COASTAL TOURISM DEVELOPMENT PLAN FOR KOLLAM - PARAVUR COASTAL STRETCH

THESIS REPORT

Submitted by

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M. Plan (2021-2023) BATCH

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in

Urban Planning

DEPARTMENT OF ARCHITECTURE
THANGAL KUNJU MUSALIAR COLLEGE OF ENGINEERING
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DECLARATION

I hereby declare that the Project entitled **"COASTAL TOURISM DEVELOPMENT PLAN FOR KOLLAM - PARAVUR COASTAL STRETCH"** is a bonafide record of mine carried out under the supervision of **Prof. Rahna Abubaker,** Assistant Professor, Department of Architecture. I declare that the work reported herein does not form any part of any other project report or thesis on the basis of which a degree or award was conferred on an earlier occasion to any other candidate. This study is done as a part of the fourth semester M. Plan (Urban Planning), Post Graduate Degree Course in the Department of Architecture, Thangal Kunju Musaliar College of Engineering, Kollam.

Place: Kollam

Date: 15.06.2023

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CERTIFICATE

This is to certify that the Thesis Report **"COASTAL TOURISM DEVELOPMENT PLAN FOR KOLLAM - PARAVUR COASTAL STRETCH"** submitted by **Bhadra Unnikrishnan** (TKM21MUP008) of MUP (2021-2023) Batch, in fulfillment of the requirements for the fourth-semester final examination in PL6401-Planning Thesis, under the **APJ Abdul Kalam Technological University** is a bonafide work carried out under our guidance and supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

The Kollam-Paravur coastal stretch in the Indian state of Kerala, stretching along the Arabian Sea, is a picturesque and significant tourist destination, offering a harmonious blend of serene beaches, lush greenery, historical landmarks, and cultural experiences, making it an ideal place for coastal tourism.

This research aims to provide a development plan for coastal tourism from Kollam - Paravur coastal stretch. This study investigates the relationship between several areas undeveloped would benefit coastal communities which have the potential for coastal tourism. This study investigates Kollam's coastline areas which offer a tonne of untapped potential for promoting development and achieving cohesion in socio-economic development. There is immense potential in this region to attract tourists as an economic development and employment generation. The scattered tourist spots are still not utilized efficiently as it has the potential to bring development to the state also. It is very much important that coastal tourism had importance and relevance, so the Kollam - Paravur stretch studies benefited the tourism industry which shows the relevance of coastal tourism and identifies parameters required to enhance the quality of the environment. The literature study was conducted to find out the coastal tourism components, and parameters for benefiting coastal tourism. This study investigates regional priorities and existing conditions of the Kollam-Paravur coastal region and identifies issues and potentials. The primary study was conducted in the study area to identify tourism infrastructure, visitor preferences, and community expectations surveys by visitor and host population surveys. Potentials and issues to promote coastal tourism development were studied. Case studies of two cities were done as part of the study to analyze coastal tourism and its pillars for development needs. Finally, a development plan for coastal tourism planning is formulated based on the proposals and action plans made through the identified parameters.

Keywords: *Coastal tourism, Kollam-Paravur stretch, Development, Tourism infrastructure, Coastal tourism planning, Tourism infrastructure, Tourism development impacts, Visitor survey, Host survey*

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CRZ	Coastal Regulation Zone
CZM	Coastal Zone Management
CPCB	Central Pollution Control Board
DTPC	District Tourism Promotion Council
ESM	Environmental Management System
ESA	Ecologically Sensitive Areas
EEZ	Exclusive Economic Zone
EEC	Eastern Economic Corridor
GOK	Government of Kerala
GDP	Gross Domestic Product
ITDC	India Tourism Development Corporation
IDDP	Integrated District Development Plan
KCZMA	Kerala Coastal Zone Management Authority
MOTS	Ministry of Tourism and Sports
MoEFCC	Ministry of Environment, Forest, and Climate Change
NCSCM	National Centre for Sustainable Coastal Management
NGO	Non-governmental organizations
NEMC	National Environment Management Council
SDG	Sustainable Development Goals
ITDC	India Tourism Development Corporation
TALC	Tourism Area Life Cycle Model
TAT	Tourism Authority of Thailand
UNWTO	United Nations World Tourism Organization
UNEP	United Nations Environment Programme

CHAPTER 1 INTRODUCTION

This study investigates the justification for the study's existence and its purpose. The chapter provides a brief description of how a development plan for coastal tourism and how the study is conducted to attain its objectives. The methodology, scope, and limitations are also mentioned.

1.1 Background study

Tourism is a rapidly expanding industry and holds a significant position as one of the largest sectors globally. According to available data from various countries, it is estimated that tourism contributes approximately 5% to the worldwide gross domestic product (GDP). This substantial contribution showcases the economic importance and widespread influence of tourism on a global scale ((UNWTO), 2013). Coastal tourism has experienced a remarkable surge in growth over the years, with the number of international tourists steadily rising since the 1950s. In the year 2020, this trend reached new heights as the number of international tourists in coastal areas surpassed an impressive figure of 1.460 million (UNWTO, Tourism Towards 2030, 2011). The coastal and marine tourist sector is also expanding, and it is predicted that there will be 1.5 million more jobs available by 2030 than there were in 2010 (from 7 million to 8.5 million) (Tonazzini, 2019).

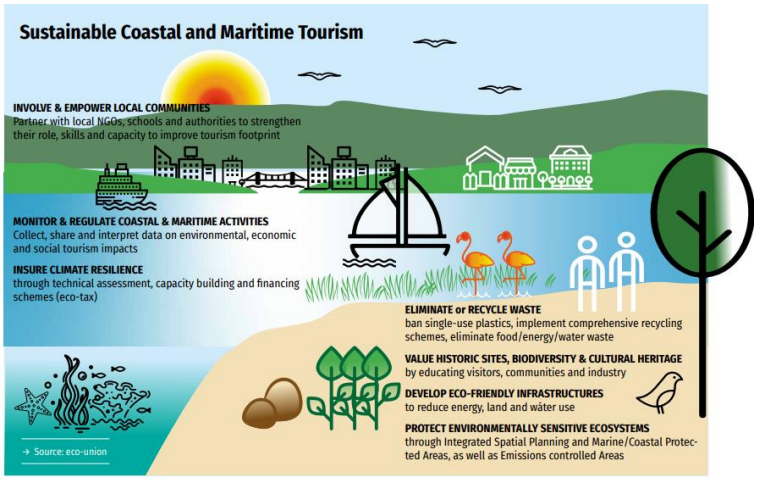


Figure 1. 1 Sustainable Coastal and Maritime tourism

Source: (Tonazzini, 2019)

With its three main components—sun, sand, and sea—coastal tourism is one of the segments of the industry that is expanding the quickest today. Therefore, tourism significantly affects the region's ecological and coastal resources. The relationship between

tourism and the environment has been established (Yashin Dujon). The word "coastal tourism" refers to a broad range of leisure, travel, and recreational pursuits that take place in coastal areas and establish intimate relationships between people and the environment (Gang Sun Kim J. C., 2021). Indeed, the distinctive characteristics of coastal environments provide for a variety of tourism development opportunities (Naik D. S., 2022). Although integrated methods to coastal and marine management include tourism, the relationship between the natural environment and tourism is inexorably intertwined. (Marafa, 2008) (COM (2014) 0086), of 20 February 2014 - A European Strategy for More Growth and Jobs in Coastal and Maritime Tourism- which seeks to promote sustainable growth and competitiveness in coastal and maritime tourism (Coito, 2019). One of the key goals of the UN for 2030 is to manage coastal and marine tourism and properly divide its advantages to the community (Gang Sun Kim J. C.-K., 2021). Since coastal areas are the most densely populated, a rise in tourism has a very significant impact on the way of life there.7,516.6 km long coastal region of India has a significant amount of opportunity for coastal tourism.

- Beaches - velvety sand and good sunshine make them perfect place for water sports and sun bath. e.g., Baga and Caligute beaches (Goa), Marina beach (TN).
- There are many beaches in Gujarat that are well-known for having white sand and clear water. Mandvi Beach is one of the beautiful, cleanest, and best beaches in Gujarat, making it ideal for swimming.
- At Goa Calangute and Anjuna destination has shown immense scope of coastal tourism, more popular with high ends tourists, especially international tourists. Vagator and Baga are upcoming tourist destinations. (Bhat. S., et al, 2010).

Also, kerala was awarded the international travel and tourism gold award for best in responsible tourism - Kerala tourism, 2018, Lonely planet travel awards for best destination for families 2018, Best responsible Tourism project / initiative – Responsible Tourism Wayanad - 2016-17, Best Facebook page award, 2018, etc. With its 10% GDP contribution and 1.5 million jobs created, Kerala Tourism is a major contributor to the State's economy. It draws both domestic and foreign tourists. (Kerala, 2018) According to Kerala tourism statistics of 2019, Central Kerala shows the maximum number of foreign tourist footfall with 53.6%. The South region attracts of about 40% foreign tourists. Out of the 4 districts of the south region, (Pathanamthitta, Alappuzha, Kollam, Trivandrum). Trivandrum

attracts the major share of tourists. Kollam only ranks 3 among the 4 with less than 1% of the tourists. Central Kerala shows the maximum number of domestic tourist footfall with 50%. The South region attracts of about 24% of domestic tourists. Trivandrum attracts the major share of tourists. Kollam only ranks 3 among the 4 with less than 3% of the tourists. Kollam has 30% of coastal tourism comparing to the other forms of tourism. Considering the local community's viewpoint on tourist development may help to increase advantages, promote social development, and create policies that will contribute more to tourism while minimizing negative consequences. (Thetsane, 2019). The focus should be to promote tourism development along the coastal regions.

Figure 1. 2 Spatial distribution of tourist attractions in Kollam district

Source: (Board, 2023)

Kollam is one of the least developed districts in terms of Kerala's tourism. Kollam contributes less than 2% of Kerala's tourists, whether domestic or international. Kollam is the nerve-Centre of the country's cashew trading and processing industry.

There are several beaches along the coast which have the potential to be developed along the coastal regions due its beauty, attractions, accessibility factors, natural resources.

There are several potentaial beaches in this stretch they are mainly,

a) Maruthadi beach (1.5 km): Scenic beauty, Pristine white sands, coconut palms.
b) Thirumullavaram beach (1.5km): Bay, beaches, coconut groves, temple, pond, pearl mariculture.
c) Thangassery beach: The Thangassery beach is a 3km stretch of pristine white sands and shallow waves that make it perfect for splashing and swimming.
d) Kollam beach (2.5km): The Thangassery beach is a 3km stretch of pristine white sands and shallow waves that make it perfect for splashing and swimming.
e) Thanni beach: Kayal and sea, with Pozhikara", an estuary on its end. Thanni and Kappil is stretch of narrow land that lies between Paravur
f) Paravur pozhikkara (4km): Pozhi, temple, coconut groves. It is a relatively long beach with soft sand and calm waters. The beach offers a serene environment and beautiful views, attracting both locals and tourists.
g) Kappil beach (3km): Barrier Beach, extensive backwater, coastal sand.

Figure 1. 3 Potential beaches in the Kollam stretch

Source: Google image

1.2 Need and Feasibility of the study

- The Kerala coast is 580 km long in the direction of north-west to south-east, with many special features like sea cliffs formed by the action of waves on the coast. Long stretches of sandy shores may be found scattered throughout the coastline. (AnishaRamdas, 2015)
- According to the Department of Tourism, there are five major beaches in Kerala, namely, Kovalam, Varkala, Fort Kochi, Kappad and Bekal (GOK, 2019). Only Kovalam and Varkala have been fully established as state-sponsored tourism destinations amongst the beaches in the region. In Kerala, it is observed that tourists are visiting only few beaches although there are a number of beautiful beaches in Kerala. Despite having a large number of tourist attractions, Kollam receives less visitors than other districts in Kerala, placing it in ninth place overall (9th for domestic visitors and 12th for overseas visitors). Kerala tourist figures for 2021 This is mostly due to ineffective marketing, planning, and management strategies used to advertise the tourist attraction. (Jamal, 2020)
- As mentioned in the Tourism department statistics, 2019. In Kollam, the main tourist attractions are Kollam beach, Thanni Beach, Thangassheri, Thenmala, Mundakal Beach and Munroe Island. However, the scale of tourism in Kollam is much less than the rest Kerala. (Garimella 2008).
- According to a ranking by international travel site Booking.com's 'traveller review awards 2020, Mararikulam, Varkala, Thekkady and Kollam in Kerala have found their place in the top 10 list.
- The Draft Development Plan for Kollam City Region has identified the need for Development & beautification of Kollam beach, Thangaserry beach, Underwater marine Aquarium, Adventure sports, and activity-based sports to be developed to lure domestic as well as foreign tourist.
- The LSGI wise spatial distribution shows that the Nature based tourism spots are maximum in Kollam Corporation. The beaches are mainly Kollam, Mundakkal, Thangassery and Thirumullavaram.
- Kerala Tourism Policy: The Kerala Tourism Policy 2017 has identified the Kollam-Paravur coastal stretch as a "heritage-cum-beach tourism circuit" and has included it in the state's tourism development plan.

- Central Marine Fisheries Research Institute has ranked these Kerala beaches on top of its list: Thirumullavaram, the second-cleanest Kollam beach, (Kollam district).
- Kerala coastal highway project-The coastal highway passes through nine districts of the state, connecting the major ports of Vallarpadom, Kollam, and Vizhinjam in Kerala along with several minor ports.
- Kollam's coastline areas offer a tonne of untapped potential for promoting development and achieving cohesion in socioeconomic development.
- There is an immense potential in this region to attract tourists as an economic development an immense potential in this region to and employment gene ration. The scattered tourist spots are still not utilized efficiently as it has potential to bring development for the state also.

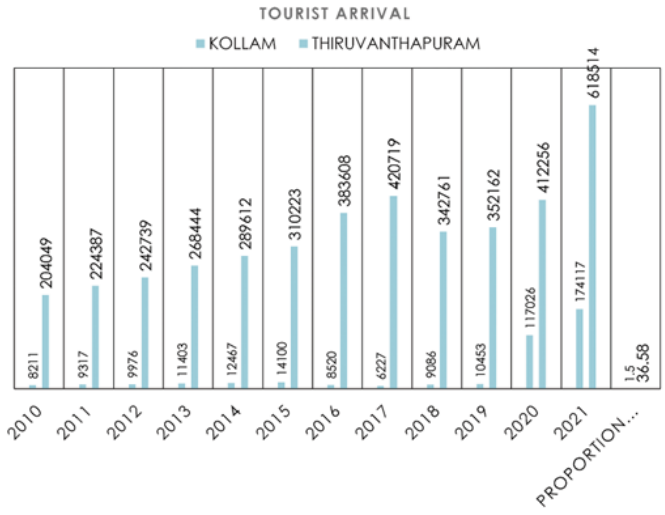


Figure 1. 4 Graph showing the tourist arrival to Kollam and Thiruvananthapuram Districts

Source: (Tourism, 2021)

1.3 Research question

1. What are the regional priorities, existing conditions, issues, and potentials for coastal tourism development in the Kollam region?

2. What are the preferences and expectations of visitors and local communities regarding coastal tourism, and how can they be addressed in the development plan?

3. What are the proposals that can be made through the identified parameters to develop a development plan for the Kollam - Paravur coastal region?

1.4 Aim

To provide a development plan for coastal tourism from Kollam - Paravur coastal stretch

1.5 Objectives

1. To study the relevance of coastal tourism and identify parameters required to enhance the quality of the environment.
2. To study regional priorities and existing conditions of Kollam coastal region and identify issues and potentials.
3. To conduct surveys of the visitor and host populations in order to determine visitor preferences, community expectations, and to formulate a vision for coastal tourism and community development.
4. To analyse the infrastructure and other development needs for supporting and substantiating destination and community through coastal tourism planning.
5. To provide development plan for coastal tourism planning based on the proposals made through the identified parameters.

1.6 Methodology

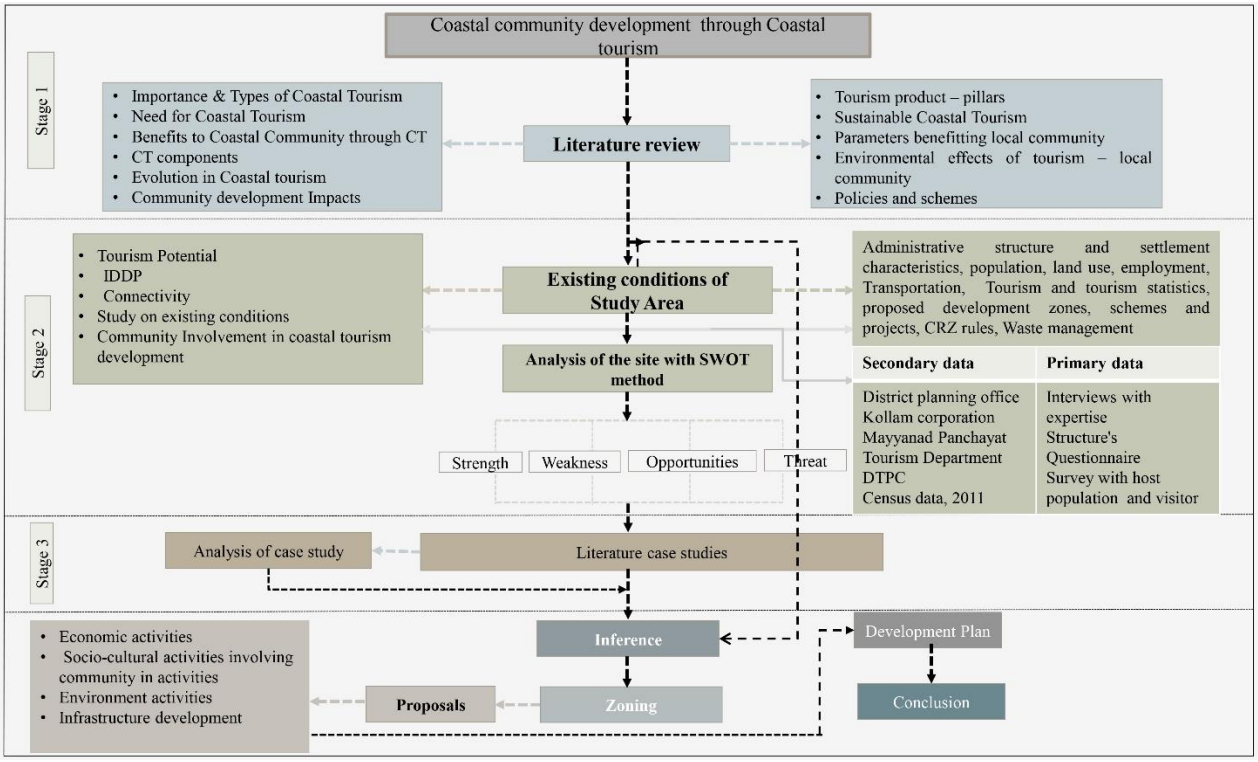


Figure 1. 5 Methodology

Source: Author generated

1.7 Scope

1. The study will help to introduce coastal tourism planning possibilities into existing tourism scenario at Kollam coastal region.
2. The study includes analysis of user perception data in terms of perceived importance and satisfaction.
3. The research would aim to assess the current state of tourism in the coastal regions of Kollam, including the types of tourists visiting, their spending patterns, and the services they are using.
4. The study creates opportunities for Intersectoral Linkages between tourism and fisheries. The study will help to identify the measures to promote community involvement in the tourism activities.
5. The investigation aims to study the problems of the study area.

1.8 Limitation

1. Scope of the study is limited to the Coastal wards coming under the Kollam Mun corporation, Paaravur Municipality, Mayyanad and Poothakulam panchayat area.
2. The research may be limited to a specific aspect of the development plan, such as the economic or environmental impact, which can impact the overall understanding of the potential impact of the development plan.

CHAPTER-2 LITERATURE REVIEW

This chapter deals with the Basic definitions and terminologies of coastal and coastal Various published and unpublished literature in this particular field of research are collected and reviewed along with the related data from various reports and journals obtained.

2.1 Tourism

Tourism is the temporary, short-term travel to places outside of people's usual living and working areas and participation in activities during their stay (England, Wikipedia, 1976)& Tourist Society of England, 1976. Tourism as a phenomenon involving people traveling to places outside their usual environment for personal or business purposes. The people who engage in these activities are called visitors, and tourism involves the spending associated with these activities. This definition highlights the importance of tourism as a social, cultural, and economic activity, which has a significant impact on the global economy. The UNWTO encourages the practice of sustainable tourism that benefits local communities while balancing economic, social, and environmental considerations. (UNWTO, Tourism Towards 2030, 2011)

Business tourist: refers to someone who travels for work-related reasons, which may include attending conferences, exhibitions, presentations, and other similar activities.

Specific tourist: someone who travels for a particular purpose or need, such as pilgrims, students, or others whose travel motivation is limited to specific and defined reasons.

Leisure tourist: those visiting places for pleasure or out of general interest, spending holidays.

2.1.1 Tourism images and product

Tourist image: refers to the perception that a tourist has of a particular destination or country based on their personal experiences, expectations, and cultural background. The tourist image can greatly impact their decision to visit a destination, and their overall satisfaction with their experience (UNWTO, Tourism Towards 2030, 2011).

Tourist product: refers to the tangible manifestation of the tourist image, which can be broken down into three distinct categories.

1. Resources at destination (inherent attractions)

2. Facilities at destinations (accommodation, catering, sightseeing, recreation, handicrafts, information and assistance, communication, etc.)
3. Transportation network at destination

Tourism attractions: can be broadly divided in to two categories, they are;
Natural resources: climate, geomorphology, hydrology, vegetation cover and wildlife.

Man-made resources: archaeology and monuments, historic cities, spectacular activities and technical achievements, vistas and avenues, traditions and cyclic attractions, such as, fairs, carnivals, cultural events, etc.

2.2 Potential of tourism in coastal areas

The potential of tourism in coastal areas is vast, as coastal areas provide a unique and diverse environment that is attractive to tourists. Coastal areas typically offer a variety of activities and attractions, from swimming and snorkelling to cultural and historical sites. Additionally, coastal areas tend to have a more temperate climate, making them ideal for year-round tourism activities. The potential of coastal tourism is further enhanced by the presence of local communities and businesses that can benefit from the influx of visitors. Tourism can stimulate economic growth, generate jobs, and create new opportunities for businesses in coastal areas.

2.3 Tourism planning

Tourism planning is a process that involves identifying issues, setting goals, creating policies and strategies, and implementing programs to address challenges related to tourism development. This process requires coordination and integration among various stakeholders and sectors to ensure sustainable tourism development (UNWTO, Tourism Towards 2030, 2011).

2.2.1 Existing approaches to tourism planning

1. To avoid negative impacts, inclusive planning involving all stakeholders, including implementing and monitoring authorities, is essential.
2. Tourism has a mutually beneficial relationship with conservation and recreation.
3. To ensure effectiveness, planning should take a pluralistic approach that includes social, economic, and physical dimensions.

4. Tourism planning needs to be strategic and integrated with other aspects of development to ensure its effectiveness.
5. It is important for tourism planning to have a regional perspective as many challenges often arise at the interface of smaller areas.

2.2.2 New approaches to tourism planning

Regenerative tourism

(Martin Mowforth, 2015)Aims to promote positive impacts and regenerate natural and cultural resources. Creates a sustainable and equitable tourism system Promotes social and environmental justice. Emphasizes sustainable practices and supports local economies. Restores ecosystems and cultural heritage sites.

Resilience tourism

(Daniel Scott, 2020) Refers to a destination's ability to withstand and recover from disruptive events while maintaining its functions and identity. Requires anticipating and adapting to challenges while continuing to benefit visitors and locals. Can be enhanced through proactive planning, risk management, diversification, community involvement, and innovation.

Smart Tourism

(Evangelos Christou, 2012) Smart tourism uses technology to enhance tourism operations, visitor experiences, and destination management.

2.2.3 Strategic tourism planning

(Costa, 2005) Strategic tourism planning involves long-term planning and policies that consider economic, social, and environmental factors. It aims to achieve sustainable and responsible tourism growth that benefits all stakeholders.

2.3 Coastal touirsm

The basis of coastal tourism is a special resource combination which is the (Hristo Stanchev, 2015) the land-sea interface provides amenities like waterways, coasts, natural views, a richness of terrestrial and marine biodiversity, a diverse range of historic and cultural artefacts, cuisine, and well-developed infrastructure. (UNEP, 2009) It entails a variety of actions that occur in coastal areas and along coastlines and involve the expansion

of tourism infrastructure (ports, marinas, fishing and diving shops, and other amenities) as well as accommodations for tourists (accommodations, vacation destinations, luxury houses, and cuisines, etc.). (Marc l. Miller, 1999) Activities for coastal enjoyment have grown in both quantity and variety during the past ten years. (UNEP, 2009)

Table 2. 1 Definitions of Coastal Tourism

AUTHOR	DEFINITION
((UNEP), 1995)	Coastal tourism as the activity of using coastal resources for leisure, recreation, and other purposes that benefit both people and the environment.
(Organization, 2017)	Coastal tourism as tourism that takes place in coastal areas and that relies on the coastal environment and its natural and cultural resources.
(Miller, 1993)	Coastal tourism as the activity of tourists visiting coastal areas and interacting with the people and places they find there, particularly the coastal environment and its natural and cultural resources.
(Butler R. , 1980)	Coastal tourism as the activity of using coastal resources for recreational and leisure purposes. From initial exploration to decline, he contends that coastal tourism is a cyclical process that passes through many stages.
(C. Michael Hall S. J., 2014)	Coastal tourism as tourism that takes place in coastal areas, including the sea, beaches, estuaries, and other coastal features.

2.3.1 Elements of coastal tourism

(Hall, 2001) From initial exploration to decline, he contends that coastal tourism is a cyclical process that passes through many stages. (Studco, n.d.)

(C.MichaelHall, 2001) specifically noted the 1950s and 1960s as a time of the expansion of the five Ss of tourism: sun, sea, sand, and surf.

(Hall, 2001) Successful coastal tourism obviously depends on clean water, healthy coastal ecosystems, and a safe, secure, and pleasurable atmosphere. The majority of leisure activities depend heavily on natural environments (wetlands, coral reefs, etc.).

Hall (2001) Additionally, Hall (2001) noted the significance of maritime resources, which include fish, wetlands, and coral reef ecosystems.

Provides protection against storm, hurricane, and tsunami dangers. The term "coastal tourism" refers to a variety of tourist, leisure, and recreational pursuits are carried out in coastal areas and offshore coastal seas. (C. Michael Hall S. , 2004)

These include (Hristo Stanchev M. S., 2015) the infrastructure needed to support coastal growth as well as coastal tourism development (including lodging, dining options, the food sector, and second residences) (e.g., restaurants, boats, and providers of recreational activities). (C. Michael Hall S. , 2004)

Recreational boating, ecotourism based on the shore and the ocean, cruises, swimming, fishing for fun, snorkelling, and diving are also included. Although it also encompasses ocean-based activities like deep-sea fishing and yacht cruise, marine tourism is strongly tied to the idea of coastal tourism. (C. Michael Hall S. , 2004).

2.3.2 Components of coastal tourism

The basic components of coastal tourism are stated with example of comparison about elements of destination are as follows: (Dimas Tegar, 2018)

Successful coastal tourism destinations need a variety of high-quality attractions, affordable lodging, and consistent accessibility. (National Environmental Management Council, 2001).

Table 2. 2 Comparison of six elements of destination

Source: (Dimas Tegar, 2018)

No	Comparison aspects	Lampung Bay tourism	Maldives tourism
1	Attractions	Natural scenery or beaches are of exceptionally high grade. Swimming, lounging, snorkelling, diving, and a variety of water sports (parasailing, flying fish, banana boat, donut, canoe, jet ski, snorkelling, and glass bottom boat) are all excellent beach tourist activities, and the local culture is distinctive.	Natural scenery or beaches are of exceptionally high grade. The variety of tourism activities is excellent (snorkelling, diving, water sports, surfing, whale watching, big game fishing, night fishing, island hopping), and the local culture, crafts, festivals, and cuisine are distinctive.
2	Amenities	There are limited hotels and choices for lodging, but there are still enough stores and eateries.	Banking services are quite readily available, including banks, ATMs, and money exchange facilities. The selection of hotels and accommodations (resorts, hotels, liveaboard (cruise)) is excellent. There are plenty of stores and eateries around.
3	Accessibility	Public transit is readily available and the roads are in decent condition.	Airport, air, sea, and public transportation accessibility is excellent (international airport, charter flights); cruise, ferry, speedboat, taxi, bus).
4	Human Resources	The effectiveness of employee replies to complaints, the calibre of employee abilities, and the quantity of employees are all fairly good.	The level of staff skill is quite high.

5	Image	The environment is quite safe, clean, and devoid of air pollution and noise. It is also very distinctive.	Has a distinctive scenery and culture that is unpolluted and highly safe.
6	Price	The expense of travel, housing, and transportation is quite low.	Transportation costs are extremely inexpensive, and hotel rates vary depending on the facility chosen.

2.3.3 Coastal tourism and sustainability

Figure 2. 1 Sustainable coastal tourism management model

Source: (Huang, 2022)

(Huang, 2022) stated that the coastline is particularly significant to urban populations worldwide. The variety of items accessible in coastal regions is growing much beyond the conventional "sea, sand, and sun" experience. Coastal tourism has a bright and promising future. To create an effective and efficient sustainable coastal tourist management model, it is crucial to consider the intricate linkages among challenges from coastal tourism, other human activities, and coastal ecosystems.

2.3.4 Principles of sustainable coastal tourism

(National Environmental Management Council, 2001) *stated about the principles in coastal tourism which can promote sustainability in coastal region.*

- (Soleiman Pour, 2003) said that economically feasible, ethically and socially just for local communities, long-term tolerant of the environment, and sustainable in terms of all these.
- (Soleiman Pour, 2003) be combined with the surrounding natural, cultural, and human environments and maintain the delicate balances that are a feature of many coastal tourist sites.

- Ponder its impact on each community's traditional elements, dynamics, and cultural heritage.
- All stakeholders, both public and private, should be encouraged to participate, and the strategy should be built on effective structures for cooperation at all levels—local, national, regional, and worldwide. (National Environmental Management Council, 2001).
- Support quality standards for the ability to satisfy visitors as well as for the maintenance of the tourism site.
- To successfully serve to improve the quality of life for everyone, to be integrated into and positively contribute to community economic development. (Soleiman Pour, 2003)
- Encourage actions that allow for a fair distribution of the benefits and burdens. (National Environmental Management Council, 2001).
- Encourage the key players in tourism, particularly industry, to develop and adhere to rules of behaviour that promote sustainability.

2.3.3.1 Tourism marketing

The process of marketing begins with the consumer identifying a certain need and continues with the demand being met. The customer is encountered at both the start and the finish of the marketing process. The strategy positions the customer at the beginning and the end of the economic cycle. This rule states that any firm must be established around the marketing function, predicting, motivating, and meeting customer requirements. The consumer, not the business, must be the centre of the commercial world.

Marketing can be defined as the process of delivering the entire offer to the consumer in such a way that:

- The offer meets the consumer's needs.
- The offer's terms and qualities are acceptable and useful to the consumer.
- In the process, all organisational goals, including profit, are achieved.

Verma, A. (n.d.). Introduction to Marketing Management. stated about the viewpoint on business is fundamentally what the marketing notion is. It states that business is essentially a need-satisfying activity and that it should be conducted with the consumer and his need as the primary considerations. The idea states that in order to achieve all company

objectives, including profit, customer satisfaction and a focus on the consumer must be fostered. There are various marketing concepts, like "exchange," "production," "product," "sales," "marketing," and "social marketing"

Generally marketing is an economic activity and activates the production- consumption chain. It makes production happen, it also generates profit and when the profits are ploughed back in the additional production the life cycle continues with increased vigour. Marketing takes a whole nation to higher levels of consumption by inducing consumers to consume more.

2.4 The dynamic coastal ecosystem

The coastal zones: (Sonia Chand Sandhu, 2019) defined as a complex ecosystem made up of the marine, coastal, and terrestrial subsystems that exists at the dynamic interface between the land and the sea. Waves, tides, varied water depths, and marine habitats like coral reefs are characteristics of the marine subsystem. The beach, foreshore, and natural coastal defence systems like mangroves and dunes are all components of the coastal subsystem. The land subsystem, which is located close to the coast, can be recognised by its topography, ground and surface water resources, ecosystems like wetlands, and built environment. The continual interactions between the waves, wind, and land make the coastal zone dynamic because they cause silt to migrate, rocks to erode, and sediment to deposit. Additionally, the force of winds and tides drives currents, which move water at speeds that vary daily and can become quite strong during storms. Silt, sand, and organic debris move and are carried further as a result. Due to its dynamic character and the strains and effects of human activity on infrastructure and services like ports, harbours, and industrial facilities, fisheries, agriculture, and tourism, the region is particularly vulnerable to natural disasters.

The coral reef, for instance, is a crucial component of the coastal environment. Coral reefs are "*marine ridges or mounds generated from the deposition of calcium carbonate by living creatures like corals, algae, mussels, etc*." (Sonia Chand Sandhu, 2019). Globally, coral reefs contribute significantly to the health of the ocean environment by "sustaining over one million plant and animal species and are of immense economic importance since their predicted value is over $30 billion yearly." Over 90% of the coral reefs on Earth are located in the Asia and Pacific region (UNEP 2006). (Sonia Chand Sandhu, 2019).

