of services:

1. **Provision services** – extractable resources that primarily benefit lowland populations (water for drinking, irrigation, timber) and ecosystem production (crops, medicinal plants)
2. **Regulatory and support services** – biodiversity, watershed and catchment protection, soil fertility, soil as store of water and carbon
3. **Cultural services** – spiritual role of mountains, biodiversity (biophilia), recreation, cultural and ethnological diversity.

2.6 AESTHETICS

When we perceive a landscape, the aesthetic qualities are assessed too. Andrew Lothian's paper proposes that landscape quality assessment may be approached on the basis of two contrasting paradigms:

Objectivist -which regards quality as inherent in the physical landscape

Subjectivist- regards quality as a product of the mind eye of the beholder(Lothian 2009).

These paradigms underlie the surveys of the physical landscape and studies of observer preferences. Philosophers like Locke, Hume, Burke , Kant identified beauty as lying in the eyes of the beholder rather than in the object. Throughout the past,t philosophers have accepted the subjectivist paradigm. They have studied beauty and aesthetics for the past several thousand years and hence their findings can be used as information by contemporary landscape planners(Lothian 2009).

On the other hand, geographers and others consider landscape as a feature to be categorized and mapped. By means of establishing pre requisites and assumptions they evaluate the quality of landscapes.Assumptions like mountains and rivers have

high landscape quality are made. Then a numerical scale or qualitative scale is used to categorize various landscapes. In this method, quality of a landscape is considered to be an inherent property of landscapes and is considered as a physical trait that can be measured (Lothian 2009).

Objective method of landscape quality mapping is wide spread in Britain, Australia, etc. but is less prominent in Canada, U.S.A, etc. This approach also considers the illustrated books on landscapes around the world and landscapes portrayed in calendars, postcards etc. along with videos of native landscapes. These are testimony to the fact that landscapes play a pivotal role in our culture. The scenery also has a major role in attracting tourists. Hence this approach assumes landscape to be a quality inherent in the scene which one visits to see, experience and enjoy (Lothian 2009).

There should be compliance with the needs that different groups have for the development of landscapes. The basis on which people project their needs and aims for landscape development is the way in which they relate to a place, the sense of place.. We use the "sense of place" as an all-enveloping umbrella concept for the manifold people-place relations in Social Science Theory. Here, the main revelation is that the place characteristics relevant to the sense of place are almost the same for both sides. As a result, when aiming for sustainable landscape development there should be a balance between economic development that the locals need and preservation of the cultural characteristics and authenticity that the tourists seek.

Cultural landscapes are places that are perceived and understood by the meanings that people associate with them (Tuan 1979), unlike objective and undifferentiated spaces. They are understood in various contexts with different meanings. Hence it is not wrong to say that it is the resultant of individual experiences and collective processes. We know that different socio-cultural groups develop the natural elements of their environments differently. Due to their unique "lifeworlds" (Lebenswelten), they associate different meanings to the same space based on their culture, interests, experiences etc (Kianicka et al 2006).

People-place relations and concepts related to it have been formed by social in recent times. "Sense of place," is one such concept introduced by Tuan (1974) and Steele (1981). It contains the meanings associated with a place including the attachment that a person or group associate with it. It is more like an umbrella concept that comprise place relations like 'at homeness', 'place attachment', 'place dependence', 'place identity' or 'regionalization' (Kianicka et al 2006)..

The major change agents in landscapes of rural areas are recreation and tourism. Because of their varying background of culture and civilization, than the natives, tourists have an "outsider's" view. Hence, they perceive and value those landscapes

differently than the natives. Various surveys using photo-visualization techniques have shown differences in assessment of landscape and change in landscapes by various socio-cultural groups (Hunziker 2000).The sense of place of members of both natives and tourists must be understood and evaluated with in the light of their varying understanding of meaning, in order to avoid conflicts and augment sustainable landscape development that caters visitors' and natives' requirements (Kianicka et al 2006).

Such pioneering studies make it clear that for tourists, the places that they visit can be as meaningful as for natives. The reasons may be restorative value of the place, the experiences they had there, etc. But, the empirical studies are more keen on defining the constituents of sense of place, the strength of place relations,etc (Kianicka et al 2006).

CHAPTER 3: DATA COLLECTION

3.1 KERALA

PHYSICAL FEATURES

Kerala is diverse in the physical features and can be divided into three natural divisions: **low land**(less than 25 ft below MSL), **midland**(25-250 ft above MSL) and **high land** (more than 250 ft above MSL). Long and narrow stretch of sandy sea board is low and is generally swampy. It is prone to flooding during monsoon . Coconut palms grow here. . The high land is broken by spurs, ravines, and jungles. The prominent feature of the highlands is the intensive coverage by forests and plantations, which sustain the economic base of the state.Each of this has its own distinctive type of settlement(Salim et. al.)

GEOLOGY

Three main geological formation can be recognized in Kerala. They are-

1. The Archaeans
2. Warkallis of tertiary age
3. The recent deposits

For stratigraphically classification, the state of Kerala can be divided onto 4 district zones each zone having north south alignment. They are the as follows:

1. Crystalline rocks representative of the Archaean group
2. Residual laterite
3. The Warkalli formation
4. Recent formation

From the map, Alappuzha region shows cenozoic sediments.

An aquifer is basically a rock unit or geological formation, which can yield considerable quantities of water (Todd, 1986).

Confining bed is referred as a rock unit having very low hydraulic conductivity that restricts the movement of groundwater.

Groundwater occurs in aquifers with different conditions, which are described as unconfined and confining units. Water in unconfined conditions partially contains the aquifer wherein the upper surface of the saturated zone is not stable. Unconfined aquifers are also referred to as water-table aquifers which fluctuate with varying hydrogeologic conditions. In situations, wherein the water completely fills an aquifer that

is overlain by a confining bed, the aquifer is said to be confined or artesian aquifer. The nature of these aquifer conditions are controlled by the prevailing geological setup.

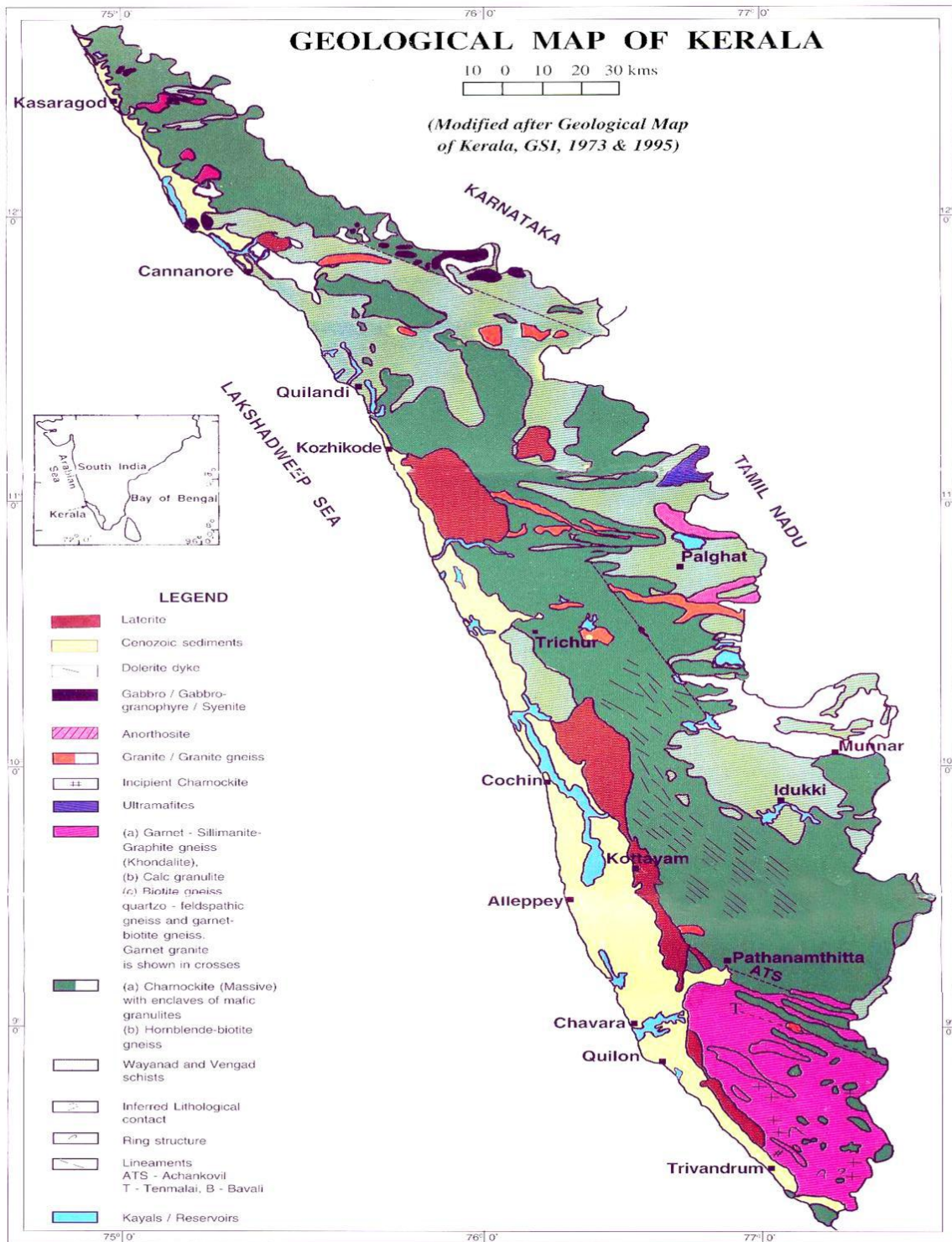


Figure 10 Geological Map of Kerala (After Soman, 2002) (Source: <http://cess.res.in/wp-content/uploads/2013/08/Glimps-of-kerala.pdf>)

CLIMATE AND RAINFALL

Kerala has a salubrious climate without extremes. A bracing cold climate exists in the highland region throughout the year. Humidity is rather high in the plains and rises the S.W monsoon. Southern part of the state receives the minimum rainfall. Temperature in the plains ranges from 70 to 80 degrees F. There is no well-defined season in Kerala. The summer and winter are practically controlled by the south west and north east monsoon. Autumn and spring are practically the only two seasons (Salim et.al).

HYDROLOGY

There are 44 rivers out of which and 3 are east flowing and the rest flows to the west. One of the main features of the state is its stretch of lagoons and backwaters that run parallel to the sea coast and receiving the water from the rivers and streams from the western Ghats. Geological evidence show that these lagoons are of recent origin. Backwaters are mainly used for fishing culture and coconut husk retting and their shores for coir manufacture.

Coastal land is almost all the river basins are subject to tidal submergence with consequent damages to cultivation. Backwaters are a continuous water link along the coast, with intermittent gaps here and there. But they have salinity caused by sea water intrusion.

TOURISM

Tourism in Kerala

National Geographic traveller lists Kerala as one among the “50 must see destinations of a lifetime”. Tourist inflow to Kerala is mainly contributed by domestic tourists.

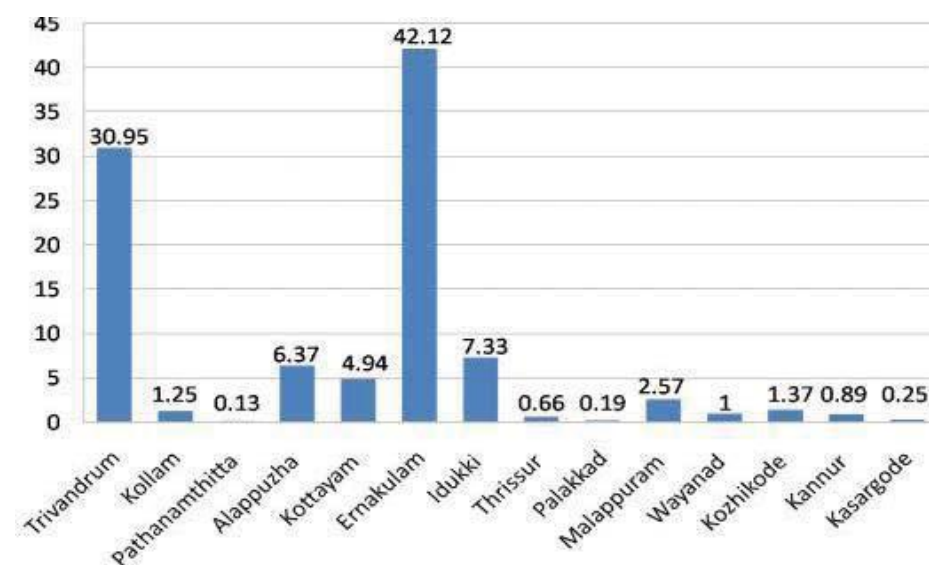


Figure 11: Percentage contribution of districts to total share of foreign tourist flow. Source: Tourism statistics 2010

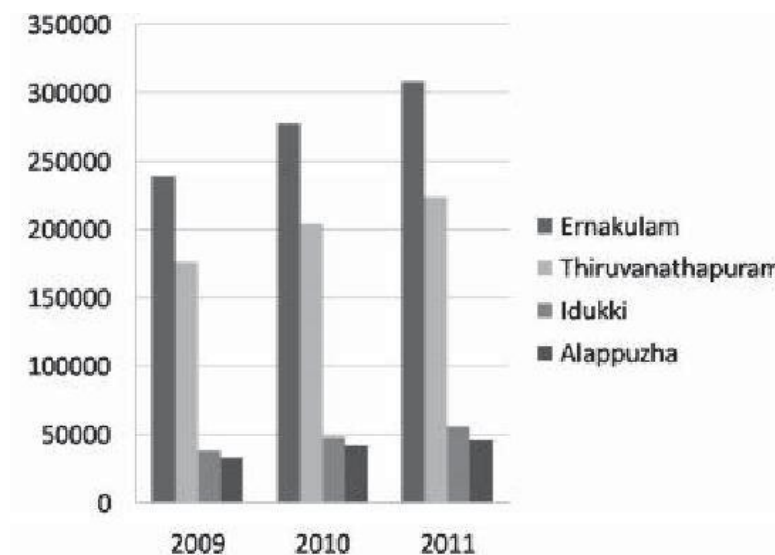


Figure 12: Tourism statistics of districts compared to Alappuzha

ECO-TOURISM

In the realm of tourism, ecotourism is a novel concept. Ecotourism is a journey to natural areas to comprehend the history of the cultural and natural environment and at the same time, not affecting the ecosystem integrity. This generates opportunities economically that make it beneficial to the local people to conserve the natural resources. In the God's Own Country of Kerala, eco tourism is a rapidly growing area. Because of Kerala's natural beauty, it can have many eco-tourism destinations known for endemic landscape. It is naturally the most-deserving hub for promoting ecotourism in the country as it is one of the greenest destinations here. A volley of products have been developed in the state to unravel the ecotourism opportunities here and by ensuring local community involvement in tourism initiatives, employment and income generation occur.

3.2 ALAPPUZHA

HISTORY

Raja Kesava Das

The Dewanship of Raja Kesava Das was remarkable in the Travancore history. He was a Minister of Karthika Thirunal Rama Varma (1759 – 1789), the erstwhile King of

Travancore. Even during a period of political turmoil and confusion, he gave a noteworthy service as Dewan during 1789-1799(Lawerence Jayaraj,RJIS).

Internal Reforms of Raja Kesava Das

Develop the economy of the country was the first and most important objective of Raja Kesava Das's. He encouraged trade and thus augured well for the economic condition of the people. Visiting coastal towns from south to north, he decided to open two new ports- at Vizhinjam and at Alleppey, to improve the commercial status of the country.

1. Opening of New Ports

Opening of a new port at Alleppey was his greatest achievement . It was a suburb with little activity. Because of the Dewan, Alleppey grew into a port town with a warehouse and numerous shops. Merchants were brought in from various places like Sindh, Cutch, etc. Canals were built to carry goods from the back-waters to the new port and vice-versa . Backwaters till the Pallathuruthy river was deepened for this purpose and coconut trees were planted on either side of it.

Agricultural and Industrial Reforms

He took special care for developing agriculture and dependent industries. Improvement and beautification of Trivandrum town, the present capital of Kerala, also happened during his time.

Revenue Reforms

Issue of coins increased foreign trade. Houses on the northern backwaters were abolished. Proper rules and regulations were made for the right administration of the state (RJIS).

RAMSAR SITE

Wetlands as defined by the Ramsar Convention are "areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters" (Article 1.1). Two processes in this coastal wetland:

- (i) weathering and source of the REE
- (ii) sedimentological characters.

21,100 mm³ of water annually(17,740 mm³ -monsoon and 3,360 mm³ –dry period)- The mean annual rainfall varies from 1,600 mm-4,800 mm-The temperature ranges from 21 °C to 36°C .The humidity ranges from 70 to 80 percentages.

Importance of the Vembanad-Kol wetland

Research studies are being carried out by organizations such as Centre for Water Resources Development and Management, Centre for Environmental Studies, Kottayam, Kerala Agricultural University and Central Marine Fisheries Research Institute. Information on various ecological aspects is available for different parts of the wetland ecosystem. Pollution of the wetland system in Kerala has reached alarming proportions. The hitherto-unseen exploitation of wetlands beyond and above its supportive capacity and influx of residues that exceeds its assimilative capacity are main contributing factors.