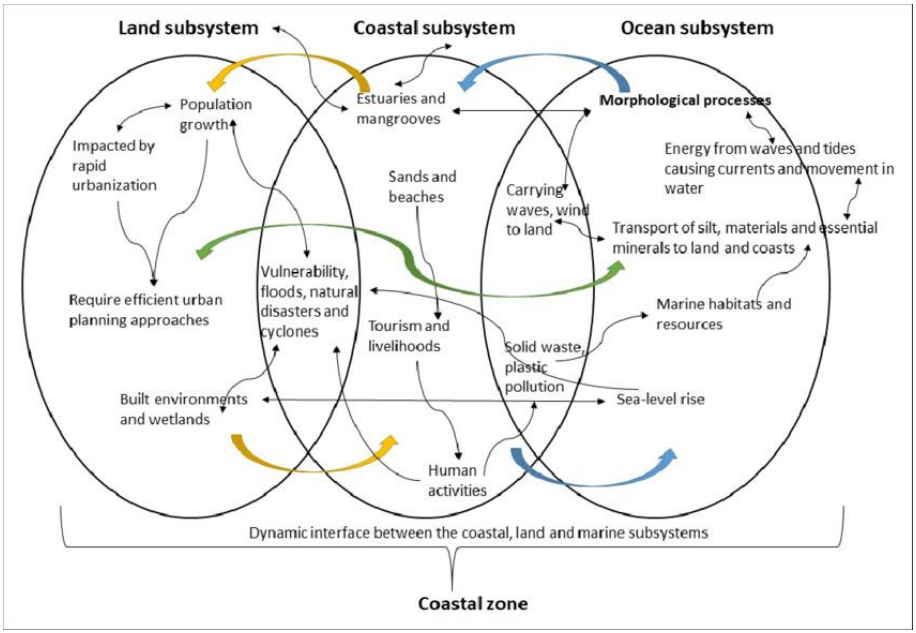


Figure 2. 2 Schematic representation of the Coastal, Land, and Marine Subsystems' Dynamic Interface and Dependencies

Source: (Sonia Chand Sandhu, 2019)

There is considerable potential for boosting tourism along the Indian subcontinent, where it currently contributes 6.23 percentage of the nation's Gross Domestic Product and 8.78 percentage of all jobs. (Kartik Roy, 2018).

2.4.1 History of coastal tourism – Global level to National level

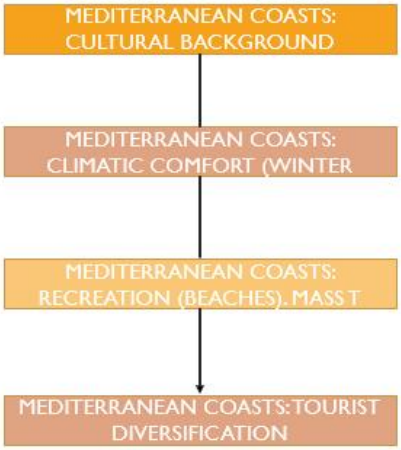


Figure 2. 3 History of Coastal Tourism – Global Level to National Level

2.5 Indian coastal characteristics

India's 7517 kilometres of coastline is divided between its eastern and western halves. The four states along the eastern coast are West Bengal, Odisha, Andhra Pradesh, and Tamil

Nadu. Gujarat, Maharashtra, Goa, Karnataka, and Kerala make up the west coast line. Pondicherry, the Andaman and Nicobar Islands, and the Daman Diu and Lakshadweep Islands are the other Union Territories on India's east coast. The combined territory of the nine coastal states, which include 78 coastal districts, stands for over 42% of India's total land area. The east and west coasts are significantly different from one another.

Figure 2. 4 Coastal states of India

Source: (Society Of Integrated Coastal Management (Sicom), 2019)

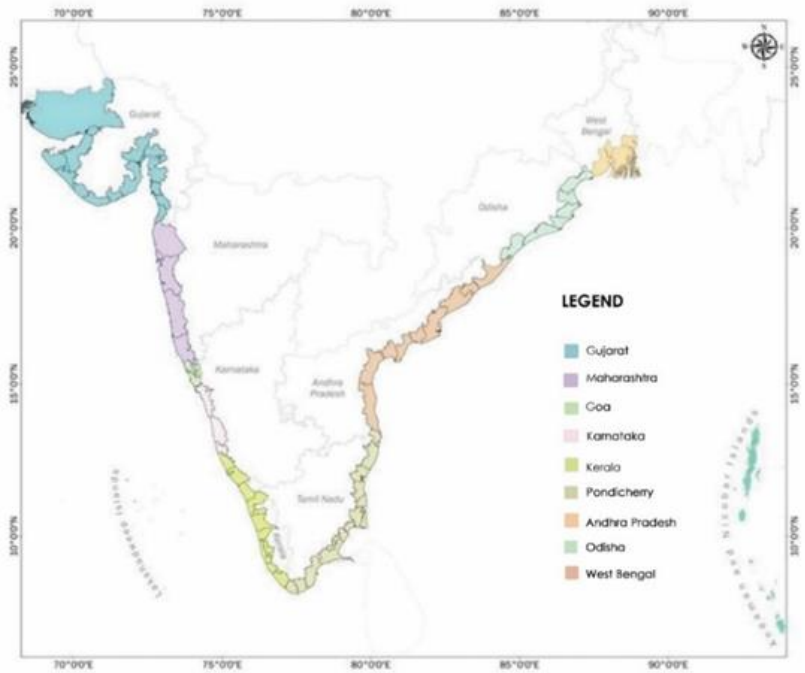


Figure 2. 5 Coastal districts of India

Source: (Society Of Integrated Coastal Management (Sicom), 2019)

2.5.1 Profile of states

India's coastal areas encompass a vast geographic area. Thus, it is necessary to gather the distinct and special baseline information of each state in detail. This section includes a description of each coastline state.

Table 2. 3 Coastal Characteristics of India

Source: (Society Of Integrated Coastal Management (Sicom), 2019)

Attributes	GUJARAT	MAHARASHTRA	GOA	Karnataka
Coastline	1214.7 km	569.7km	476.4 km	131 km
Coastal Geographical Area	133495.77 km sq.	23276.94 km2	25827.46 km2	133495.77 km2
Demographical Indicators				
Total Population	6.04 million (Census 2011)	3.34 million (Census 2011)	45.09 million (Census 2011)	14.59 lakhs (Census 2011)
Rural Population	3.46 million	1.65 million	38.31 million	9.07 lakhs
Urban Population	2.58 million	1.59 million	7.68 million	50.80 million
Population Density	308 persons/km2	860 persons/km2	300	365 persons/km2
Literacy rate	78.03% (Census 2011)	94.01 % (Census 2011)	67. % (Census 2011)	82.30% (Census 2011)
Coastal Administrative information				
No. of districts	17	9	6	7
No. of Taluks	107	45	12	50
No of Villages	4987	894	5001	2573
No. of fishing villages	247	22.84 sq. km	2606.85 sq. km	811.46 km2 (99.97%, 0.03%)
Ports and Harbours				
Major Ports	1	1	1	2
Minor/ Intermediate Ports	7	18	12	14
Tourism				
No of tourist spots	35	42	20	42

Average annual tourist	44.8 million (as of 2017)	1.58 million (as of 2017)	1.42 million (as of 2017-18)	11.4 million (as of 2011)
No of beaches	17	67	32	108

Table 2. 4 Coastal Characteristics of India

Source: (Society Of Integrated Coastal Management (Sicom), 2019)

Attributes	TAMILNADU	KERALA	ANDHRA PRADESH	ODISHA
Coastline	906.9 km	280 km	973.7 km	476.4 km
Coastal Geographical Area	55344.66 km2	19938.94 km2	101610.39 km2	255827.46 km2
Demographic Indicators				
Total Population	72.14 million (Census 2011)	6.11 million (Census 2011)	53.06 million (Census 2011)	45.09 million (Census 2011)
Rural Population	37.19 million	2.36 million	35.36 million	38.31 million
Urban Population	34.95 million	2.36 million	17.70 million	7.68 million
Population Density	277 persons/km2	320 persons/km2	308 persons/km2	300
Coastal Administrative information				
No. of districts	13	3	9	6
No. of Taluks	82	28	84	12
No of Villages	4139	752	2694	5001
No. of fishing villages	2215.99 sq. km	142.18 sq. km	3245.55 sq. km	2606.85 sq. km
Ports and Harbour				
Major Ports	3	1	1	1
Minor/ Intermediate Ports	17	10	14	12
Tourism				
No of tourist spots	42	42	83	20
Average annual tourist	16.3 million (as of 2017)	85 million (as of 2015-16)	121.8 million (as of 2015-16)	1.42 million (as of 2017-18)
No of beaches	62	46	75	32

2.6 Theories of coastal tourism

Various theories related to coastal tourism are listed below.

Butler's Tourism Area Life Cycle Model

- The Tourism Area Life Cycle (TALC) model is a framework that describes how a tourism destination evolves over time. It has six stages, each with its own challenges and opportunities (Butler R. W., 1980).
- Destinations can use the TALC model to plan for and manage their tourism growth.

Cohen's Tourist Typology

- Cohen's Tourist Typology theory categorizes tourists into four types based on their motivations and behavior: drifters, explorers, individual mass tourists, and organized mass tourists. (Cohen, 1979)
- Drifters are the most independent and adventurous, while organized mass tourists are the most dependent on the tourism industry.

Plog's Psychographic Model

- Plog's psychographic model divides tourists into two main categories: allocentrics and psychocentrics.
- Allocentrics are more adventurous and open to new experiences, while psychocentrics are more traditional and prefer familiar surroundings.

Figure 2. 6 Theories of coastal tourism

2.7 Coastal zone regulations and guidelines

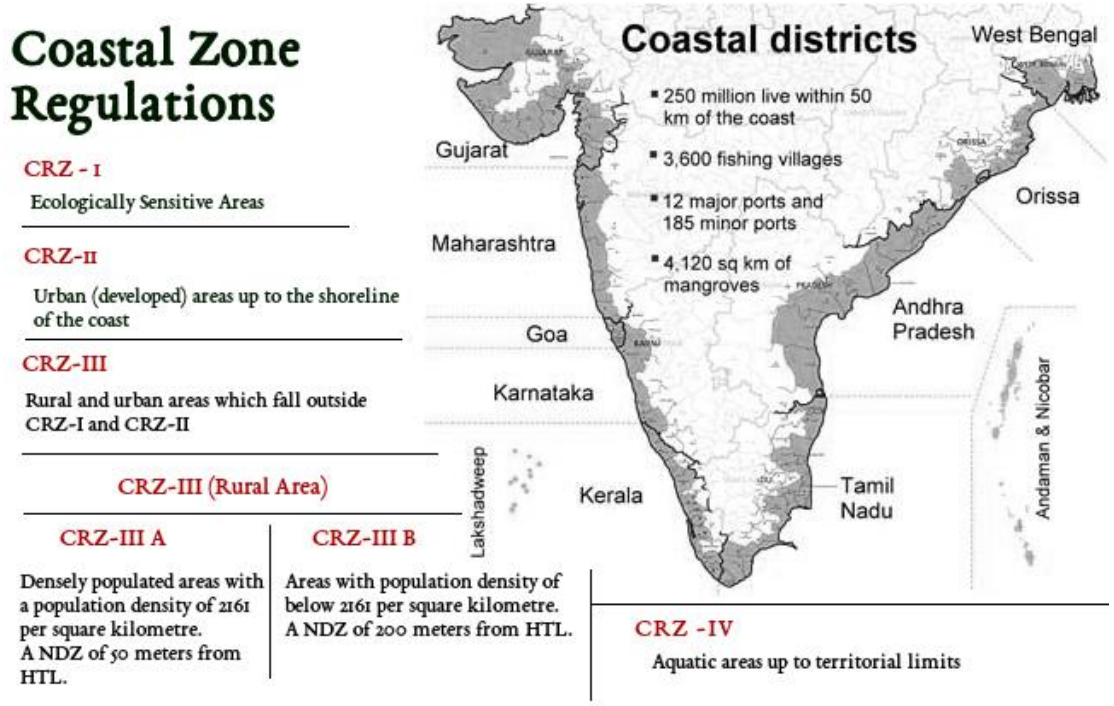


Figure 2. 7 Coastal Regulation Zone

Source: (MOEF, 2018)

2.8 Tools for tourism management policy

(Filippo Magni, 2019) UNWTO and UNEP have established a framework of management instruments organized into five categories (UNEP/ UNWTO, 2005):

Table 2. 5 Tools for tourism management impacts

Source: ((UNWTO), 2013)

Tools	Description
Measurement instruments	Instruments for measuring effect and levels of tourism as well as for tracking current and potential changes include indicators and monitoring.
Command and control instruments	Such as laws, regulations, and licences, as well as land use planning and development control, allow governments to exercise rigorous control over certain elements of operation and development
Economic instruments	Include taxes, fees, and financial incentives for influencing conduct and effect through financial methods as well as market-based signalling.
Voluntary instruments	Instruments that stakeholders can use at their discretion to voluntarily adhere to sustainable methods and practises include voluntary certification, reporting, and auditing systems.
Supporting instruments	Infrastructure supply, capacity building, marketing, and information dissemination are some of the ways that governments may, directly and indirectly, influence and support businesses and visitors in making their operations and activities more sustainable.

Any of these techniques can be employed to varying degrees in performing important managerial activities such as tourist development, growth control and influence, tourism services influence, environmental protection, and community engagement.

2.9 Coastal tourism zones

Table 2. 6 Coastal tourism zoning

Standards	Sub-standards	Sources
Infrastructure	Road Accessibility, Having Water Supply, Having Electricity Power, Accessibility to Medical Centre, Accessibility to Airport, Accessibility to harbour	*(Dr. Baqer Al-ramadan, 2004), (Katiyar P, 2006) (WTO, 2004)*
	Having sanitary sewage and waste disposal, Beach length, Beach Width	*(Partnership, Guidelines for Coastal Tourism Development in Tanzania, 2003), (Eduard Ariza, 2008)*
Competitiveness and Supply	Protection of the coastal landscape beauty, Spatial development possibility of coastal destination	*(Sanctuaries, 2006), (Eduard Ariza, 2008),*
	Usage possibility of the coastal destination during the year	*(WTO, 2004)*
	Amount of demand for the coastal destination in the current situation	*(Francisco Javier Blancas, 2010)*
	Plan for development of the coastal destination	*(WTO, 2004)*
Socio-economic	Crowd in coastal destination, Security, Population	*(WTO, 2004), (Francisco Javier Blancas, 2010), (Eduard Ariza, 2008), (Dr. Baqer Al-ramadan, 2004),*
	Accessibility to restaurant, Accessibility to tourist accommodations, Accessibility to financial services, Accessibility to tourist information centres, Settlement, Closeness to industrial area, Closeness to tourist area	*(Dr. Baqer Al-ramadan, 2004), (Katiyar P, 2006) (Partnership, Guidelines for Coastal Tourism Development in Tanzania, 2003), (Eduard Ariza, 2008), (Reinhold, 1991)*

2.10 Comparison of literature papers

The section deals with literature review, the parameter and planning approach selected in each case, the conclusion and outcome in the same. It was after completing literature review, the parameters were selected for the study area.

Table 2. 7 Comparison of literature reviews

Article	Area study	Parameters selected	Planning selected	Planning approach	Conclusion	Inference
(Ganguly, 2021)	Coastal areas of India	Natural resources, environmental quality, socio-economic factors, tourism demand, tourism supply, tourism planning	Integrated coastal zone management (ICZM)	Top-down approach	Effective coastal tourism development requires planning that respects local culture, involves community members in resource management and environmental protection, considers infrastructure needs, and involves stakeholders in the planning and marketing process	Coastal tourism can be developed in a sustainable manner through ICZM, which involves a holistic approach to planning and management that considers all the relevant factors.
(Sussaangana Unhasuta, 2021)	Cha-am Beach	Infrastructure & community facilities, Visitor consumption, Beach pollution, financial incentives, beach pollution, tourism demand	3 Phase Planning	Case study Approach	Interview "question asking" approach, stakeholder and local community participation was more focussed.	Coastal beach destination contributes to community development.
(Anastasia Arabadzhyan, 2021)	Coastal areas of the world	Climate change impacts on coastal tourism, such as sea level rise, coastal erosion, and changes in weather patterns	Adaptation strategies for coastal tourism	Multi-stakeholder approach	Prioritize environmental protection, incorporate the cultural heritage of the local community, and enhance visitor	Climate change is a major threat to coastal tourism. Adaptation strategies are needed to ensure that tourism can continue to be a

					experiences. An ecosystem-based approach to integrated planning that involves stakeholders is necessary for successful implementation.	viable industry in the face of climate change.
(Mustafa Daskin, 2020)	Sinop, Turkey	Economic impacts, environmental impacts, social impacts, tourism demand, community involvement, infrastructure,	Bottom-up planning	Community-based planning	ANOVA test shows that there were differences between educational groups in negative environmental impacts and age groups in positive economic impacts.	Coastal tourism development can have both positive and negative impacts on a community. It is important to involve the community in the planning process to ensure that the development is sustainable
(Suresh Kumar Kundur, 2013)	Maldives	Environmental impact, economic impact, social impact, Biodiversity conservation, EIA	Integrated coastal management	Top-down planning	Tourism development has had a significant impact on the environment, economy, and society of the Maldives.	Coastal tourism development can have both positive and negative impacts, and it is important to carefully manage these impacts in order to ensure sustainable development.
(Thongphon Promsaka Na Sakolnakorn, 2013)	Phuket Province, Thailand	Environmental impact, economic impact, social impact, Tourism demand, infrastructure, visitor consumption, cultural sustainability	Integrated coastal management, sustainable development	Bottom-up planning	Sustainable coastal tourism development is possible, but it requires careful planning and management.	Infrastructure development, cultural preservation, and effective marketing are critical for sustainable coastal tourism development, and stakeholder engagement is crucial for effective planning and

						implementation. Tourist factors should also be considered for successful tourism enterprises.
(Babu, 2012)	India	Economic impacts, environmental impacts, social impacts, cultural impacts, tourist factors, marketing	Top-down planning	Centralized planning	Coastal tourism has been a major driver of economic development in India. However, it has also led to several environmental and social problems.	Coastal tourism development should be planned in a sustainable way that takes into account the economic, environmental, and social impacts of tourism.

CHAPTER 3 INTRODUCTION TO STUDY AREA

3.1 Profile of Kollam

3.1.1 Location

Kollam is located on India's south-western coast, between latitudes 90 10' and 80 45' and east longitudes 760 25' and 770 15'. The district is bounded on the North by Mavelikkara and Karthikappally Taluks of Alappuzha District and on the North-East by Adoor and Kozhenchery Taluks of Pathanamthitta District, on the East by Thirunelveli District of Tamil Nadu, on the South by Nedumangad and Chirayinkeezhu Taluks of Thiruvananthapuram District and on the West by the Lakshadweep Sea.

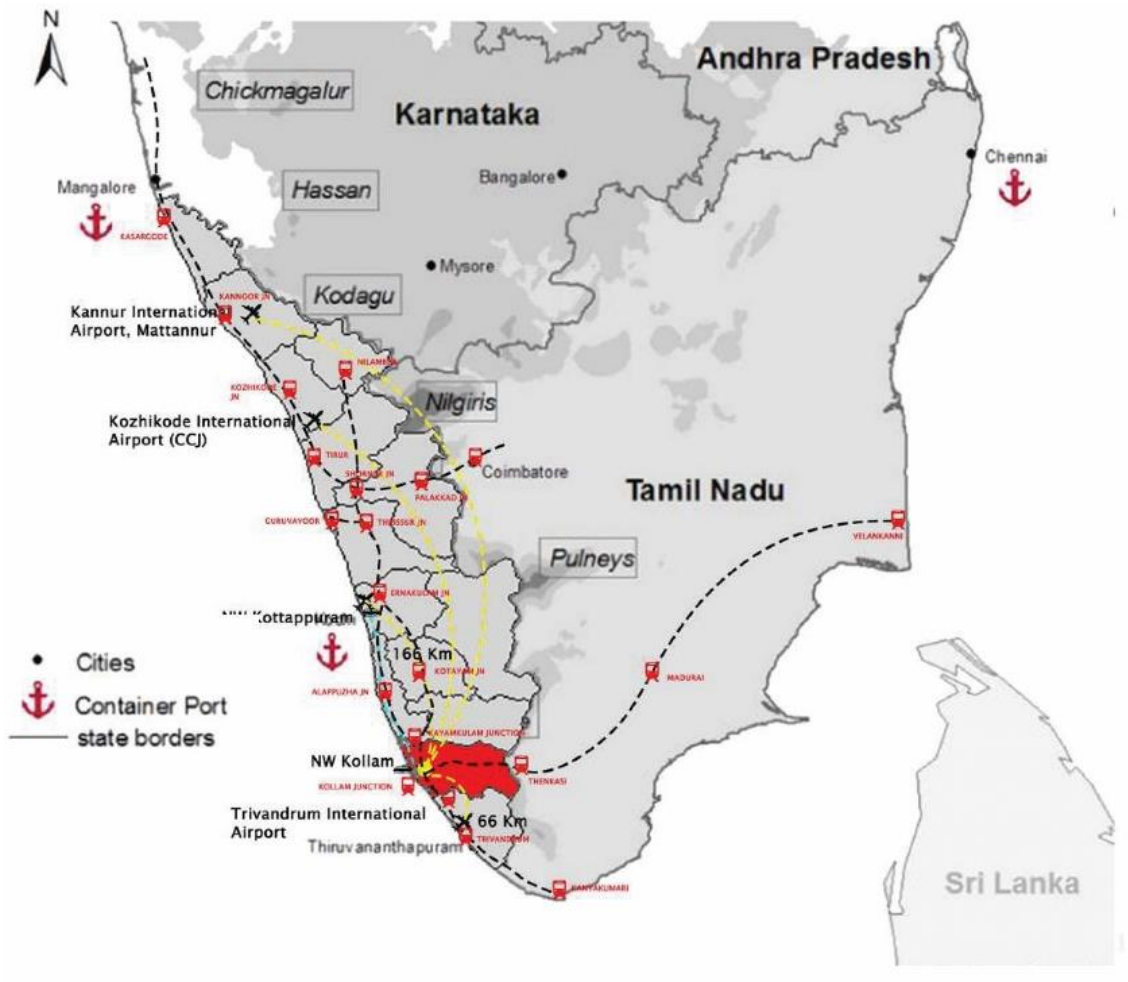


Figure 3. 1 Location map of Kollam district

Source: (District planning committee, 2009)

3.1.2 Regional connectivity

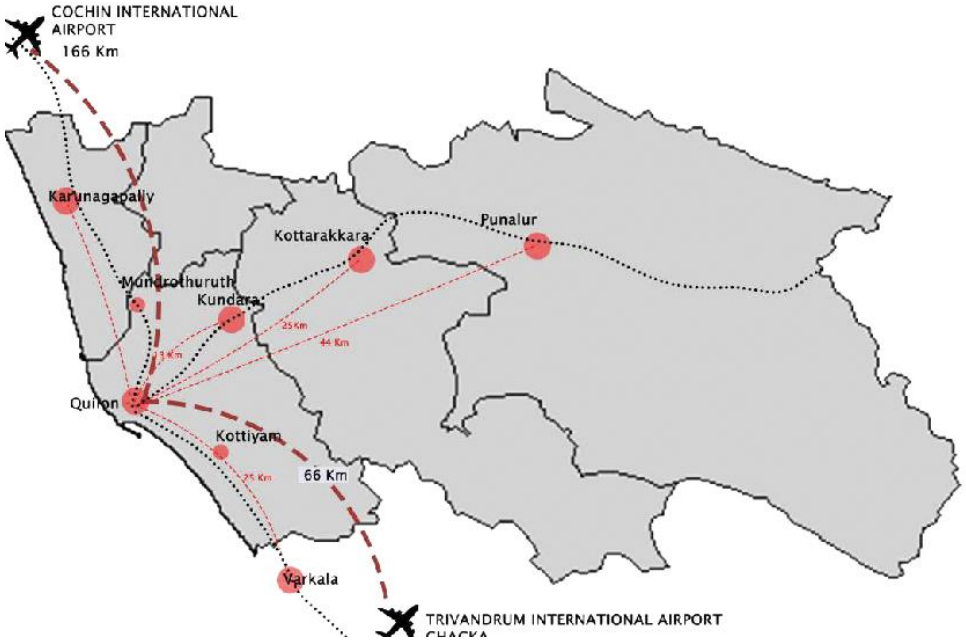


Figure 3. 2 Regional connectivity

Source: (District planning committee, 2009)

3.1.3 Evolution of Kollam port

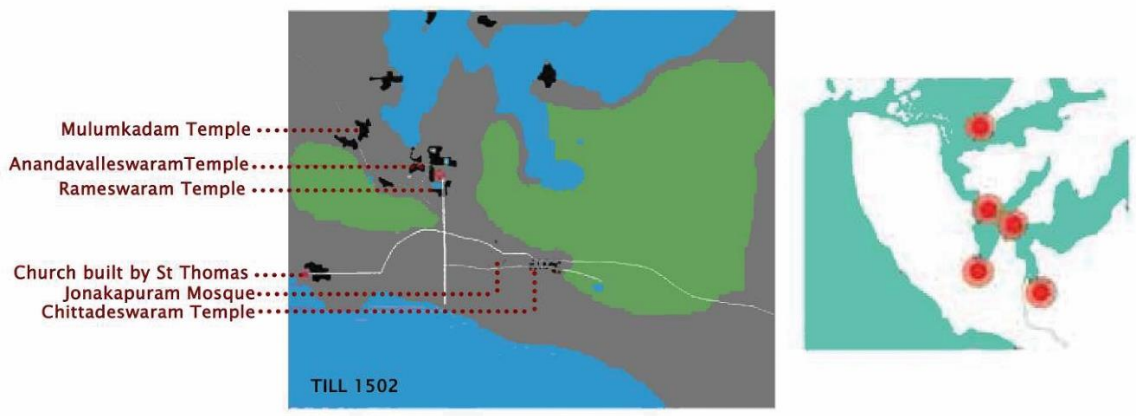
Before the independent Venad kingdom, whose capital was Kollam, was established, the city served as a port for the Chera Dynasty. (Wikiwand, n.d.) Prior to then, Kollam was regarded as one of the four original seaports in the 13th century, with Malacca in the Malaysian archipelago, Alexandria and Cairo in Egypt, Quanzhou in China, and Kollam. With approval from the Tamil monarch of the Venad, Udayamarthandavarma, Mar Abo established the port. (Contributors, 2022) The city operated as a port for the Chera Dynasty before to the establishment of the independent Venad kingdom, whose capital was Kollam. (Contributors, 2022)

Figure 3. 3 Early trade routes

Source: (Unveiling Kollam, IUDI Kerala Chapter)

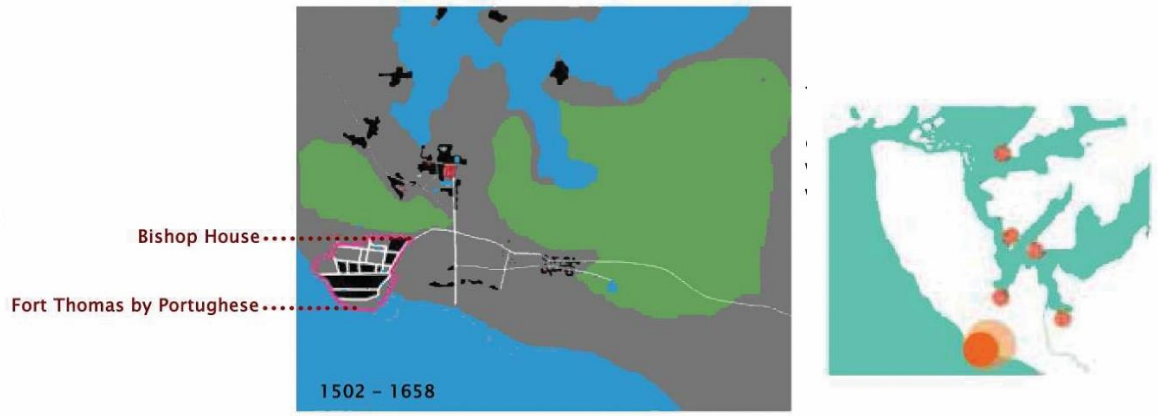
3.1.4 Evolution of Kollam

a) Till 1502: Trade relations with Asia minor and China which lead to settlements located towards the coast and lake edge. Chinese traders established smaller ports in the inland lake edges along Ashtamudi.



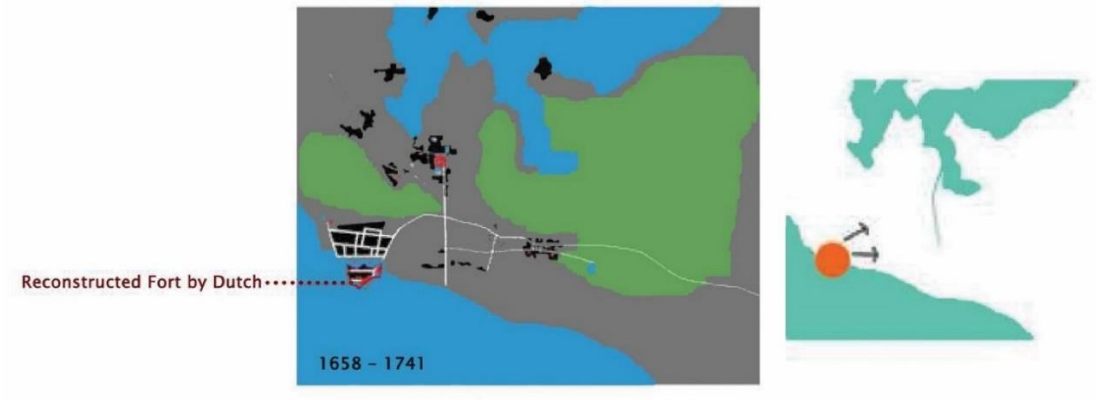
a)

b) Timeline 1502-1658: European traders established port in Thangassery region with topographical considerations. Portuguese hegemony and construction of Fort resulted in weakening the trade relations with China.



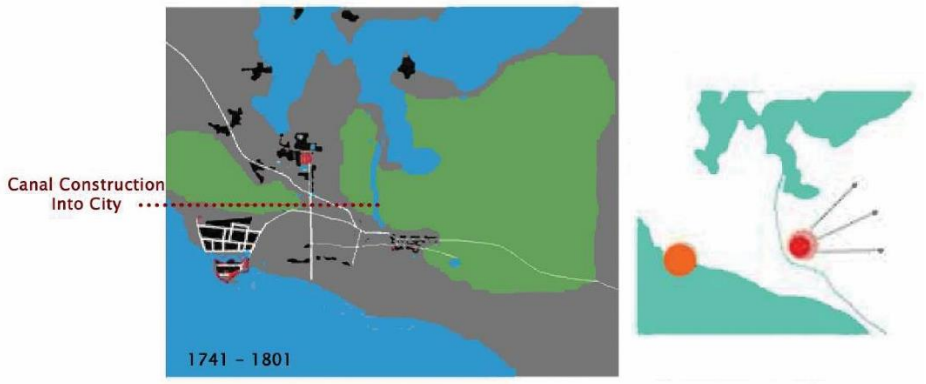
b)

c) Timeline 1502-1658: Dutch conquered the fort and the trade with Portuguese was replaced by the Dutch Reconstructions of Fort Thomas with moat (canal). Small markets came up in the coastal region.



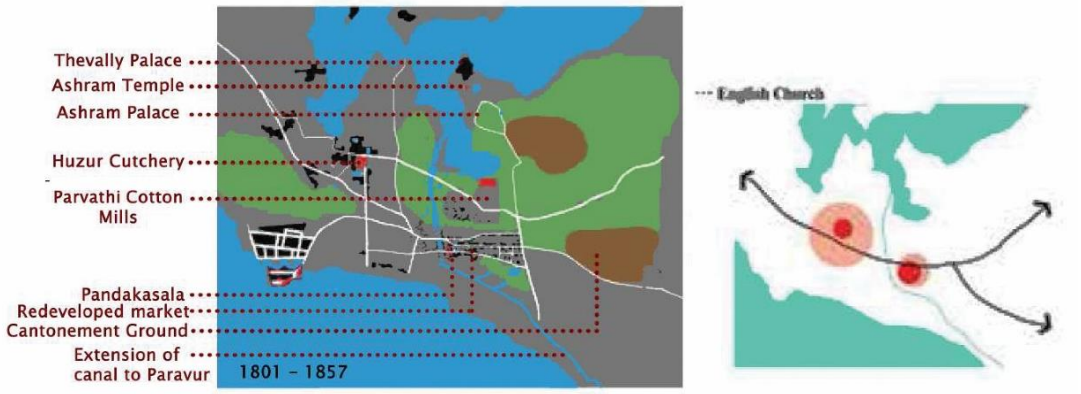
c)

d) Timeline 1741-1801: Marthanda Varma conquered Quilon and re-established markets and warehouses. Works on canal connection from Ashtamudi lake into the city was started.



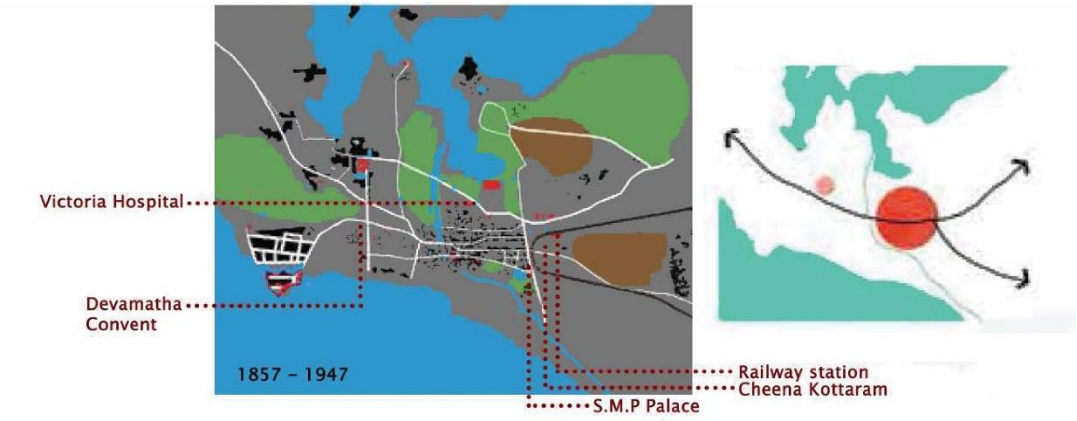
d)

e) Timeline 1801-1857: The renovation of Quilon took olace during the time of Velu Thampi Dalawa Redevelopment of coastal markets was done. City became the administrative capital of Travancore state. Later during the time of settlements increased in Quilon.



e)

f) Timeline 1857-1947: Missionaries established educational and health facilities throughout Quilon.



f)

Figure 3. 4 Figure Evolution of Kollam

Source: (Unveiling Kollam, IUDI Kerala Chapter)

3.2 Study area

The Kollam Coastal Stretch is in the Indian state of Kerala, along the southwest coast of India. The stretch of study area focuses on the 37 km coastal stretch of Kollam district with wards within 2 km of extent of the shore line which includes a total of 8 panchayats, 2 municipalities and one municipal corporation towards northwards up to the Edava-Nadayara coastal belt in Thiruvananthapuram district. The study area comprises of a total population of 3,55,693 in an area of 91.68 sq. km. There is a total of 92,241 households, most of which is concentrated in the corporation area. It covers a total length of approximately 37 km. The Kollam Coastal region stretch is known for its scenic beauty, sandy beaches, backwaters, and unique cultural heritage, and is a popular destination for both domestic and international tourists.

The area was delineated based on the extend of

1. The morphological characteristics of coastal tourism considering the physical boundaries.
2. Tourism potential area such as beaches, historic sites and cultural attractions.
3. Accessibility to infrastructure, tourism facilities and services.

3.3 Delineated study area

Study area (26Km) is limited to the Coastal wards coming under the Kollam Muncipal corporation, Paravur Municipality, Mayyanad and Poothakulam panchayat area.

The entire coastal line of Kollam has Fishermen settlements, majority of them are settled near to the Thangasseri and Vaadi is one of the top fishing destinations in Kerala. There are 27 fishing villages in Kollam district. One can easily reach Vaadi as the port road connects Kollam beach and the Vaadi fishing harbour.

The port road that connects Kollam Beach with the Vaadi Fishing Harbour makes it simple to go to the Vaadi district. The majority of visitors and locals use the port road to get to Thangasseri in order to see the harbour at dusk. The view of the port at sunset is breath taking, with golden hues of light illuminating the deep-blue water and numerous fishing boats dotting the Arabian Sea horizon. Many use this port road for their daily strolls and rides on bicycles merely to enjoy the calming sea breeze and the view of one of Kerala's best fishing harbours. (Quilon Beach Hotel, n.d.)

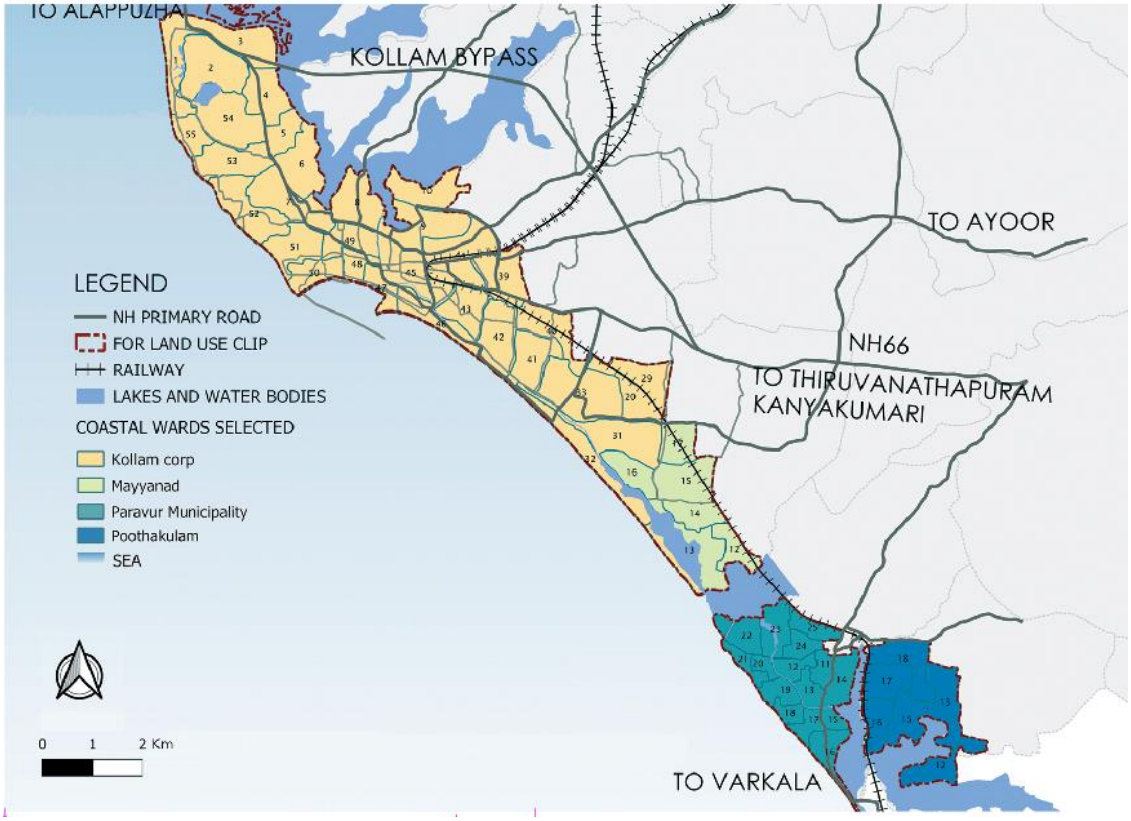


Figure 3. 5 Map showing of Kollam Coastal Area

Source: Author generated writ QGIS

Table 3. 1 Ward name and ward number

Source: Author generated wrt QGIS

LSG	Ward No	Ward Name
Kollam Corporation	1	Maruthadi
	2	Sakthikulangara
	3	Meenathuchery
	4	Kavanad
	5	Vallikeezhu
	6	Kureepuzha west
	7	Kureepuzha
	8	Neeravil
	9	Anchalummoodu
	10	Kadavoor
	41	Thekkevila
	42	Mundakkal
	43	Pattathanam
	45	Udaya marthandapuram
	47	Pallithottam
	48	Port
Kollam Corporation	49	Kachery
	50	Kaikkulangara
	51	Tangasery
	52	Thirumullavaram
	53	Mulamkadakam
	54	Alattukavu
	55	Kannimel
Mayyanad	12	Mukkam
	13	Mukkam West
	14	Mayyanadu South
	15	Mayyanadu South
	16	Mayyanadu West

	17	Koottikkada
Paravur	11	Perumpuzha
	12	Town
	13	Attinpuram
	14	Puthiyidam
	15	Kottamoola
	16	Thekkumbhagam
	17	Puthiyakavu
	18	Vadakkum bhagam
	19	Kurandikulam
	20	Anchaloffice
	21	Chillakkal
	22	Pozhikkara
	23	Anchaloffice
	24	Maniyamkulam
	25	Kurumandal
Poothukkulam	12	Nellettil
	13	Maavila
	15	Kalakkode
	16	P.H.C Ward
	17	Perumkulam
	18	Njarode

CHAPTER 4 PRIMARY STUDY AND ANALYSIS

The chapter presents a detailed overview of the primary and secondary data of Kollam – Paravur stretch. The complete data collection and study were based on four pillars of sustainability. Each pillar has a set of dimensions with different elements included in it.

4.1 Socio - Cultural Pillar

4.1.1 Demography

Kollam district shows an increasing trend in population from 1971 to 2011. The growth rate of the population of all the local bodies of the district is declining from 1981 to 2011.

1981: Coastal plains and high land eastern region of the district had high population growth rate due to the increase in fishermen population and migration of plantation labourers from Tamil Nadu which indicates the strength of the economic base once existed.

1991: Population growth rate in the eastern region reduced indicating a possible reduction in the migration of Tamil labourers, due to declining plantation works which indicates the weakening of the economic base. 2001: Population growth rate adjacent to the urban local bodies is higher, indicating possible out-migration from the urban areas.

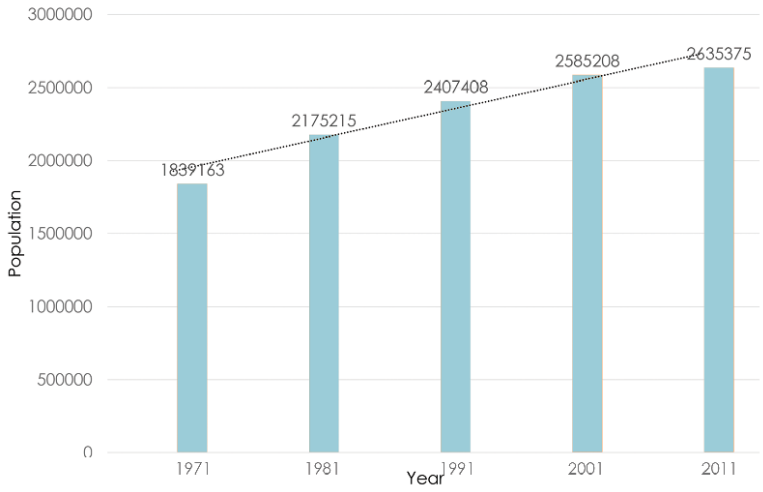


Figure 4. 1 District Population (1971- 2011)

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Operations, District Census Handbook (DCHB), 2011)

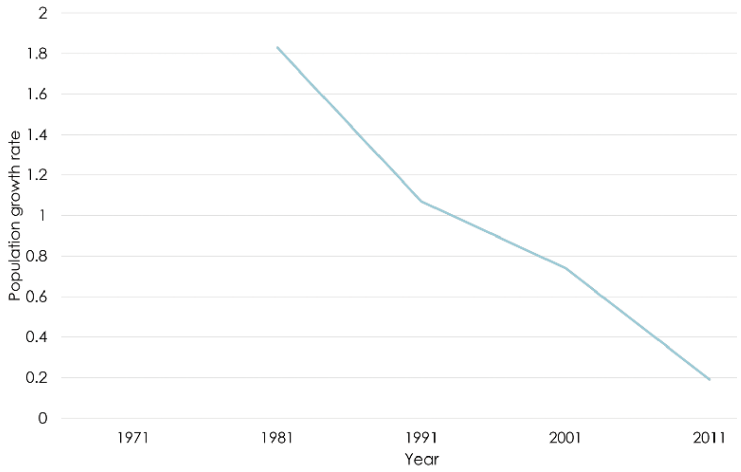


Figure 4. 2 Growth Rate

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Operations, District Census Handbook (DCHB), 2011)

1. Population concentration

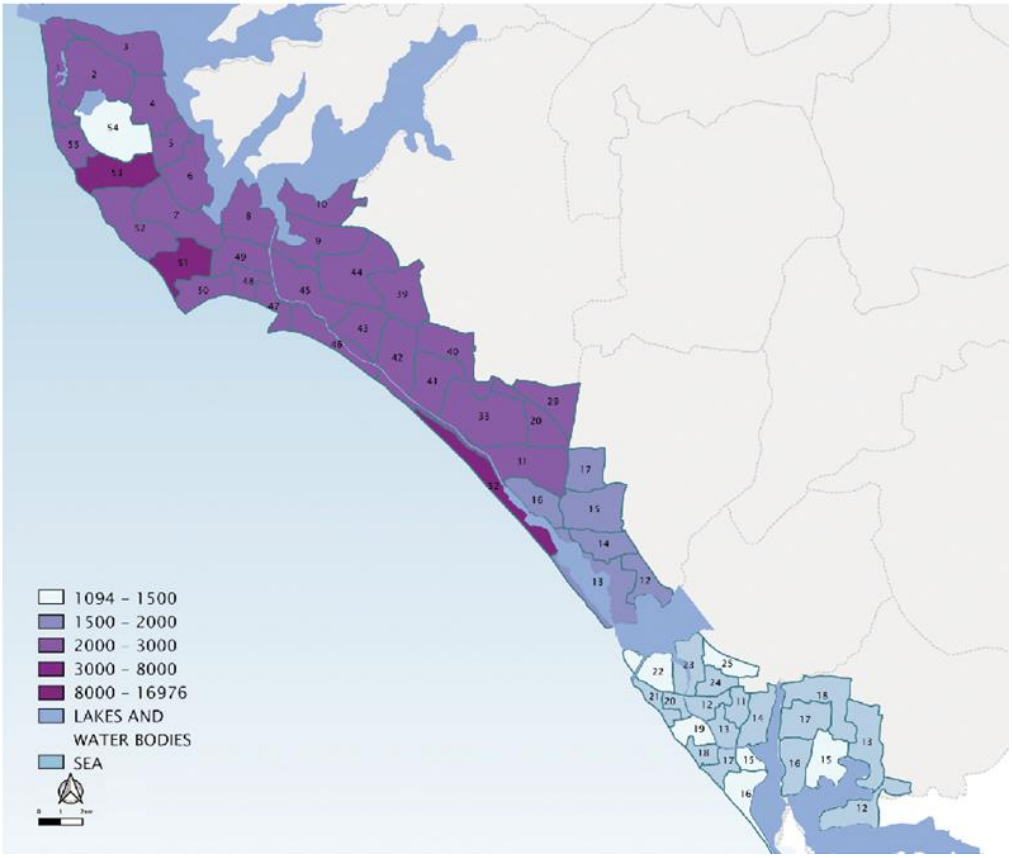


Figure 4. 3 Population Distribution of study area

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Operations, District Census Handbook (DCHB), 2011)

Study area has 1,48,011(0.148 million) number of total populations, with almost equal number of male and female population. Lowest population: Kurumandal with ward no. 25 of Paravur Muncipality has lowest population of 1318, in study area. Followed by Kalakkode ward:15 of poothakulam has 1199 population. Kollam corporation has the highest population concentration in the study area i.e., 16,976 - inward 53 (Mulamkadakam) followed by wards 51, 32. Concentrated in the triangle-shaped area enclosed by the sea, the Paravur-Pozhikkara, Paravur-Kappil, Chathanoor-Paravur, and Paripally-Chathanoor roads, as well as the sides of those roads. (Paravoor Municipal council, 2021)

2. Population Density

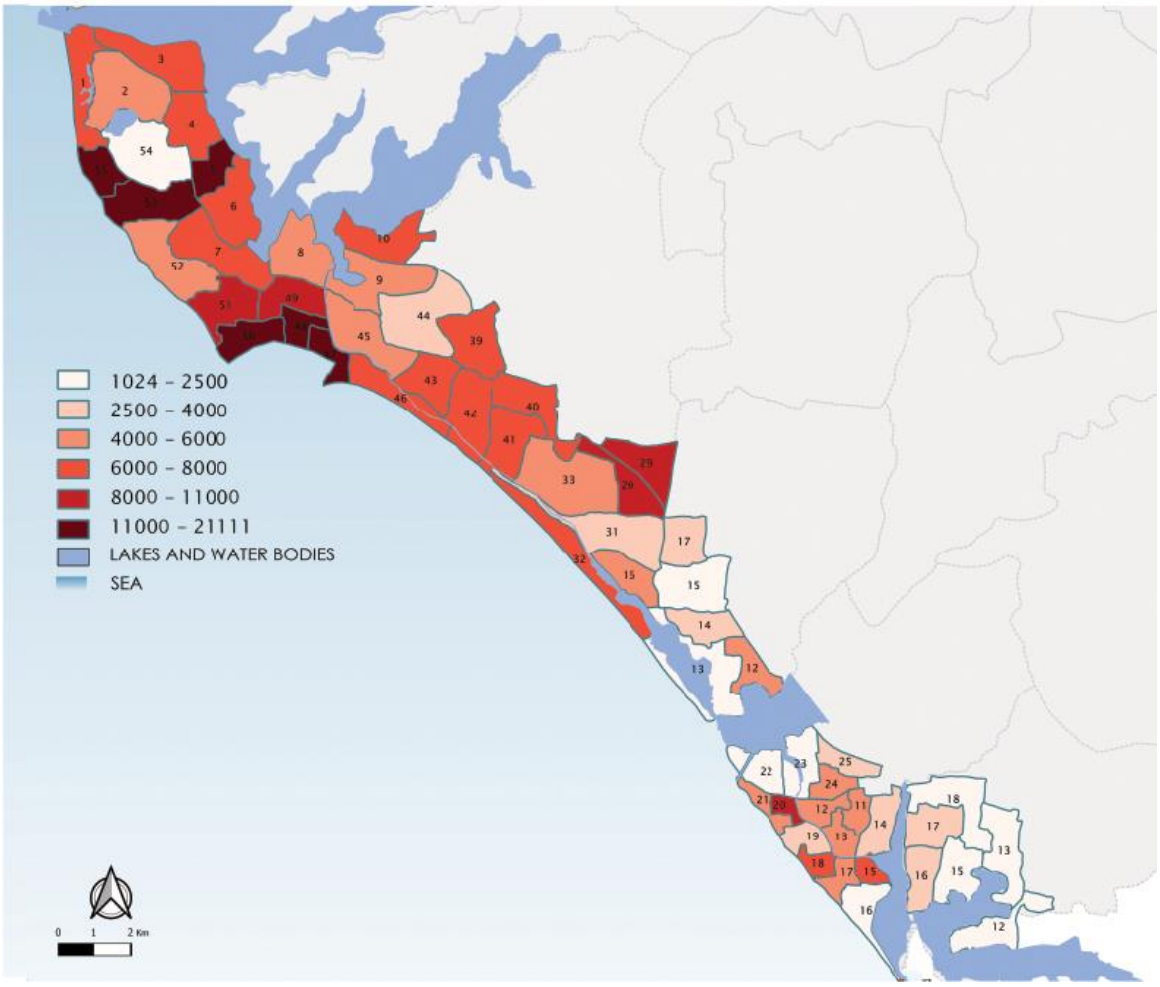


Figure 4. 4 Population Density

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Operations, District Census Handbook (DCHB), 2011)

Population density is higher in wards 53, 55, 5, 50, 48, 47 of corporation area. Density is higher in the urban centre of the corporation area and wards adjacent to the coastal region. And it reduces towards southern region. Population is concentrated along both sides of the major arterial roads as well as in the coastal areas.

3. Number of households

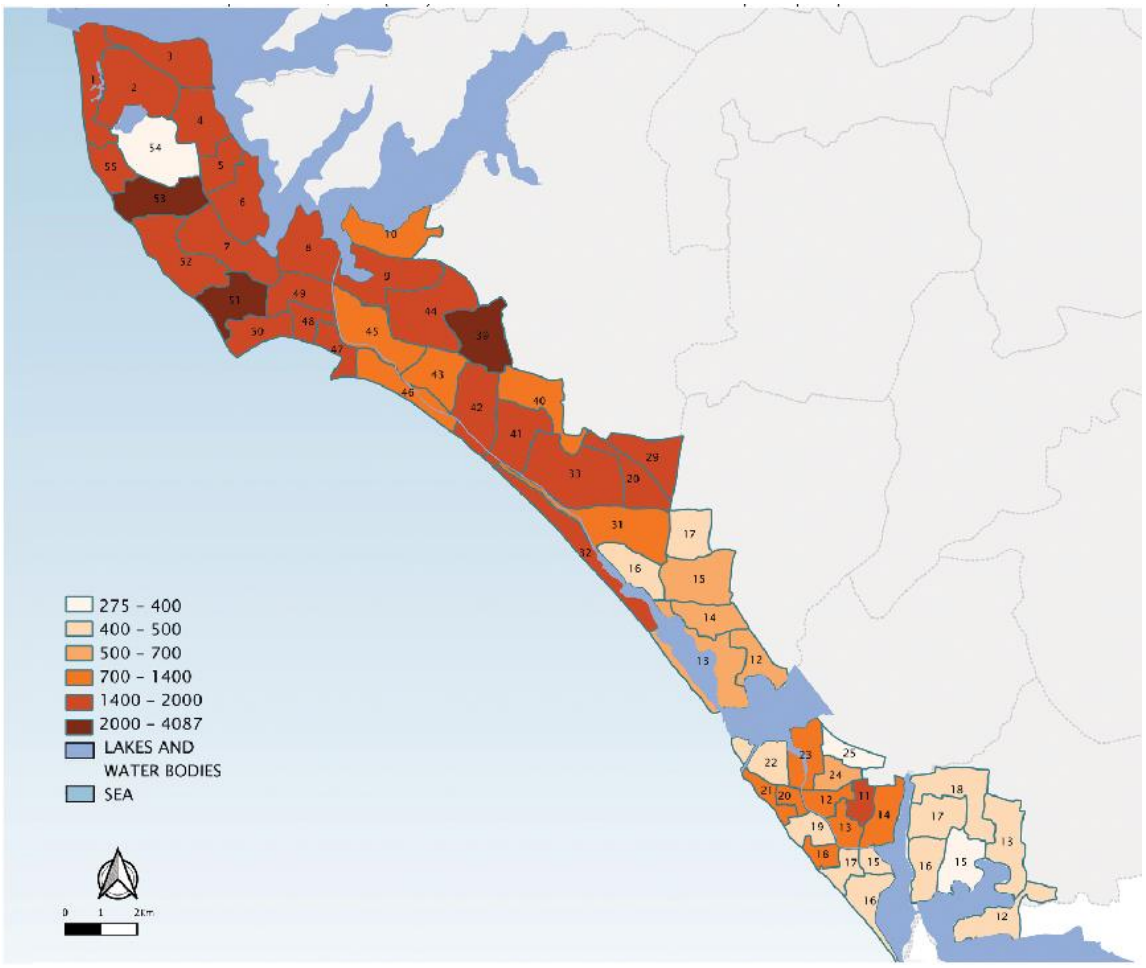


Figure 4. 5 Number of households

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Operations, District Census Handbook (DCHB), 2011)

District average household size: 4.3. Avg. Household size in Kollam Corporation is about 4.62, the coastal area is also high (4.65). There are 65341 number households in the study area. The wards 53, 51(highest population distribution), 39 has the highest number of households is in Kollam corporation. Because more job opportunity is found near the CBD and coastal areas.**Sex ratio**

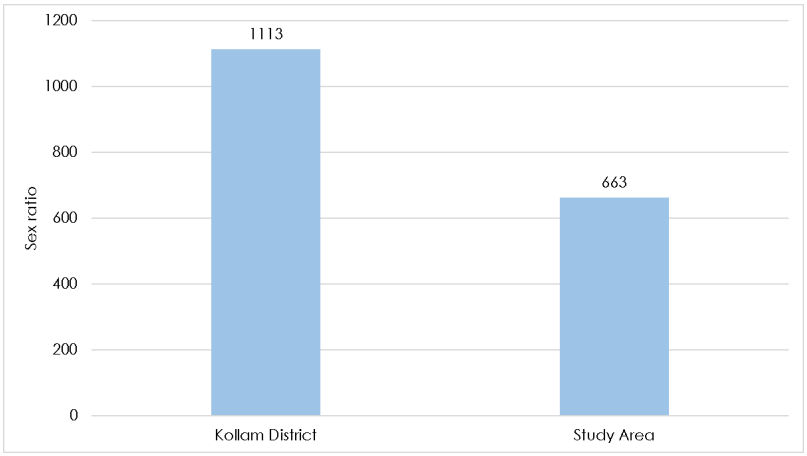


Figure 4. 6 Sex Ratio

Source: (Operations, District Census Handbook (DCHB), 2011)

The Kollam district has the 3rd position in sex ratio in the state. Sex ratio in the planning area (663) is less than the district (1113).

4. Child Sex ratio

The Kollam district is the 2nd in child sex ratio in the state.

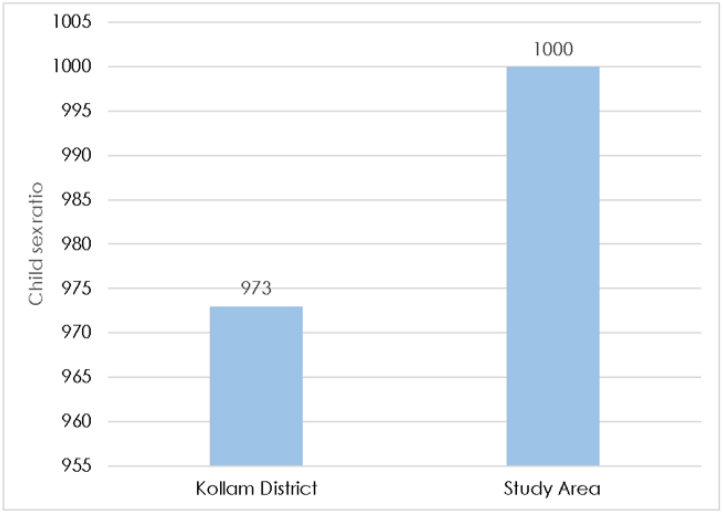


Figure 4. 7 Child sex ratio

Source: (Operations, District Census Handbook (DCHB), 2011)

A higher value means that there is out-migration of male (for jobs etc.) population from district. Whereas the study area shows a lower value as coastal dependency is high as majority of people relay on fishery sector for their livelihood.

Comparing sex ratio with child sex ratio, it shows that at birth the sex ratio is more or less uniform, but it changes later due to the migration pattern (for education, etc.).

5. Literacy rate

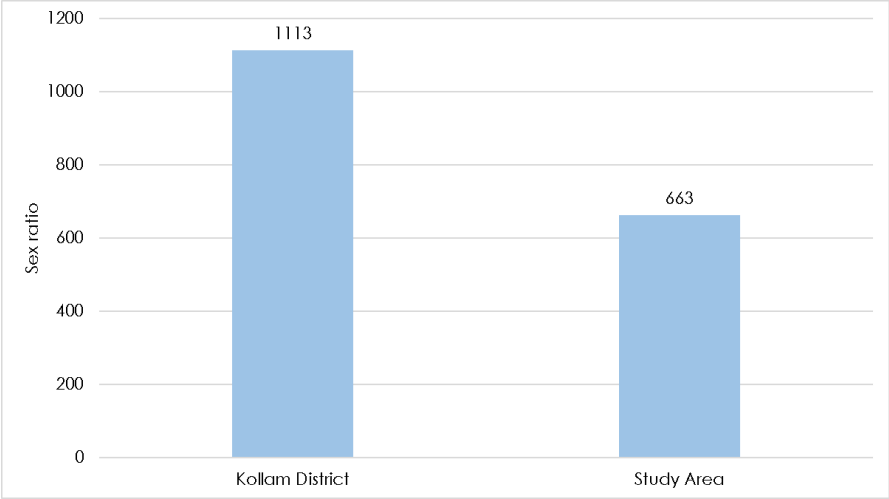


Figure 4. 8 Literacy rate

Source: (Operations, District Census Handbook (DCHB), 2011)

The district occupies the 8th position in literacy rate. (Operations, District Census handbook Kollam, 2011) The study has 3,05,887 literates which is less than the district (94.09%). This might be because of social factors.

Study shows that female and male literacy is comparatively equal. Higher literacy among women means lesser dropouts, and can provide greater contribution towards work participation and economic development.

4.1.2 Working population

Out population in the study area only 34%, are working. More than half, of the total (66%) falls under the nonworker's category. As most of the population are above 60 and retired.

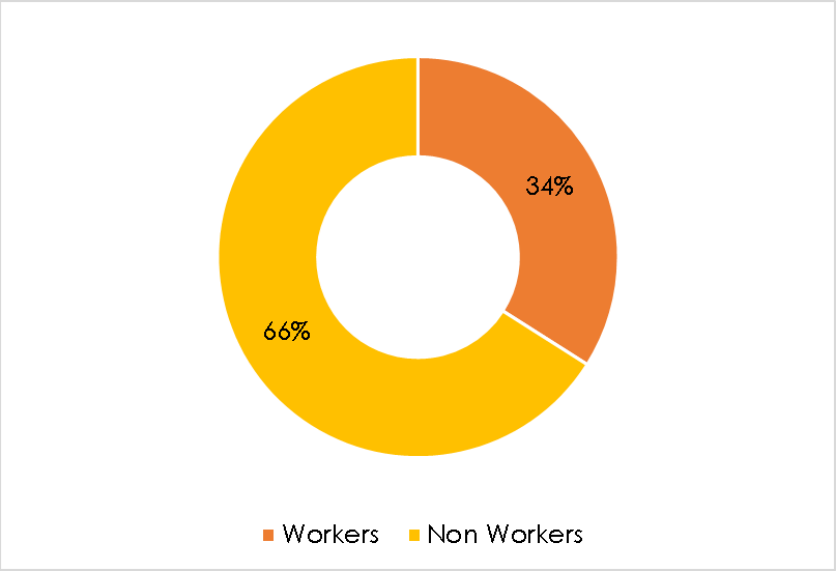


Figure 4. 9 Percentage of workers

Source: (Operations, District Census Handbook (DCHB), 2011)

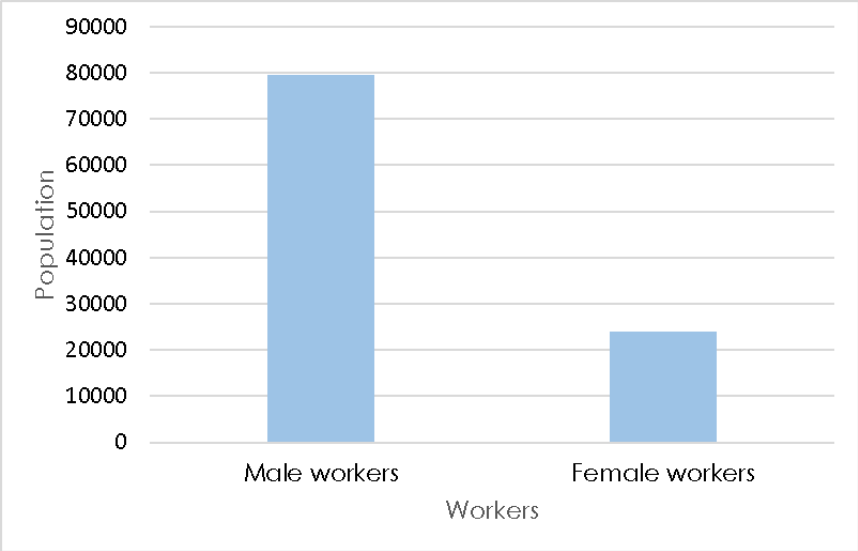


Figure 4. 10 Classification based on gender

Source: (Operations, District Census Handbook (DCHB), 2011)

Out of the total working population, 74% are constituted by male population (79662) and only 26% is female (23996). Among non-workers, females constitute 66%

In the coastal belt study area, men are more involved in the fishing sector than women, thus showing an increase in work participation among men.

1. Employment pattern

The main workers constitute of 103346, Marginal workers constitute of 18331, and non-workers 232086. The female working population is majorly daily wage marginal workers involved in the fishery, cashew sector, etc. and with the declining of cashew might affect their participation. Kudumbashree helps to boost their employment.