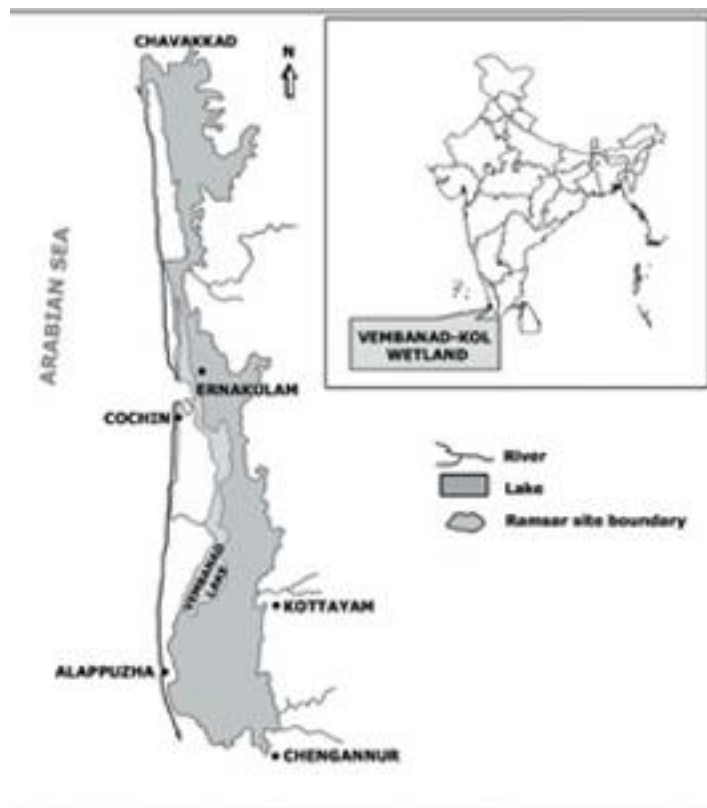


Figure 13 : Vembanad Kol Wetland

Source:cpreec.org

Thannermukkom Bund

- Rapid weed growth
- Diminishing water quality
- Depletion of fisheries and shell life
- Proliferation of stomach and skin diseases.

- Thannermukkom Bund and other salt-entry barriers to safeguard rice products are operated unscientifically and this has prevented the connectivity of the Kayal to the sea.
- Also, there are several management issues regarding the operating and closing of shutters.
- The mechanical opening of the shutters takes a week to 10 days. Consequently, there is considerable delay in either flushing out flood water or preventing saline water intrusion.

Thottapally Spill Way

- Siltation is the major issue in Thottapally Spill Way.

The term backwaters refers to a series of interconnected waterways, lakes, inlets, brackish lagoons and riverine estuaries. They form an intertwined network along Kerala's coast.

The Kuttanad region receives much of its water from four rivers mainly Manimala, Meenachil, Pampa and Achankovil which is also known as Pampa _ Kuttanad river system. Of its two main tributaries River Manimala joins Pampa at Nerettupuram and River Achankovil converges with it at Veeyapuram. The Natural mechanism of water environment has been temporarily regulated by Thanneermukkam and Thottappilly.

AGRO ECOLOGICAL ZONES

Four parameters together constitute the evolution of distinct agronomic environments where specific cropping patterns can happen. They are altitude, rainfall, soil and topography. How these parameters are used to delineate these ones are explained below (kerenvis.nic.in).

Variations in altitude influence temperature which affects crops. Rainfall pattern I and II (areas south and north of 10°N latitude are found in the state), also influence crops. Soil type is another factor for identifying these zones. Soils include laterite and its variations. In case of areas with similar rainfall pattern and soil type, they are classified into zones based on topography (kerenvis.nic.in).

Parameter	Level	Description
I. Altitude	Type I	Up to 500 m above MSL (Low altitude zone- hot humid tropics, spread over the entire state)
	Type II	More than 500 m above M;SL
II. Rainfall	Pattern I	Both the southwest and northeast monsoons are active and moderately distributed. Southwest monsoon with June maximum (South of 10°N latitude).
	Pattern II	Poorly distributed rainfall; southwest monsoon with July maximum and concentrated in 3-4 months. Northeast monsoon relatively weak (North of 10°N Latitude).
III. Soil types	1	Alluvial soil (Spread over river banks)
	2	Sandy soil (Coastal areas)
	3	Sandy loam soil (Coastal areas)
	4	Laterite soil with well defined B horizon (Natural midlands)
	5	Laterite soil without B-horizon (Natural highlands).
	6	Red soil (Southern-most Kerala)
	7	Black soil (Chittur taluk of Palakkad district)
	8	Peat (kari) soil (Kuttanad)
	9	Acid-saline soil (Pokkali and Kaipad areas)

	Valleys	Hill tops	Slopes	
Model-I	Extensive valleys with level but raised garden lands			
Model-IIa	Valleys less extensive	Hills with moderate gradients	Slopes having mild gradients	
IV. Topography	Model-IIb	Valleys less extensive	Hills with moderate gradients and top with egg shaped hump	Steep slopes
	Model-IIc	Valleys less extensive	Hills with table tops	Steep slopes
	Model-III	Narrow valleys	Hills with steep gradients	Steep slopes

Figure 14: Parameters of agro-ecological zones

Source:ENVIS Centre,Kerala

VEGETATION

According to C.N.Sunil 2000,vegetation of the district can be classified as follows:

1. Sacred grove vegetation
2. Aquatic or semi-aquatic vegetation
3. Mangrove or semi-mangrove vegetation
4. Seacoast vegetation

5. Vegetation in cultivated and wastelands.

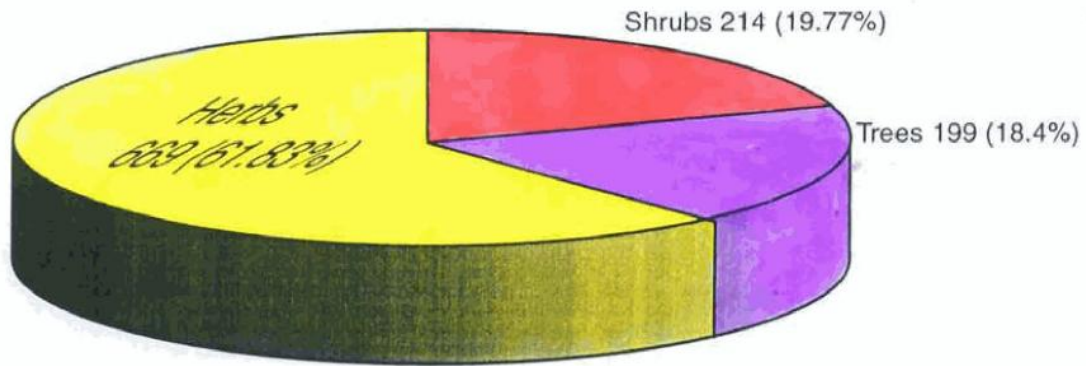


Figure 15: Composition of Flora of Alappuzha based on habit. Source: C.N.Sunil

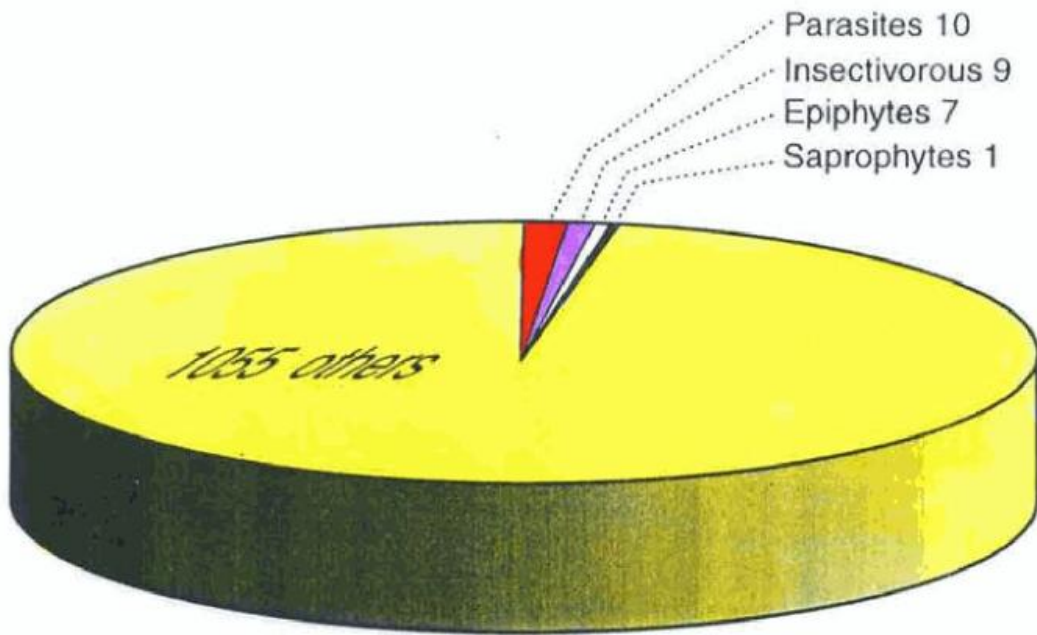


Figure 16: Relative abundance of group of plants in Alappuzha . Source:C.N.Sunil, Flora of Alappuzha

CHAPTER 4: CASE STUDIES

4.1 CANAL DEVELOPMENT

MONTGOMERY CANAL RESTORATION, Oswestry, UK

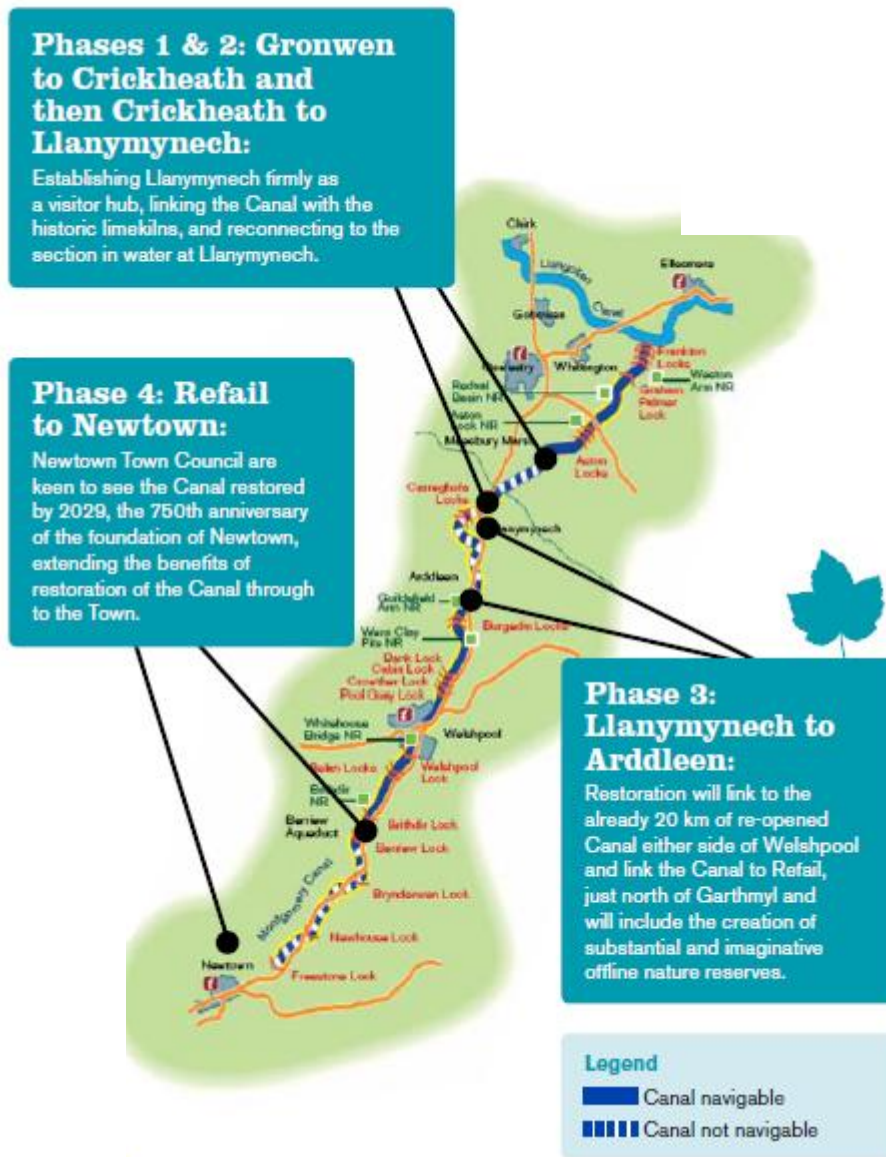


Figure 17: Montgomery canal .

Source: Canalrivertrust.org

Waterway restoration for delivering economic, environmental and social benefits to the local community and bringing more tourism potential. Besides adding resilience to the local economy, it connects people with their cultural heritage and nature.

PRINCIPLES OF RESTORATION

- Navigation
- Economic and rural regeneration
- Landscape
- Built heritage
- Nature conservation
- Water
- Community and visitor access

4.2 WETLAND PARK

TANNER SPRINGS PARK, Portland, Oregon

An industry drained the land and neighbourhoods started coming up. It was later converted into a wetland park. Stormwater runoff from the park goes into a natural water feature. It has a spring and also a natural system for cleansing.



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Figure 18: Tanner Springs park .

Source: landezine.com

CHAPTER 5: SITE ANALYSIS

5.1 SITE LOCATION

Alappuzha or Alleppey, also known by the sobriquet 'Venice of the East' is a city in the east coast of India. When we see the etymology, it comes from two words-'ala' which means 'wave' and 'puzha' which means 'river'. Canals run across the city and connect it to the hinterland.

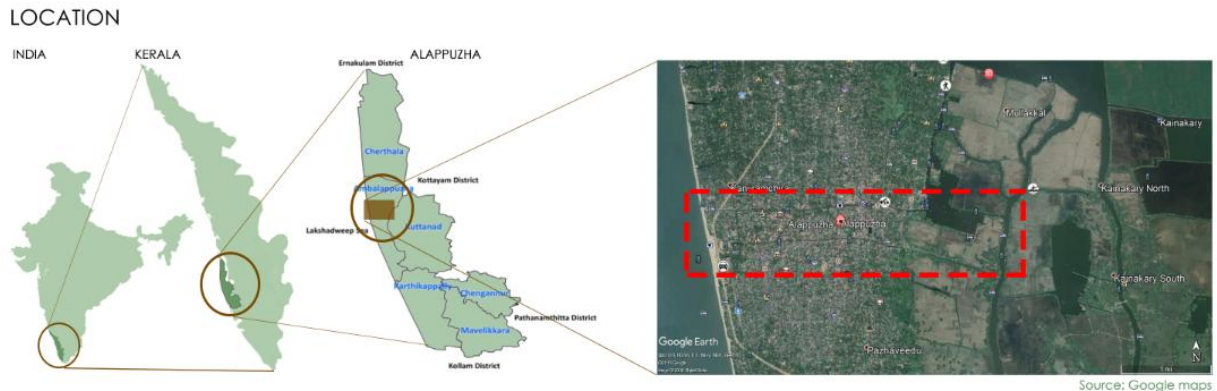


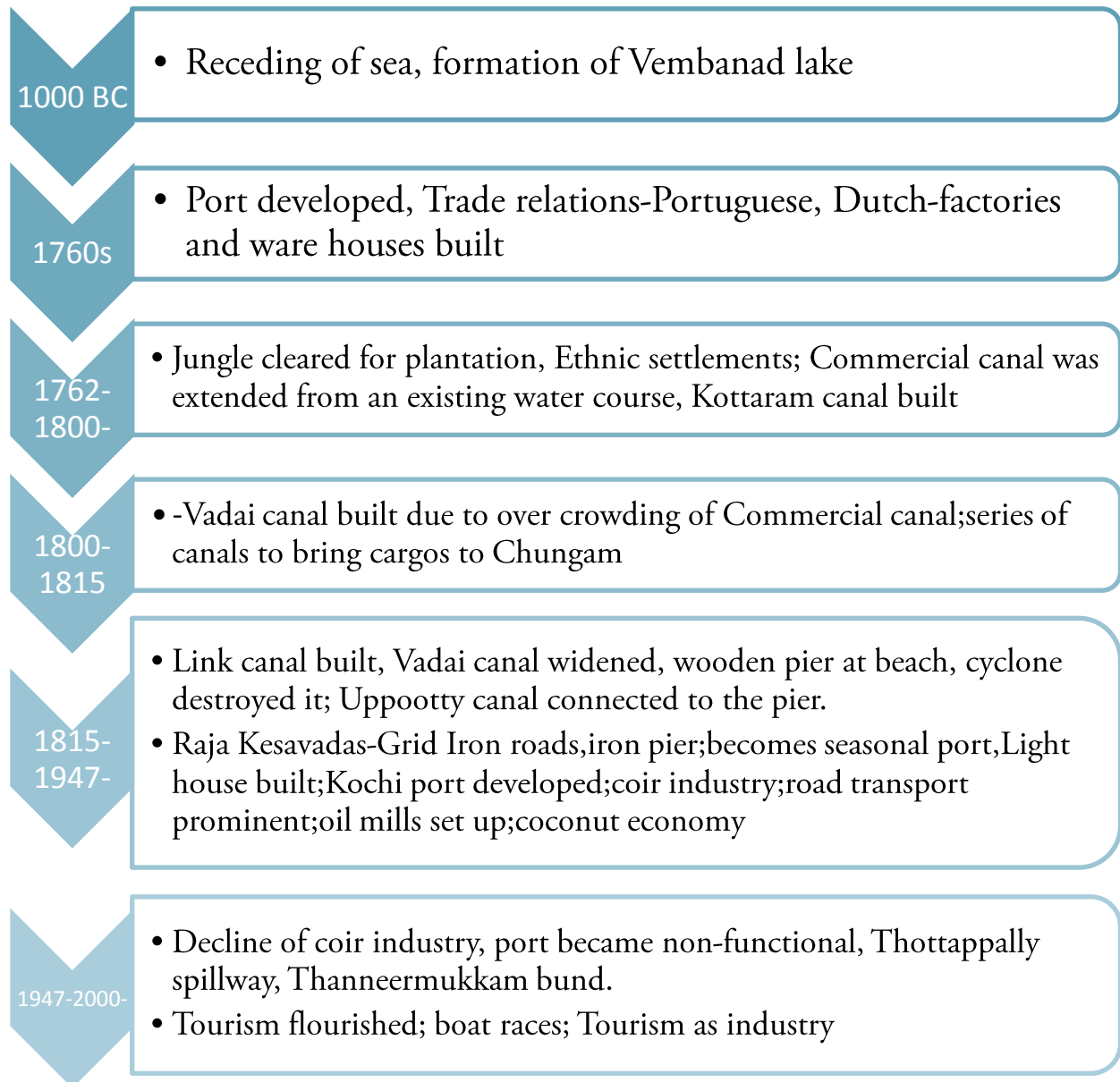
Figure 19: Location map of study area

The backwaters and the beach are two major traveller destinations. Apart from a few better known places, people doesn't know the heritage value and places of importance of the historic port town. Mostly because the port area has been totally transformed as the port shifted to Kochi. The remnants of that glorious past also fell in ruins. There is a need to showcase the rich heritage of Alappuzha to the people who come here.