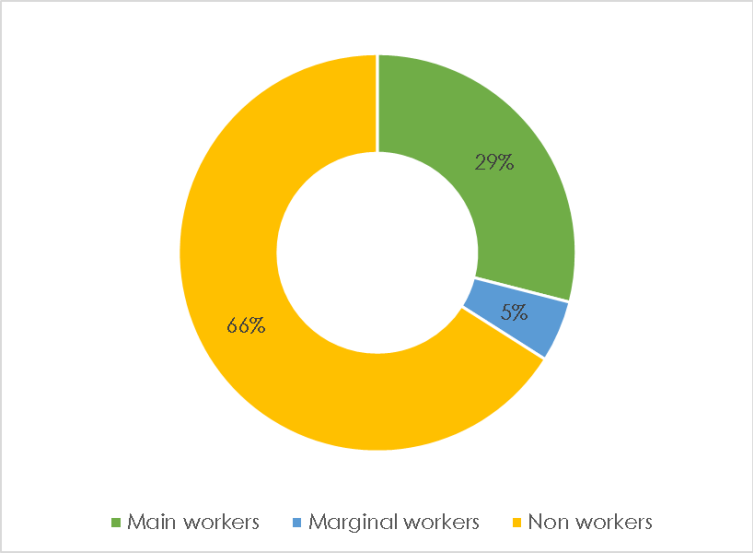


Figure 4. 11 Total workers

Source: (Operations, District Census Handbook (DCHB), 2011)

2. Industrial category of main workers

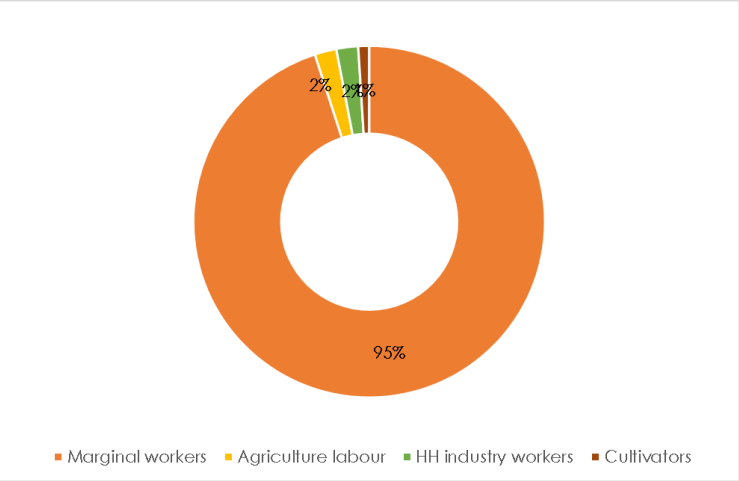


Figure 4. 12 Industrial category of main workers

Source: (Operations, District Census Handbook (DCHB), 2011)

The marginal workers constitute of (95969), Agriculture labour (1762), HH industry workers (1779), Cultivators (768).

3. Industrial category of marginal workers

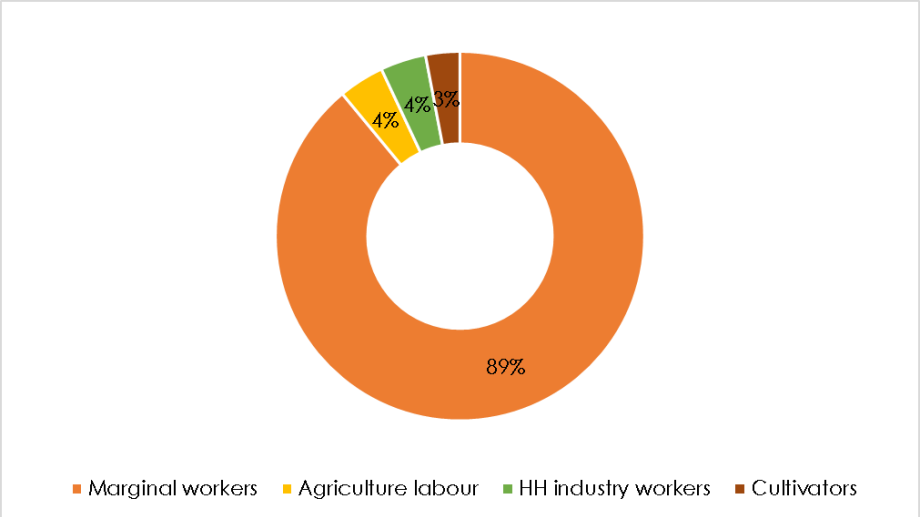


Figure 4. 13 Industrial category of main workers

Source: (Operations, District Census Handbook (DCHB), 2011)

The marginal workers constitute of (14785), Agriculture labour (725), HH industry workers (671), Cultivators (502). Workers in the study area belong to fishery sector (i.e., other workers category). Implies that primary sector's (agro, cultivators) contribution to the economy is very low in the area.

INFERENCE

Population in corporation area is higher than the rest of LSG's. Higher population concentration is seen in wards near to the coastal region, where there is fisherman settlement. Majority of people in the study area depend of fishery sector as the main source of income and has been practicing it for a long time.

4.2 Environmental Pillar

4.2.1 Land use

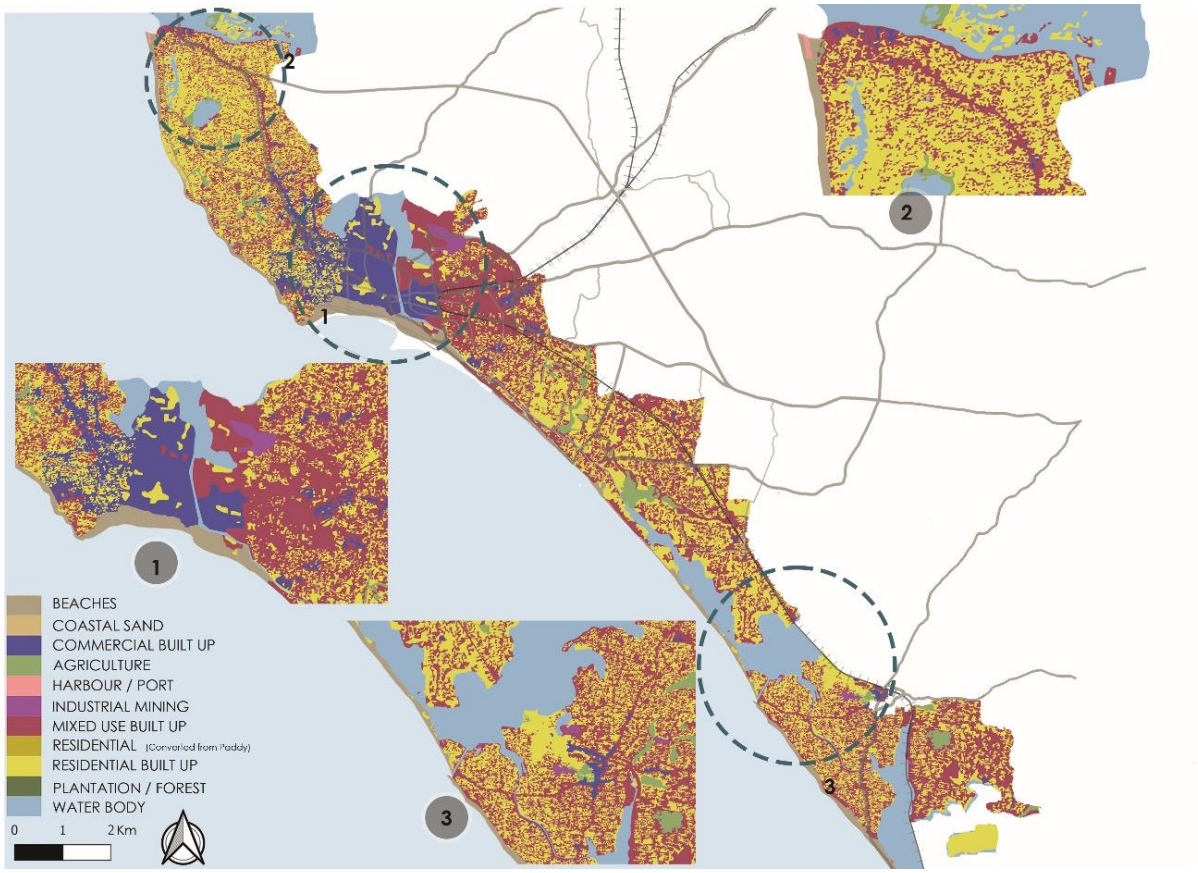


Figure 4. 14 Map showing Land use of the study area

Source: Author generated wrt from Urban Planning studio, generated on "Base map using My Maps App" & 'Photoshop software

Based on the natural ports at Thangassery, settlements grew around these ports and Kollam developed as an important commercial centre in the southern part of Kerala. The land use plan of Kollam city and its region around is predominantly occupied by residential use with a few pockets or thin linear stretches of commercial use land. *(Department of town and Country planning and Joint Town Planning Committee of Kollam Municipal Corporation & Grama Panchayats of Neendakara, Kottamkara and Thrikkadavoor).* Four major land uses which are relevant to the production sectors that is Commercial, Industrial, Agricultural and Forest zones. Kollam has a patchy development, with the majority of the public and semi-public, commercial, transit, and recreational amenities being located in the central core region. (Kovoor, 2021). Core area of the city is having high commercial industries concentration. Industrial activity in the urban area is on the decrease, and workers

in other category is increasing in both urban and rural areas, narrowing down of the boundary. Distinguishing the character of rural and urban areas, resulted in the dilution of the rural nature of the rural area.

Agricultural area is on a lower- concentration towards the coast, the major part lies in the mid and high land region of the district which fulfils the need of the households in the study region.

4.2.2 Coastal environment

The 590 km length Kerala coast faces the Arabian Sea. The Kerala coastline runs parallel to the north and trends NNW-SSE till it reaches the Thangassery headland at Kollam. South of Thangassery, the shoreline is oriented in a NW-SE manner. South of the continental shelf, the bathymetry gets steeper. (The pre-tsunami beach profiles , 2004)

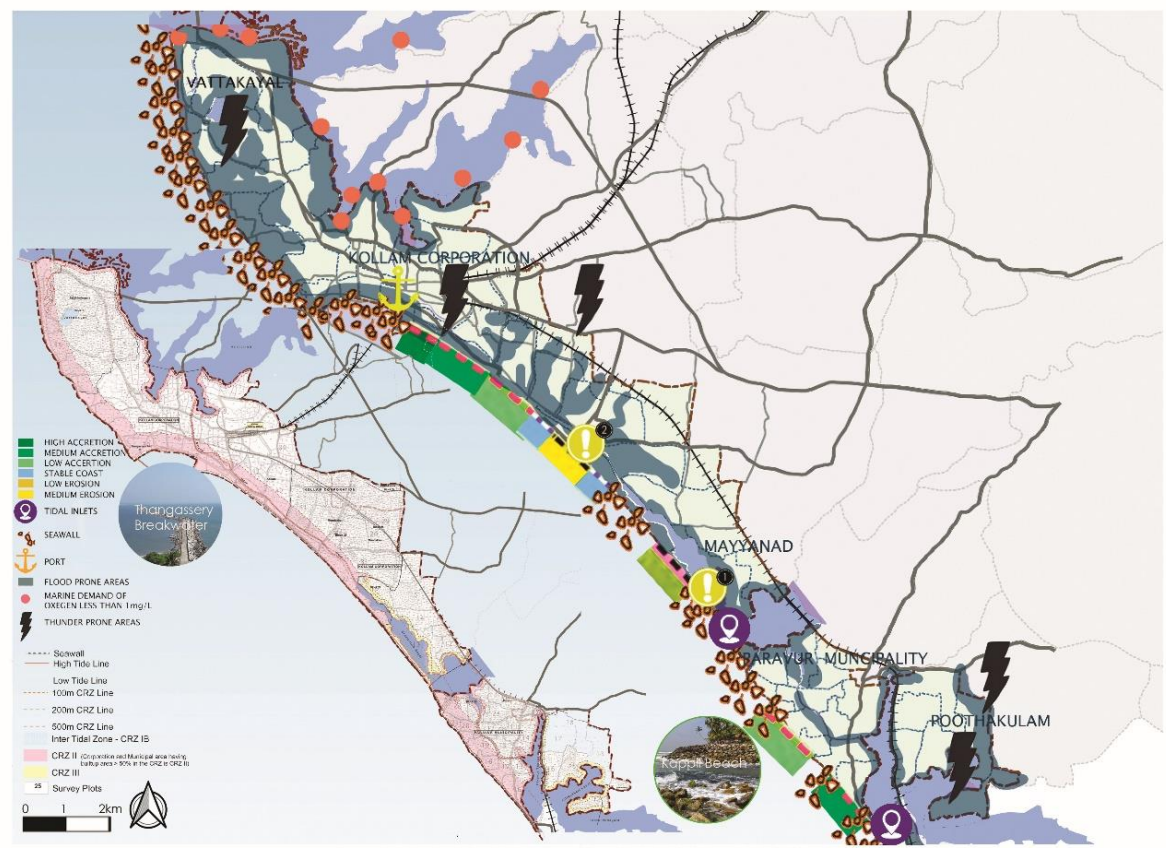


Figure 4. 15 Map showing the coastal environment

Source: Author generated wrt from Urban Planning studio, S3 MPlan, 2020-2021 Batch and CZMP Report

- **Species**

The 15 hectares of dense mangrove trees are found on the estuary Vincent Island in Kollam, which is located on Ashtamudi Lake in Shakthikulangara. The island is the only place in India where the rare yellow mangrove (Ceriopstagal) is found. A large concentration of juvenile fish care found within the mangrove protection of the island. Development operations near the lake are endangering the mangrove trees. (Development, 2014)

- **Coastal Regulation Zone**

The study area comes under CRZ II, and CRZ III . Half of the study area comes under CRZ regulation so new construction are prohibited in this area and the only method which can be developed in this area is regeneration of the existing buildings.

Figure 4. 16 Coastal areas

Source: Author generated from open street map and picture taken during primary survey

- **Sea walls and Groynes**

Large substantial portions of the seawall and groynes erected along the coast. The Kappil beach area has been already protected by a seawall. Thangassery breakwater protection a barrier built out into the sea to protect a coast or harbour from the force of waves. Seawall for about 3.1 km at Maruthadi.

- **Climate change**

The average annual atmospheric temperature of the area is about 27 C; the annual temperature range is 27.8 to 33 C as a maximum and a range of 22.3 to 26.1 C as a minimum.

Around 30 of the area is prone to various types of natural disasters about 50 of the area is prone to flooding, 12 of the coastal area is under of risk of both flood and tsunami 15 kms

of coastal area is under high risk of coastal erosion (District Disaster Management Plan, 2015)

- **Cyclones**

Due to the heavy outbreak of summer rain and storm, in 2012 April 2013 persons died, 8 persons injured and 1000 of buildings including houses were damaged. Due to Ockhi in Dec 2017 Sea erosion intensified along coastal Kollam (Thanni, Vadi).

- **Sea Erosion**

Sea Erosion is a perpetual threat in our study area Coastal beds in Mayyanad, Shaktikulangara, villages are vulnerable points. 18 houses were damaged due to this severe sea erosion on June, 2012 and 12 families 36 persons) were rehabilitated at temporary camp at CVM LP School at Thanni. At Paravur municipality the ward number 21 due to coastal erosion land slide is seen in this area.

- **Flood**

The coastal villages in our study area are flood prone areas High intensity of rainfall during the monsoons causes severe floods Increasing flood plain occupancy and reclamation of water bodies and wet lands results in increasing flood damage. (District Disaster Management Plan, 2015)

Tsunamis - The tsunami occurred was on December 2004. Most regions along the coastal belt of Kerala experienced the fall and rise in water levels majorly affected Shaktikulangara. (District Disaster Management Plan, 2015)

4.2.2.1 Beach characteristics

Table 4. 1 Beach characteristics of the study area

Source: Author generated wrt Kerala Coastal Zone Management Authority (KCZMA), Gov representatives

Beach names	Sand color	Water color	Wave type	Beach slope	Tidal range
Sakthikulangara	Grey	Clear blue	Moderate	Gentle 1:5	Semi diurnal 2.0-2.5 m
Thirumullavaram	Golden	Clear blue	Moderate	Gentle 1:5	Semi diurnal 1.5-2.0 m
Kollam	Silver colored	Clear	Low	Gentle 1:5	Semi diurnal 1.5-2.0 m
Mundakkal	Golden	Clear	Low		Semi diurnal 1.5-2.0 m
Eravipuram	Golden	Clear	Moderate	Gentle 1:5	Semi diurnal 2.0-2.5 m
Thanni	Golden brown	Clear	Moderate	Gentle 1:5	Semi diurnal 2.0-2.5 m

Paravur	Golden	Clear	Low	Gentle 1:15	Semi diurnal 1.5-2.0 m
Kappil	Golden	Greenish blue	Moderate	Gentle 1:15	Semi diurnal 2.0-2.5 m

Beach names	**Beach L/W**	**Temp**	**Geomorphology**	**Coastal vegetation**
Sakthikulangara	3km 25m	Warm 28°C	Sand dunes and sedimentary rocks	Casuarina trees, Coconut palms
Thirumullavaram	1.5km 25-30m	Warm 28°C	Sandy beach with dunes	Casuarina trees, Coconut palms
Kollam	25km 20-25m	Warm 28°C	Sandy beach with rocky outcrops	Mangroves, Coconut palms
Mundakkal	1km 15-20m	Warm 28°C	Vegetation patchy rocky outcrops	Casuarina trees, Coconut palms
Eravipuram	1km 10-15m	Warm 28°C	Vegetation sparse sandy beach	Casuarina trees, Coconut palms
Thanni	1.5km 10-15m	Warm 28°C	Sandy beach with dunes	Casuarina trees
Paravur	6km 20-25m	Warm 28°C	Estuary with sandy beach, Mudflats	Mangroves, Coconut palms
Kappil	4km 10-15m	Warm 28°C	Sandy beach with dunes, rocky outcrops	Casuarina trees

4.2.3 Water supply

KWA Water which included Sasthamcotta Lake serves as the source of water supply for Kollam Corporation and a number of Grama Panchayats. It is a Perennial source with superior quality of drinking water. Water harvesting is not done in any of the houses. Water from the intake well located at Sasthamcotta is treated in the 37.5mld treatment plant at Sasthamcotta and supplied to Kollam Corporation and the Grama Panchayats. KWA water also included with Tube, Bore Wells and Public wells. Jala Nidhi work for Kallada River Project at Mayyanad. (Integrated District Development Plan, Kollam (Volume III), 2009)

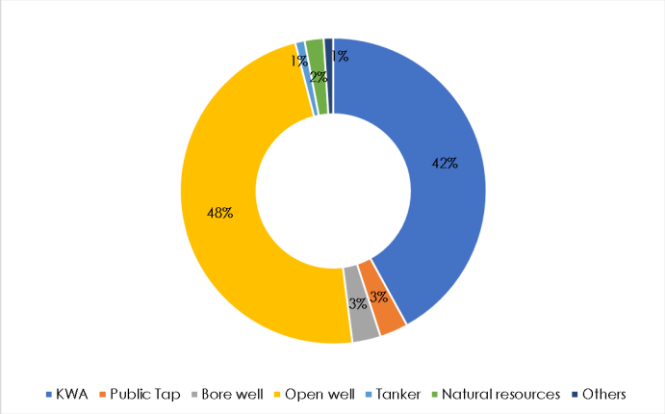


Figure 4. 17 Water supply in the study area

Source: (KWA Water Authority handbook, 2018)

Scheme/Project: Japan drinking water project by Japan International Cooperation Agency Provision: Water supply distribution networks, storage tanks, pumping stations Source: Kallada River at Tholikode and the water treatment plant at Panamkuttimala Areas of distribution: Kolam corporation, Paravur town &13 grama panchayats including Mayyanad & Poothakulam, benefits a of population 5 lakhs

Cost: Rs.295 crore Meenad drinking water scheme

Completion: 2020-2021 (Mayyanad & Poothakulam), Kollam corporation completed in 2016. *(The Hindu 17 March 2016)*

4.2.4 Solid waste management

- Kollam estimated rate of 200 grams per capita/day, Study area have a population of 1,48,011(0.148 million) including the Kollam Municipal Corporation, Coastal Municipalities and Panchayats- waste generated would be 48.6 MT/day. Most of the waste generation is from households, then commercials, Industries and from Fisheries.
- In Kollam, a significant portion of households, businesses, and retail establishments often do not practise waste segregation at the source. A few establishments separate recyclable / reusable wastes and sell to scrap dealers/available facilities. Plastic waste is collected regularly every month by Harithakarmasena,

  Rs 30-40/ month household level

  Rs 50/ month Shops

  Rs100/month Institutional buildings
- Have street cleansing done by Sanitary workers supervised by Sanitary inspector. Only the main roads and city centre area cleaned daily (06:30AM and 12.30PM).
- Under Suchitwa mission - Bio gas plants are also provided for households.
- Primary collection

  Open storage, Concrete. Cylindrical bins, steel bins: emptied manually)

  Secondary collection

  Open places of waste disposal conveniently identified by the staff for waste disposal from households, street sweepings and drain cleanings.
- Waste treatment plant at Kureepuzha (MC) The composting plant is to upgrade the waste management in Kollam city including waste segregation collection,

transportation storage, treatment and disposal. (STP Plant of 12 MLD capacity is at Kureepuzha)

- Rejects of the compost plant are disposed into trenches then covered with clay.
- With no proper management and treatment, the collected waste from the city were dumped in heaps, resulting unbearable stench spreading all over.
- The new landfill is currently lying in proximity with Ashtamudi Lake. the distance being less than 50 m. (CRZ limit 100M) resulting in shutting down of the facility.
- Currently have no proper Waste management facilities.
- Proposal in UIDSSMT scheme to start a solid waste treatment plant in Paravur Municipal Town. The Municipality has taken over the land for this purpose.

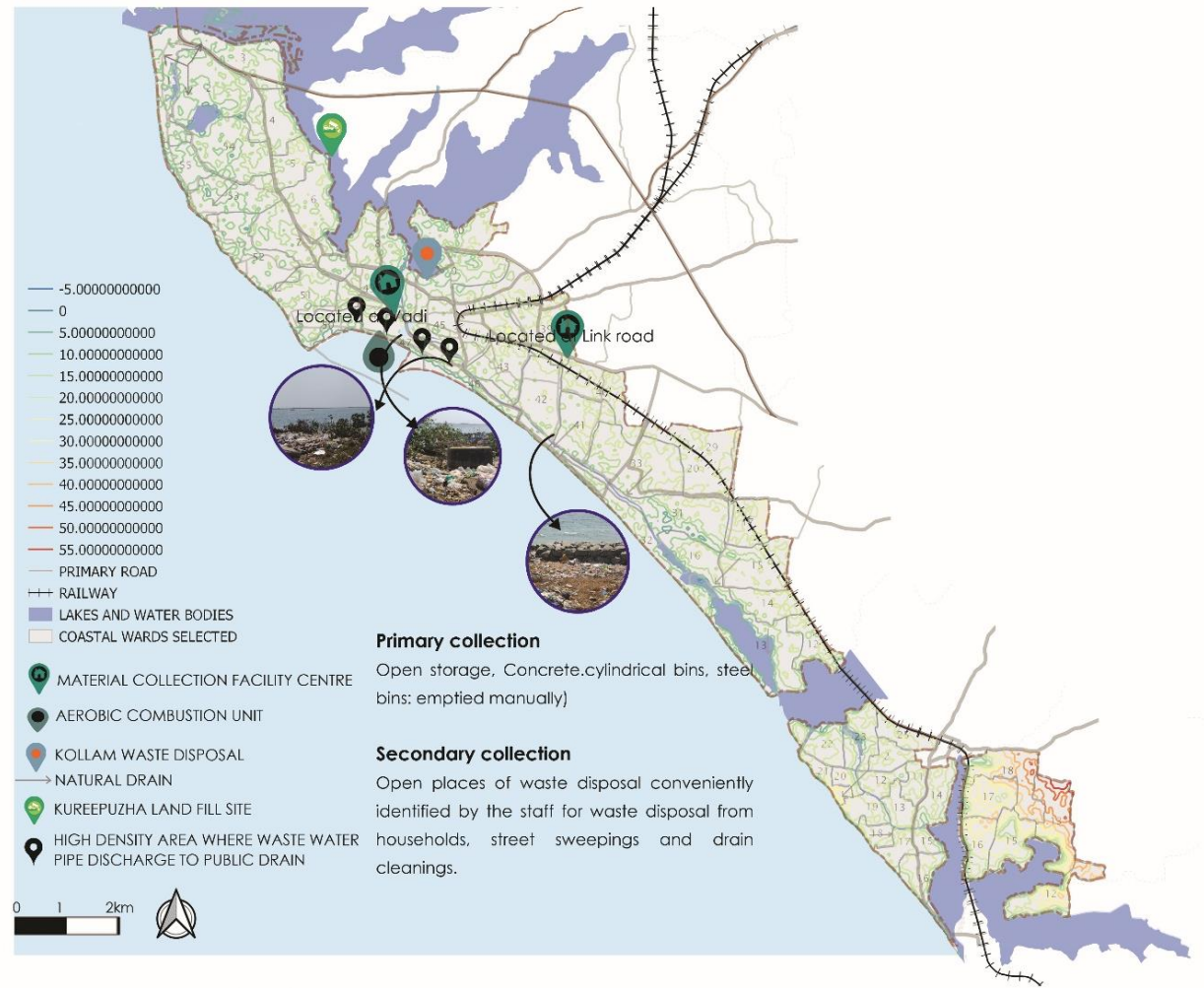


Figure 4. 18 Map showing the physical infrastructure

Source: (Development, 2014)

4.2.5 Sanitation

The sanitation mechanism in Kollam is based on household 82% on-site septic tanks, generally located in middle and high-income residential areas, and 2% shallow pit latrines in areas with low-income groups. Even in the Corporation area, these services are poorly performed due to financial constraints creating problems of health, sanitation and end mental degradation. Community latrines are provided wherever the area of individual land holding is not sufficient for constructing Individual Household Latrines and where there is high density of population.

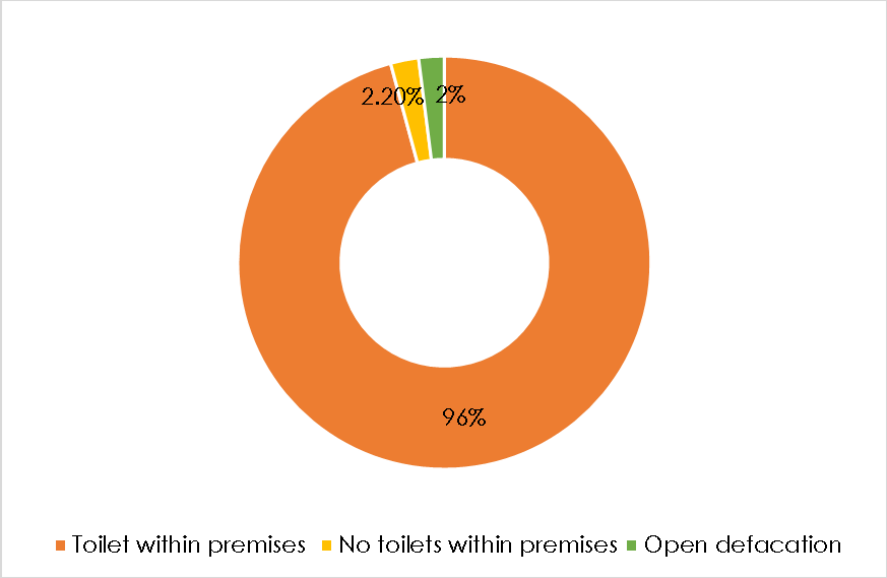


Figure 4. 19 Coverage of Toilet facility

Source: Survey conducted by Kudumbashree with Harithakarmasena mission conducted on 20/06/2022

The generation of sewage has been estimated in Kollam Corporation's CDP-2041 based on the assumption that 80% of the water supply will be converted to sewage. (Kovoor, 2021) Therefore, the sewerage generated in 2041 will be 65.44 MLD.

Sewerage network in Kollam city is not functioning. Due to this, sewerage disposal and treatment are taken care of by individual toilets and onsite septic tanks. Because of the homestead settlement pattern, individual toilets and open wells are situated in the same premise with an average distance of 8-10 meters. No specifications have been issued for the construction of septic tanks and septage managements are not regular in the city.

4.2.6 Storm water drainage

- Sloppy terrain results in easy drainage, unplanned filling of small natural streams and paddy areas, and chocking of drains causing periodic flooding of area.
- Number of natural canals (Thodu) exist in the city. These canals act as primary drains and are main recipients of the city storm runoff.
- The natural drains outfall either in the sea, the T.S. Canal or to the Lakes.
- Have drainage facilitated over Highway area
- Decreased carrying capacity of the existing canals/drains due to heavy silt deposition, discharge of solid wastes in the canals/drains and growth of vegetation in the canals/drains;
- Panchayats improves the drain network by providing drains to the arterial roads which is remedial for waterlogging issues.
- Inadequate or no drainage facilities in certain areas.
- Natural Drainage flow: -

  Kollam MC area - coastal stretch draining towards Arabian sea

  Kollam MC area - central stretch drains towards Ashtamudi through TS Canal

  Coastal stretch drains towards sea

  Inner parts drains towards lake side (Vattakkayal and Paravur kayal)

4.3 Economic Pillar

4.3.1 Trade and commerce

Kollam was an important trade centre during the 17th century and was known for its trade linkages with the Middle East and China. It serves as the nation's commercial and processing hub for cashews. In the district, there are 17 major and one medium-sized enterprises, including two Central Government undertakings. The development of the region's economic foundation also includes the handloom, clay, and wood industries. (Government of India) Kollam district is also a hub for marine products" industry. About 1,963 SSI units have been registered in the district.

- The junction where maximum retail shops are existing is Chinnakkada (820) followed by Kavanadu (255) and Kadappakkada (131). However total number of district level retail shops ar e maximum at Kadappakkada (44followed by Chinnakkada (25).

- Total number of wholesale shops is maximum at Chinnakkada (736) followed by
- However total number of district level wholesale shops is Found maximum at Sakthikulangara junction followed by Chinnakkada.
- Chinnakkada is the core city centre where most of the wholesale and retail trading activities happen. Around 700 wholesale trades of various types and categories flourish in the city. The retail shops are spread across the city.

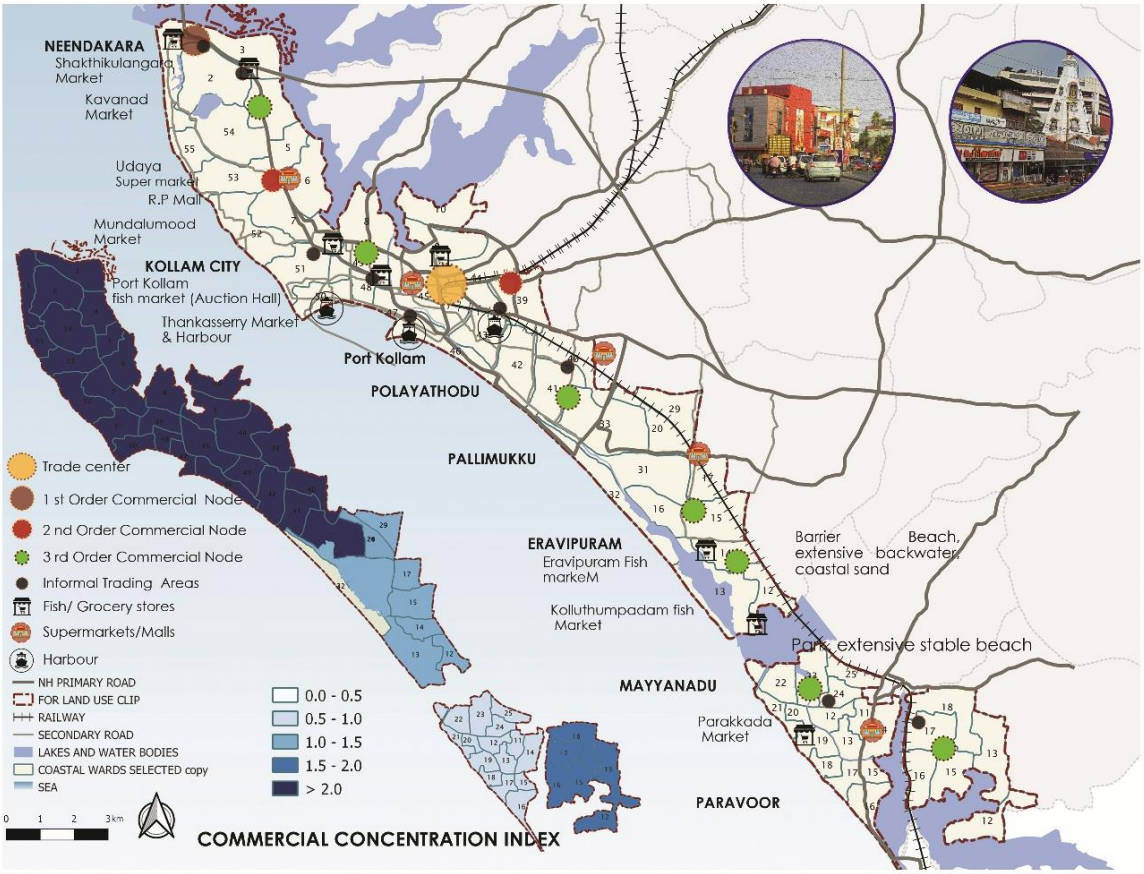


Figure 4. 20 Map showing the trade and commerce sector and its commercial concentration

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Ministry of Urban Development, 2014)

4.3.2 Fisheries

While comparing the fish production at other districts, Kollam stands first position in the total number of fish production and in marine fish production. So, in Kollam, Fisheries is an important economic activity.