- Alappuzha owes its existence to the wise and clever **Diwan Raja Kesava** during 18th century's second half.
- It was the first among planned cities in the region.
- Alleppey was a port town during the 1700s to 1970s.
- Lord Curzon, Viceroy of that time, visited Alleppey during the 20th century and called it the Venice of the East. The sobriquet has gained a place in the tourism map today.
- What motivated Lord Curzon to make this comparison with Venice : the port and pier, the grid iron roads and bridges across canals and the wide coastal line.
- Kuttanad, famously called the rice bowl of Kerala, has a never-ending region with paddy fields, canals, coconut palms etc. Kuttanad was widely acclaimed during

the early eras of Sangam age too. The one and only place that does agriculture below sea level in India - that is also Kuttand.

5.2 HISTORIC TIMELINE



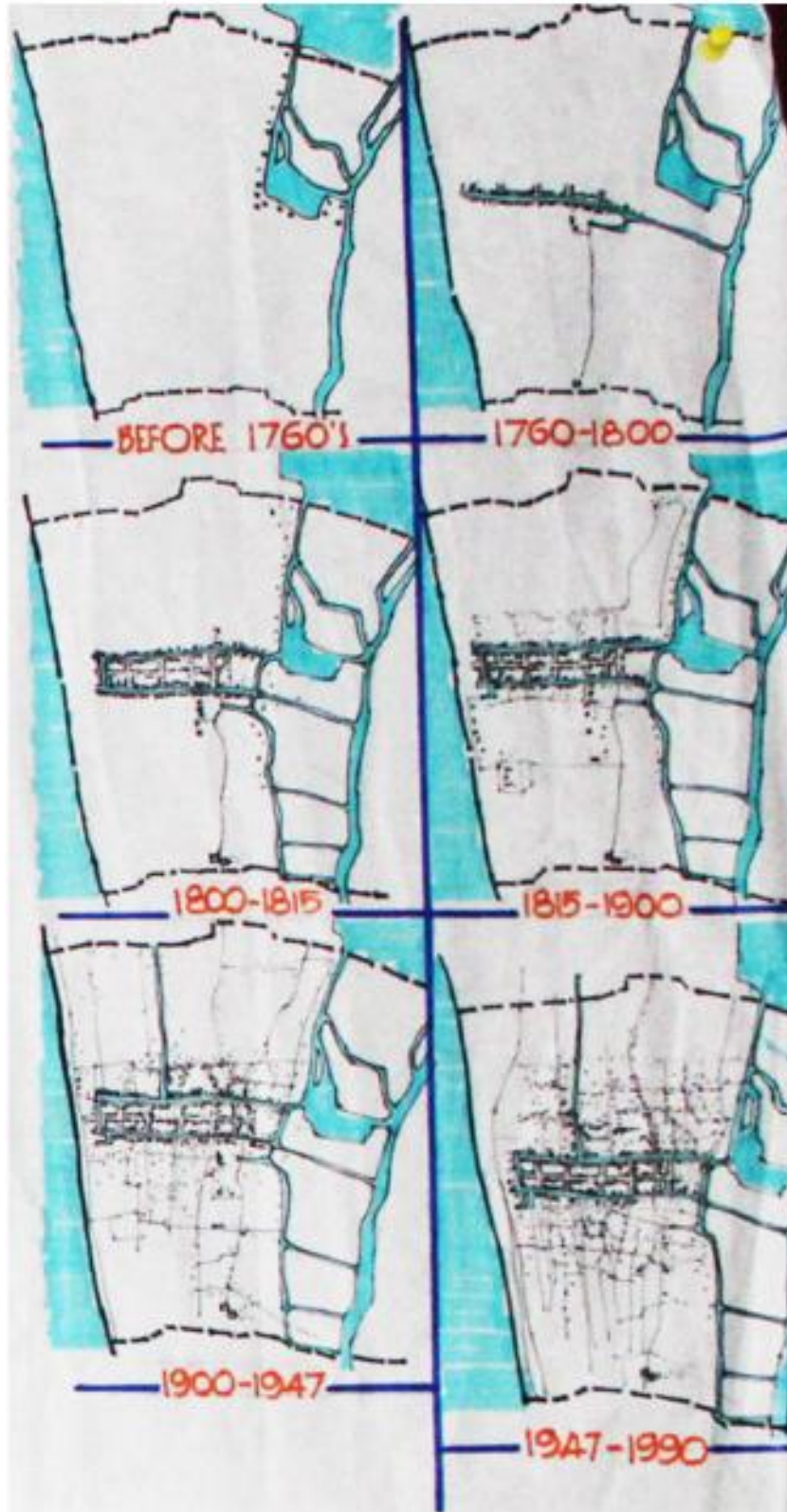


Figure 20: Evolution of settlements in the study area. Source: Diksha

5.3 GEOLOGY AND SOIL

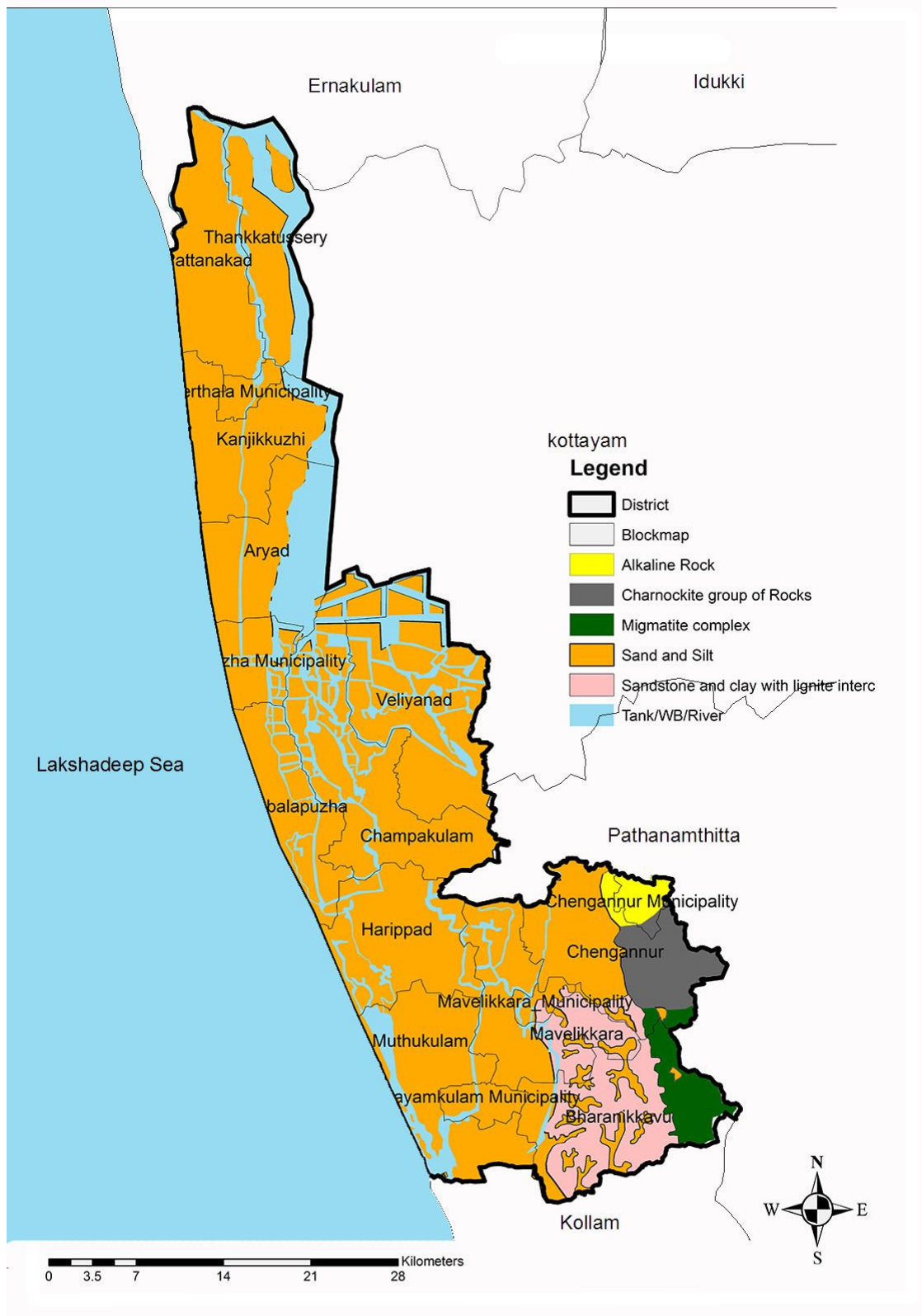


Figure 21: Geology map of Alappuzha

Source: MURP Studio SPAB

The study area is full in a low land region . The main soil type here is Coastal alluvial soil that has been formed due to marine and estuarine deposits. They are very deep and have high water table. They are often acidic (pH values less than 6.5) . Texture is dominated by sand. They have high permeability and drain well. Usually the fertility level and organic matter content is low in coastal alluvial soils. With a thin soil horizon, its usual surface texture is loamy and sandy loam(DSR 2016).

Coastal plains comprise a major part of the Alappuzha district. It's average elevation is 6 metres above MSL where some areas are 1-2 m below MSL . Here coastal geomorphic features like beaches , beach ridges, spit, bars etc. are found (Saritha 2013).

Table 1 Geology and Soil of Alappuzha district.

Source:CGWB 1992,Soman1997

Era	Age	Formation	Lithology
Quaternary	Recent	Alluvium	Sands and clays along the coast
	Sub Recent	Laterite	Laterite and lateritic clay derived from Tertiary sediments and Archean crystallines
Tertiary	Lower Miocene	Warkali beds	Current bedded friable variegated sandstone inter bedded with plastic clay variegated clays Carbonaceous and alum clay with (mio-Pilocene) lignite seams. Gravel and pebble beds. Base marked by gibbsitic sedimentary clay.
	Lower Miocene	Quilon Beds	Fossiliferous shell limestone alternating with thick beds of sandy clays, calcareous clays and sandstones.
	Oligocene to Eocene	Vaikom beds	Sandstones with pebble and gravel beds. Clays and lignite bands
	Eocene	Alleppy beds	Carbonaceous clays and sands
Archaean		Intrusives	Pegmatites, Quartz veins, granites, dolerites and gabbro
		Migmatite group	Granite-gneisses, hornblende-biotite gneisses and Garnet-biotite gneisses
		Charnockite group	Cordierite gneisses, charnockites, charnockite gneisses, pyroxene granulites
		Khondalite Group	Garnet-Silliminite gneisses, graphite-gneiss, quartzites and Calc-granulites

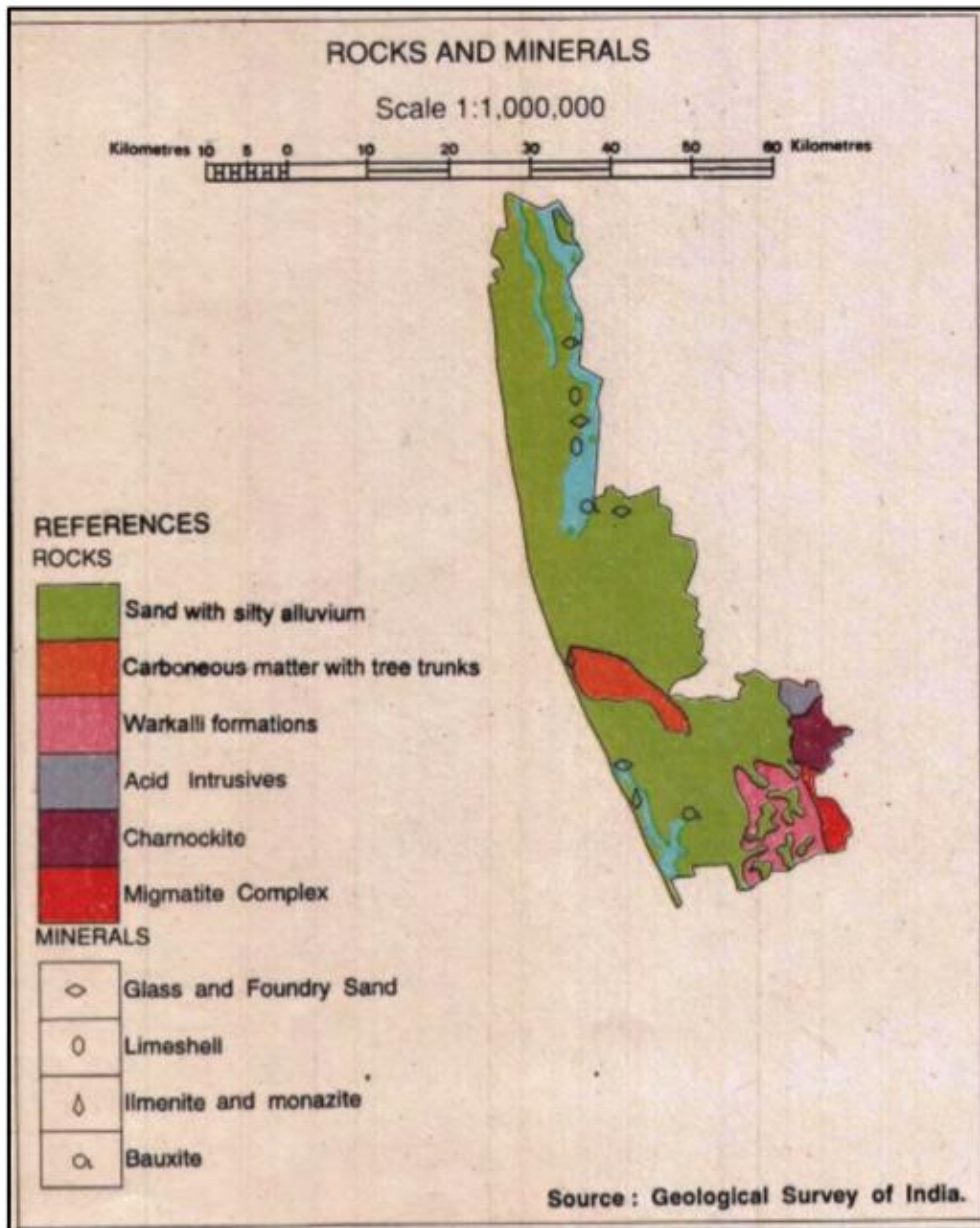


Figure 22 : Rocks and minerals map of Alappuzha District. Source: Geological Survey of India

Kuttanad region comprises 409sq.km of the eastern and south-eastern region of Alappuzha town . It is a low-lying deltaic region comprising of wet lands. The beach ridge came into existence due to marine regression. It is narrow but straight. There is no tidal plain but coastal erosion happens. This could indicate neo-tectonic activity(Saritha 2013).

5.4 GEOMORPHOLOGY

We can classify the geological formations of Alappuzha as below :

- crystalline rocks -archean group
- residual laterite
- warkalli bed -tertiary group
- coastal -recent deposits (alappuzha.nic.in).

Charnokites form the most relevant rock type in the crystalline segment. The laterite is a product of the alteration of crystalline archean rocks. The Warkalli beds comprises a series of variegated clays and sand stone. Sediments like luvium, marine and lacustrine can be seen in the coastal belt of Alappuzha

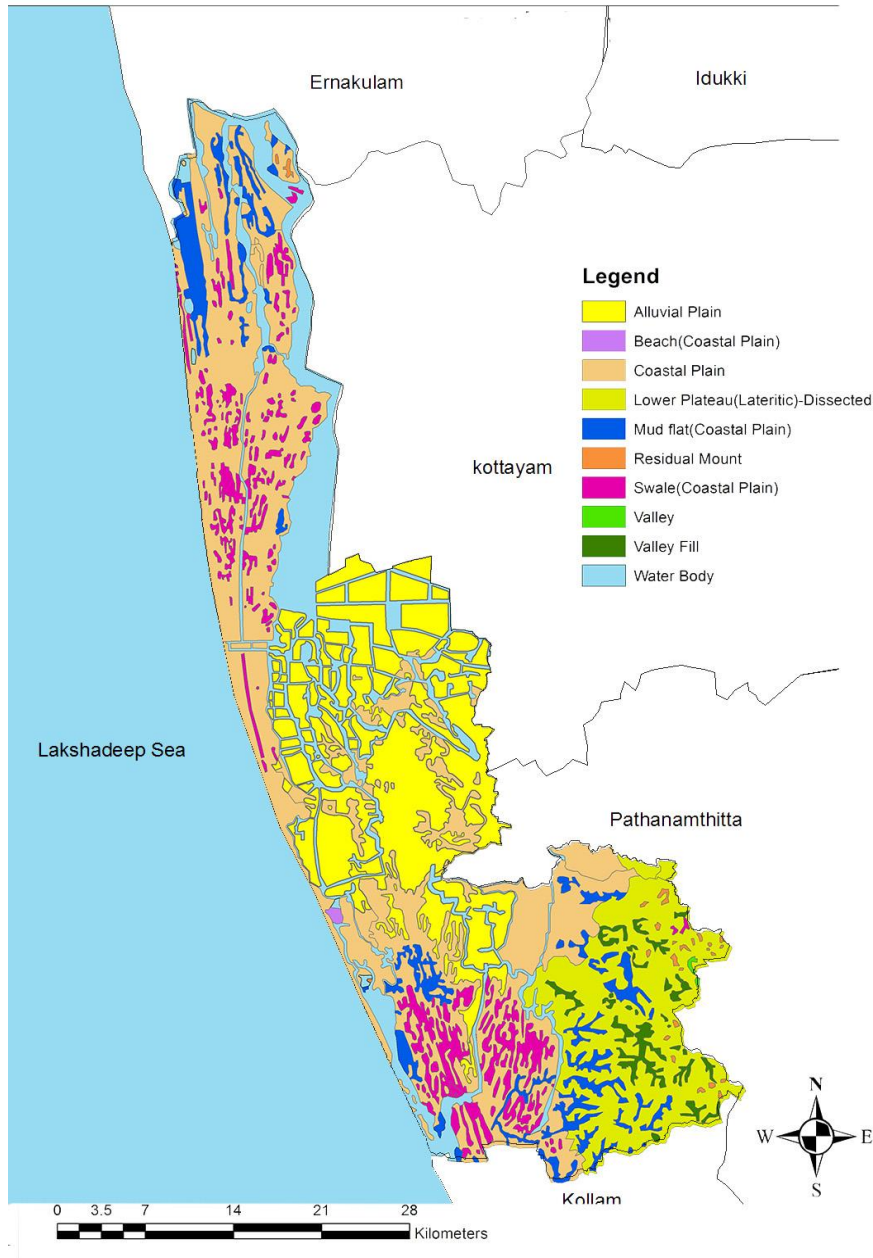


Figure 23: Geomorphological map of Kerala.

Source: MURP Studio, SPAB

5.5 AGRICULTURE

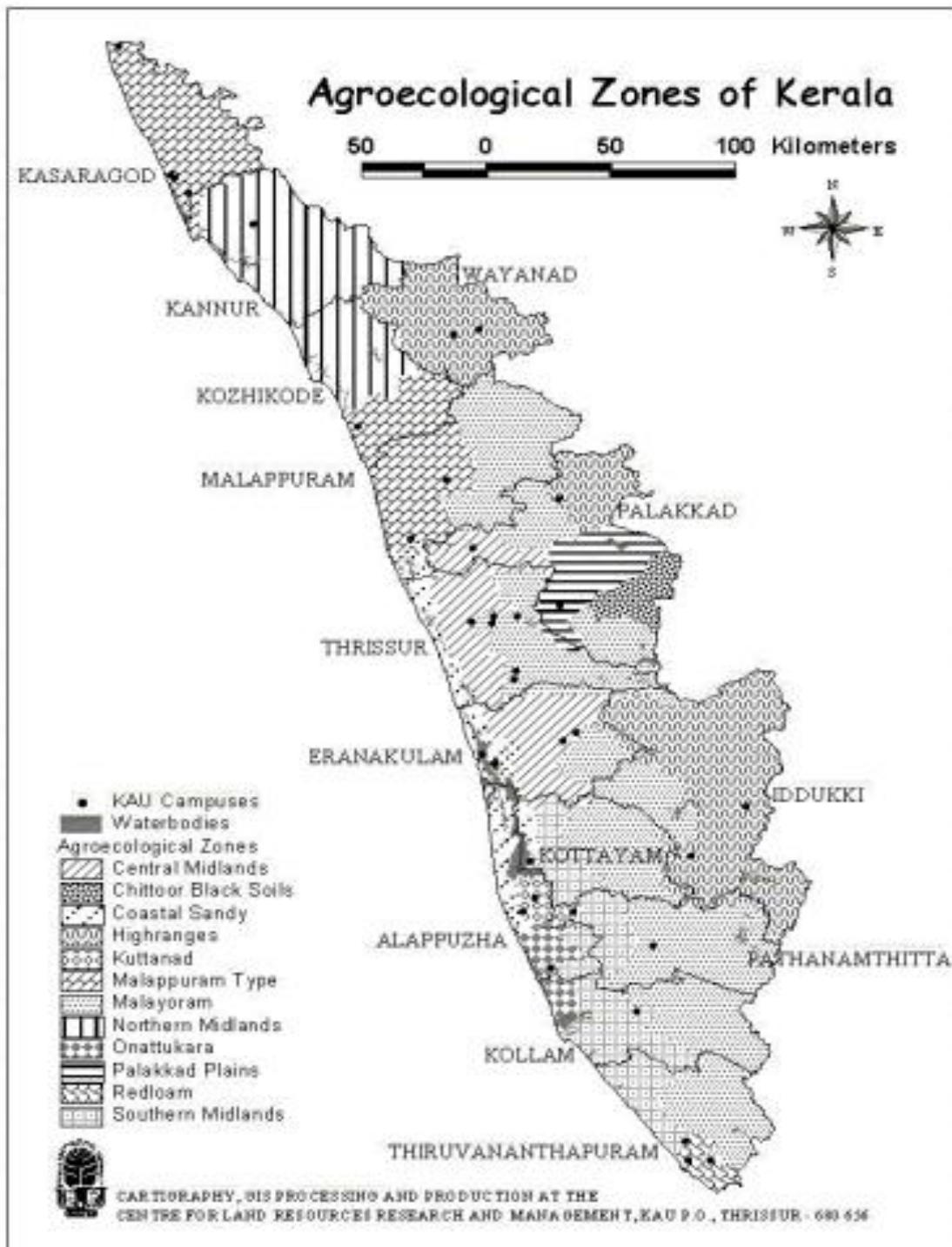


Figure 24 : Agro ecological zones map of Kerala.

SOIL	TALUK	CROPS[Main]
Sandy	Cherthala(West), Karthikappally, Ambalapuzha	Coconut
Peaty & Kari	Cherthala(East) , Kuttanad(West), Ambalapuzha	Low yield
Alluvial	Kuttanad(Remaining portions), Karthikappally(N-E Portions), Chengannur(West), Mavelikkara(N-W) ,delta of Pamba, Manimala and Achenkovil rivers near Vembanad lake	Paddy and Sugar cane
Laterite	Chengannur , Mavelikkara	coconut, arecanut,fruit trees
Sandy	Cherthala, Karthikappally , Ambalapuzha	Coconut

Table 2 : Crops according to soil types

Source: Alappuzha.nic.in

5.6 THE TOWN CANALS

These were once busy routes of water traffic , used to transport goods.Unlike other areas, the settlement occured along the canals and roads were added only later. Heritage buildings, activities and connectivity has always been related to the canals. Canals act as an image of the city

Rather than roads, the spatial organistaion of the settlement is based on the canal as datum. Roads came only later.

The Vadai canal and Commercial canal, which are the main transportation routes of tourists, are found to be very unhygienic owing to the heavy dumping of human, animal and other wastes. Besides huge deposit of silt from the frequent gush of sea water makes these canals dirties. Slaughter houses on the river banks deposit animal waste into the rivers. All these make water transportation very difficult.

The boat races conducted during the monsoon season also aid tourism development. These aquatic festivals nurture a sense of unity, fraternity and sportsman spirit among the people of Alappuzha as well as among the visiting tourists.

5.7 CULTURE AND HERITAGE

Alappuzha has a rich and diverse heritage and a unique culture. The tangible and intangible elements comprise this heritage. Punnamada kayal and Kuttanad have been subjects of songs and other art forms, literature, etc. Details of trade relations have been mentioned in Sangam literature. The tangible and intangible elements of the town of Alappuzha are listed below.

TANGIBLE HERITAGE

LIGHT HOUSE
MULLACKAL TEMPLE
JAIN TEMPLE
ST.GEORGE CHURCH
SAUKAR MASJID
PUNNAMADA LAKE
ALAPPUZHA BEACH
VIJAY PARK
OLD MARKET
OLD PIER
ASPINWALL
COIR FACTORIES

WARE HOUSES
PUNNAMADA

INTANGIBLE HERITAGE

CHIRAPPU
BOAT RACE
BEACH FESTIVAL
LOCAL CUISINE-
ART FORMS-
SCENIC BEAUTY
OTHER FESTIVALS

5.8 THE POETIC LANDSCAPE OF ALAPPUZHA- AN EXPERIENTIAL MAPPING

The experience varies as one moves from the sea wardside to the backwaters along the canal spine passing through the city core. The very air feels different. The visual sensations at the beach and the olfactory sensations are prominently varied from the visual, olfactory and auditory sensations of the backwaters. And the middle ground in between these two zones have a totally different aura to itself. The rustic feel of the heritage structures takes you to another era.

THE MESMERIZING SEA SHORE

The feet sink into the granulated sand bed as the waves soak them and retreat. Bubbles and froth remain and they start popping and bursting one by one in a dash of seconds, tickling your feet. The scintillating sea spreads across the horizon. The smell of the sea, the sea breeze brushing and gushing past you, dampening your face a little. Wet your lips and you can taste the saltiness of the sea breeze. Stroll along the shoreline as waves come and go. You'll reach the rusted remains of the old pier and get reminded of the glorious port. Close your eyes and imagine the ships coming in, visible at the horizon as a dot, gradually becoming bigger and bigger as they near the shore ready to get anchored. It docks at the end of the pier. The trolley unloads the goods from the ship. Cargo filled with gold coins, coral, raw glass, wine, realgar, orpiment, clothing, etc. in exchange of spices, pearls, diamonds, sapphires, ivory, etc. You can hear the hustle and bustle of the port town resounding in your ears.

Open your eyes and look beyond the sea. The sun is setting at the horizon, sending out its vibrant vermilion hues, as magically and beautifully as it was 200 years ago at the port. The red dot now slowly sinks beneath the horizon. The clouds make way for

the royal 'bhupravesham' of the sun. The golden rays that pierced the eyes are no more as dusk falls.

THE SCINTILLATING BACKWATERS

The green waters sparkled in the sun, reflecting its golden rays. One is surrounded by various shades of green all around. 'What magical land is this?', one may wonder. As the ripples follow suit to touch the granite edges, the sound of the water rippling against the wall is mesmerizing. The coconut palms that sway lightly in the wind, the skyline composed of green tree canopies, the backwaters of Alleppey makes it truly God's own country.

5.9 TYPOLOGICAL ASSESSMENT OF SPACES

Alleppey is a heterogeneous landscape and is also a highly fragmented urban landscape. An organising scheme is required to study such a heterogeneous landscape. The patch dynamics approach by Zipperer et.al. (2000) is ideal for human dominated systems like that of Alappuzha. The following are the various typologies identified .

1. BRIDGES

○ Across Vadai canal

Vellappalli palam

Nadappalam near north police station

Shavakkotta paalam(Power house bridge)

Power house Nadapaalam

Vazhicherry paalam

YMCA Paalam

Jilla kodathy paalam

Govanipaalam

Nadapaalam near Rajiv jetty

○ Across AS canal

Mattancherry palam

○ Across link canal (West Junction. Canal)

Karuthakali palam (Cullen Bridge)

- **Across Commercial canal**

Muppalam

Kochukada paalam

Kannan Varkey Palam

Nadapaalam near LP school

Kothuval Chavadi Bridge

Irumbupaalam

Kallupaalam

Chunkam Palam

Nadapaalam

2. LANES

- PRIMARY

NH 66

VCNB Road

VCSB Road

VCSB-Boat jetty road

SH 46

District court road

Mullackal road

- SECONDARY

- TERTIARY

Coirfed lane

Alisserry road

W.B.Unnamed Rd from Bapu vaidyer junction to muppalam

E.B.Unnamed Rd from Bapu vaidyer junction to muppalam Cullen road

Unnamed rd through Dutch square

Vazhicherry road

New bazaar road

Vellakinar road

Poonthottam road

VP road

YMCA Road

Pazhavangadi church road

Thirumala North gate road

Thirumala east gate road

Palace road

Makaam road

CCNB Road

CCNB-Chungam road

CCSB Road

Beach road

3. OTHER TRANSPORT CORRIDORS

Elevated Overhead bypass road

Railway line

National Waterway 3

Kollam-Kottarapuram waterway

4. STREETS

Gujarati Street

Streets along the canal Edge

Mullackal Street

Old Market

5. CANALS

- **Main canals**

Vadai Canal

Commercial Canal

East Junction Canal

Murinjapuzha Canal

West Junction Canal

Uppootty canal

Kottaram canal

Ambalappuzha-Alappuzha Canal

AS canal

- **Branch canals**

Ayyappan Pozhi

Emru Link

Emru thodu

Kavi

Rani thodu

Railway station link

Vattayal Palli

Konnakka Pally - Madachithra Thodu

Malika Thodu

Vadapozhi Link Thodu

Panichithra

Patharam Arimbu Thodu

Railway Station Thodu

Sadamani Thodu

Vada Pozhi Thodu

YMCA

YMCA 2

Sub

Thottathodu

6. SQUARES

Nagara chatwaram-Town Square

7. PARKS

Vijay Park

Amaze world

Sea View Park

8. OTHER PUBLIC OPEN SPACES

Beach

Municipality Recreational ground

EMS Stadium

9. JETTIES AND WATERWAY BOARDING POINTS

Matha Jetty

Rajiv Jetty

KSWTD Boat jetty

Nurse Jetty

Bhargavan Jetty

Punchiri Jetty

Vilakkumaram jetty

Punnamada finishing point houseboat terminal

10. TOURISM INFRASTRUCTURE

○ RESORTS

Lake Palace

Pagoda Resort

White Sand Beach Resort

Palm Beach resort

Baywatch Beach resort

Panoramic sea resort

5.10 ISSUES

ISSUES – Backwater

- Reduction in water spread
- Reduction in retention capacity by encroachments and filling up of backwater areas
- Reduction in depths due to silting
- Vertical clearance is blocked by construction of bridges across the roads which hinders passage of house boats.
- No prioritization has been done in the structures of backwater/canals to protect areas of soft character (sensitive areas)

- No efforts have been done to enhance the visual quality enhancement of edges
- Degeneration of overall environment
- Imbalanced water quality degradation and mixing of polluted water into main canals and stream
- Pollution from Pamba, AchanKovil and Manimala
- No regulation in tourism activities especially to house boats in term of the width of canals, tributaries or water courses
- No regulation for area allocation or route allocation
- Overcrowding at some points/terminals
- No regulation in circuit selection mechanism
- No effective waste collection points
- Water hyacinth problem

CHAPTER 6: JURY PANELS

TITLE LANDSCAPE DESIGN OF AN INTEGRATED LOOP, ALAPPUZHA

SYNOPSIS

AIM

The aim of the thesis is to map the landscape character of the town of Alappuzha with emphasis on the town canal precincts and propose the comprehensive landscape plan of the area which is proposed for integrated tourist circuit.

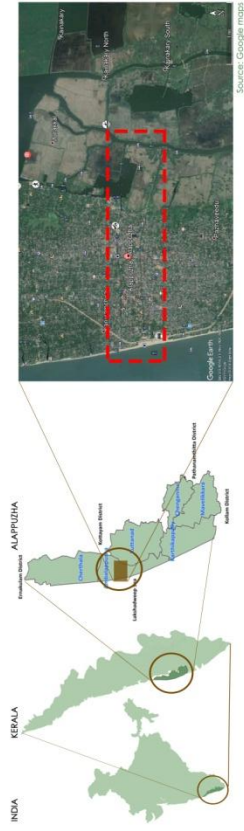
OBJECTIVES

- Map the landscape character of the town of Alappuzha.
- Identify the elements of cultural heritage of the erstwhile port town.
- Design the canal circuit that is proposed for Alappuzha .
- Enhance the tourism infrastructure of the town with landscape sensitive design.
- Revitalize the canals that are in a dilapidated condition and enhance the water transport of the town.

THE SITE

Alappuzha or Alleppey, also known by the sobriquet ' Venice of the East' is a city in the east coast of India. Etymologically, Alappuzha is derived from two words : 'Ala' meaning waves and 'puzha' meaning river.Channels cross the city and connected to the hinterland.

LOCATION



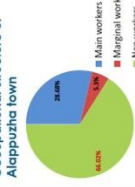
DEMOGRAPHICS

Alappuzha District comprises of six Taluks, namely, Cherthala, Ambalappuzha, Kuttanad, Karthikappally, Chengannur and Mavelikkara, 12 Blocks and 73 Grama Panchayats. The study region falls under Alappuzha municipality of the Ambalappuzha taluk.

Smallest district in Kerala

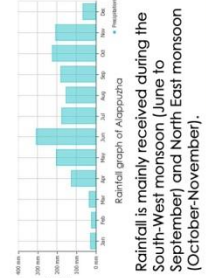
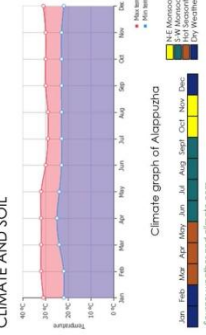
Only district having no high lands and forest Area : 141011 hectares (1414sq.Km).
 Location : 9 0 5' N Latitude, 76 0 17' - 76 0 44' E longitudes.
 Coastline : 82 kms.
 Rivers : Pamba, Manimala and Achankovil.
 The largest backwater in the state: Vembanadu
 Population : 2127789 (10131 male, 1114647 female)
 Population density : 1501 per sq.km
 Population Alappuzha Municipality : 1,74,176
 2011 Census

Occupational Structure of Alappuzha town



CLIMATE AND SOIL

Alappuzha has a warm and humid tropical climate due to its proximity to the sea. Annual maximum mean temperature -30.6° C. Annual minimum mean temperature -24.1° C Major soil types are sand and alluvium



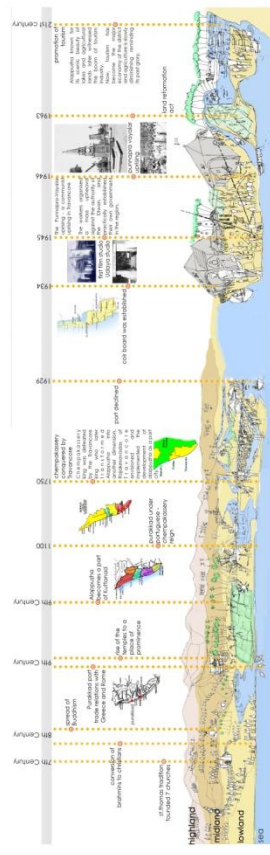
Rainfall is mainly received during the South-West monsoon (June to September) and North East monsoon (October-November).