Income from Fisheries Sector: GVA from Fisheries sector (Rs in Lakhs) in 2018-19 in Kerala: 1147323 % contribution of Fisheries sector to Primary sector in 2018-19: 14.75%

Income from Fisheries Sector: GVA from Fisheries sector (Rs in Lakhs) in 2018-19 in Kerala: 1147323 % contribution of Fisheries sector to Primary sector in 2018-19: 14.75%

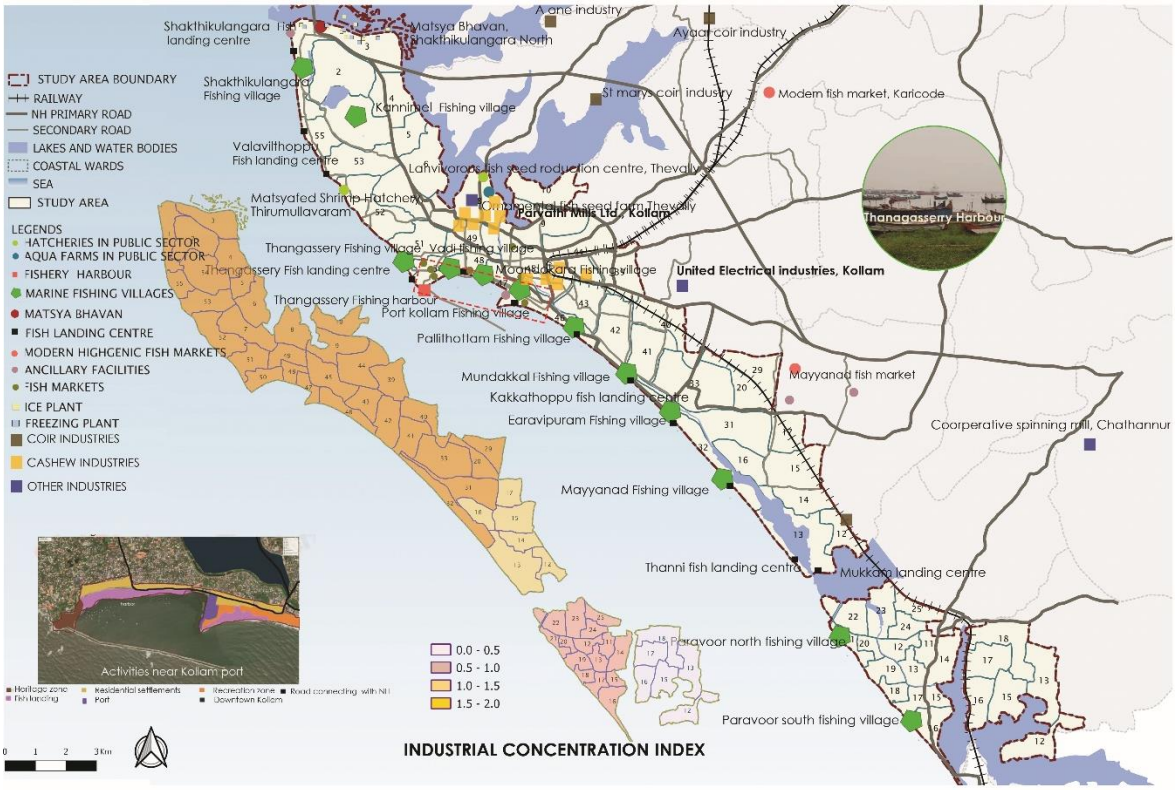


Figure 4. 21 Map showing fisheries and industries concentration and infrastructure

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Ministry of Urban Development, 2014), (Development plan-Town & Country planning dept. Primary Survey)

4.3.3 Industies

- Marine Exporting is a flourishing Industry now also in kollam district.
- Due to the presence of one of the biggest fishing harbours in Asia, Shakthikulangara harbour and the nature gifted marine wealth, the sector is an evergreen sector in Kollam district.
- A problem that the sector faces is the unavailability of an exporting port.
- Cochin or Tuticorin ports handle the majority of Kollam's exports. In the previous ten years, the city had more than 600 cashew processing facilities.

- Inadequate number of fish processing units and ice plants.
- Unhygienic atmosphere in fish landing centres and fish markets.
- Lack of training facilities for hygienic handling, coastal aqua culture, scuba diving.

4.3.4 Tourism

Kollam's coastal region is a popular tourist destination, with visitors flocking to its beaches to enjoy the sun, sand, and sea. It is situated on the banks of the Ashtamudi Lake and is known for its picturesque backwaters, pristine beaches, and historical landmarks. Kollam has been a prominent trading hub for centuries, and its port has been visited by traders from all over the world, including the Greeks, Romans, and Chinese.The region is dotted with numerous beaches such as Thirumullavaram Beach, Tangasseri Beach, and Mahatma Gandhi Beach, each offering a unique experience to visitors.

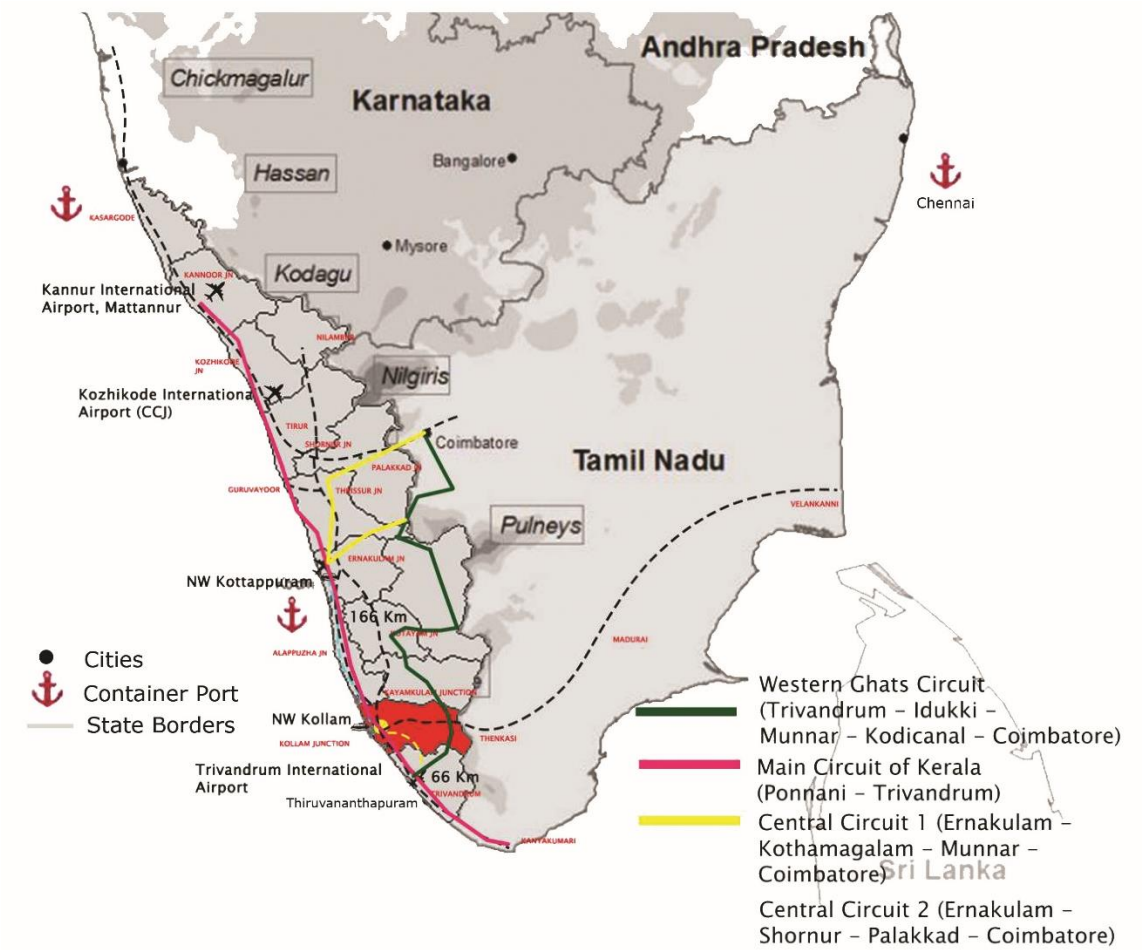


Figure 4. 22 Regional Tourism

Source: (Board, 2023)

Figure 4. 23 Tourism circuit district level

Source: (Board, 2023)

4.3.4.1 Tourism statistics

The percentage share of Kollam in tourism sector is very low compared to neighbouring cities like Thiruvananthapuram, Alleppey and Kottayam. About 1.2% of the total foreign tourists to Kerala visits Kollam and the share of domestic tourist is about 2.2%. Kollam is not a prominent destination in the tourist circuit mainly because of its location, lack of branding, CRZ regulations prevents the development along the beach side, competition from other cities etc.

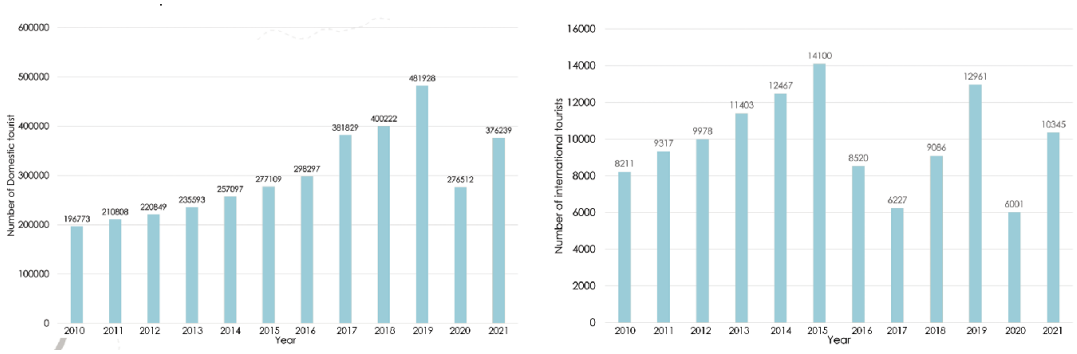


Figure 4. 24 Tourism statics

Source: Kerala Tourism Statistics over the years

Figure 4. 25 Map showing Tourism infrastructure

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Ministry of Urban Development, 2014)

4.3.4.2 Visitor survey analysis

About 30 visitors including both domestic and international tourist were surveyed. A convenience sampling method was incorporated.

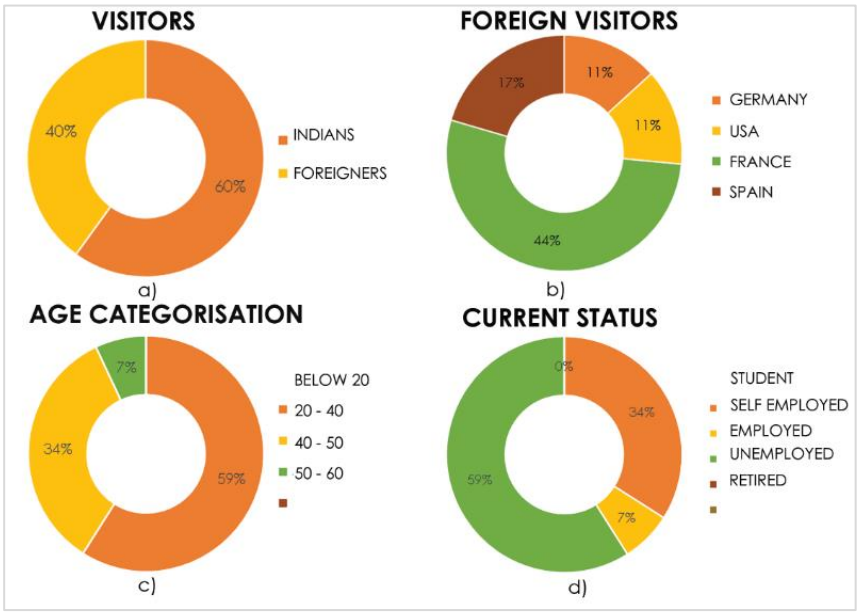


Figure 4. 26 Visitors b) Foreign visitors c) Age categorisation d) Current status

Source: Visitor survey conducted on 16/03/23 to 20/03/23

Visitors are found of the natural beauty, beaches, coastal stretch walking, parks, Local food. The visitor mostly/mainly prefers to stay homestays rather than resorts in the village. The homestay cost around 1000-2000 per person per night including food.

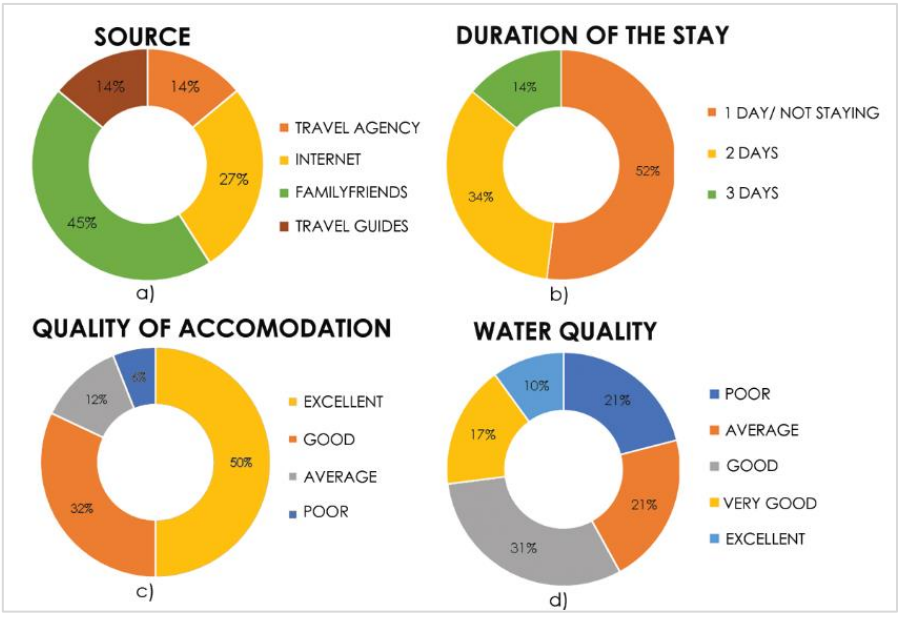


Figure 4. 27 a) Source of information about tourist spot b) Duration of the stay c) Quality of accommodation d) Water quality

Source: Visitor survey conducted on 16/03/23 to 20/03/23

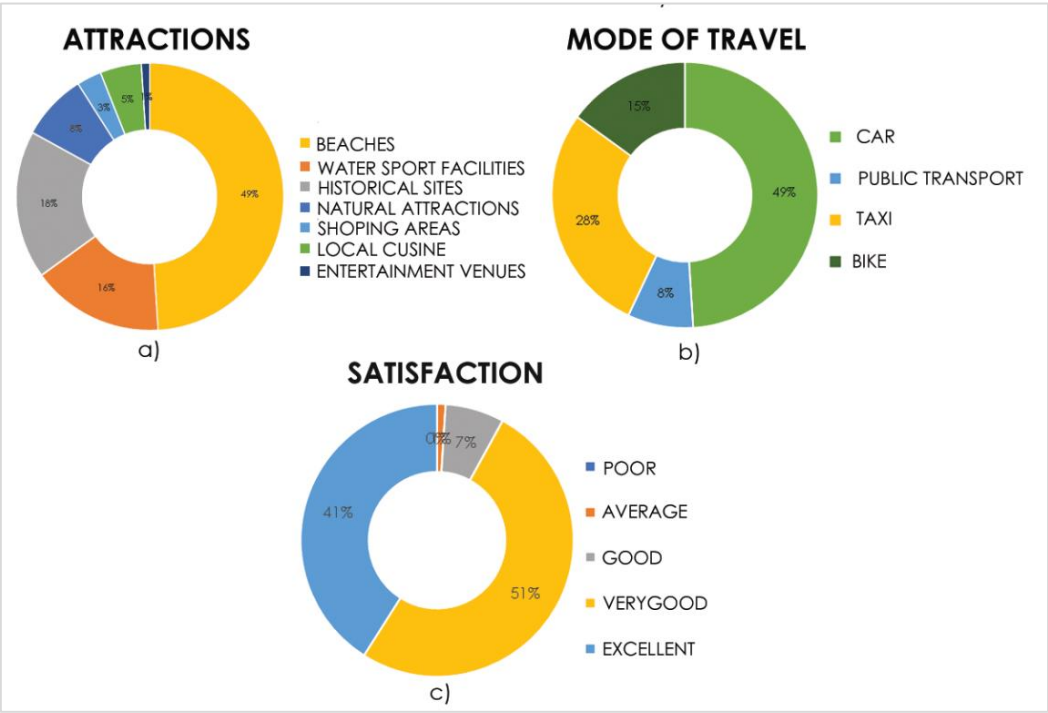


Figure 4. 28 a) Attractions of the study area b) Mode of travel c) Satisfaction of visitors

Source: Visitor survey conducted on 16/03/23 to 20/03/23

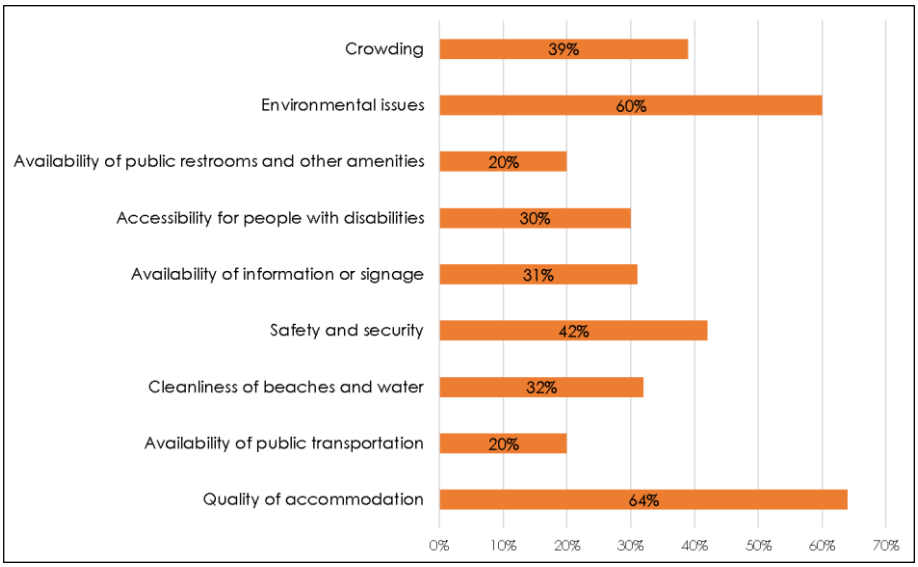


Figure 4. 29 Improvement needs in the study region as per opinion of visitors

Source: Visitor survey conducted on 16/03/23 to 20/03/23

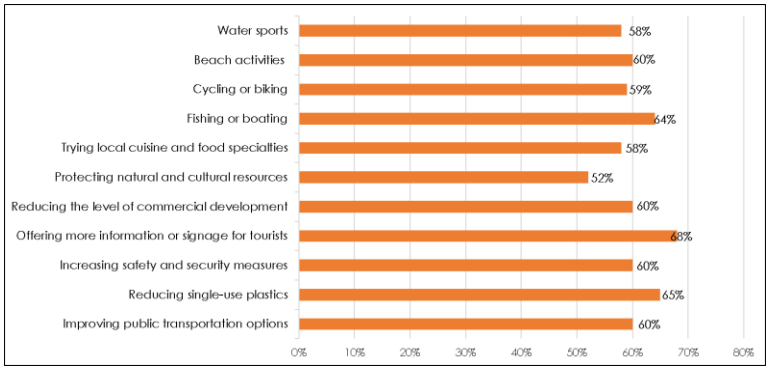


Figure 4. 30 Suggestions made by the visitors

Source: Visitor survey conducted on 16/03/23 to 20/03/23

From the survey it is identified that the destination is not crowded with visitors. The main suggestion made by the visitors.

4.3.4.3 Household expectation survey

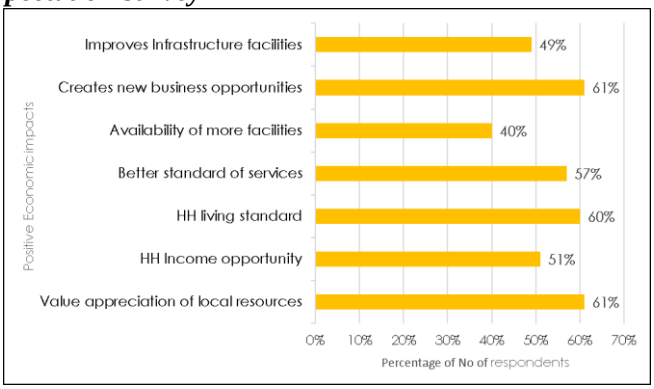


Figure 4. 31 No of responses showing positive Economic impacts

Source: Primary household survey conducted on 16, -21 March 2023

Figure 4. 32 Number of responses showing negative Economic impacts

Source: Primary household survey conducted on 16, -21 March 2023

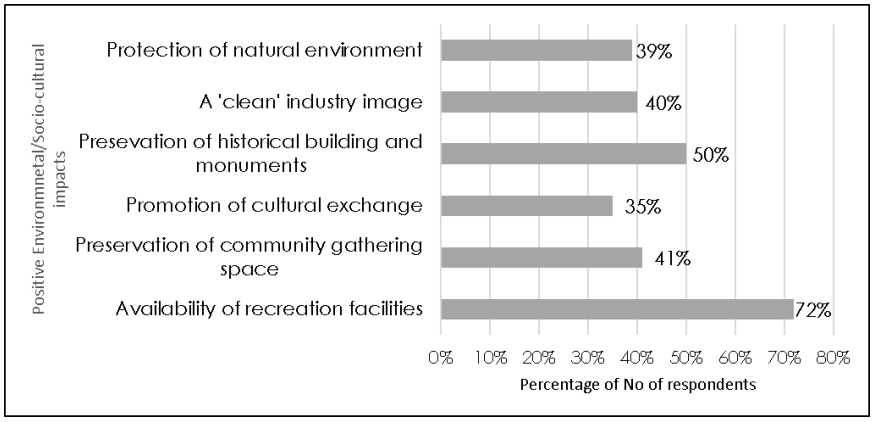


Figure 4. 33 Number of responses showing positive environmental/ Socio-cultural impacts

Source: Primary household survey conducted on 16, -21 March 2023

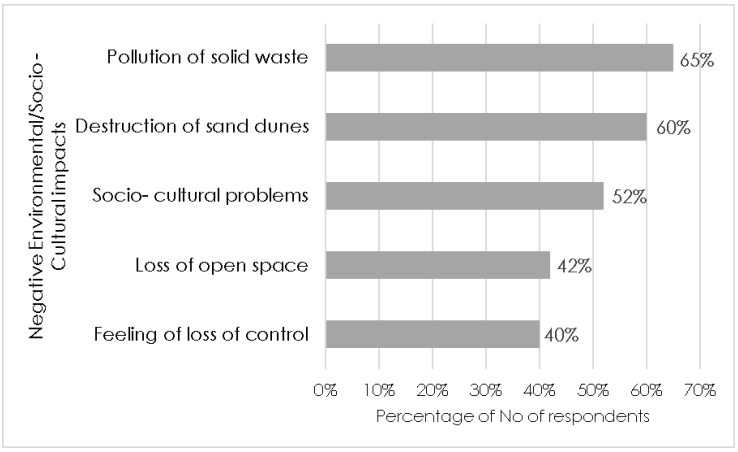


Figure 4. 34 Number of respondents showing negative environmental/ Socio-*cultural impacts of coastal tourism*

Source: Primary household survey conducted on 16, -21 March 2023

4.4. Transversal Pillar

4.4.1 Transportation

4.4.1.1 Regional connectivity

Road

The Kollam district is well connected to other parts of Kerala and India through the NH-66, NH-183 and NH-744. The National Highway 47 covers a distance of 57.4 km in the district. The National Highways NH-744 (Kollam Shencottai) and NH 183 (Kollam- Theni) originate from Kollam.

Rails

The Kollam railway station is considered to be one of the biggest railway stations in Kerala state after Shornur and Palakkad junctions. The Trivandrum-Ernakulam line, which goes via Kottayam and Alappuzha, passes through Kollam.

Inland Waterways

Through waterways, Inland Waterways Kollam is well connected to various regions of Kerala. (Ports, 2010) The Kollam-Kottapuram segment of the West Coast Canal and the Champakara and Udyogmandal Canals (205 km) in Kerala together with the Champakara and Udyogmandal Canals (205 km) in Kerala, have all been designated as National Waterway No. 3 (NW3) by the Centre. (Corporation, 22) The extension of the NW3 to Kovalam and further to Colachel is under its active consideration. Major waterbodies of Kollam are TS Canal, Ashtamudi Lake, Kallada, Ithikkara and Achankovil River.

Airways

Kollam Airport was the first aerodrome in Kerala but fell into disuse. Later came to known as the Asramam Maidan. Currently, Kollam district lacks direct air connectivity. (Paravoor Municipal council, 2021) International Airport - 66km. Cochin International Airport 169 km.

4.4.1.2 Road Network characteristics

National Highway 66 (Kanyakumari-Panvel): Most important road-passes through CBD area of the city. It connects the neighbour districts viz Alapuzha on the north and Thiruvananthapuram on the south. Boundary nodes of NH 66 are Mevarom Bypass junction on south and Oachira on north. Thattamala - Kavanad stretch of this road is characterized by intense ribbon development and several high intense commercial establishments. NH is generally two lane and has four lane width from Kapplandimukku to Chinnakkada. Carriageway width varies from 10 to 15 meters. Ramakulangara Junction is a bottleneck in this stretch due to encroachment.

National Highway 744 (Kollam - Thirumangalam): It is the second important national highway in Kollam and was previously notified as NH 208. Provides connectivity to eastern side of the district and connects urban centers like Kottarakka, Punalur and also connects Kollam with Madurai via Schenkotal, Tenkasi, Rajapalaiyam, Srivilliputturand Tirumangalam. Two lane road with 7m carriageway. Right of Way of this road is 13m.

National Highway 66 Bypass: It has a total length of 13.4 km starts from Mevarom and ends at Kavanad on NH 66. 7m carriageway+1.5m paved shoulder in general. Right of Way of this road is 45m.

National Highway 183 (Kollam - Theni): Connects Kollam with TamilNadu via Adoor, Kottayam, Mundakkayam, Kumily and Cumbum. The road has nearly 7km length in Kollam Corporation from High School Junction to Pavuvayal. It is two lane road with 6m carriageway. The road is characterized by residential and commercial activities Right of Way of this road is 11 m.

Kollam - Ayoor Road: Major district road which connects Kollam City with south-eastern parts of the district. The two-lane road originates from Railway station Junction connects and ends at MC road near Ayoor. Road has average 11m carriageway width. Chemmamukku to Ayathil section is narrow section having average carriage way width of 6.5m. Right of way varies from 8m-10m. The road is characterized by residential, Institutional and commercial activities.

Coastal Road: Connects Kollam with Paravur and Varkala municipalities and provide an alternate connectivity to Thiruvananthapuram. Coastal road enters Kollam Corporation near Thanni Bridge and has single lane carriageway width. Row from Thanni-Kollam beach parking pround varies from 5-7m. Kollam beach parking ground-Kochuplamoodu section has two lane width and ROW of 19m. Kochuplamoodu- Thangassery stretch of coastal highway has From Thangassery coastal road passes through Thirumullavaram and reaches Neendakara. Thangassery-Neendakara stretch is having single lane carriageway width only. The coastal road connecting Paravoor with Kollam (Kollam-Mayyanadu - Paravoor - Kappil- Varkkala coastal road) is currently not used for transportation due to its inadequate maintenance.

Beach Road: Another major district road which connects Chinnakada with Kochuplammoodu Junction. The road is characterized by residential and commercial activities, intense commercial activities present on both sides of the road. The road has nearly 3 km length in Kollam Corporation.

Pozhikkara - Paravoor Junction Road: Paravur-Pozhikkara-Thanni Road stretches for a length of 2.77 Kms in subdistrict Kollam of the district Kollam. Passes through several residential areas, commercial establishments, and tourist attractions.

Paravur - Varkkala Thekkumbhagam Road: Varkala-Paravur Road stretches for a length of 1.34 Kms in subdistrict Kollam of the district Kollam.

Services

Boat 1- Starts from Kollam Terminal at 10:00 AM and operates to Sambranikodi. This boat does the ferry services in Sambranikodi - Kavanad - Vallakadavu stretch and returns to Kollam next day 8:40 AM. 25 passengers from Kollam to Sambranikodi and Sambranikodi-Kollam service will have 15 passengers to Kavanad and 10 passengers to Kollam.

Boat 2- operates from from Kollam terminal and provides services in Kollam-Sambranikodi and Kollam- Plavarakadavu sector.

Boat 3- operates from Kollam to Alapuzha at 10:30 AM via Chavara Amruthapuri. This operation is mainly aimed at tourist and number passengers vary across the year depending upon the tourist season. During tourist season number of passengers will be in the range 25-30.

Issues

Most of the arterial roads have inadequate capacity, substandard road geometry and carry a significant amount of intercity traffic in addition to local traffic. As a result, there is huge congestion on the main roads as well as at the intersections. The damaged situation of the coastal road is a hurdle for the people to reach Chinnakkada (Kollam Corporation). Now the people of Paravoor have to travel 28 kilometres to reach Chinnakkada meanwhile the coastal road reduces the distance between Paravoor and Chinnakkada to 13 kilometres.

Inference

Reaching the Kollam Corporation's central business district, Chinnakkada, is difficult due to the lack of a coastal road between Mayyanad and Paravoor. (Paravoor Municipal council, 2021) It is important for the local government and stakeholders to invest in and improve the accessibility and transportation infrastructure in the area to fully realize its tourism potential.

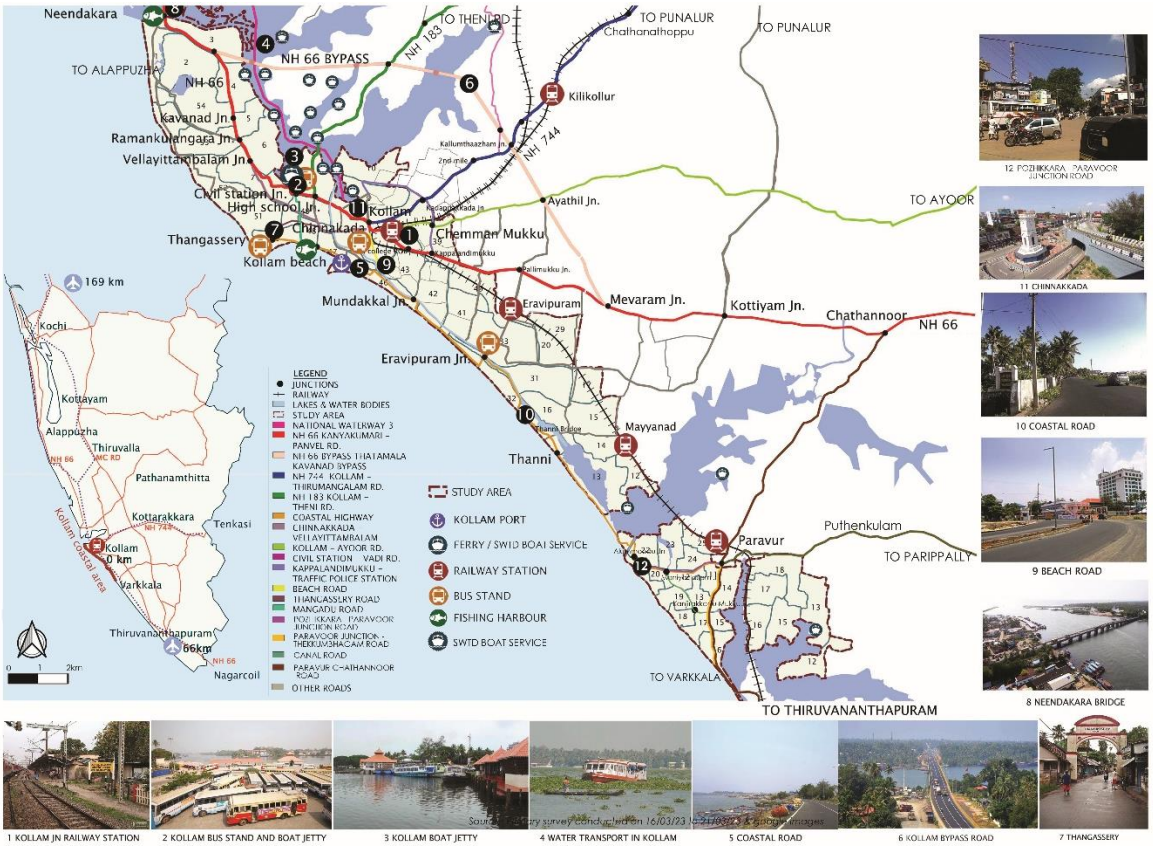


Figure 4. 35 Accessibility in the study area

Source: Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Ministry of Urban Development, 2014)

4.4.2 Recreational facilities

From the existing land use, it is found that the share of parks and open spaces is only 1.7%, of which the area used for recreation is quiet low. Water body constitute about 10.43% of area. Hence the recreation potential may be considered as 12.13% of total area. As per recommended standards for a medium town, about 18.20% of total land may be reserved for recreational activities. However, the beaches and the back waters in the city are other potential areas that could facilitate recreational activities in the area. The types of recreational facilities available in the area are parks, back waters, beaches and maidans.