- Water quality improvement by eradication of water hyacinth and floating weeds using proper measures.
- Link the canals with the national waterway3(as proposed) and make it suitable for navigation.
- Ensure balance of the ecosystem and prevent the fauna from disappearing.
- Methods to revitalise the canals and ensuring flow and natural flushing .
- Conserve the interfaces between the sea, the backwaters and the lake- the wetlands.
- Boost the tourism of the town and showcase the culture and heritage of Alappuzha.
- Promote small scale industries and handicrafts like coir products by showcasing them as part of the programme.

SCOPE AND LIMITATION

- The increasing influx of tourists and the demand of well designed infrastructure adds to the scope of the project.
- Only the manmade canals(Commercial and Vaddai canals) and their precincts are considered for landscape design.

HISTORY & EVOLUTION



CULTURE AND HERITAGE



THE TANGIBLE AND THE INTANGIBLE

Source : 'Diksha'-Study on Alappuzha



House boats in the Venembar Lake and Paddy fields of Kuttanad

Punnarnada finishing point

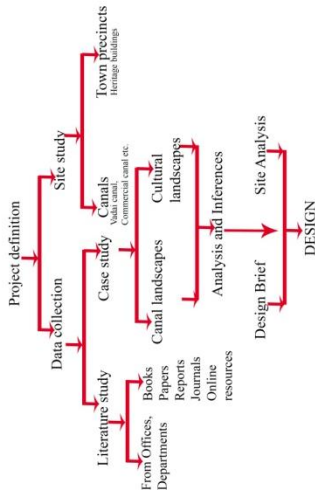
NEED FOR THE PROJECT

The backwaters and the beach are two major traveller destinations. Apart from a few other better known places, people doesn't know the heritage value and places of importance of the historic port town. Mostly because the port area has been totally transformed as the port shifted to Kochi. The remnants of that glorious past also fell in ruins. There is a need to showcase the rich heritage of Alappuzha to the people who come here.



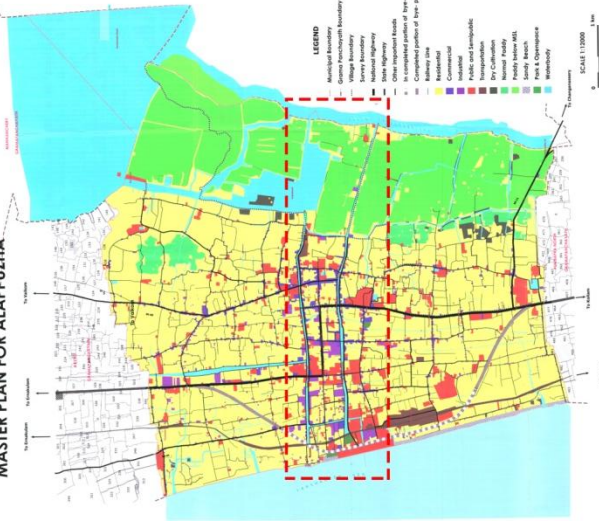
OUTCOMES

- The systematic study of the region and design proposal for the canal development will be the final outcome from this thesis. But the interim goal is as important as the final outcome.
- Identify Typological features of the landscape such as canals, streets and paths, paddy fields, etc.
- Landscape master plan and design of specific identified stretches
- Projecting the canal as the image of the city along with the lakes.
- The study shall also propose a landscape management plan for the region in order to preserve the landscape character of the town.



LANDUSE

MASTER PLAN FOR ALAPPUZHA



Snake boat race

TANGIBLE

- LIGHT HOUSE
- MULLACKAL TEMPLE
- JAIN TEMPLE
- ST. GEORGE CHURCH
- SAUKAR MASJID
- PUNNAMADA LAKE
- ALAPPUZHA BEACH

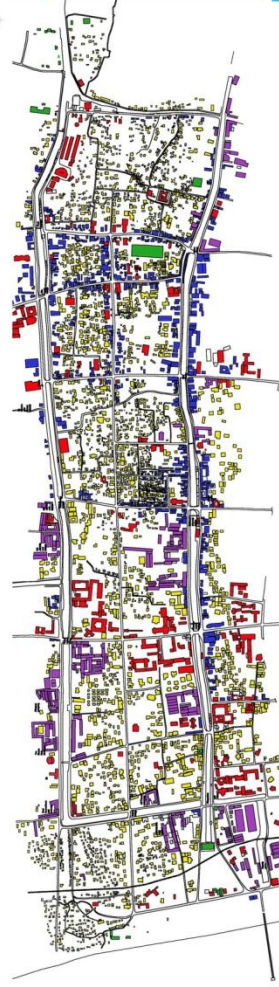
INTANGIBLE

- CHIRAPPU BOAT RACE
- BEACH FESTIVAL
- LOCAL CUISINE- ART FORMS-
- SCENIC BEAUTY
- OTHER FESTIVALS

HYDROLOGY



IMPORTANCE OF THE TOWN CANALS

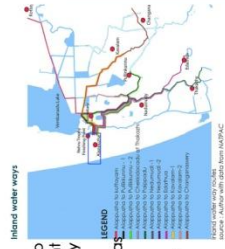


BUILT USE MAP

NIS



These were once busy routes of water traffic, used to transport goods. Unlike other areas, the settlement occurred along the canals and roads were added only later. Heritage buildings, activities and connectivity has always been related to the canals. Canals act as an image of the city. Rather than roads, the spatial organisation of the settlement is based on the canal as datum. ROADS CAME ONLY LATER.



LAYERS GEOGRAPHY

The State is classified physically as: LOW LAND, MID LAND AND HIGH LAND



Fig. 1: Kerala Physical map Source: ENIS Kerala

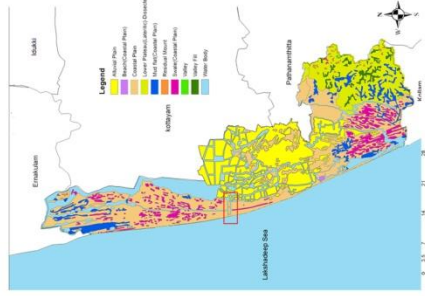
The ALAPPUZHA DISTRICT COMPRISES MAJORITY OF THE LOW LANDS AND A SMALL PORTION OF THE MIDLANDS ALONG THE SOUTH-EAST END.

Alappuzha district consists of 3 Sub-micro Regions :

- (1) Alleppey Coast
- (2) Kuttanad Low-lying Plains
- (3) Chenganoor Rolling Plains.

GEOMORPHOLOGY

The district represents coastal plain characterised by landforms of marine, fluvial and fluvio-marine origin. The general elevation of the area is less than 6 m above mean sea level with some parts of the area below mean sea level in the range of 1-2 m. The prominent landforms of this area are the coastal geomorphic features such as beaches, shore platforms, spit and bars, beach ridges. Backwaters in the form of lagoons (kayals), canals, and distributor systems of the rivers occupy a considerable part



HYDROLOGY

The study region comes under Pamba river basin and is comprised of various water sheds as shown below:



Fig. 1: Kerala- River Basins - Pamba River Basin

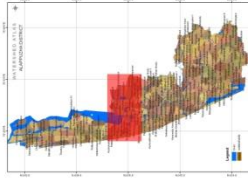
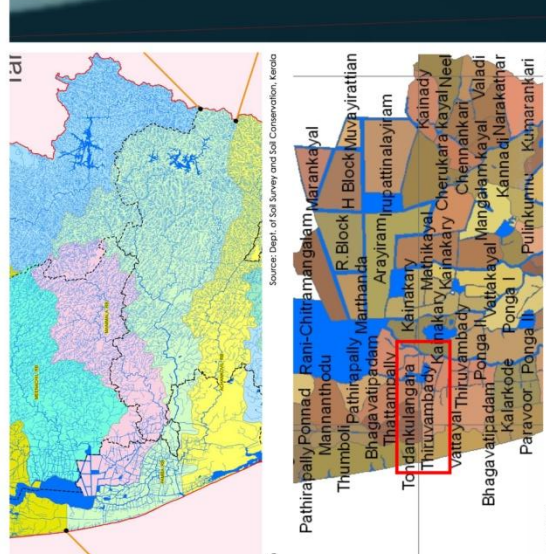


Fig. 1: Alappuzha - Water sheds - Study Area- water sheds



Source: Dept. of Soil Survey and Soil Conservation, Kerala

Source: Dept. of Soil Survey and Soil Conservation, Kerala

GEOLOGY AND SOIL



Table 1.1: Descriptions of the soil and pedology of the Alappuzha area

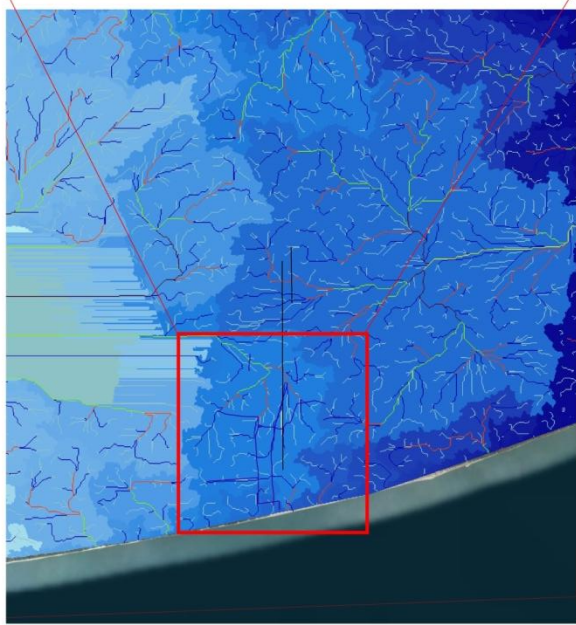
Soil	Quantity	Soil Series	Soil Profile	Soil Description
Soil Series	Quantity	Soil Profile	Soil Description	Soil Description
Soil Series	Quantity	Soil Profile	Soil Description	Soil Description

Source: Central Research Institute, Madurai, 1977

Khondalite is the oldest rock of the area and it includes quartzites which occur as lenticular bodies and garnet-biotite-sillimanite gneiss with or without graphite. The charnockite group of rocks including acid and intermediate varieties are found in the north eastern parts. Rocks of the migmatite group represented by biotite gneiss (quartzo-feldspathic gneiss) is noticed as small bodies in along the eastern margin of the district.

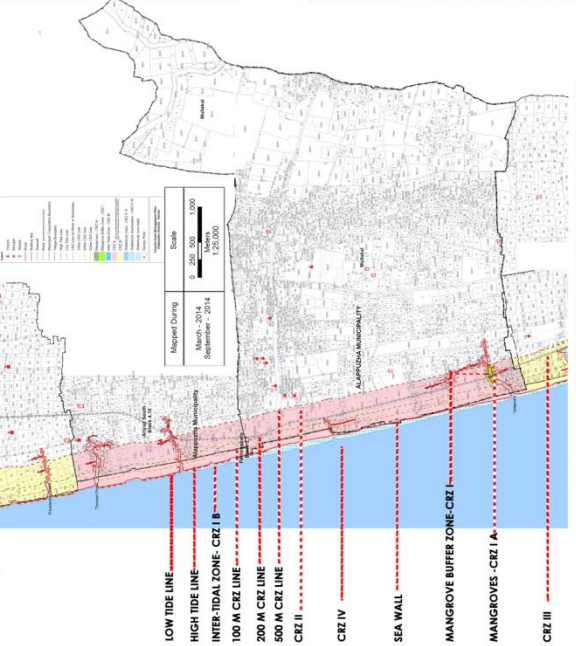
The study area lies fully in low land region. Coastal alluvial soils are the main soil type of the study area. These kinds of soils have been developed from marine and estuarine deposits and are very deep and usually have a high water table. Tertiary basin is deepest along the coastal plains of the district and is more than 600m deep south of Alappuzha town. The Kuttanad low land covering an area of approximately 100 sq. km, is reported to have plenty of semi-carbonised and partly decayed wood trunks, roots, branches, leaves etc. buried under a thin veneer of black carbonaceous clay. This region is locally known as Karipadams because of yielding of coal-like (carbonised wood) material from the paddy field. It is believed that this area is a downward forest of Chintamani road.

Stream order and basins of the study area



Setback line for CRZ II

For urban areas like Alappuzha, Kayamkulam and Cherthala Municipal Councils in which developed areas are eligible to be categorized as CRZ II, the setback lines are different.



SOURCE: NATIONAL CENTRE FOR EARTH SCIENCE STUDIES, THRIUVANANTHAPURAM

Major crops cultivated in the area are paddy, coconut, tapioca, jack, mango, Pulses, Pepper, Ginger, Turmeric, Areacanut, Tamarind, Clove, Nut meg, Cinamon, plantain, Lemon, Cashew, Tapioca, Elephant foot yam, Colocasia, Sweet Potato, Koorika, Drumstick, etc. Paddy is the major crop cultivating in the District which comes around 34.16 percent of total cropped area of the District and 17.38 percent of total paddy area of the State. Coconut is the other major crop cultivating in the District, which contribution is around 36.26 percent of the total cropped area of the District. Out of the total rice production in the District nearly 63.76 percent is from summer crop.

Animal husbandry plays an important role in generating employment and income to the weaker sections of the population. As per Live Stock Census 2007 total live stock population in the District is 158657 which contribute 4.42 percentage of the total live stock population in the State.

Agroculture is done below sea level



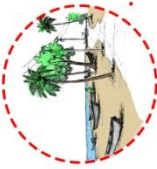
AGRICULTURE

SOIL	TALUK	CROPS(Main)
Sandy Pony & Kari	Western parts of Cherthala, Ambalappuzha, Karthikappally Eastern regions of Cherthala & Ambalappuzha portions of Kuttanad	Coconut Poor fertility & of low yields
Alluvial	Best of Kuttanad, north eastern portions of Karthikappally, western portions of Chengannur, north western regions formed by Panzha, Marumala and Adichenyol rivers near its confluence with the Vembanad lake	Paddy, Sugar cane
Laterite Sandy	Major portion of Chengannur & Maruthickara Cherthala, Ambalappuzha, Karthikappally	coconut, arecanut, fruit trees etc. Coconut

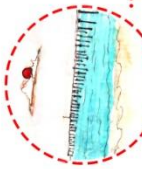


THE MESMERIZING SEASCAPE

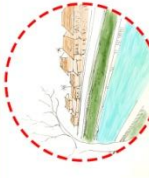
The feet sink into the granulated sand. As the waves soak them and retreat, the toes pop and burst one by one in a dash of seconds, tickling your feet. The breeze brushes your face and the sea breeze breaking and gushing past you, dampening your face a little.



THE LIVELIHOOD - FISHING



SUNSET AT THE BEACH AND PIER



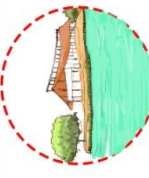
UNIQUE ARCHITECTURE ALONG CANALS



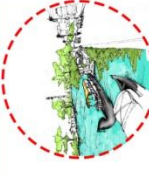
SWTD BOAT JETTY



TEMPLE ALONG CANAL AND THE PIPAL TREE



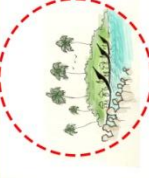
PUNNAMADA FINISHING POINT



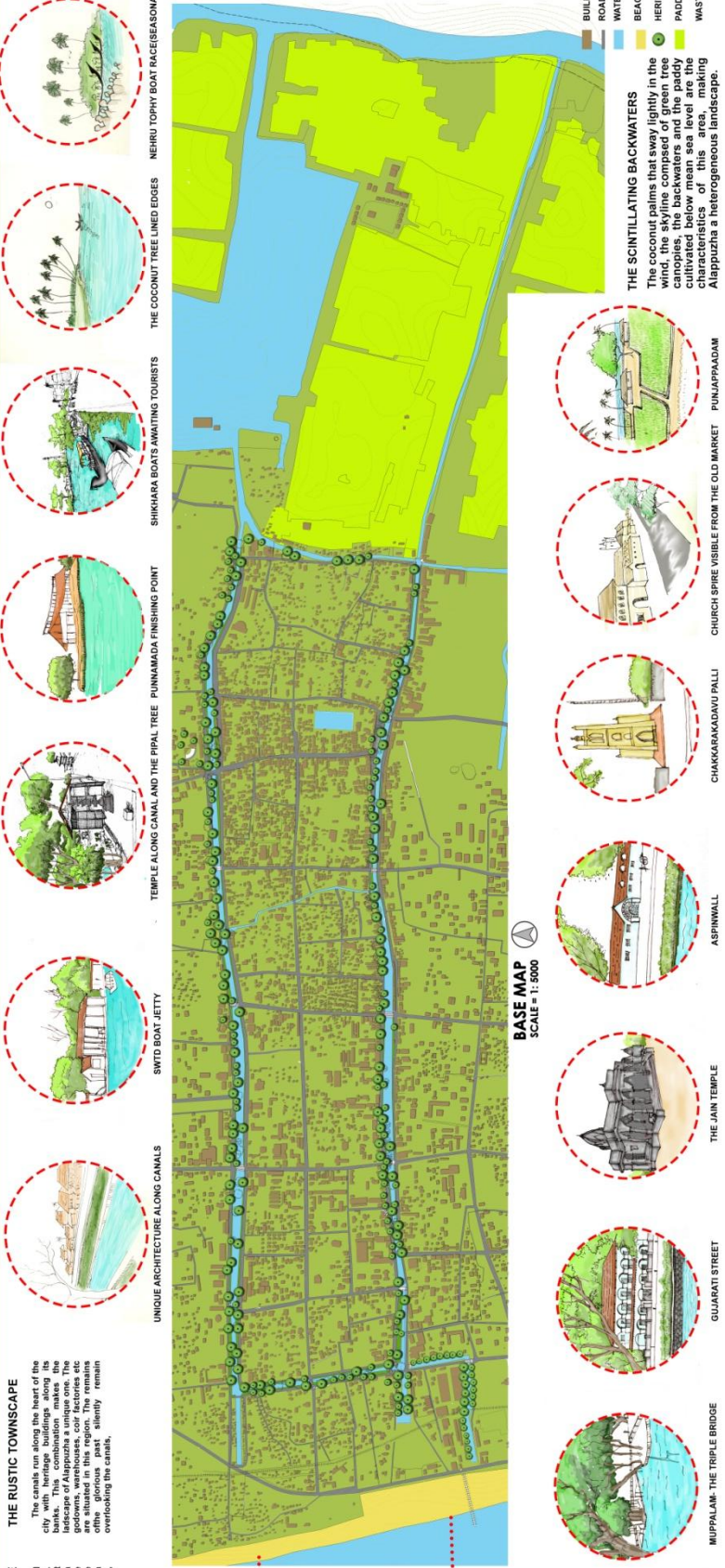
SHIKHARA BOATS AWAITING TOURISTS



THE COCONUT TREE LINED EDGES



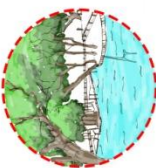
NEHRU TROPHY BOAT RACE(SEASONAL)



BASE MAP
SCALE = 1:5000



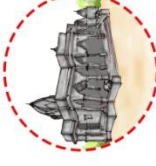
THE MAJESTIC LIGHTHOUSE



MUPPALAM - THE TRIPLE BRIDGE



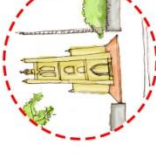
GUJARATI STREET



THE JAIN TEMPLE



ASPINWALL



CHAKKARAKADU PALLI



CHURCH SPIRE VISIBLE FROM THE OLD MARKET



PUNJAPPAADAM



HERITAGE TREES

LEGEND

- BUILDINGS
- ROADS
- WATER BODIES
- BEACH
- HERITAGE TREES
- PADDY FIELDS
- WASTELAND

THE SCINTILLATING BACKWATERS
The coconut palms that sway lightly in the wind, the skyline composed of green tree canopies, the backwaters and the paddy cultivated below mean sea level are the characteristics of this area, making Alappuzha a heterogeneous landscape.

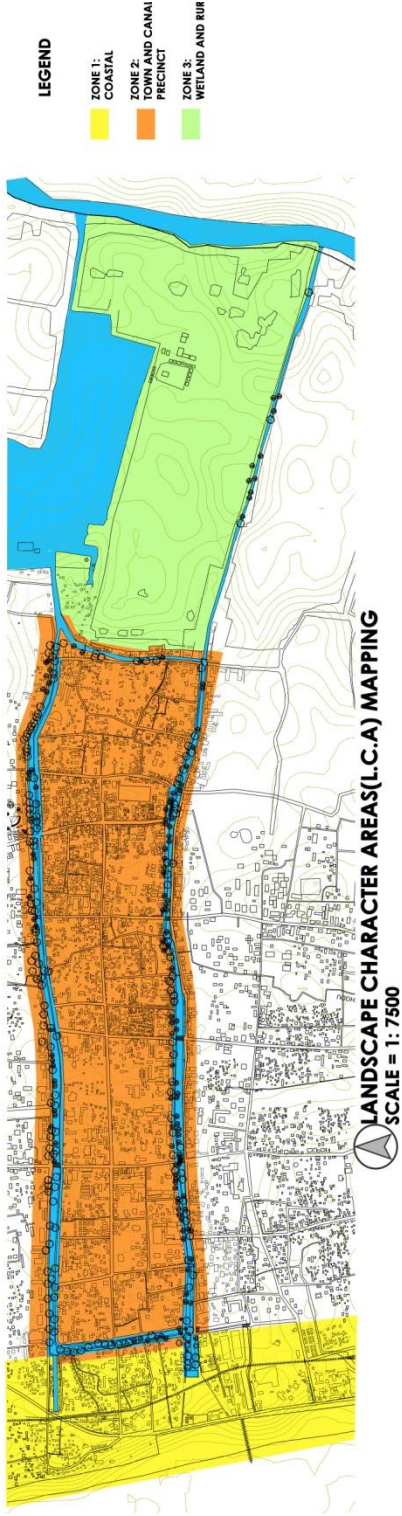
NISHA NELSON
2016MLA007 | SPAB

LANDSCAPE DESIGN OF AN INTEGRATED LOOP ALAPPUZHA

EXPERIENTIAL MAPPING

ANALYSIS OF NATURAL AND CULTURAL LAYERS

LANDSCAPE AREAS ZONATION



OZONE 1 : COASTAL

CHARACTER : COASTAL WETLAND AND BEACH

SOIL : COASTAL ALLUVIUM

VEGETATION : COCONUT TREES, CASUARINA GROVES, MANGO TREES, JACK FRUIT, TAMARIND, BETEL NUT, DUNE GRASS

CULTURAL ELEMENTS : OLD PORT AREA, FISHERMEN SETTLEMENTS, RESORTS, CHURCHES, TEMPLES, MOSQUE, PARK, RECREATION GROUND, ELEVATED BYPASS

PHENOMENON : NATURAL : MUD BANKS, SOIL EROSION, ANTHROPOGENIC : SAND MINING, SOIL EROSION

VALUES : SCENIC, SOCIO-ECONOMIC, ECOLOGICAL

OZONE 2 : TOWN AND CANAL PRECINCT

CHARACTER : URBAN WITH DISTINCT HERITAGE AREAS

SOIL : COASTAL ALLUVIUM

VEGETATION : HERITAGE TREES LIKE RAIN TREE, GULMOHAR, COPPERPOD, TEAK, ETC.

CULTURAL ELEMENTS : CHARACTER DISTRICTS, HERITAGE BUILDINGS, OLD WARE HOUSES, GODOWNS, FACTORIES, ETC.

PHENOMENON : NATURAL : SOIL EROSION ANTHROPOGENIC : ENCROACHMENTS, CUTTING OF TREES

VALUES : HERITAGE, SOCIOCULTURAL, SCENIC

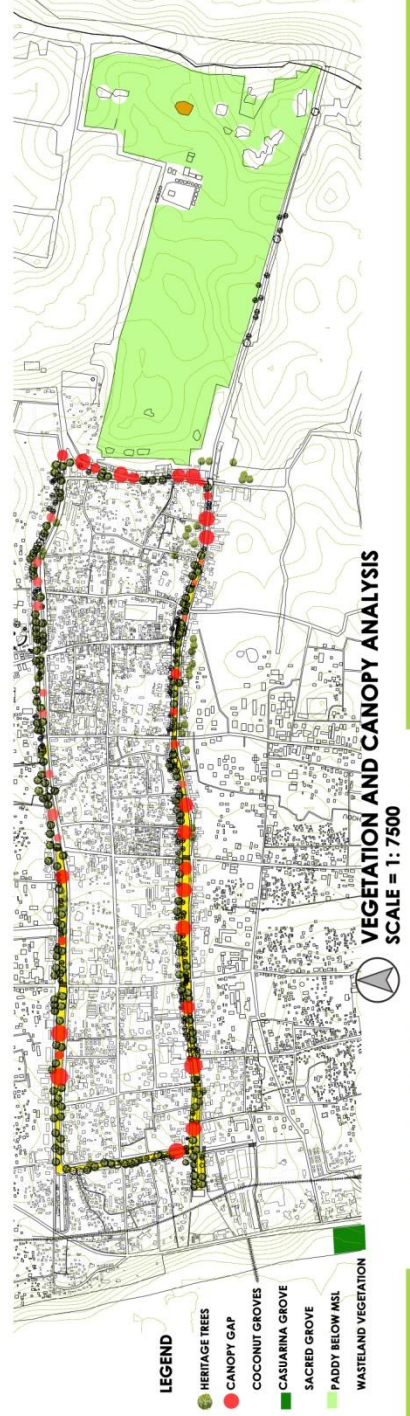
OZONE 3 : WETLAND

CHARACTER : WETLAND AND RURAL SOIL : RIVERINE ALLUVIUM

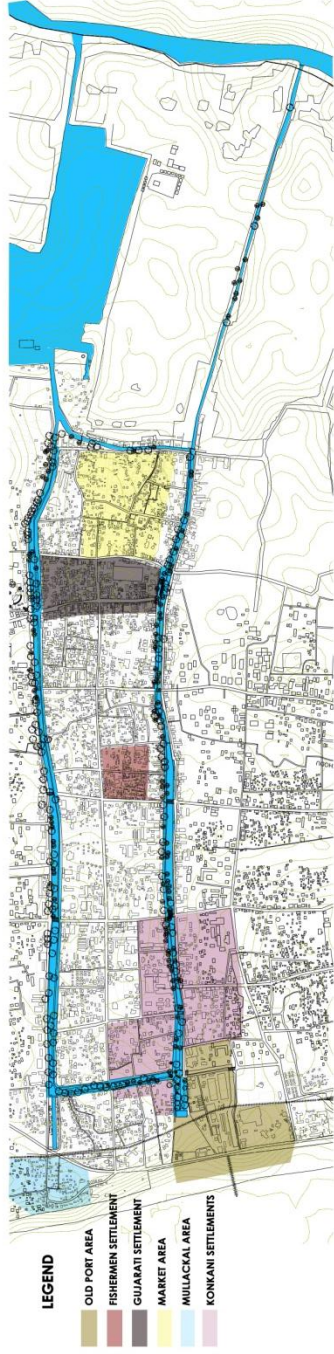
VEGETATION : COCONUT TREES, PADDY, MARSH VEGETATION CULTURAL ELEMENTS : RURAL SETTLEMENTS, PADASHEKHARAM,

PHENOMENON : NATURAL : RIVER AND ITS RELATED PHENOMENON ANTHROPOGENIC : LAND RECLAMATION, AGRICULTURE

VALUES : SCENIC, ECOLOGICAL, SOCIO-ECONOMIC



CULTURAL AREAS ZONATION



CULTURAL DISTRICTS MAPPING
SCALE = 1: 7500

OLD PORT AREA	FISHERMEN SETTLEMENT	GUJARATI SETTLEMENT	MARKET AREA	MULLACKAL AREA	KONKANI SETTLEMENT
<p>CHARACTER : ABANDONED GODOWNS AND SINGLE STOREY CONSTRUCTION, LIGHTHOUSE AS LANDMARK</p> <p>ZONE : 1COASTAL</p>	<p>CHARACTER : LOCAL VERNACULAR ARCHITECTURE WITH THATCHED ROOF</p> <p>ZONE : 1COASTAL</p>	<p>CHARACTER : COLONIAL STYLE BUILDINGS WITH TRADITIONAL CHARACTER</p> <p>ZONE : ZONE 2 CANAL AND TOWN PRECINCT</p>	<p>CHARACTER : SINGLE STOREY BUILDINGS, HUMAN SCALE OF STREETS</p> <p>ZONE : ZONE 2 CANAL AND TOWN PRECINCT</p>	<p>CHARACTER : INTENSE COMMERCIAL CHARACTER, MULLACKAL TEMPLE AS LANDMARK</p> <p>ZONE : ZONE 2 CANAL AND TOWN PRECINCT</p>	<p>CHARACTER : RESIDENTIAL BUILDINGS CHARACTERISED BY SLOPING ROOF.</p> <p>ZONE : ZONE 2 CANAL AND TOWN PRECINCT</p>

VEGETATION ANALYSIS

HERITAGE TREES

- TREES OF AGE GREATER THAN 100 YEARS SITUATED ALONG THE CANAL BANKS
- SAMANEA SAMAN, DELONIX REGIA, PELTOPHORUM PTEROCARPUM, SPAITHODIA CAMPANULATA, ETC.

SEACOAST VEGETATION

SPINFEX LITOREUS, CANAVALLIA ROSEA, INDIGOFEIRA LINNAEI, I. UNRFLORA, ROTHIA INDICA, LAUNAEA SAMRANTOSA, LPOMOEA PES-CA PRAE, I. ALBA, CYPERUS ARENARIUS, C. ROTUNDUS, REMIERA MARITIMA, BULBOSTYLIS BARBATA, MARISCUS JAVANICUS, MARTYNIA ANNUA, PEDALUM MUREX, PHYLA NODIFLORA, ZOYSIA MATRELLA, TEPHROSIA MAXIMA, CROTALARIA NANA, C. VERRUCIOSA, GISEKIA PHARNACOIDES, WEDELIA BIFLORA, XANTHIUM STRUMARIUM, ETC. .

VEGETATION IN CULTIVATED AND WASTELANDS.

PLACES ALONG THE ROADS OR RAILWAY TRACKS ARE OCCUPIED BY A LARGE NUMBER OF SPECIES DURING RAINY SEASONS: DALECHYDIA FRAXYLLI, S. UCUTA, S. RHOMBOIDEA, S. CORDIFOLIA, PENNISETUM POLYSTACHYON, CLEOME VISCOSA, URENA LOBATA, ETC. ARE COMMON PLANTS FREQUENTLY GROWING IN LARGE ISOLATED PATCHES IN PURE OR COMBINED FORMATIONS.

SACRED GROVE VEGETATION

- SMALL PATCHES OF NATIVE VEGETATION TYPES TRADITIONALLY PROTECTED AND MANAGED BY THE LOCAL COMMUNITIES. CONTAIN ALL THE RARE AND ENDANGERED SPECIES OF THE WESTERN GHATS AND RARE SPECIES OF PLANTS AND ANIMALS.
- TREES OF VARIOUS SIZES, SOME HERB WITH ONLY A FEW TREES AROUND A TEMPLE
- TREE SPECIES ARE ARTOCARPUS HIRSIUTIS, ALSTONIA SCHOLARIS, HOPEA PONGA, HOPEA PARVIFLORA, MIMUSOPS BERGII, CALOPHYLLUM CALABA, XANTHOHYLLUM FLAVESCENS, VATERIA INDICA, CARYOTA URENS.

AQUATIC AND SEMI-AQUATIC FREE-FLOATING HYDROPHYTES: HYGRORYZA ARISTATA, LEMNA PERPUSILLA, SPIRODELA POLYZYLZA, WOLFFIA GLOBOSA, PISTIA STRATIOTES AND EICHORNIA CRUSSIPES. **SUSPENDED HYDROPHYTES :** -JTRICULARIA UREA AND U. EXOLETA, CERATOPHYLLUM DEMERSUM, HYDRILLA VERTICILLATA AND EROCAULON SETACEUM **SUBMERGED-ANCHORED HYDROPHYTES:** EROCAULON SETACEUM, NAJAS GRAMINEA, N. INDICA, HYDRILLA VERTICILLATA

TYPOLICAL ASSESSMENT OF SPACES

CANALS	
COMMERCIAL CANAL	VADAPUZZHI LINK THODU
EAST JUNCTION CANAL	PANICHIRRA
WEST JUNCTION CANAL	PATHARAM ARIMBI
UPPOOTTY CANAL	KAYI THODU
KOTIARAM CANAL	RAILWAY STATION LINK
AS CANAL	VADAYAL PALLI
	VADAPUZZHI LINK THODU
	VADA POZZHI THODU
	YMCA 2
	SUB

PARKS	
VJAY PARK	
SEA VIEW PARK	
PICNIC SPOT	

SQUARES	
NAGARA CHATWARAM-TOWN SQUARE	
CHUNGOM	

SPORTS AND RECREATION	
EMS STADIUM	
MUNICIPALITY RECREATIONAL GROUND	
AMALE WORLD BEACH	

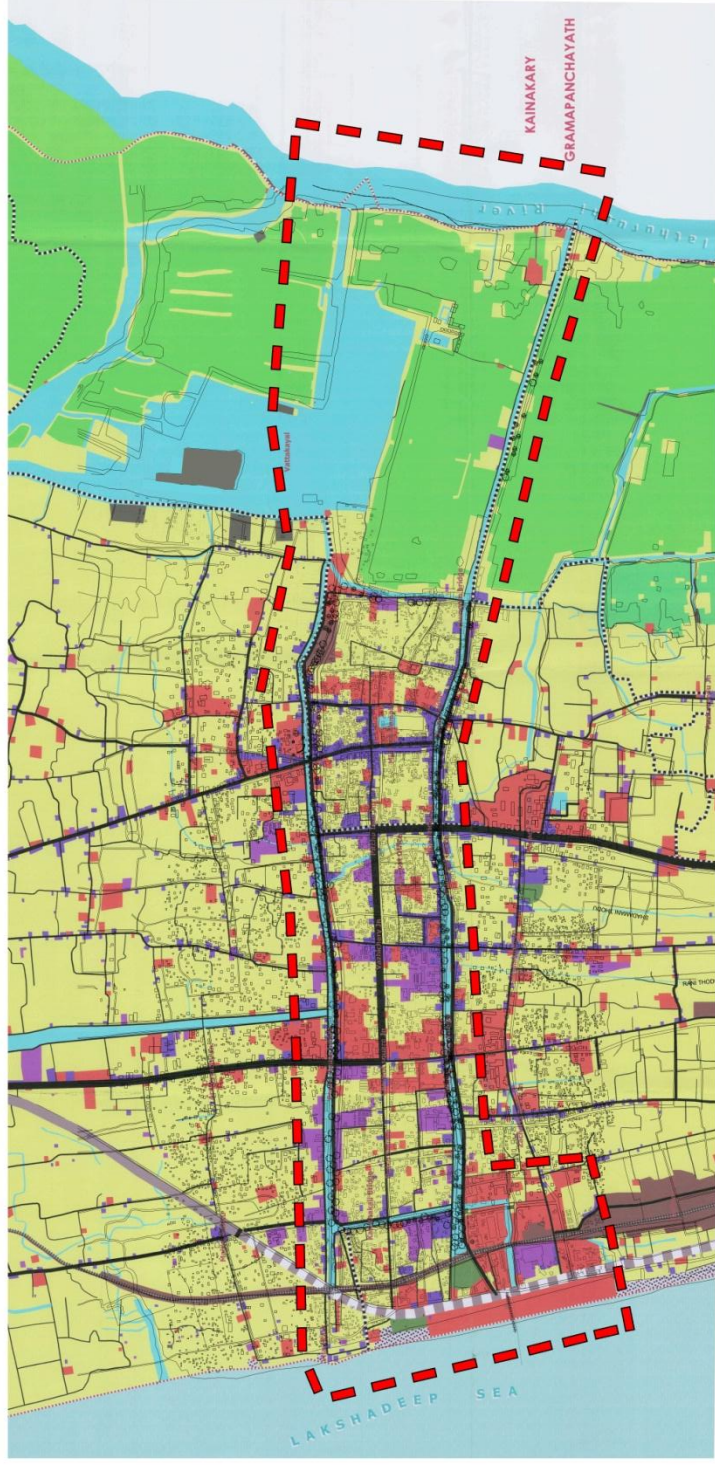
OTHER PUBLIC OPEN SPACES	
BEACH	

JETTIES AND WATERWAY BOARDING POINTS	
MATHA JETTY	
RAJIV JETTY	
KSWID BOAT JETTY	
BIJACANAL JETTY	
PUNCHIRI JETTY	
VILAKKUMARAM JETTY	
PUNNAMADA FINISHING POINT HOUSEBOAT TERMINAL	

STREETS AND LANES	
GUJARATI STREET	
STREETS ALONG THE CANAL EDGE	
OLD MARKET STREET	
COIRRED LANE	

LEGEND

---	Municipal boundary
---	Gramapanchayath boundary
---	Survey boundary
---	State boundary
---	National Highway
---	State Highway
---	Other important roads
---	In completed portion of bye-pass
---	Railway line
---	Completed portion of bye-pass
---	Commercial
---	Industrial
---	Public and semipublic
---	Transportation
---	Dry Cultivation
---	Normal Fertility
---	Paddy (low-MLL)
---	Soilly Branch
---	Park & Open-space
---	Waterbody
---	Study area



LAND USE AND SITE PLAN
SCALE = 1: 5000

LANDSCAPE DESIGN OF AN INTEGRATED LOOP, ALAPPUZHA

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TYOLOGY OF SPACES

PRESENT SCENARIO AND ISSUES

Despite being a ramzar site, negligence and irresponsible actions continue.