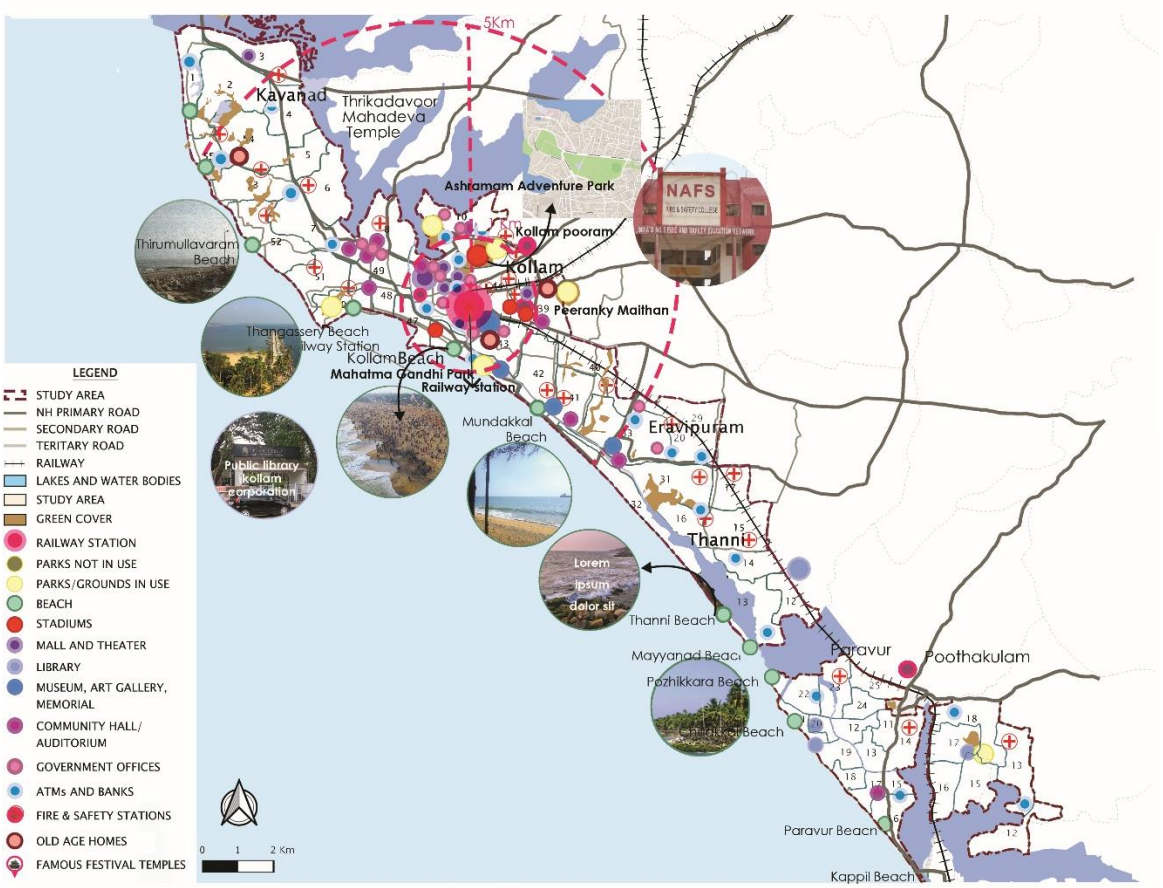


Figure 4. 36 Map showing recreational facilities

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Ministry of Urban Development, 2014)

4.4.2.1 Important recreational facilities

Mahatma Gandhi Park

The park is just 2 km away from the city centre and is owned by KMC. This park attracts many visitors not only from the city but also from the district. It is maintained by a private sector company Rural Tourism Development Company (Rutodec) on contract for a period of five years. There is a fee for entry into the park but entry to the beach area is free. Pay parking facilities are available for vehicles coming to the beach and the park.

Ashramam Maidan

The Ashramam Maithan is an Urban Park in the city of kollam. It extended to 72 acres of land and one of the largest open spaces within Kerala Municipal Corporation Limit. Maithan is Considered as one of the lung spaces of the city and regularly hosts the city's main cultutal and sports events. Foot path and street furniture’s are: provided around the Ashramam Maithan.

Lal Bahadur Shastri Stadium

The Lal Bahadur Shastri Stadium includes several opportunities to conduct various games and it functions under District Administration such as office for urban affairs, for welfare office for women and children etc.

Peeranki Maithan

Peeranki Maithan is the principal location in the city for holding fairs, exhibits, the celebration of the Fourth of July Parade, circus performances, etc. (Development, 2014) The ground is situated at a slightly lower level and hence water-logging is frequent issue during the monsoon.

From 360 household samples

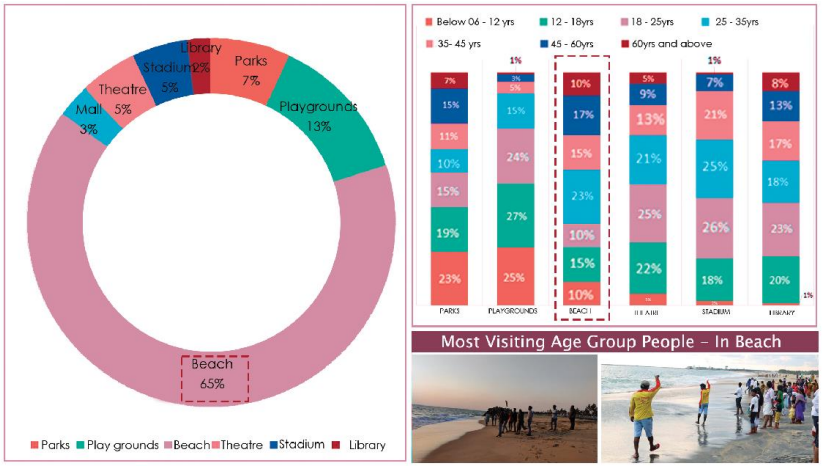


Figure 4. 37 Household preferences

Source: Household Survey conducted on 16/03/2023 to 20/03/23

- Thirumullavaram beach is the most safe and potential beach in Kollam District.
- Kollam beach is attracting many foreign as well as domestic tourists (most visiting is Varkala beach). This beach is facing so many issues related to maintenance & dangerous (took many lives due to high tide) (as per Integrated District Development Plan, 2009).
- Beaches at Thangassery, Mundakkal, Thanni, and Paravur beach acts more or less as local level recreation centres.
- Most of the age groups prefer beach equally than other recreational space, because the beaches are more accessible.

- KMC is maintaining the MG Park at Kollam beach through the PPP model; the prime concern is lack of periodic maintenance
- Small parks lack proper maintenance and up keeping and are therefore kept underutilized.
- Inadequate maintenance of TS Canal.
- The city is blessed with many beaches and lake fronts but these are not explored fully.

ISSUES

- KMC is maintaining the MG Park at Kollam beach through the PPP model; the prime concern is lack of periodic maintenance.
- Small parks lack proper maintenance and up keeping and are therefore kept underutilized.
- Inadequate maintenance of TS Canal.
- The city is blessed with many beaches and lake fronts but these are not explored fully.
- For the awareness and safety, 3 warning boards(blue) were put up by District Tourism Promotion Council and another 5(red) by City Police Commissioner.
- Their effectiveness is impacted by the absence of tools like red flags, ropes, iron rods, alarms, resuscitation equipment, and binoculars. According to the report, human carelessness is the main cause of accidents on Kollam Beach. The effect of antisocial characters on the beach is another fascinating discovery. (K, 2016)

Figure 4. 38 Issues relating to signages

Source: Primary survey 16/03/2023 to 20/03/23

4.4.2.2 Cause of accidents

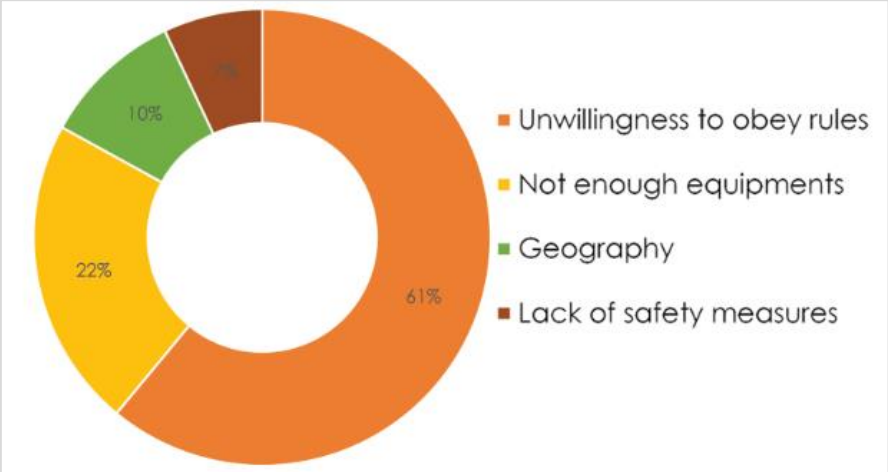


Figure 4. 39 Cause of accidents

Source: Stakeholder survey conducted 18/03/2023

According to the survey, the primary reason for accidents in Kollam beach is due to negligence of people. Another interesting find is the influence of anti-social elements in the beach. A lot of complaints were reported destroying public property built to help tourists. None of the signages being highlighted.

Figure 4. 40 View of beach from the entrance & None of the signages installed

Source: Photograph taken during primary survey

Potentials

- The existing parks and open space to be maintained for meeting the recreation demand of people. The water logging in parks to be removed by providing proper drainage facilities and the sides are to be planted with flowering trees and organized parking area.

- Beautification of TS Canal and Maithan can be done to promote peoples visit.
- Issues of Kollam Beach can be reduced by providing off shore breaker.
- Open Spaces are largely left uncovered it can be utilized as parks or open theatre to conduct more program.

4.4.3 Civic Amenities

Kollam has many important civic amenities to enhance the socio-cultural development of the people. The Kollam Municipal Corporation is rich in department level and administrative level offices and there are adequate level offices in the Panchayat area.

Civil Station, Kollam Corporation Office, Tourism Office (DTPC), ICDS Office, Gram Panchayat Offices, PWD Offices, Post Offices, Port Offices, Police Stations, Department of Urban Affairs, Regional Transport Office, District Treasury etc.

4.4.4 Health

Kollam city is served with efficient health infrastructure and all the wards in the city have easy access to health care systems.

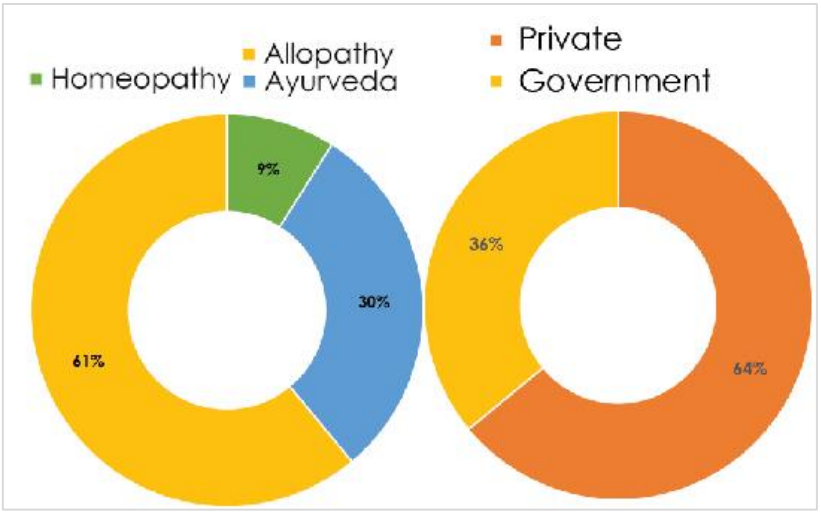


Figure 4. 41 Percentage of health care facilities

Source: Kerala vision 2030

Inference

- Major Recreational facilities are concentrated at the CBD area, within 1 to 5Km of radius from railway station.

- Frequent usage of recreational facilities is Thirumullavaram beach, Thangaserry beach, Kollam beach and Thanni beach (during weekend high volume of people visit these beaches) and other parks, open spaces, play grounds are less used than beaches.
- But the Kollam beach is dangerous (as per integrated District Development Plan, 2009) than any other beaches, government have taken various initiates to overcome (by providing in-shore sea breaker).
- Kollam Pooram and other important temples is one of the attracting tourist spots in Kollam.
- As per the IDDP and GKDP 2031, the health infrastructure in Kollam exceeds the standards prescribed in the URDPFI norms. In KMC (Kollam municipal corporation), at least one hospital with IP facility is accessible to all the wards within 2-3 km and is reachable to people within reasonable time.

CHAPTER 5 ANALYSIS AND ISSUES

This chapter deals with issues and its inferences after a detailed study. All issues are mentioned under its corresponding pillar for easy understanding. All sectors are analysed based on its importance to the development of the coastal region.

5.1 Four Pillar Analysis

ECONOMIC PILLAR

Dimensions	Elements	Issues and Inferences
Tourists' satisfaction and seasonality	Tourism seasonality Tourism satisfaction Tourist accommodations	➢ Major seasons from October - February, peak months are mainly April-September. During these months almost all the homestays/resorts will be filled too most. ➢ Tourists are not satisfied with overall activities and facilities available in the region. ➢ The accommodation facility available is of same category, there is no choice of higher or better options.
Supply chain	Tourism operations and services	➢ There is no huge investment on the base of tourism happening in the region. ➢ To increase the local economic diversity several programs were implemented by the ULBS, with the involvement local community.
Marketing and branding	Product demand Product available	➢ Investment by outsiders the area is medium in the region which needs to be enhanced. ➢ Tourism potential is still under exploration and there is need in infrastructure support in many areas. ➢ Shakthikulangara harbour, Thangassery port are the nature gifted marine wealth. ➢ Number of harbours, fish landing centres, ancillary facilities which will help in the development of fisheries. ➢ Fisheries tourism can be introduced to boost tourism sector as well as fisheries sector. ➢ Cashew processing and coir production which also serves the main attraction for the foreign tourist visiting the coastal regions.

SOCIO – CUTURAL PILLAR

Dimensions	Elements	Issues and Inferences
Socio-Economic employment	Socio-economic characteristics	➢ Majority of people in the study area depend of fishery sector as the main source of income and has been practicing it for a long time. ➢ People want to participate in tourism or related activities and some want to invest. ➢ Living standard of the people living in the coastal region has shown a visible variation after the emergence of tourism.

ENVIRONMENTAL PILLAR

Dimensions	Elements	Issues and Inferences
Waste Management	Solid waste Residual waste water	➢ Improper waste disposal and waste management near beach areas. ➢ Infrequent collection of biodegradable waste collection by the authority. ➢ Unscientific onsite disposal by residents. ➢ No specifications have been issued for the construction of septic tanks and septage management. ➢ Waterlogging issues during flash floods.
Natural Resource management	Water, climate management, Land change, disaster management, beach characteristics	➢ Clean and hygienic drinking water is available. dependence on open wells. ➢ The commercial land use is majorly concentrated at the core of the study area (1st order settlement) and along NH66 which provides an economic advantage. ➢ Sea Erosion is a perpetual threat in our study area Coastal beds. ➢ In Mayyanad, Shaktikulangara, villages are vulnerable points.

		➢ Thirumullavaram has sand dunes, while Kollam has rocky outcrops, and Mundakkal has rocky features. ➢ Eravipuram has boulders on the beach, while Thanni has sandbars. ➢ Paravur is unique in that it is an estuary with mud flats, and Kappil has sand dunes.

TRANSVERSAL PILLAR

Dimensions	Elements	Issues and Inferences
Safety and security	Safety and security	➢ Majority of people in the study area depend of fishery sector as the main source of income and has been practicing it for a long time. ➢ People want to participate in tourism or related activities and some want to invest. ➢ Living standard of the people living in the coastal region has shown a visible variation after the emergence of tourism.
Infrastructure services	Transportation services, Access to facilities	➢ Their effectiveness is impacted by the absence of tools like red flags, ropes, iron rods, alarms, resuscitation equipment, and binoculars. Accessibility of one of the issue damaged situations of the coastal road is a hurdle for the people to reach Chinnakkada. from Paravur.

5.2 Swot analysis

STRENGTH

- A proximity of multi modes of transit (port, railway station, national waterway Inland) will aid in developing and integrating tourist circuits and excelled export base of kollam.
- Activity and recreational zones within 10 kms radius from the transit nodes. Presence of 9 beach stretches and Ashramam Malthan provides adequate number of recreational spaces. Frequent usage of recreational facilities is Thirumullavaram beach.
- Thangaserry beach, Kollam beach and Thanni beach (during weekend high volume of people visit these beaches) and other parks, open spaces, play grounds are less used than beaches.
- Kollam have developed as one of the main commercial centres due to the presence of Neendakara and Thangassery port.
- Presence of NH66, bypass, coastal highway and National waterway 3 in our study area.
- The commercial land use is majorly concentrated at the core of the study area (1st order settlement) and along NH66 which provides an economic advantage.
- The Kollam Municipal corporation is the second-largest revenue co earning city corporation in Kerala. The major economy of the city is from the fishing sector where Kollam stands for the highest fish producing district of Kerala.
- Kollam has considerable number of harbours, fish landing centres, ancillary facilities, Coastal spots and waterbodies.

WEAKNESS

- Due to the presence of First order node where commercial concentration at the centre of our study area creates urban pressure
- KMC is maintaining the MG Park at Kollam beach through the PPP model: the prime concern is lack of periodic maintenance.
- No regulations to maintain and conserve the character of the heritage area of Thangasery and haphazard building development without preserving street character.
- Lack of tourist amenity center, interpretation center, accommodation etc.

- The inner-city tourist circuit is not well developed. The city is blessed with many beaches and lake fronts but these are not explored fully.
- Improper waste disposal and waste management near beach areas.
- The working population in our study area is less, so the contribution to the economy is low, this might be because of fewer job alternatives.
- Large scale industries like Parvathy mills. Kerala prime pipe factory are in declining stage. There is absence of Infrastructure facilities like truck terminals and freight corridors for industrial growth.
- Lack of local people's knowledge and skill.

OPPORTUNITY

- The new coastal highway can help in the development of new commercial nodes and tourist destination.
- Willingness of people to participate in tourism or related activities and some want to invest.
- Most of the age groups prefer beach equally than other recreational space, because the beaches are more accessible.
- Several upcoming projects in the coastal port region including harbour renovation new passenger and cargo terminals will boost the economy.
- Water based adventure tourism and fisheries based four-ism can be developed.
- Fisheries tourism and export through Kollam Port can be introduced which will help to boost the fisheries & tourism sector,
- Presence of backwaters, coast and heritage structures have the potential to attract more domestic and international tourists.
- Kollam has considerable number of harbours, fish landing centres, ancillary facilities and water bodies has high potential for duck farms: which will help in the development of fisheries sector.

THREAT

- Visitors to the beach also tend to litter the area and beach pollution is extremely hazardous to other bio forms living on the beach.
- The lack of equipment’s like red flags, ropes, iron rods, alarms, resuscitation equipment’s and binoculars affect their efficiency.

- Primary reason for accidents in Kollam beach is due to negligence of people.
- Steep beach slope at Kollam beach is dangerous and makes it unsafe for tourism and related activities.
- Improper waste disposal and waste management near beach areas.
- Improper maintenance of liquid & solid waste management leads to depletion in small craft-based fisher folk.
- CRZ Encroachments
- Sea Erosion is a perpetual threat in our study area Coastal beds in Mayyanad, Shaktikulangara, villages are vulnerable points. 18 houses were damaged due to this severe sea erosion on June, 2012 and 12 families 36 persons) were rehabilitated at temporary camp at CVM LP School at Thanni.

CHAPTER 6 CASE STUDY

6.1 Case study 1: Galle, Sri Lanka

Introduction

The coastline of Sri Lanka is a vital lifeline that supports the nation's social and economic advancement. The bulk of people who live along the shore rely on its natural resources for their food, livelihoods, and housing. 33 percent of Sri Lanka's population lives in the coastline region, which makes up 24% of the country's total land area. The coastal region of the country has 65% of the country's built-up areas, and it is home to 45% of the region's population (Kumara, 2021). Overall, the coastal region of Sri Lanka accounts for 40% of the country's GDP, has 50% of the nation's developed infrastructure, and provides 90% of the country's industry and seafood output.

To study the strategies in the Galle coastal region of Sri Lanka and how these study the various issues, analyse tourism development and management strategies can be adopted in Coastal Belt of Kollam.

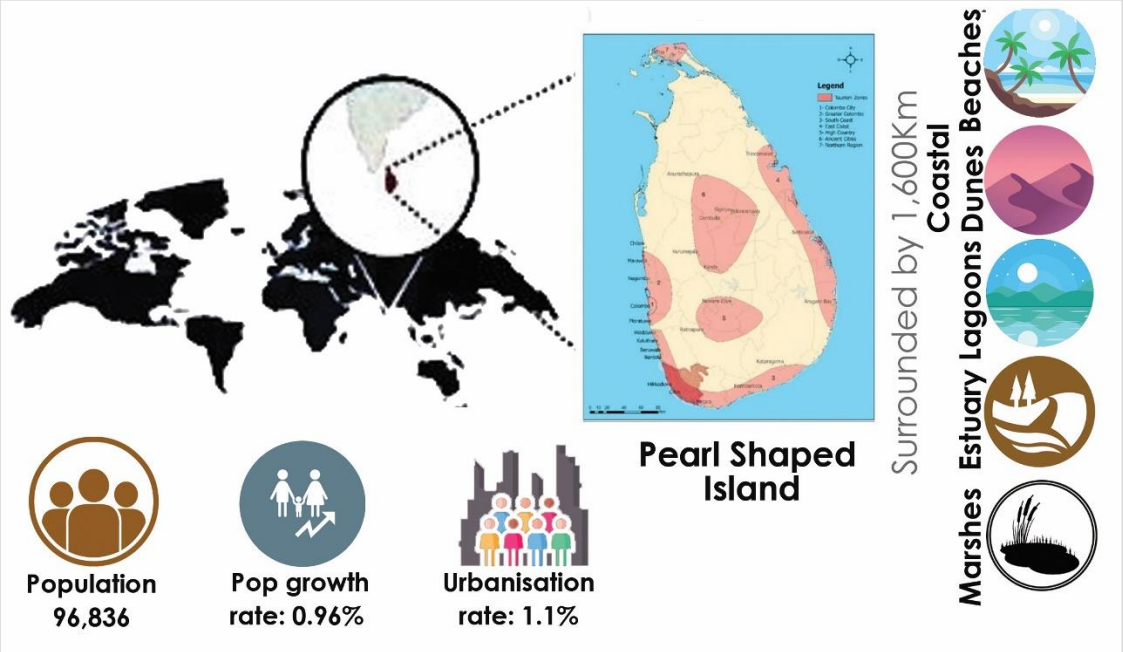


Figure 6. 1 Location map of Galle, Sri Lanka

Source: (Koop, 2022)

Along Sri Lanka's southern coast, 116 km separate Colombo from the coastal resort of Galle. This town, which is in a rainy area, receives 2377.9 mm of rain annually from the

South-West Monsoon. The humidity ranges from 80 to 88 percent, and the average annual temperature is 26.7 0 Galle, a well-liked tourist destination in Sri Lanka's south, is well-known for its stunning beaches, old fort, and cultural attractions. The area has a colourful native culture and a rich history that includes colonisers like the Portuguese, Dutch, and British.

Despite being the largest metropolitan centre in the Galle District and a place with a lot of potential for development, Galle hasn't been consciously used to further development. (Authority, 2018) The other two major local industries that offer prospects for cash generation in the city are fishing and tourism. (Council, 2006)

- Fisheries and tourism are the other two major industries that offer potential for the city to generate income globally.
- The country's fishing sector provides 1.3% of the GDP, while Tangalle and Galle, two of the 15 fisheries districts, are responsible for 27% of the nation's total marine fish production.
- In addition, the agricultural sector—particularly paddy and other minor export crops—holds a significant proportion of the city's economy.

6.1.1 Galle tourism stastics

Table 6. 1 Tourism Statistics

Source: (RanawakaChathushka, 2014)

Year	Tourists Arrivals before	Tourists Arrivals after	%increase in tourist arrivals	Revenue before (USD)	Revenue after (USD)	% Increase in revenue	Employment before	Employment after	% Increase in Employment
2015	100,000	120,000	20%	50 million	60 million	20%	5,000	5,000	20%
2016	120,000	140,000	17%	60 million	70million	16.7%	6,000	7,000	16.7%
2017	140,000	160,000	14.3%	70million	80million	14.3%	7,000	8,000	14.3%
2018	160,000	180,000	12.5%	80million	90million	12.5%	8,000	9,000	12.5%
2019	180,000	200,000	11.1%	90million	100million	16.7%	9,000	10,000	11.1%

6.1.2 Capital investments

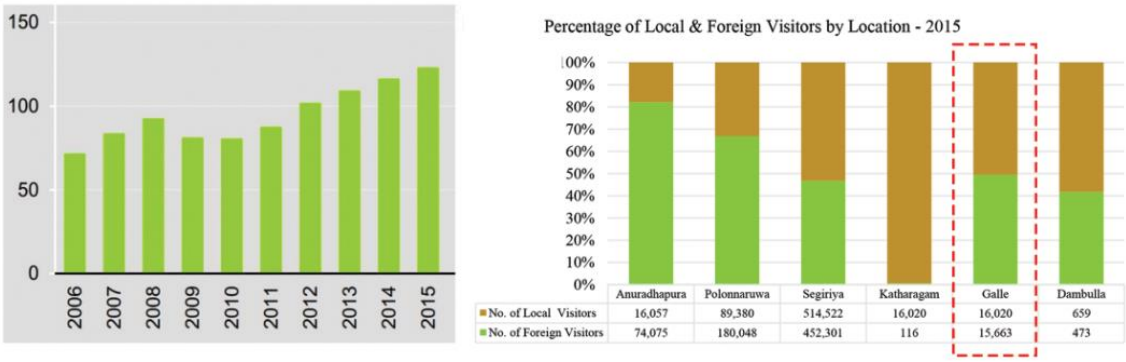


Figure 6. 2 Capital investments and foreign visitors

Source: (Bank, Sri Lanka: Managing Coastal Natural Wealth, 2017)

6.1.3 Issues

Table 6. 2 Potential issues and elements

Elements	Potential issues
Beaches	Overcrowding, pollution, littering, erosion, loss of natural habitats: - Unawatuna Beach, Hikkaduwa Beach, Mirissa Beach
Coastal infrastructure	Unplanned/haphazard development, encroachment on sensitive areas, strain on local resources, inadequate infrastructure management
Marine ecosystems	Overfishing, destructive fishing practices, pollution, damage to coral reefs and other habitats
Local communities	Displacement, loss of livelihoods, social/economic inequalities, conflicts over land/resource allocation
Visitor Management	Overcrowding, improper waste disposal, disturbance to local communities, irresponsible tourist behaviour
Environmental conservation	Pollution, habitat destruction, wildlife disturbance, inadequate conservation measures
Climate change resilience	Increased vulnerability to climate change impacts, need for adaptation/mitigation measures
Cultural heritage	Damage to cultural sites/practices, lack of community involvement, inadequate preservation/promotion of local cultural heritage

6.1.4 Development plan for Galle

The city structure with specialised activity centres will be formed with functional integrity, considering the ideal locations for such amenities. As a result, the concept for the

development plan was properly created after taking into account the huge array of growth potentials in Greater Galle. (Authority, 2018)

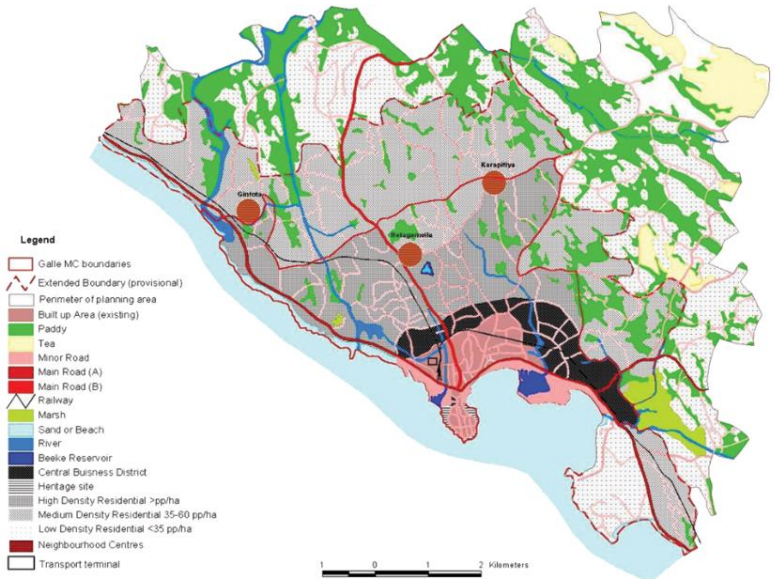


Figure 6. 3 Development Plan for Galle

Source: (Authority, Development plan for Greater Galle area 2019 - 2030, Volume 1, 2019)

6.1.5 Zoning plan

Growth of the tourism industry as a regional hub, historical preservation, natural ecosystem preservation in order to reduce the impact of natural calamities, and eventually, planned development through zoning and a set of rules.

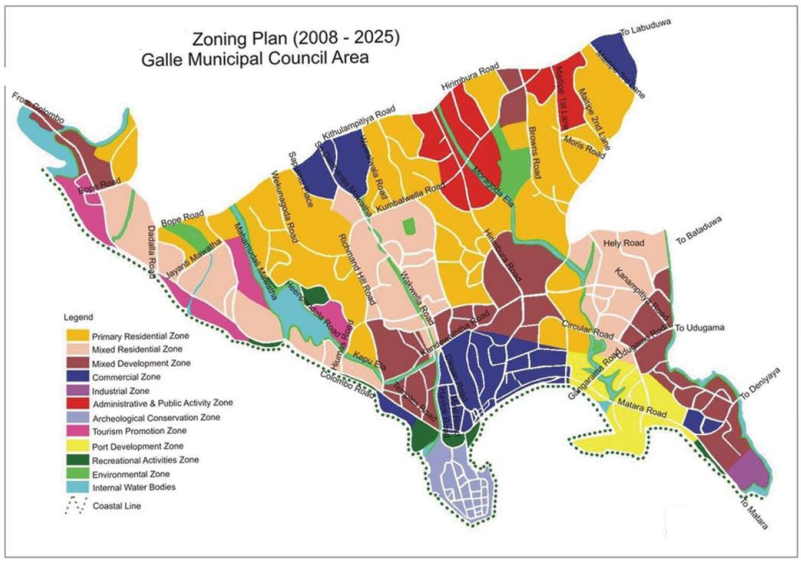


Figure 6. 4 Zoning Plan

Source: (Authority, Development plan for Greater Galle area 2019 - 2030, Volume 1, 2019)

6.1.6 Concept plan

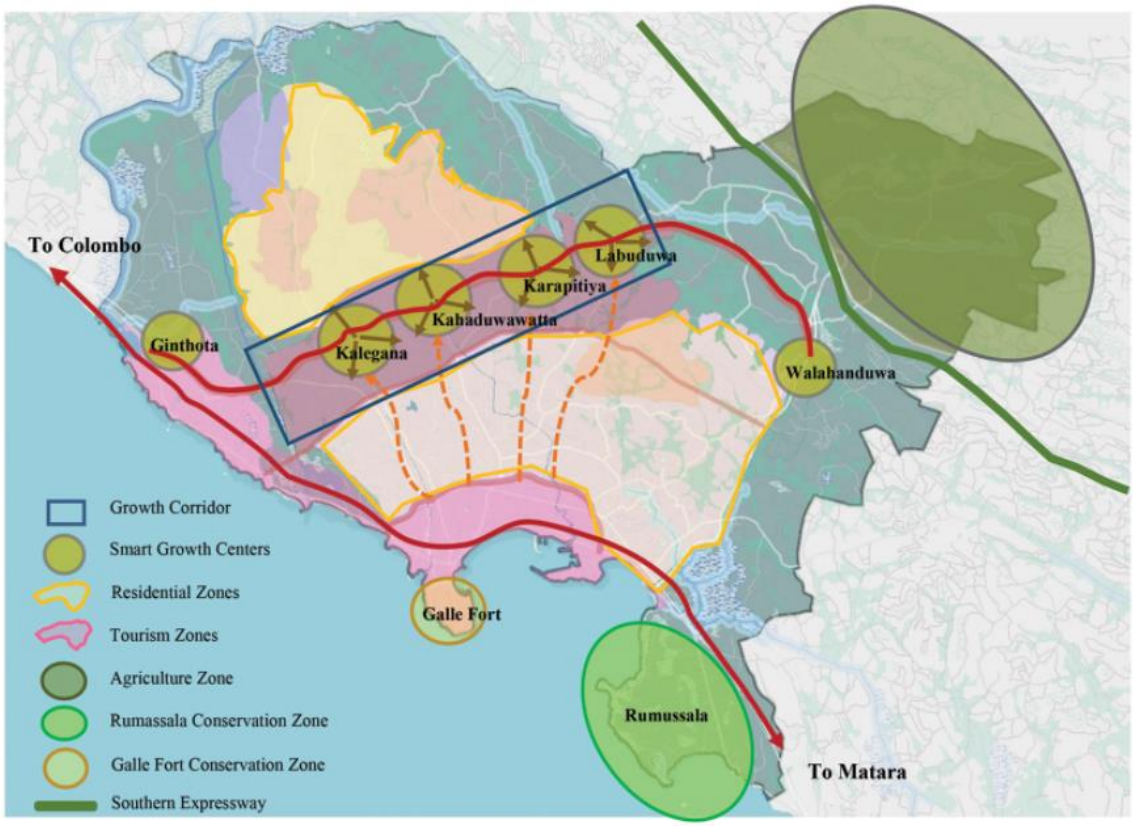


Figure 6. 5 Concept Plan

Source: (Authority, Development plan for Greater Galle area 2019 - 2030, Volume 1, 2019)

6.1.6.1 infrastructure development/ coastal tourism promotion

To enhance accessibility and the overall visitor experience, the government made investments in trash management programmes, public transportation, and road upgrades.