View to opposite side from the Same bridge
 Areas back to public spaces for recreation. The open spaces available in the locality pocket only are along the canal edges. This potential must be tapped into create breathing spaces for the residents.
ECOLOGICAL AND OTHER
 Construction of Thannemukkam band
 Construction of Thattappally railway



- Disconnect to sea
- Encroachments
- Erosion of Canal banks
- Degradation of water quality
- Eutrophication
- Wastes from houseboats
- Domestic waste disposal
- Collection of water hyacinths and other weeds.
- The pathways already continues are not providing any line the path ends.
- Reclamation of wetlands along edges of water body



Map: Open Space file; Source: Design

NAME OF PAPER/REPORT/BOOK	AUTHOR/ YEAR	DOMAIN/ SUBJECT	REMARKS
SUSTAINABLE LANDSCAPE PLANNING	PAUL EBELMAN	LANDSCAPE PLANNING	RECOGNITION AS A RAMAZA
CONSERVATION OF CULTURAL LANDSCAPES	ANITA SHUKLA	CULTURAL LANDSCAPE	SITE SPECIFIC DOCUMENTATION AND DESIGN FOR CULTURAL LANDSCAPE
THE CONCRETE TOWNSHIP	GORDON GLEN	URBAN STUDY	QUALITATIVE ASSESSMENT OF URBAN SPACES
THE APPLICATION OF ECOLOGICAL PRINCIPLES TO URBAN DESIGN	SPYRIDON KALAS	URBAN LANDSCAPE	PACT DYNAMIC APPROACH
THE CHANGING LAND USE PATTERNS OF ALAPPUZHA DISTRICT IN INDIA	DR. N. MANICKAVELU	URBAN, RURAL GRADIENT	SHARE OF CELESTIAL WASTE IS PONDING IN THIS FROM THE BACK OF PONDING AT SIGNATURE OF RAIN.
ECOSYSTEM SERVICES AND REPLICATION ALONG URBAN RIVERS AND CANALS	U.S. KANDASWAMY AND S. A. PAVITHRA	URBAN RURAL GRADIENT	URBAN RURAL GRADIENT
CIRCUIT DEVELOPMENT PLAN DETERMINATION	EMMON COFFIN	TOURISM- THEMES	THESE THEMES INCLUDE THE ESTABLISHMENT OF ALAPPUZHA DISTRICT IDENTIFIED AS IN OPERATIONAL AND ROUTE
A Critical Analysis of the provisions included in the Appropriation for the Provision of Aqueducts for Irrigation	PLANNING COMMISSION	WETLANDS ECOSYSTEM	FACTORS THAT PROMOTE TOURISM
REPORT ON WYRANANDU, KOJIKODI AND WETLANDS	DR. P. RAMA MAHESH	WATER BIODIVERSITY, HOUSING	IMPLEMENTATION OF THE NATIONAL WETLANDS CONSERVATION AND MANAGEMENT CONSERVATION OF CATCHMENT AREA
REVIEW AND UPDATE OF DETAILED PROJECT REPORT FOR DEVELOPMENT OF ALAPPUZHA DISTRICT, KERALA	DELOITTE TOUCHÉ	REPORT	IDEAS WITH THE ENVIRONMENTAL ISSUES RECOMMENDATIONS TO AVOID THEM.
REVIEW AND UPDATE OF DETAILED PROJECT REPORT FOR DEVELOPMENT OF ALAPPUZHA DISTRICT, KERALA	DELOITTE TOUCHÉ	REPORT	ISSUES PROJECT REPORT ON ALAPPUZHA MARINA
ALTERNATIVE TOURISM DEVELOPMENT NETWORK WATER INFORMATION GUIDE FOR ALAPPUZHA DISTRICT	JAMES P. GEORGE	CO-OPERATIVE REPORT BY COOP	Detailed study on the status of ALAPPUZHA DISTRICT
GROUND WATER INFORMATION GUIDE FOR ALAPPUZHA DISTRICT	N. V. V. S. S. S. S.	REPORT BY COOP	IT SHOWS HOW PEOPLE COME TOGETHER AND SHARED IDEAS TO GENERATE BYVINE ROADS TO GROUND WATER SCHEMA OF THE DISTRICT

CASE STUDIES

CASE STUDY	CASE STUDY ASPECT	LOCATION
MONTGOMERY CANAL FONTAINHAS KOCCHI BERNALLE ASHION CANAL	CANAL REVITALIZATION RURAL HERITAGE CONSERVATION/TOURISM CULTURE INTERPRETATION CANAL REJUVENATION	ENGLAND GOA KOCCHI ENGLAND

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LANDSCAPE DESIGN OF AN INTEGRATED LOOP ALAPPUZHA

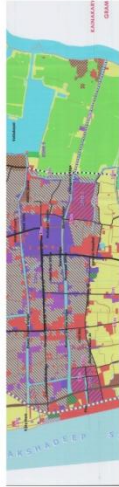
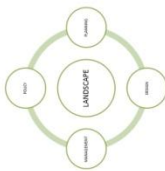
ISSUES

Concepts regarding the full length of the town and hence can be used for navigation. The increasing traffic intensity on roads can also be moderated.

As defined by the Ramsar Convention on Wetlands, wetlands are "areas of marsh, fen, peat land or water, whether natural or artificial, that is flooded or flowing, having water that is static or flowing, fresh, brackish or salt, including areas of marine littoral zone that do not exceed six meters (Article 1.1 of the Convention text).

REGIONAL LEVEL

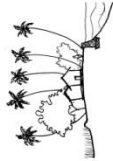
ARENAS FOR PRESERVING LANDSCAPE CONNECTIVITIES- PAUL SELMAN



TYPOLGY-ZONE MATRIX OF STRATEGIES

ZONE	TYPOLGY	PARKS	SQUARES	OTHER PUBLIC OPEN SPACES	CANALS	JETTIES	BRIDGES	STREETS AND LANES
COASTAL		PARKS IN THE CITY CORE SHOULD BE ATTACHED HERE. PROMINENT MANGROVE AREAS SHOULD BE PRESERVED AND PLANTING AS THE SOIL IS BRACKISH SALTY	THE TOWN SQUARE PRESENTLY PRESENTS THE NORMAL CITY GRID. SQUARES AND PLAZAS WILL BE DESIGNED FOR USER COMFORT	THE RECREATION WALKWAY AND BEACH ARE BOTH TO BE PRESERVED AND ENRICHED FROM EROSION. MANGROVE EDGES SUGGESTED.	EXTEND THE MAIN CANAL TILL THE SEA TO ENSURE AN UNINTERRUPTED FLOW OF WATER. PROVIDE A PROTECTIVE CANAL WITH WATER RESERVOIR AS WELL.	NEW JETTIES PROPOSED TO EXTEND TO THE SEA WITHOUT THE TOWN THROUGH CANALS	NONE PRESENT	NARROW LANES AND HERITAGE STREETS MAINTAIN. UPLIFT THE EXISTING STREETS FOR HERITAGE WALK
TOWN AND CANAL PRECINCT		NO PARKS ARE PRESENT. URBAN LINAR PARK ALONG CANAL	THE TOWN SQUARE PRESENTLY PRESENTS THE NORMAL CITY GRID. SQUARES AND PLAZAS WILL BE DESIGNED FOR USER COMFORT	THERE ARE VACANT PLOTS LYING IN THE CITY SOME OF WHICH ARE ACCESSIBLE FOR PUBLIC USE AS THE CITY LACKS PUBLIC OPEN SPACES.	THE BANKS OF CANAL TO BE ENRICHED WITH PLANTING FOR THE USE OF RESIDENTS. CANALS SHOULD BE OPEN TO GROW THE CANOPY	NEW JETTIES PROPOSED TO EXTEND TO THE SEA WITHOUT THE TOWN THROUGH CANALS	CLEAR HEIGHT OF BRIDGES WITH 100 SECTION BRIDGES WHERE NECESSARY	THE ADDITION OF BICYCLE LANES AND HERITAGE STREETS MAINTAIN. UPLIFT THE EXISTING STREETS FOR HERITAGE WALK
WETLAND AND RURAL		NO PARKS ARE PRESENT. SHOULD BE DEVELOPED AS PARKLAND	NO SQUARES PRESENT IN THIS AREA.	THE WETLANDS SHOULD BE USED AS PUBLIC OPEN SPACES.	THE EDGES OF THE CANALS SHOULD NOT BE ENRICHED WITH PLANTING FOR THE USE OF RESIDENTS. SHOULD BE PROVIDED.	IMPROVEMENT OF APPROVED JETTIES ASSOCIATED WITH EXISTING JETTIES.	CLEAR HEIGHT OF BRIDGES WITH 100 SECTION BRIDGES WHERE NECESSARY	NARROW STREETS ALONG THE CANAL CHARACTER TO BE MAINTAINED.

STRATEGIES FOR EDGES

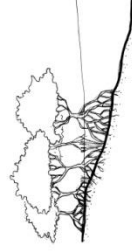


- ZONE 1 STRATEGIES**
- MANGROVE EDGES INSTEAD OF SEA WALL
 - SAND DUNE PROTECTION
 - SEASONAL ACTIVITIES
 - BEACH FEST
 - SAND ART FEST
 - KITE FESTIVAL
 - DESIGN OF PARKS
 - DESIGN OF ORIGINAL GROUND
 - CAFES
 - EATERIES
 - PORT MUSEUM



ZONE 2 TOWN STRATEGIES

- ENCROACHMENTS SHOULD BE REMOVED FROM THE WEST END OF VADA CANAL.
- CONVERT SLOPES TO SANITISE SLOPES AND PREVENT SOIL EROSION AND SUBSEQUENT FALLING OF TREES.
- SEASONAL ACTIVITIES
- FLOWERING PERIOD OF HERITAGE TREES.



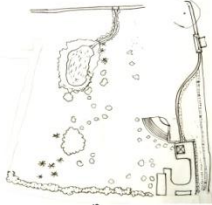
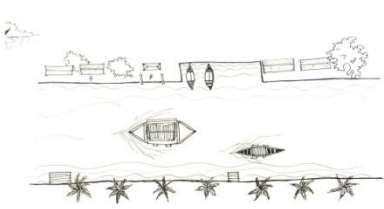
ZONE 3 WETLAND ZONE- STRATEGIES

- MANGROVE BUFFER VEGETATION ALONG CANAL
- PROHIBIT RECLAMATION OF LAND FROM LAKE
- SEASONAL ACTIVITIES
- BOAT RACE
- MONSOON TOURISM



ZONE WISE VEGETATION STRATEGIES

- ZONE 1**
- MANGROVES FOR SHORE PROTECTION
 - MANGROVES FOR WIND PROTECTION
 - COCONUT AS MAIN CROP
 - DUNE GRASS TO BE PROTECTED
 - VEGETATION ALONG 'POZH'- ESTUARIES- TO BE PROTECTED
- ZONE 2.**
- NO TREES ALONG THE CANAL BANKS SHOULD BE CUT DOWN.
 - MISSING CANOPIES ALONG CANAL TO BE REPLACED BY PLANTING TREES. NOT OBSTRUCTING THE VIEW TO HERITAGE STRUCTURES.
- ZONE 3.**
- 100M BUFFERS SHOULD BE PROVIDED AROUND FARMLANDS TO FILTER POLLUTANT BEFORE ENTERING THE CANALS AND RIVER.



STRATEGIES AND PROPOSALS

LANDSCAPE DESIGN OF AN INTEGRATED LOOP, ALAIPUZZHA

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THE MESEMERIZING SEA SIDE

SEASONAL ACTIVITIES

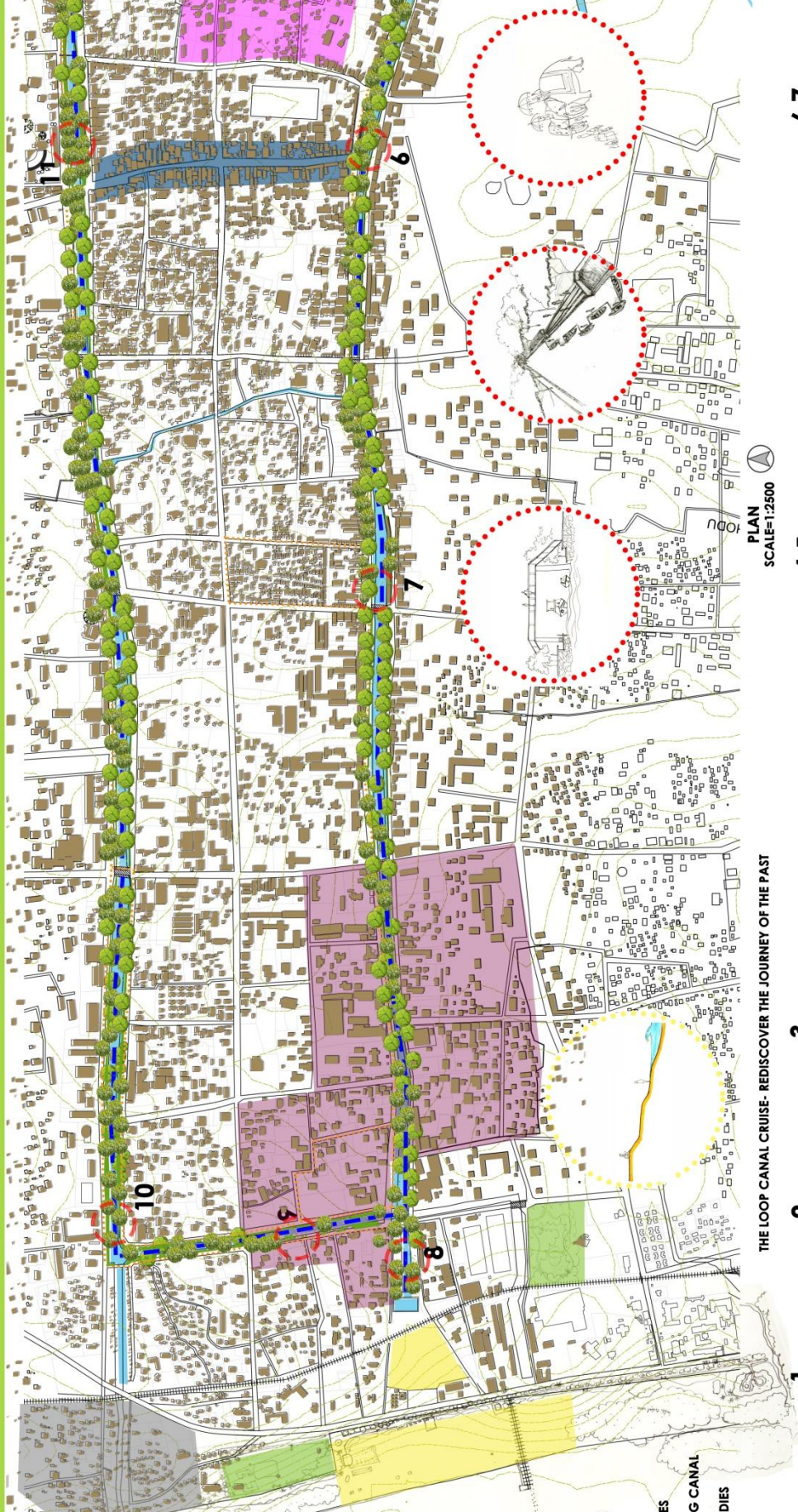
- BEACH FEST
- SAND ART FEST
- KITE FESTIVAL

SENSORY EXPERIENCES

- VISUAL: View of the sea
- HEARING: Sound of waves
- OLFACTORY: Sea breeze
- TASTE: Sea food experiences
- TACTILE: Feet in water, sand, wind brushing past