Create a Tourism Corridor: The coastline line is recommended to develop as a tourism corridor, providing new economic potential, adjacent to the tourism activities in the region. Gintota to Dewata's coast has been chosen as the beginning of this tourism corridor.

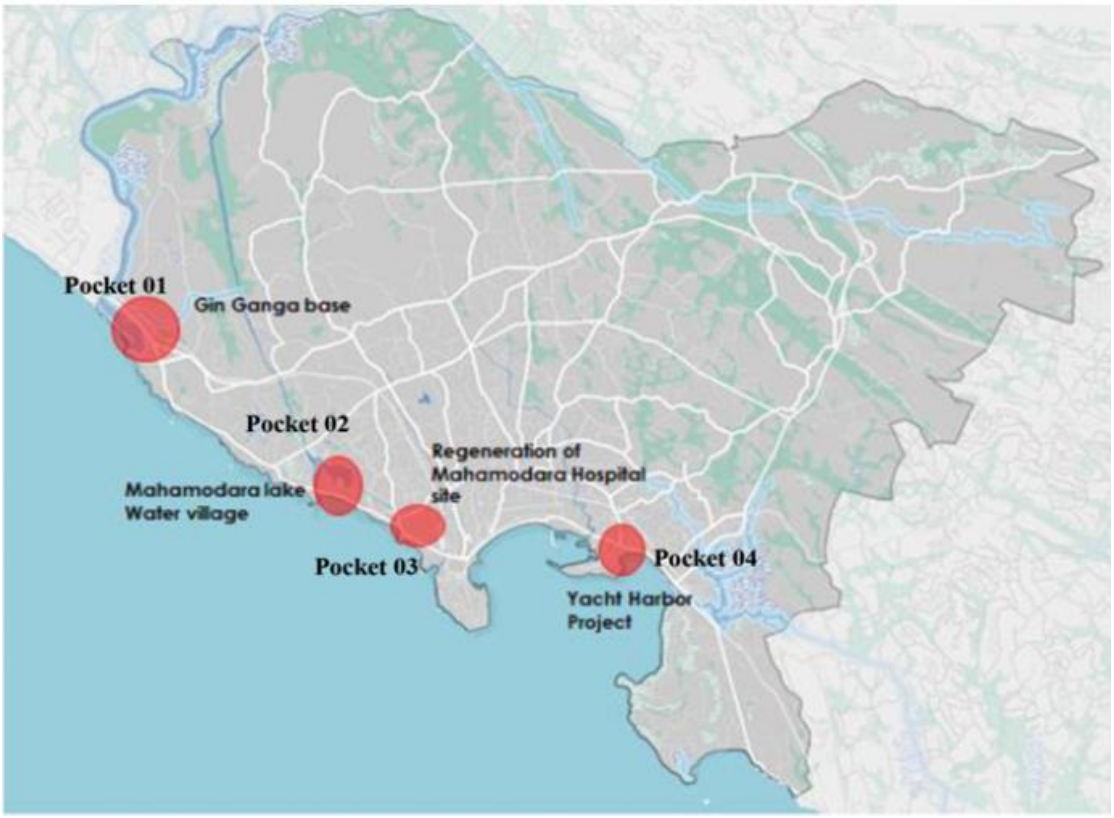


Figure 6. 6 Locations of proposed Tourism pockets

Source: (Authority, Development plan for Greater Galle area 2019 - 2030, Volume 1, 2019)

6.1.6.2 Attractions and accessibility

Pocket 01 – Gin Ganga base's aqua-based activity point

Activities/ Uses

- Cruise/ Boats
- Water jets – Sea
- Open Restaurants
- A jetty for cruise/ boats

Pocket 02 – Mahamodara Lake Water village

Activities/ Uses

- Aquatic Playgrounds
- Restaurants
- Water base leisure activities
- Cruise/ Boats

Pocket 03 – By establishing boat landing facilities and access points at designated sites, promoting boat/cruise service facilities along Mahamodara Lake, Kepu Ela, and Gin River

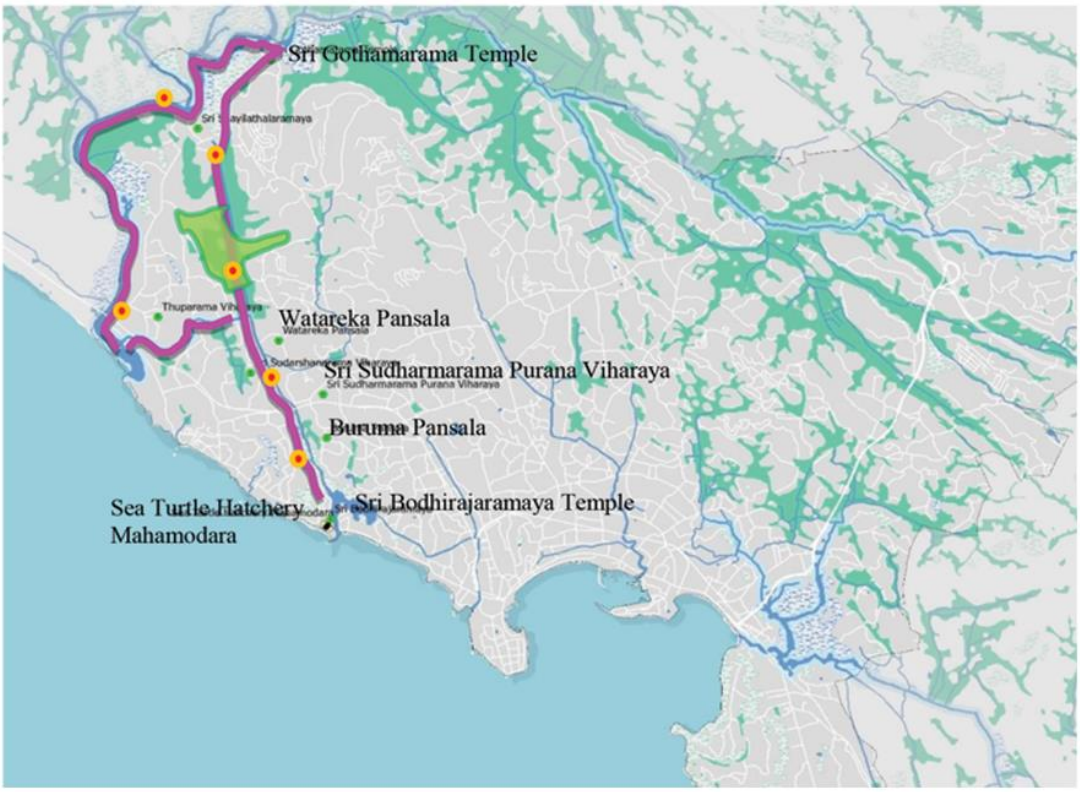


Figure 6. 7 Boat / Cruise Service facilities along Mahamodara Lake, Kepu Ela and Gin River

Source: (Authority, Development plan for Greater Galle area 2019 - 2030, Volume 1, 2019)

The idea would involve designating an area of 82 ha on either side of Kepu Ela for tourism-related businesses including restaurants and cabanas.

Fig**ure 6. 8 Cycle Bay**

Source: (Bank, Sri Lanka: Managing Coastal Natural Wealth, 2017)

Pocket 03 – Fishery tourism Activity Improvement Plan

The best possible use of the region's unique natural resources. Therefore, it is suggested that inland water bodies link with tourism activities in tandem to beachside growth.

Increase the number of known fish landing places along the shore, facilitate their improvement, and connect them to tourism endeavours.

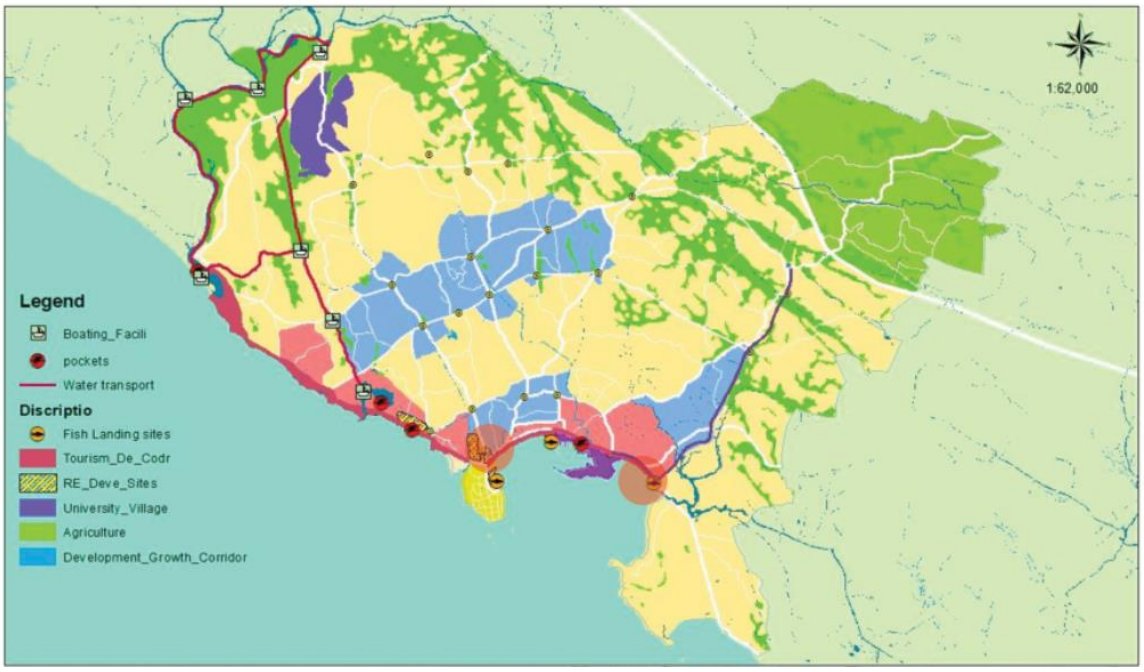


Figure 6. 9 Fishery tourism Activity Improvement Plan

Source: (Authority, Development plan for Greater Galle area 2019 - 2030, Volume 1, 2019)

1. Open Deck towards the sea & enhance the sea view
2. Re - organize buildings to enhance the Sea view

Figure 6. 10 Open decks

Source: UDA District Office,2017

- Building an ocean pathway from the premises of the Light House Hotel to Dewata Junction that is approximately 6 metres wide.
- Creating new access points along the Ocean route that connect Sea Street and Main Street for acupuncture.

IMPLEMENTING AGENCY:

Implemented by UDA, Galle MC, Strategic Cities Development Project

Figure 6. 11 Streetscape

Source: (Authority, Development plan for Greater Galle area 2019 - 2030, Volume 1, 2019)

6.1.7 Environmental challenges in coastal area

Additionally, there is a lot of natural and human-induced strain on coastal habitats. The coastal economy's ability to thrive economically in the future will rely on how aggressively environmental deterioration is stopped.

Due to the concentration of people, industry, and urban expansion in the restricted coastal space, coastal resources are deteriorating, especially in the Western and Southern regions.

Unsustainable practices

- Mangrove and seagrass harvesting
- Sand-Mining
- Collection of corals
- Removal of the buffering coastal vegetation
- Deforestation of Mangroves due to Shrimp Farming

Both natural and human-made processes have altered the shoreline. The dynamic coastline of Sri Lanka is constantly receding and accumulating; some changes are temporary while

others are more seasonal. The loss of beaches and the quality of the landscape, harm to homes, companies, and infrastructure, as well as the loss of individual homes, are the main manifestations of the economic effects.

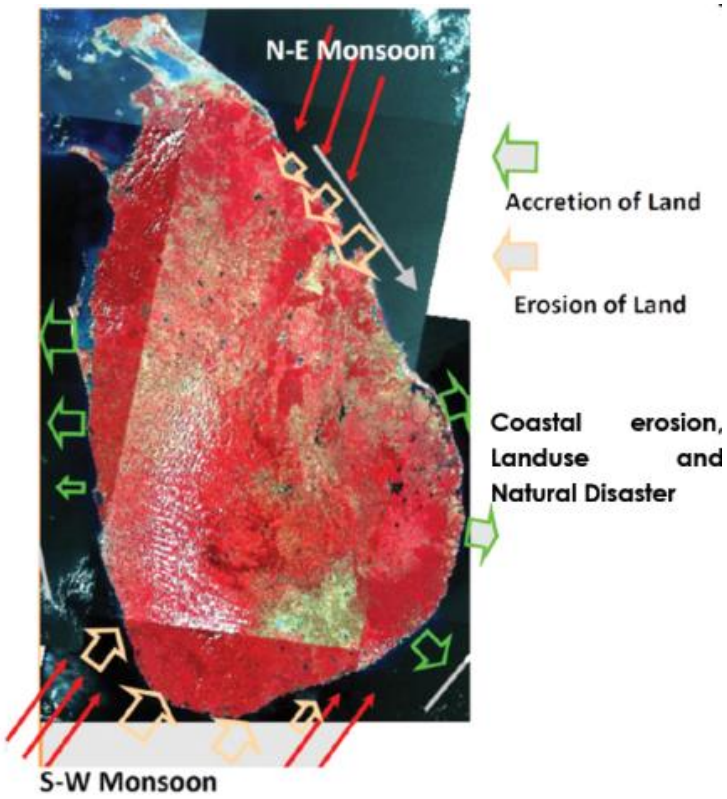


Figure 6. 12 Shoreline of Sri Lanka

Source: (Bank, Sri Lanka: Managing Coastal Natural Wealth, 2017)

The mechanisms causing coastal erosion are influenced by climate, natural catastrophes, and land use.

LOSS OF GREEN COVER AND SANDY BEACH IN GALLE HARBOUR

- Sand mining activities in rivers that are excessively and improperly located cause coastline erosion and beach retreat.
- The process of sand mining is primarily mechanised, which has serious negative effects because large quanones are extracted quickly.
- Between 1956 and 2007, there was a significant loss of green space and coastal sand due to unregulated development.

- Coral reef damage and depletion result from the exploitation of coral for construction materials.
- Sri Lanka passed the Coastal Conservation Act in 1981, which established the coastal zone's boundaries as being 2 km out to sea and 300 m inland from the high tide waterline.

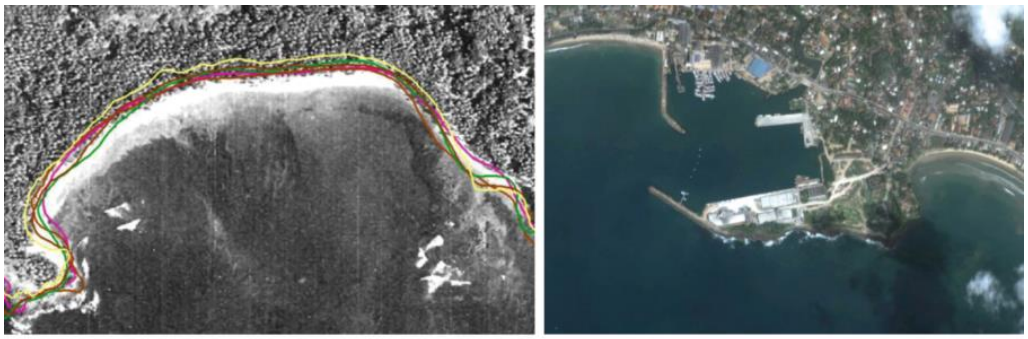


Figure 6. 13 Green cover changes

Source: (Bank, Sri Lanka: Managing Coastal Natural Wealth, 2017)

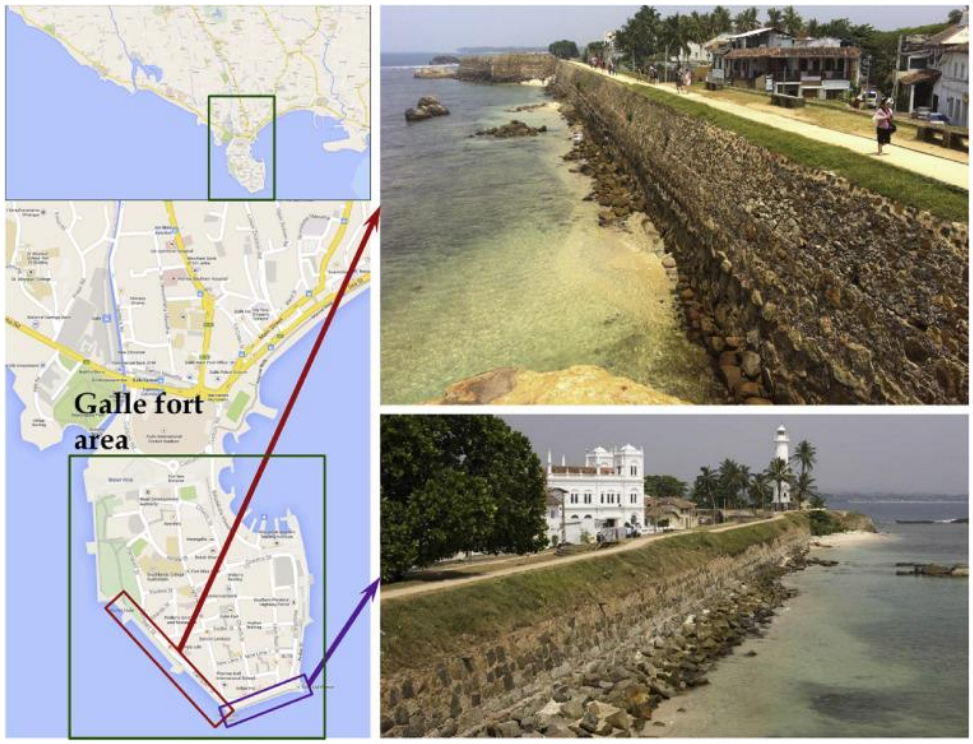
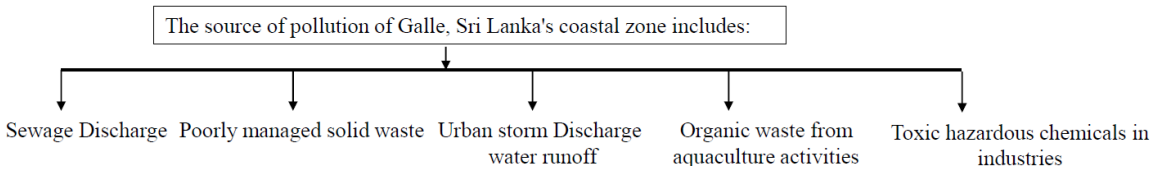


Figure 6. 14 Coastal erosion happened at Galle Fort

Source: (Bank, Sri Lanka: Managing Coastal Natural Wealth, 2017)

Coastal pollution

Waste and effluent contamination of water bodies and coastal waterways endangers the health of coastal systems.



- The condition of beaches and coastal waterways is impacted by improper solid waste management.
- Septic systems are present in less than 5% of the population.
- Water quality deterioration and visual policing of beaches and near-shore waterways have been caused by inadequate environmental infrastructure and lax management of tourism growth.
- Squatter communities that spontaneously sprung up near hotels and resorts add to the faecal contamination that endangers recreational pursuits like nautical sports in coastal waterways.
- In addition to natural reasons, pollution caused by humans also degrades many coral reefs, which lowers the value of tourism.

6.1.8 Coastal resilience and disaster management

- The physical, economic, and social effects of climate change on coastal regions are multifaceted.
- Increased coastal flooding, which results in the loss of lives and property, is only one of the many ways that sea level rise will affect the environment. saltwater intrusion, which decreases the availability of fresh water in coastal towns by contaminating fresh and groundwater sources. modified tidal range in estuaries and tidal river systems that may cause the extinction of estuarine ecosystems and alteration in sedimentation patterns.
- Tourism and fishing are the two industries most at risk from climate change.
- The quality of tourism goods may be affected by rising ocean temperatures and shifting weather patterns, which can have a substantial effect on coastal ecosystems.

- There is a compelling argument in favour of safeguarding and restoring coastal vegetation, especially mangroves, which are vital for the environment's ecological, biological, and social functions.

6.1.9 Coastal zone management

The main motivations for Sri Lanka's coastal zone management strategy are the concerns to solve four major issues:

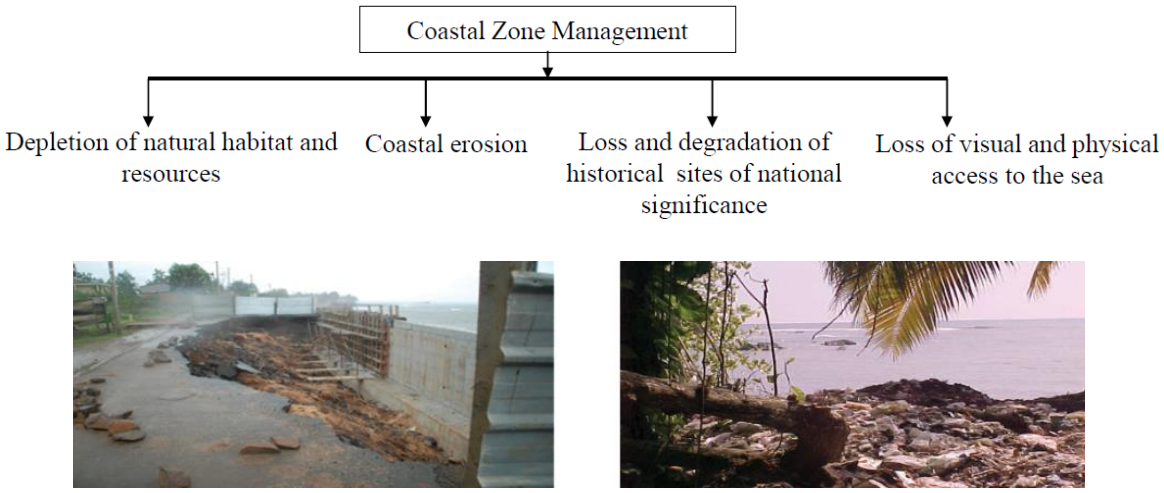


Figure 6. 15 Road eroded due to erosion and waste dumped near the beach areas

Source: (Bank, Sri Lanka: Managing Coastal Natural Wealth, 2017)

6.1.10 Strategies Proposed

6.1.10.1 Shoreline management

The erosion process is sped up by a variety of human activities in addition to its natural sources, such as storm surges, wave action variations, and river silt. Mining for river sand lowers the amount of sand that reaches the coastline, and constructing along the shoreline (too near to the beach) diminishes coastal stability, which in turn causes coastal erosion to grow significantly.

Strategy 1

Recognise patterns of coastal erosion Based on places with the greatest risk of erosion, prioritise protecting such regions.

Strategy 2

To reduce the effects of coastal erosion, employ strategy number two: develop shoreline management plans and coast protection programmes.

Strategy 3

Coastal zone regulations only should be used to approve new development activities,

Strategy 4

To guarantee a complete halt, more enforcement of the sea coral mining prohibition is required.

Strategy 5

Consider future sea level rise while developing a climate adaption strategy.

6.1.10.2 Management and conservation of coastal habitats

A total of nearly LKR 24,716 million was spent on the worldwide shipping of fisheries goods in 2015, including prawns, lobster, crab, sea cucumber, chank, shell, and other seafood. A wide diversity of flora and animals, including endangered marine mammals and reptiles, may be found in the coastal ecosystems, which are also very diversified. In addition to serving as spawning grounds for several commercial fish species, mangroves, coral reefs, estuaries, and lagoons also serve as buffer zones that play a crucial part in the protection of coastlines from storm surges, floods, and cyclones. In boosting seaside tourism, they are crucial as well. Protection of these ecosystems is essential.

Strategy 1

Promote the use of alternate sources of lime to protect coral reefs

Strategy 2

Prevent/reduce over-exploitation of reef creatures including aquarium fish, lobsters, chank, sea cucumbers, etc. by proper management practises.

Strategy 3

Reduce the amount that encroachments, reclamation, the removal of vegetation, and other development activities reduce the functional area of lagoons and estuaries.

Strategy 4

Reduce the negative effects of water diversion and irrigation systems on estuarine/lagoon habitats through initiatives. cooperative initiatives

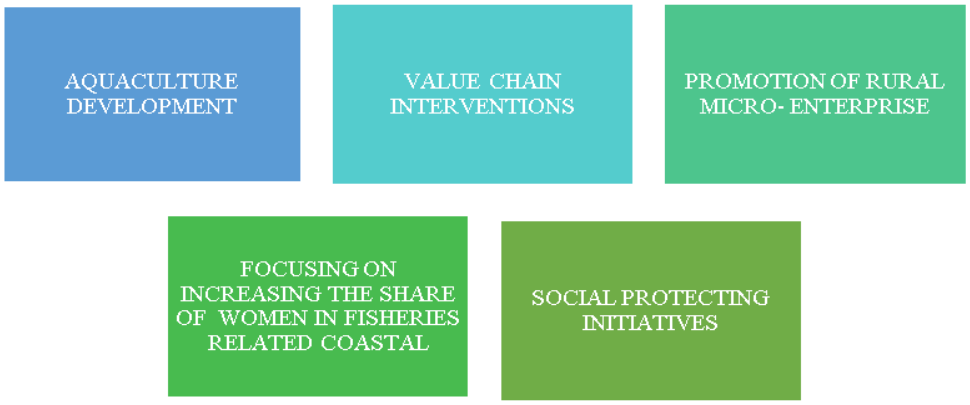
Strategy 5

Encourage community involvement and agency cooperation to manage mangroves sustainably for economic purposes.

Strategy 6

Encourage and encourage the application of the law to conserve mangroves in the coastal area reduce the negative effects of development activities on barrier beaches, spits, and sand dunes by establishing dune protection lines (DPLS) and adopting regulatory measures.

Livelihoods and social inclusion



Disaster risk management

Spatial planning should be built on the principles of "limited use" and "non-use" to protect coastal resources from overexploitation. Climate change adaptation into coastal management.

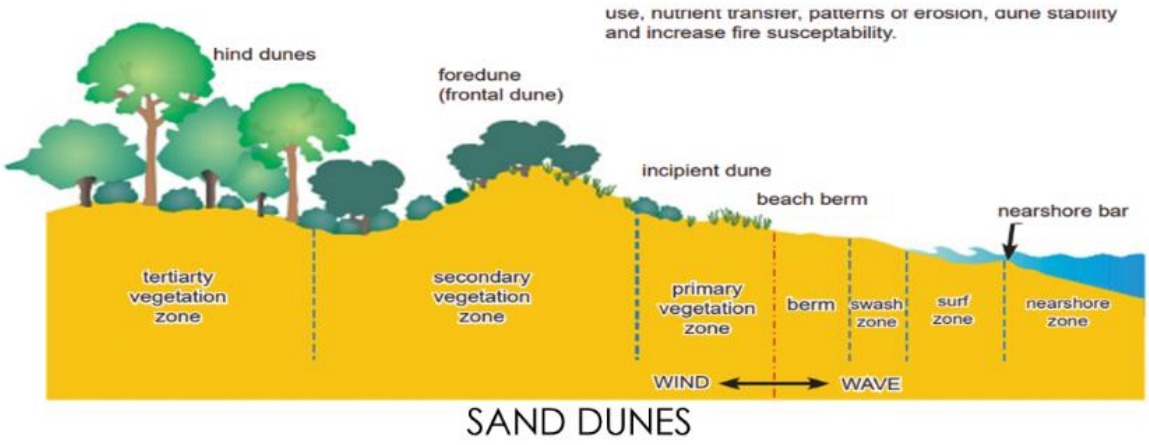


Figure 6. 16 Beach Nourishment using sand dunes

In order to provide stability, increased energy dissipation, and erosion resistance, dunes on which coastal vegetation has developed function better. In terms of protecting against coastal floods, sand dunes have excelled.

6.1.11 Inference

Galle, Sri Lanka, has successfully developed its coastal tourism industry through a holistic approach. Model for other coastal regions seeking to develop their tourism industry in a sustainable and responsible manner. For an integrated coastal area management plan, measures which mitigate the impact of the coastal hazard and protect the community needs to be considered.

6.2 Case study 2: Cha-am beach

In the Western Gulf of Thailand (WGOT), one of the most well-known coastal tourist spots is Cha-am, which has experienced major coastal urbanisation expansion. The famous international beach of Hua-hin is connected to the neighbourhood. (Sussaangana Unhasuta, 2021) The Cha-am Coast is situated in CATM, Phetchaburi Province, 170 kilometres south of Bangkok, and 20 kilometres north of Hua-hin, a well-known beach resort town.

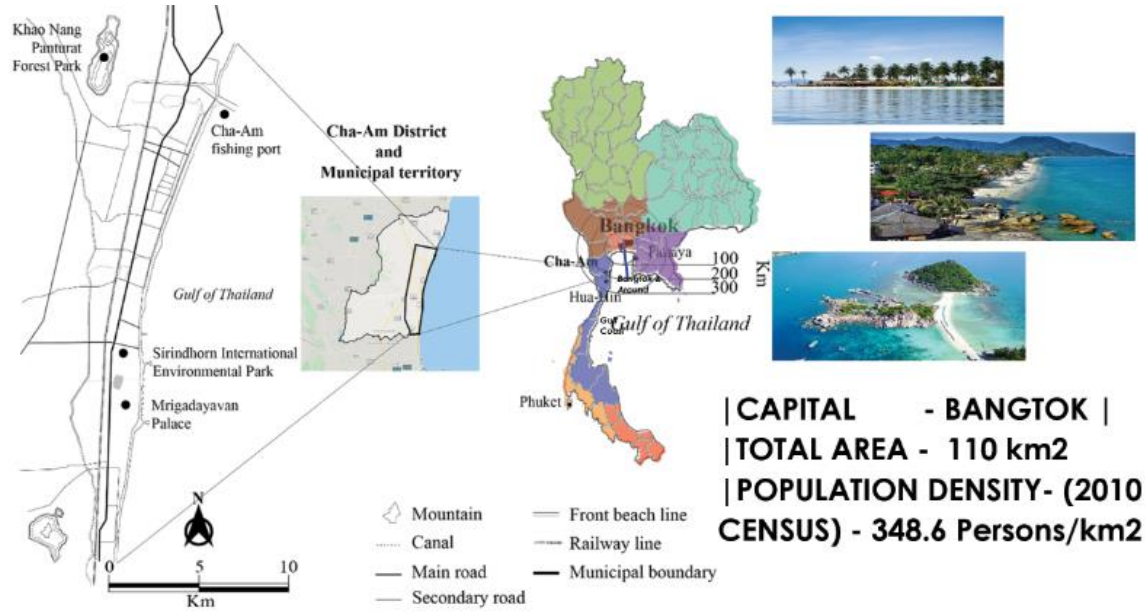


Figure 6. 17 Location map of Cha-am Beach

Source: (Department of Public works and Town & Country Planning (DPT). Cha-am District Development Planning Report; DPT: Bangkok, Thailand, 2016.)

Why Cha-am coast?

The Cha-am coast, a well-liked seaside vacation spot. international beach vacation spot. Selection standards: How Cha-am, a coastal beach attraction, has developed its coastal tourist industry. Thailand was ranked #35 out of 141 countries in the World Economic Forum's assessment of the Travel and Tourism Competitiveness Index (TTCI), coming in third among the most popular destinations for tropical beach vacations. Thailand scored particularly well in the areas of natural resources (#16), air transport infrastructure (#17), tourist service infrastructure (#23), and coastal tourism (#16).