LEGEND

- CANAL CRUISE
- BICYCLE TRACK
- PEDESTRIAN PATH
- PARKS
- RECREATIONAL SPACES
- MANGROVE SWAMPS
- EXISTING HERITAGE TREES
- PROPOSED TREES ALONG CANAL
- CANAL AND WATER BODIES
- STREETS AND LANES
- HERITAGE BUILDINGS
- RELIGIOUS STRUCTURES



PLAN
SCALE=1:2500

THE LOOP CANAL CRUISE- REDISCOVER THE JOURNEY OF THE PAST

- 1**
- START POINT-PROPOSED JETTY
 - INTERPRETATION CENTRE
 - BICYCLE POINT
 - AMPHITHEATRE

- 2**
- PROPOSED JETTY
 - WETLAND PARK
 - KAYAKING TRAIL
 - CHANGADAM

- 3**
- FERRY TERMINAL
 - PROMENADE WALK
 - REFRESHMENT KIOSK
 - AGRICULTURE INTERPRETATION CENTRE
 - VIEWING DECKS FOR BELOW MSL FARMING

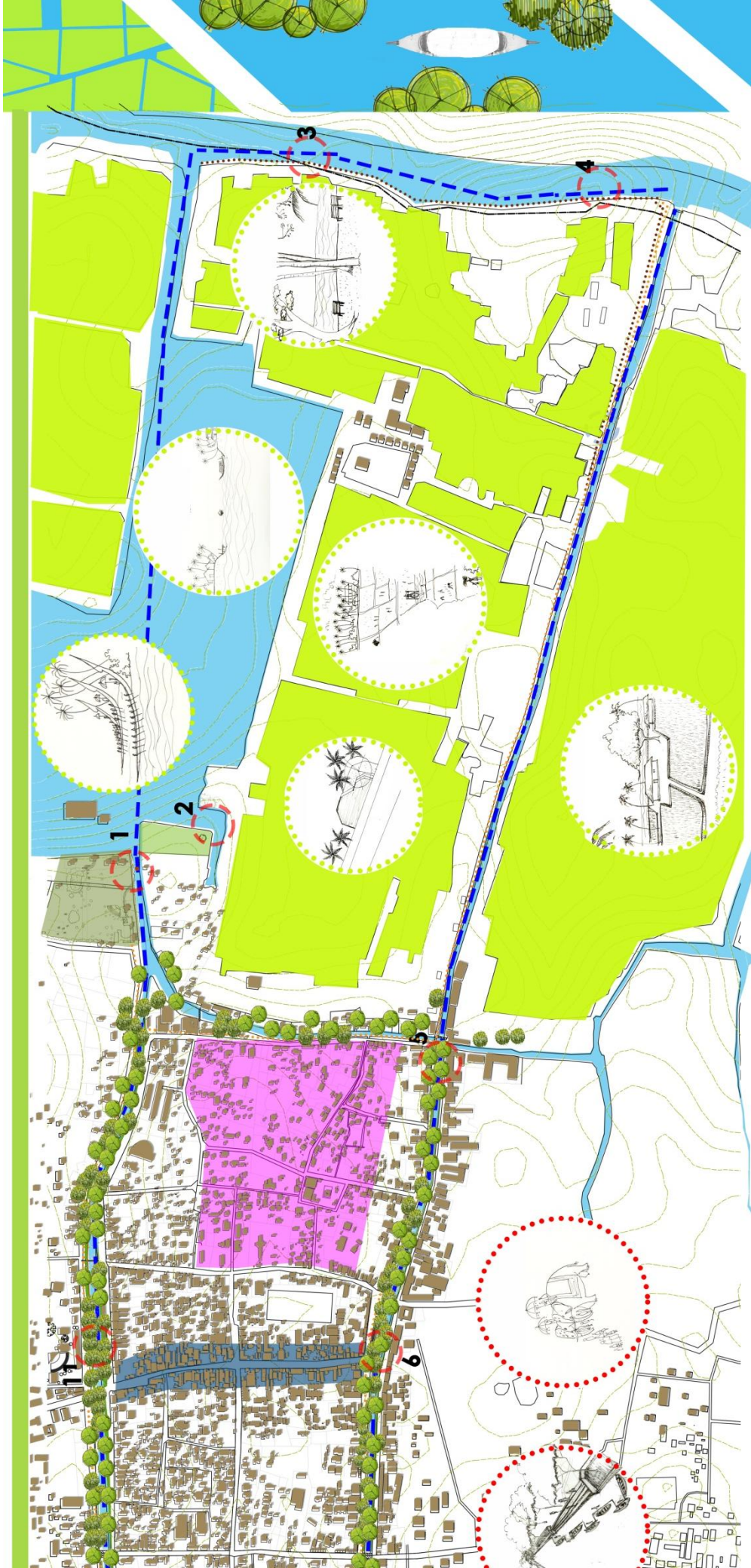
- 4**
- TODDY SHOPS- LOCAL CUISINE
 - WALK THROUGH VARAMBU
 - HOMELY FOOD EXPERIENCE AT SELECT DWELLINGS
 - VIEWING DECK AT BRIDGE

- 4.5**
- BOARDING POINT: BHARGAVAN JETTY
 - STOP 3- CHUNGOM(NO JETTY REQUIRED)
 - 1. OLD CHUNGOM MARKET AREA
 - 2. VENKATACHALAPATHY TEMPLE

- 6.7**
- BOARDING POINT- PROPOSED
 - FLOATING MARKET
 - STOP 4
 - 1. OLD MARKET AREA
 - 2. SPICE TRAIL

COMPREHENSIVE LANDSCAPE PLAN

LANDSCAPE DESIGN OF AN INTEGRATED



- 6.7**
- BOARDING POINT - PROPOSED JETTY**
 - 1. TAMIL BRAHMIN SETTLEMENTS
 - 2. MULLACKAL TEMPLE
 - 3. ST. GEORGE CHURCH
 - 4. ASPINWALL
 - 5. COIR CORP
 - 6. SOUVENIR SHOPS
 - STOP 4**
 - 1. OLD MARKET AREA
 - 2. SPICE TRAIL
 - FLOATING MARKET**

- 8**
- STOP 5-PROPOSED JETTY**
 - 1. GUJARATI STREET
 - 2. JAIN TEMPLE
 - 3. CSI CHURCH
 - 4. SPICE MILLS
 - 5. OLD WAREHOUSES**
 - 6. LIGHT HOUSE**
 - 7. OLD PORT AREA**
 - 8. PIER**

- 9.10**
- 10. MUSEUM**
 - 11. PARKS**
 - 12. FISHERMEN SETTLEMENT**

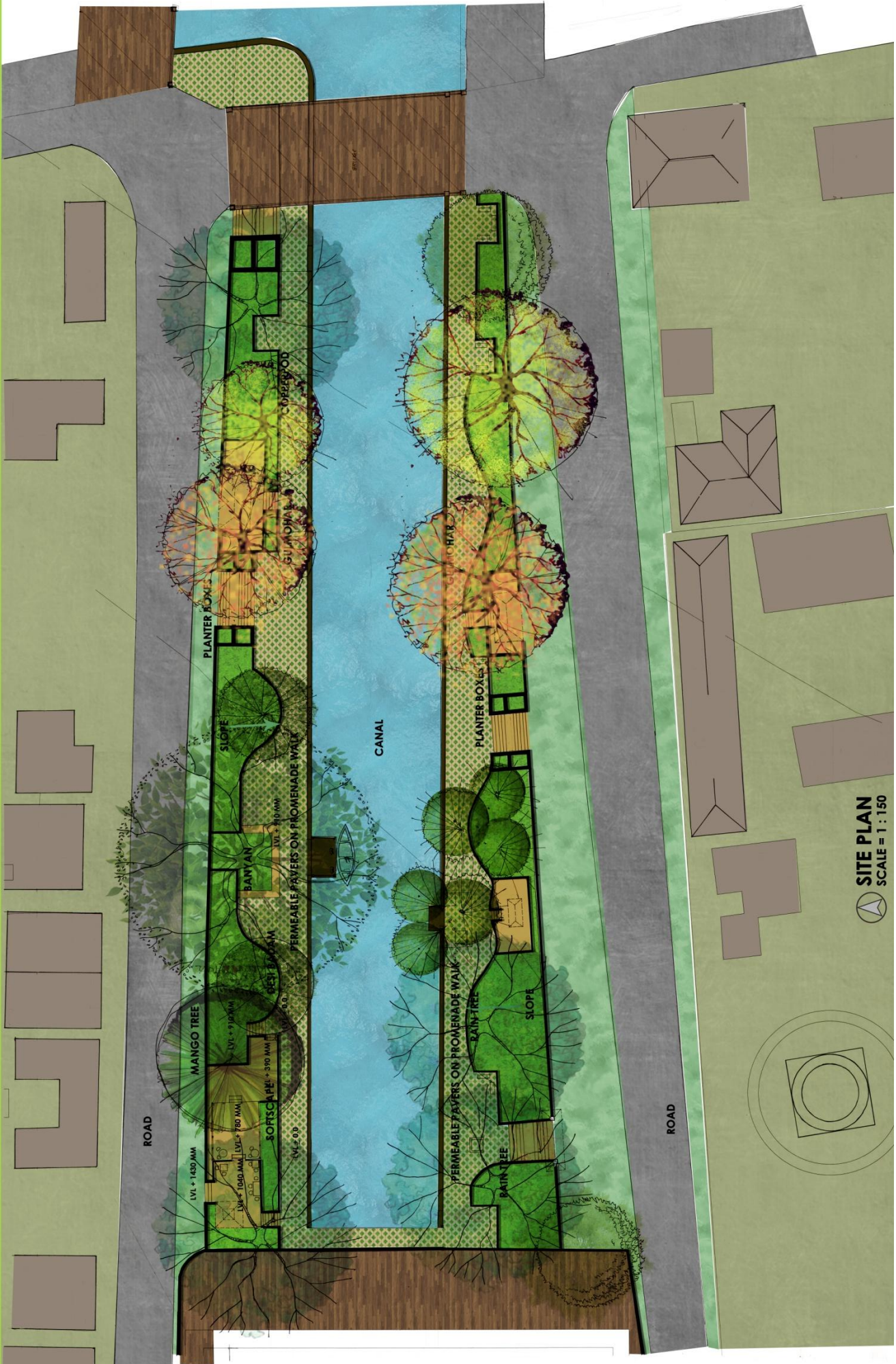
- 9.10**
- BOARDING POINT-PROPOSED JETTY**
 - 1. COIR GODOWN
 - 2. FISHERME'S MARKET
 - STOP 6**

- 11**
- STOP 7**
 - 1. TOWN SQUARE
 - 2. PERFORMANCE
 - 3. STREET SHOPPING AT MULLACKAL STREET
 - FINISH-START POINT**
 - HOUSEBOAT TERMINAL**

DESIGN OF AN INTEGRATED LOOP ALAPPUZHA

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SITE PLAN
SCALE = 1 : 150

PHYSICAL ELEMENTS OF THE LANDSCAPE

EXISTING

- SKYLINE**
 - HERITAGE BUILDINGS AND HERITAGE TREES.
 - UNIQUE ARCHITECTURAL STYLE- DUTCH.
- TREES AND CANOPY**
 - TREES OF HIGH HERITAGE VALUE.
 - AVENUE PLANTING DONE IN THE PAST.
 - ONLY ONE LAYER OF VEGETATION PRESENT
 - VALUES ASSOCIATED WITH INDIVIDUAL TREES. EG: BANYAN TREE- RELIGIOUS
 - CANOPY IS INTERLACED ABOVE THE CANAL.
 - VOIDS IN CANOPY DUE TO FALLING OF TREES IN THE RAIN, SOIL EROSION, ETC.

- BUILDINGS**
 - HERITAGE BUILDINGS- UNUSED, DILAPIDATED WARE HOUSES, HERITAGE OFFICE
 - RESIDENTIAL BUILDINGS, HOSTELS, HOME STAYS
 - LIGHT HOUSE

- URBAN SPACE**
 - STREETS AND THRESHOLDS THAT MAKE THE STREETS LIVELY

- THE CANAL**
 - THE ONLY REFUGE IN THE DENSELY PACKED URBAN FABRIC.
 - EARLIER USED AS A TRANSPORT CORRIDOR FOR GOODS
 - HYDROLOGICAL FUNCTION OF COLLECTING AND CONVEYING STORMWATER.

- STREET FURNITURE**
 - BUILT-IN SEATING ALONG WALLS & TOW WALLS
 - STREET LIGHTS, LAMP POSTS THAT ARE NOT FUNCTIONAL, NO ACTIVITY AT NIGHT.

- PEOPLE**
 - USERS INCLUDE MORE OF YOUTH AND ELDERLY USUALLY SEEN IN GROUPS.

PROPOSED

- SKYLINE**
 - NOT BE ALTERED BY BUILDING MODERN STRUCTURES
 - SLOPING ROOFS FOR NEW STRUCTURES, IF ANY.
- TREES AND CANOPY**
 - ADD HIERARCHY IN VEGETATION
 - THE PROPOSAL TO CUT TREES IS ABSURD. THE VISUAL AND FUNCTIONAL VALUES THEY PROVIDE MUST BE CONSIDERED.
 - PLANT TREES TO FILL VOIDS IN CANOPY

- BUILDINGS**
 - HERITAGE BUILDINGS SHOULD BE CONSERVED
 - ADAPTIVE RE-USE OF UNUSED STRUCTURES
 - LIGHT HOUSE

- URBAN SPACE**
 - ADD STREET FURNITURE, LIGHTING.

- THE CANAL**
 - URBAN LINEAR PARK ALONG THE BANKS
 - REMOVE WATER HYACINTH
 - COIR GEOTEXTILE FOR STABILISATION OF BANK
 - UTILISE FOR PUBLIC TRANSPORT

- STREET FURNITURE**
 - FLEXIBLE AND DYNAMIC SEATING ARRANGEMENTS
 - STREET LIGHTS, LAMP POSTS FOR ACTIVITY AT NIGHT.
 - STATUES

- PEOPLE**
 - ACTIVITIES TO ATTRACT ALL AGE GROUPS

LEGEND

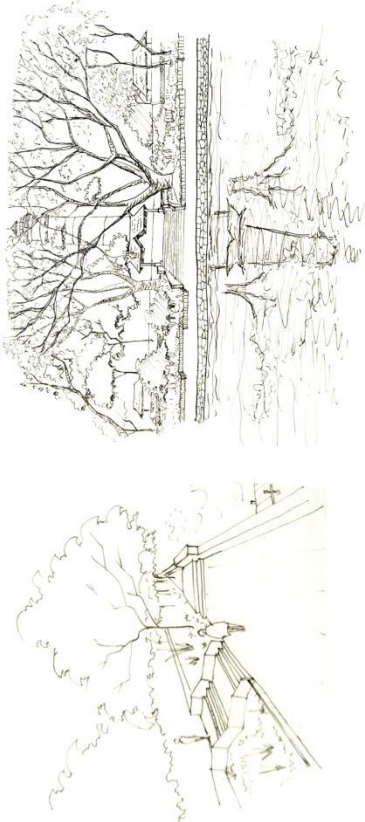
STATIC

- JETTY
- GATEWAY
- PROMENADE WALK
- STEPS
- CAFE
- GALLERY
- SOUVENIR SHOP
- PLANTER BOX
- HERITAGE BUILDINGS
- BRIDGE
- ROAD

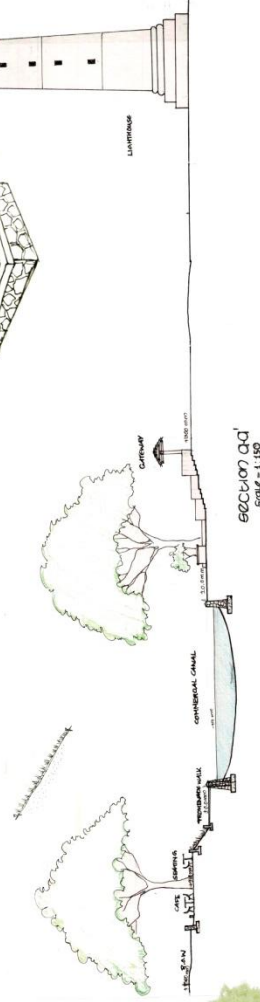
DYNAMIC

- PLANTING TREES
- SOFTSCAPE
- TEMPORARY PAVILIONS
- FISHING POINTS
- SEATING
- CANAL

PHYSICAL CONNECTEDNESS- RECONNECTING LINKAGES BETWEEN PEOPLE AND PLACE
 SOCIAL CONNECTEDNESS- RECOVERING LINKS BETWEEN PEOPLE AND PLACE



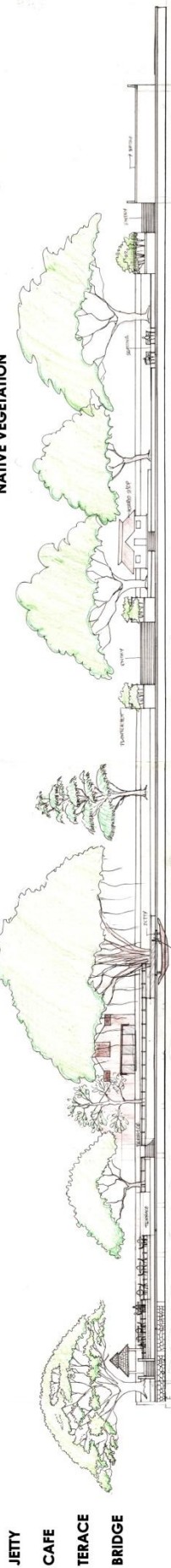
'AALTHARA'



- BANYAN TREE
- FICUS BENGHALENSIS
- GULMOHAR
- DELONIX REGIA
- SAMANEA SAMAN
- CASUARINA
- RAIN TREE
- COPPERPOD
- MANGO
- MANGIFERA INDICA
- EUCALYPTUS
- E.GIOBULUS

COIR CURIO SHOP SEATING BRIDGE

PLANTER BOXES SLOPING BANK WITH NATIVE VEGETATION ENTRY STEPS



CHAPTER 7: REFERENCES

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