Coastal tourism

- Infrastructure
- Water
- scenic beauty
- Biodiversity rich
- Cultural heritage diversity
- Seafood

6.2.1 Tourism lifecycle

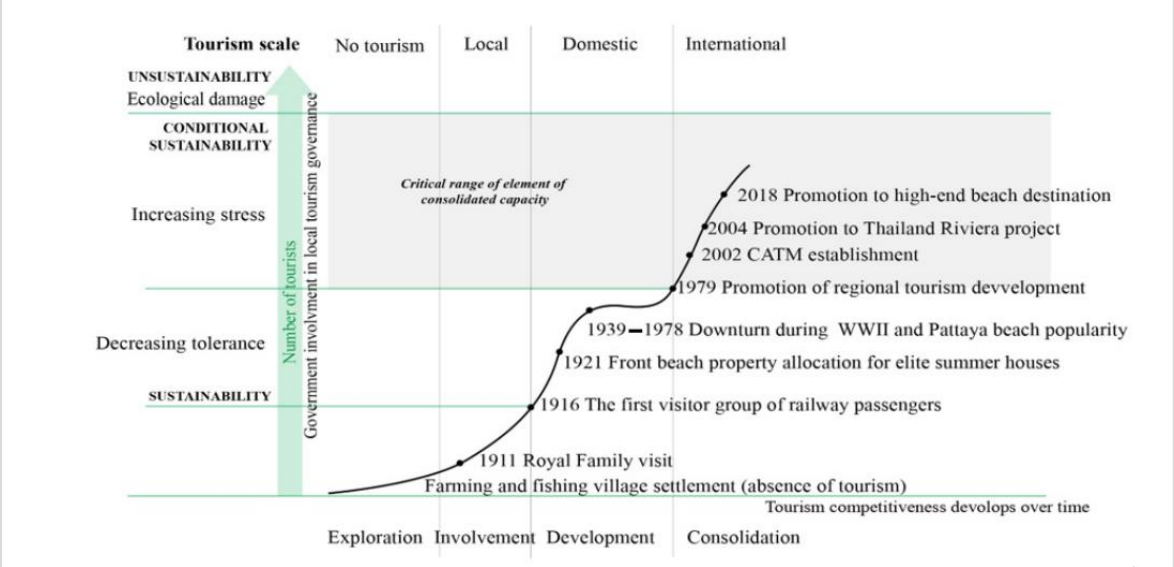


Figure 6. 18 Tourism lifecycle

Source: (Sussaangana Unhasuta, 2021)

6.2.2 Land use analysis

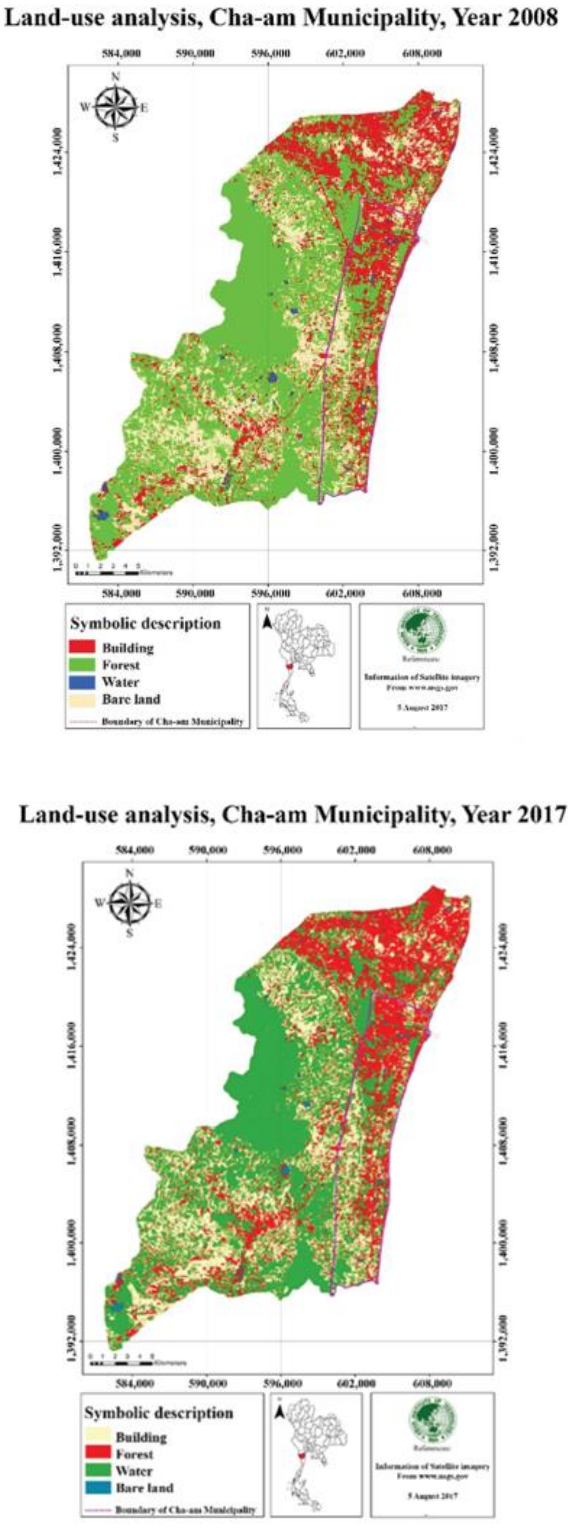


Figure 6. 19 Comparative land-use change analysis in Cha-am coastal urban expansion, the years 2008 and 2017

Source: (Sussaangana Unhasuta, 2021)

Building areas have grown by 1.86%, while forest and arid terrain areas have shrunk by 1.48% and 0.48%, respectively. (Sussaangana Unhasuta, 2021)

6.2.3 Analysis and Issues

Table 6. 3 An analysis of the Coastal tourism

Source: ((UNDP), 2018),(DPT: Bangkok, Thailand, 2016)

Name of Organizations	The beach management strategic plans and policies	Five elements of the beach tourism attraction				
		(1) Tourist Attractions	(2) Accessibility	(3) Accommodation	(4) Tourism Activities	(5) Amenities and Security
Songkhla Municipality (2012-2016)	• Societal management				+	*
	• Revenue management					+
	• Natural resources and environmental management	+				
	• Infrastructure management					*
Office of Songkhla Tourism and Sport	• To develop quality and safety of tourism products and services	+				*
	• To promote quality tourism for the sustainable growth		*		+	*
	• To promote the creative economy in tourism and sport				+	
Songkhla Provincial Administrative Organization (PAO) (2012-2017)	• To develop sufficient and modern public infrastructure					*
	• To promote tourism and sport	*	+		+	*
	• To manage natural resources and environment	*				
Tourism Authority of Thailand (TAT): Songkhla and Phattalung Service Branch	• To promote the brand image of Thailand	+	+	+	+	+
	• To create marketing promotion				+	
	• To promote tourism products and services	+				

6.2.4 Proposals

6.2.4.1 Cluster based tourism

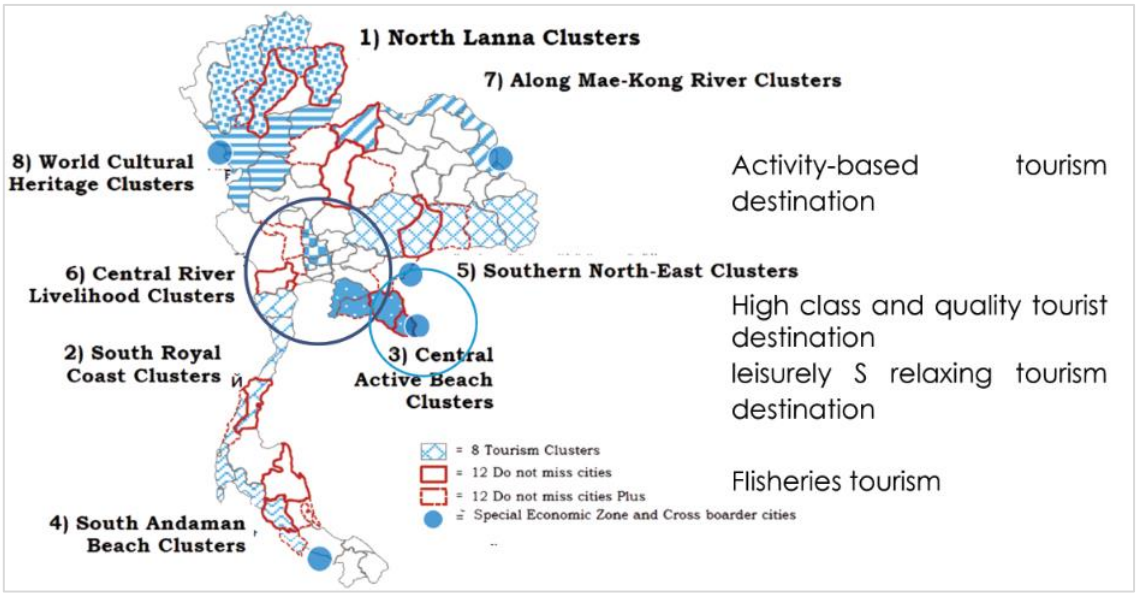


Figure 6. 20 Cluster based tourism

Source: (Pacific, 2019)

6.2.4.2 Coastal tourism circuit

Attraction: Hua Hin and Cha-am should be connected to ensure adequate tourism capacity and quality, and that royal projects in Phetchaburi and Prachuap Khiri Khan.

Culture enhancement: Organising the festival requires close collaboration between Hua Hin Municipality and Thailand Convention and Exhibition Bureau.

Accessibility: New roads will need to be built to ease traffic and allow access to spectacular views along the coastline.

Fresh water resources: along the coastline will have to be well-regulated to prevent conflicts from arising between the farm and tourism sectors when demands from the latter grow.

Figure 6. 21 Coastal tourism circuit

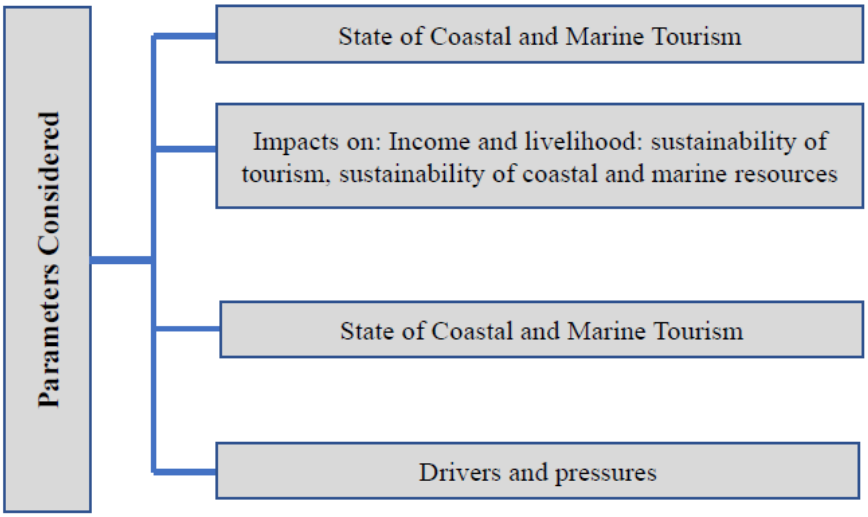
Source (UNWTO, Thailand set to fast-track riviera project to promote coastal provinces, 2018)

Four coastal provinces known as the "Thailand Riviera" will be the focus of a marketing campaign led by the Tourism Authority of Thailand (TAT), with the aim of creating tourism revenue for the locals, communities, and companies. (UNWTO, Thailand set to fast-track riviera project to promote coastal provinces, 2018)

The provinces of Phetchaburi, Prachuap Khiri Khan, Chumphon, and Ranong will be enhanced as part of a comprehensive Master Plan created by the Ministry of Tourism and

Sports to fully realise their potential for natural, cultural, historical, culinary, sports, and community-based tourism community-based tourism.

6.2.4.3 BLUE ECONOMY



Coral reefs, mangrove forests, seagrass beds, and varied beach habitats are just a few examples of the diverse range of creatures and ecosystems found in marine and coastal locations.

6.2.5 Some practices adopted

1. COBSEA's Secretariat, which serves as the Coordinating Body on the Seas of East Asia (COBSEA), organised the Green Fins initiative in 2004.

The program's primary goal is to provide dive operators with support so they can reduce the negative effects that diving and snorkelling have on the environment. A network for the defence, preservation, and sustainable usage of coral reefs will be formed by Green Fins members.

By the Phuket Marine Biological Centre (PMBC) and DMCR, Thailand launched the Green Fins Programme in 2004.

2. **Khung Kraben Bay Royal Development Study Centre**

The Kraben Khung Bay Royal Development Study Centre, a royal initiative project of H.E. King Rama IX, is situated in Kraben Khung Bay, Chantaburi Province. The project's goal was to advance locals' well-being while preserving the maritime environment,

particularly mangrove forests. The centre has concentrated on reducing and avoiding pollution from shrimp farms in order to promote the growth of sustainable shrimp farming. A training course on managing coastal resources, managing forests, and conserving soil and water is also offered to the community by the facility.

The facility has given visitors with a range of activities to educate them about sustainable fisheries, aquaculture, and agricultural development, as well as local culture, way of life, and environmental protection.

3. **Bor Hin Farmstay, Amphor Sikao, Trang province**

Seagrasses play multiple ecological roles in the coastal system, and Bor Hin Farmstay established a "Seagrass Seeding Bank" to help preserve the biodiversity in Thailand.

6.2.6 Tourism strategies

Strategy 1: Creating new tourism goods, services, and attractions while promoting their sustainability, environmental friendliness, and Thainess.

Measures:

- Boost the standards of tourism offers for all types of travellers.
- Create tourist products that respect environmental and cultural sustainability.
- Develop tourism offers in a balanced way across all time and geographic locations.

Initiatives:

- Leading destination through cultural coastal and medical tourism, Wellness tourism, gastronomy tourism, MICE, Shopping and sports tourism Travel tourism etc.
- Maintaining Thainess and preserving local heritage and sustainability.
- Environmental sustainability through stake holder participation.

Strategy 2: Supportive infrastructure and amenities development and improvement without having a disadvantage on the local communities and environment.

Measures:

- Support increased visitor arrivals by expanding the logistical network. build and enhance tools.

- Develop and improve amenities, safety and hygiene for Cham-am coastal tourism.

Initiatives:

- Creation of tourist subclusters to open lesser-known regions maintaining a healthy level of tourists both during peak season and off-peak.
- Accessibility and connectivity of domestic aviation.
- Shuttle services for domestic land and rail transportation to touristic centres.
- Facilitating transit mode inside cities.
- A single card for installing wifi hotspots, many modes, and an IT platform or app for full online travel information.
- Disaster management systems and checkpoint waste distribution mechanism.

Strategy 3: Growth of tourism's potential for human capital's development consciousness among people and the tourism Thai.

Measures:

- Increasing the capacity of those working in the tourist sector will help them become more competitive and comply to international norms.
- Develop tourist sector human resources that are suited to the market's resources.
- Develop tourist sector human resources that are suited to the market's resources.
- Give local communities the tools they need to support, participate in, and profit from tourism.

Initiatives:

- Workforce participation in the accommodation industry.
- Involvement of the local workers in skill development and local security.
- Development of tourism-related skills in the neighbourhood Workshop and certification incentives to support education and better company management Thai locals are aware of local heritage and its preservation.
- Develop the populace's business skills Tourism and services provided by the community.

Strategy 4: Balance created between target groups of tourism through targeted marketing that embraces threatens and creates confidence among tourism.

Measures:

- Reiterate Thailand's reputation as a quality and secure destination.
- Use customised marketing to draw and promote visitors from a certain group. Promote and highlight Thailand's distinctiveness as a destination.
- To achieve a balance between place and time, promote domestic tourism.
- Boost marketing initiatives by collaborating with stakeholders and using technology.

Initiatives:

- Providing travellers with high-quality service through evaluation and rating. educating visitors on the fundamental laws, rules, and behaviour expected inside the country.
- Thainess and individuality in tourism services.
- Promoting the distinctiveness of each area or province, as well as any associated arts or crafts (postcards with stamps).
- Targeted advertising for key visitor demographics targeted advertising for tourist segments that have the potential to grow, such as wellness tourism.
- Prevalence of off-season travel increased construction and focus on less-traveled areas to spread the population.

Strategy 5: Organisation of cooperation and integration between the public, private, and general public sectors in the development and management of tourism.

Measures:

- To assist efficient tourist development, encourage excellent management and governance.
- To assist the growth of the tourist industry, enhance and integrate laws, regulations, and standards related to tourism.
- Encourage the creation of the Tourism Intelligence Centre and private investment. Improve international cooperation in the development of sea side tourism.

Initiatives:

- Clarification and application of the tourist legislation.
- Collaboration will make it simpler for residents and visitors to report crimes.
- Raise the bar for national tourism service standards.
- Encourage cooperative marketing initiatives and regional tourism corridors.
- Improved travel convenience and regional connections.

6.2.7 Inference

The attractive image of the destination can enhance number of tourists and establish the link between the favorable attitude of native communities and tourists in order to prevent the distress caused by unregulated tourism. Sustainable tourism development, the Thai government and tourism industry stakeholders are taking steps to address these issues by protecting coastal ecosystems and promoting responsible tourism practices. Therefore, it is important to continue promoting sustainable tourism practices to ensure the long-term viability of the industry while minimizing its negative impacts on the environment.

CHAPTER 7 PROPOSALS AND RECCOMENDATION

7.1 Vision

Establish a sustainable and thriving ***coastal tourism destination*** on the ***Kollam-Paravur stretch*** that not only boosts ***the local economy and maximizes*** the benefits to the ***local community*** but also ***safeguarding the natural environment for future generations.***

7.2 Mission

Coastal spots integration: Enhance the attractions, accessibility, and infrastructure of coastal tourism along the Kollam Paravur stretch, creating a world-class destination that balances economic growth with environmental sustainability and benefits the local community.

Inter sector linkage: Foster sectoral linkages in coastal tourism along the stretch, promoting collaboration between various industries to create a sustainable and integrated destination that enhances the economic, social prosperity and provides visitors with a unique and authentic travel experience.

Coastal Resilience: Enhance resilience to hazard by implementing adaptation strategies along coastal area of Kollam and preserving biodiversity.

7.3 Concept

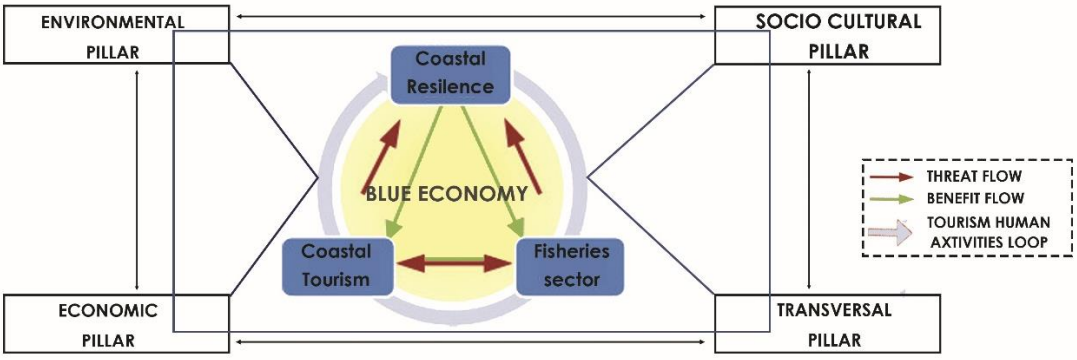


Figure 7. 1 Concept of Development Plan

Source: Author Generated

7.4 Goals

Transverse Pillar

- Development and beautification of beaches by introducing watch-towers, water sports activities and eco restoration along the beach embankment for the visitors.

- Developing the physical infrastructure and amenities necessary for sustainable coastal tourism.
- Improvement and preservation of cultural and historical traditions in Kollam by protecting built heritages.
- Including Thangassery Fort, Cheena Kottaram, Thevally Palace, Munroe Residence introducing coastal tourism circuits, revitalize native cultures.

Economic Pillar and Socio-Cultural Pillar

- Improving Kollam's potential places rich in seafood, and seafood tourism can be promoted to attract tourists to the region.
- Incorporating Inclusive community-based approaches in tackling the economic down thrust during off seasonal periods by initiating temporary active hubs, showcasing local handicrafts, seafood cusines, fishing.
- Incorporating the coastal stretch spots has a diverse character with its urban context, heritage areas, beaches, industries with coastal Tourism potential.
- Establish strong marketing platform to respectfully promote the destinations coastal tourism experiences.
- Creation of new employment opportunities by direct and indirect employment opportunities.

Environmental Pillar

- Implementing soft and pro-active disaster management methods, proper maintenance of existing sea walls and breakwaters etc to combat increasing coastal erosion and tidal surges
- Limiting Deforestation of mangroves and sand mining through bio-shield (Green belts) would represent an appropriate protection measure, as increased coastal erosion is likely to affect these systems.

Figure 7. 2 Development plan

Source: Author generated

6.5 Transversal Pillar

6.5.1 Infrastructure development

1. Developing Kollam Beach to Thirumullavaram by introducing hardscape, lighting, signage, landscaping, with proper solid waste management by utilizing extensive public participation.

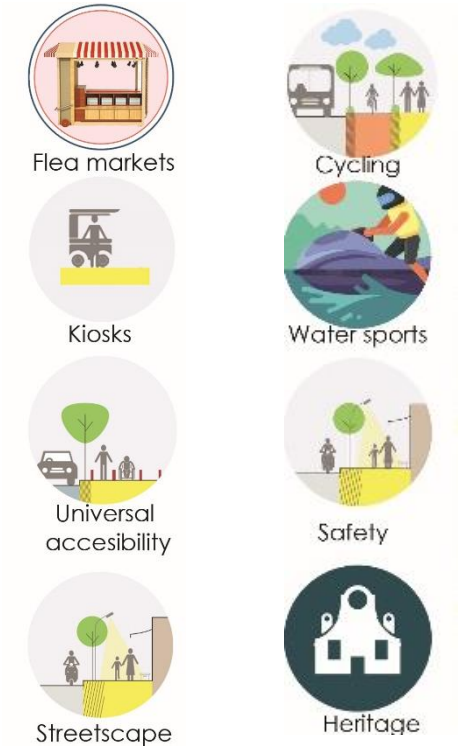


Figure 7. 3 Proposed Beach infrastructure provided

Source: Google images

Action plan

1. Providing night bazaars/ flea markets to attract both domestic, international tourists and to promote local economy.
2. Develop water sports facilities to offer more recreational activities.
3. Connecting entire stretch of beaches in accessibility study area community and its engaging local management by in providing awareness and training programs.
4. Promoting Kollam beach as a destination for events and activities.
5. Connecting the ancient lighthouse, Thangassery fort, and breakwater, Thangassery could unlock its lasting potential.

2. Developing Thanni - Kappil stretch to increase the number of foreign tourists is identified for seaside tourism

Thanni and Kappil is stretch of narrow land that lies between Paravur Kayal and sea, with "Pozhikara", an estuary on its end. Proximity to Varkala Beach (16 km) makes the locations feasible for attracting foreign tourist. The area identified for development is under CRZ restrictions, thus only temporary structures will be provided.

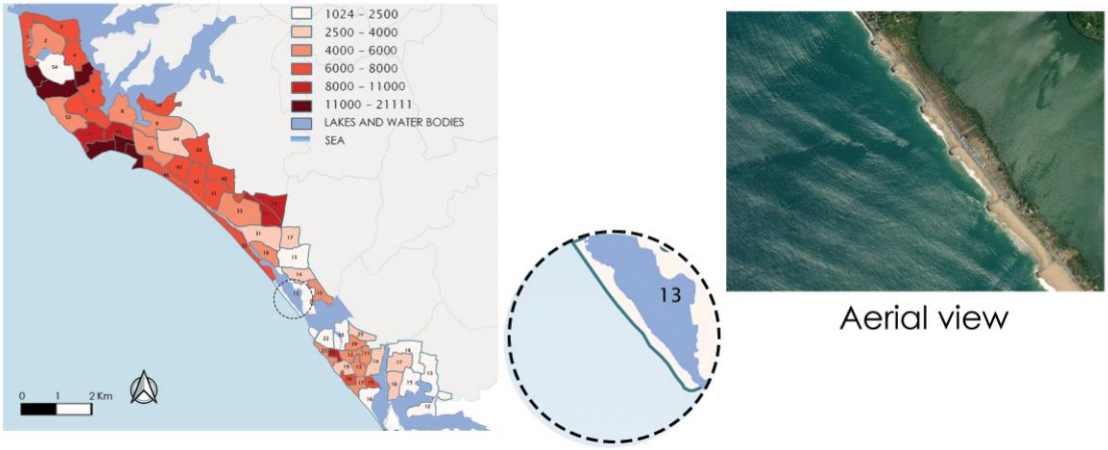


Figure 7. 4 Map showing Population density

Source: (Integrated District Development Plan, Kollam (Volume III), 2009), (Operations, District Census Handbook (DCHB), 2011)

Since population density in the proposed site is low, only small number of residences must be relocated to the adjust site.

Figure 7. 5 Proposed Commodities and action plan provided

Source: Google images

Developing Thanni and Kappil with govt. initiatives to attract foreign tourist. Land for the proposed area will be pooled for promotion of seaside tourism and suitable land to be provided to the owners.

6.5.2 Coastal tourism circuit

The study shows that Kollam has tourism potential but it is underutilised when compared to adjacent cities like Kochi and Thiruvananthapuram. So, Kollam need tourism upliftment.

Action plan

Introduce measures to increase the number of tourists

Varkala and Alappuzha are individually areas of high tourism potential and located adjacent to the study area. When connected as a whole tourism circuit it will be highly beneficial for **the proposed tourism activities in our study area.**

Attraction: Connecting beaches with Ashtamudi lake adjoining major tourist spots.

Tourism Bus route along the circuit: Sight-seeing bus services can be provided periodically. Tourism bus route can be proposed along the regional based route.

Cycle bays/cycle way: Self-Service Cycle Bays with renting services, are proposed along with the existing and proposed bus stops.

The Cycle Bay is proposed to be positioned in such a way as it does not cause an obstruction to the road travellers.

Also, the cycle and pedestrian route are proposed in a similar way, without making hindrance to the buses stopping at the bus-stops and to the on- foot and cycle travellers.

Figure 7. 6 Accessibility and attraction

Source: Google image

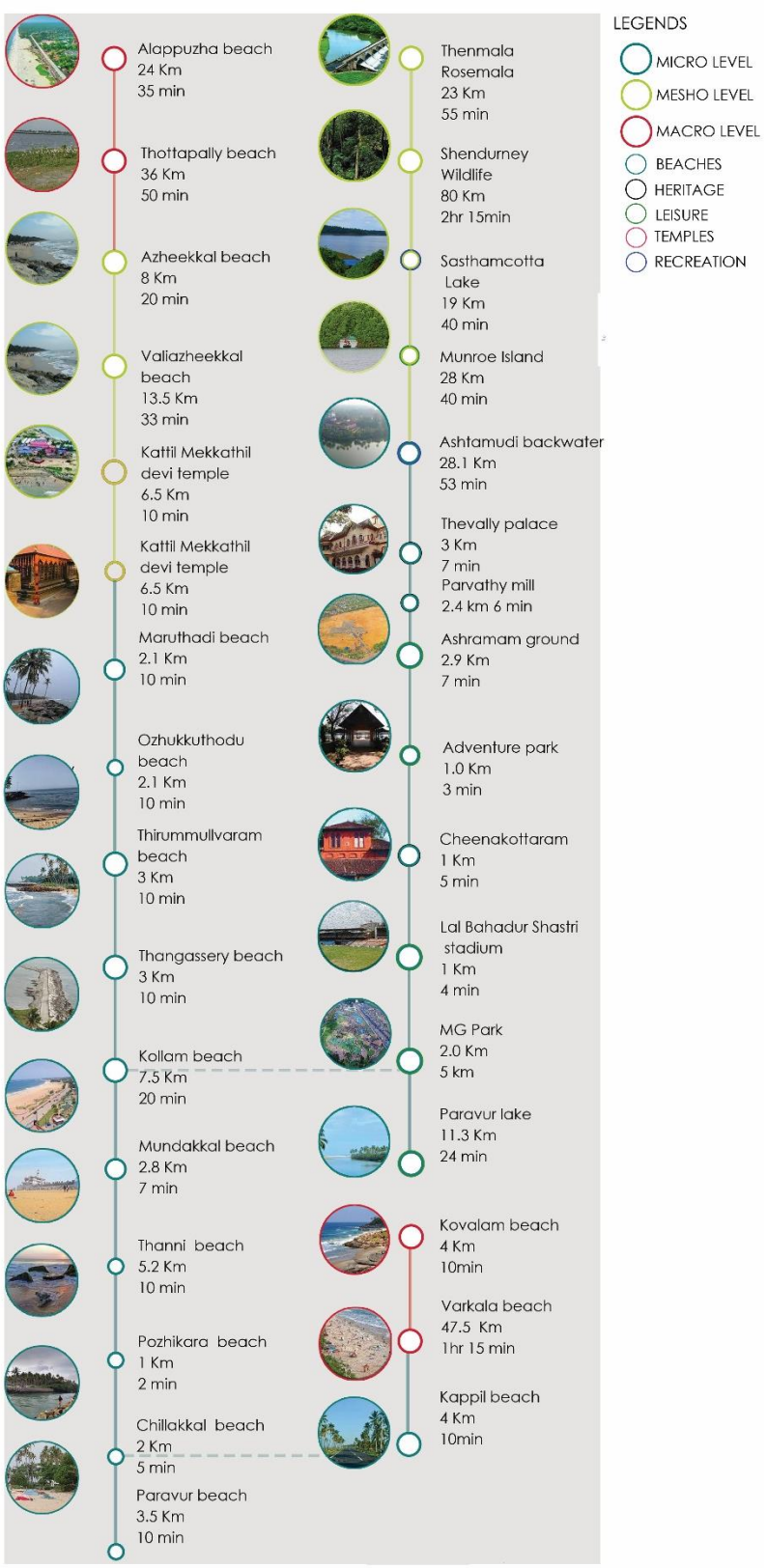


Figure 7. 7 Coastal Tourism circuit

Source: Author generated

6.6 Economic Pillar and Socio - Cultural Pillar

6.6.1 Introduce sectoral linkages within coastal tourism, fisheries and industries

Promote Seafood Tourism:

Kollam's potential places are rich in seafood, and seafood tourism can be promoted to attract tourists to the region.

Organizing food festivals that showcase local seafood cuisine, providing tourists with opportunities to sample fresh seafood and learn about the local culinary culture.

Proposal: Fishermen week

Action plan

The proposed site is at Thanni Beach because of the proximity to Paravur where the wards 16,17,18,19& 20 are located which are having high fishermen community concentration.

1. **Enhancing Tourism Potential** - The fest will be held at major locations under the same name to increase media attention and publicity in order to attract tourist and the local populace.
2. **Fish farms** can be set up to provide tourists with a unique experience of feeding fish and understanding the fish farming process. Fishing activities can also be organized for tourists, with local fishermen providing guidance and support.
3. **Increasing Public Awareness:** The fest provides an opportunity for the public to learn about various fishing activities, Local gastronomy, condition of fish.
4. **Uplifting Marginalized community** - By implementing social interventions, Skill training activities, Information and communication training, Economic and Health activities etc

6.6.1.2 Promotion of cashew and coir products

The proposed site is at Kollam Beach and Thirumullavaram Beach and Thanni beach because of the proximity to cashew industries and coir industry at Kollam corporation (67 no’s), Mayyanad and Paravur along the coastal belt.

Cashew and coir Industry experience: This can involve setting up outlets and shops that sell locally-made cashew and coir products, such as cashew nuts, coir mats, and coir ropes.

Private Sector Partnership: Provide investment, expertise, and support for the development of infrastructure and tourism activities. They can also assist in marketing and promotion of the products and services offered by the cashew and coir industries.

6.6.2 Coastal Urbanism

The area has diverse character with its urban context, heritage areas, beaches, industries with coastal Tourism potential.

Chinnakada:

Located 1km adjacent to the railway station. The area has a dynamic location of commercial importance. The clock tower and the Chinese palace are also located within the destination.

Conservation of Cheena Kottaram:

- Cheena Kottaram can be converted to a museum, thereby preserving it.
- Descriptions regarding Travancore era must be collected and kept and if possible, the mural paintings of that time can be collected and preserved here.
- Details about materials used for the construction of the palace could be collected and exhibited.
- A reasonable fee could be charged to visit the museum and thus the amount required for preserving the particular building could be generated by itself.

Ashramam

It is located 6kms away from railway station. Ashramam picnic village, Thevally Palace are adjacent places to visit. Adventure sports at ashramam by the Ashtamudi lake and to take part in Kollam Pooram are some interesting activities to take part while nearby.

Beach

The beach is located 1km from the railway station. Beach and the thangasery fort precincts are places to visit. A walk through the breakwaters and watching sunset with the view of the lighthouse and of the fort ruins.

Implementing agency: The **KTDC's** efforts to develop tourism in Kollam are having a positive impact on the local economy. The company's projects are creating jobs and generating revenue for the region. Tourism is also helping to preserve Kollam's rich cultural heritage and natural beauty.

Implementation schemes

The Swadesh Darshan scheme: This scheme was launched in 2014 by the Ministry of Tourism, Government of India. The scheme aims to promote domestic tourism by developing thematic circuits across the country. Under this scheme, 13 coastal circuits have been identified for development.

Premium Life Membership Scheme: This scheme offers individuals a lifetime membership of KTDC hotels and resorts. Members are entitled to a 7-day complimentary stay in any KTDC property per year, subject to availability. They also receive a 40% discount on food and beverages, and a 20% discount on alcoholic beverages. The fee for the premium life membership is Rs. 10 lakhs.

Off-Season Package Scheme: This scheme offers tourists a discounted rate on stays at KTDC hotels and resorts during the off-season. The off-season is typically from May to September. The discount is applicable on all room categories and is subject to availability.

Group Package Scheme: This scheme offers tourists a discounted rate on stays at KTDC hotels and resorts for groups of 10 or more people. The discount is applicable on all room categories and is subject to availability.

6.6.3 Marketing and branding

Establish strong marketing platform to respectfully promote the destinations coastal tourism experiences.

Long -Term strategies

Developing a strong brand identity:

Create a unique destination identity such as logo or tagline that promote the coastal tourism of Kollam - Paravur stretch.

Develop or enhance print media such as brochures on locality, including information of each site and program.

Mid - Term strategies

Commission a video documentary integrated with tour websites showcasing the best visual content.

Long - Term strategies

Explore the creation of a 'Coastal tourism ambassador' program. Trains and empowers local residents to promote their coastal communities to tourists through a variety of channels, such as social media, public speaking, and word-of-mouth.

Offering discounts and promotions:

Offering discounts and promotions is a great way to attract tourists and boost visitation. Discounts can be offered on hotel stays, food, and activities. Promotions can be used to encourage tourists to visit during the off-season or to try new attractions.

Partnering with travel agencies and tour operators:

Partnering with travel agencies and tour operators is a great way to reach a wider audience and promote the Kollam and Paravur coastal regions as a destination. Travel agencies and tour operators can help to book hotels and arrange transportation, and they can also provide information and advice to potential visitors.

6.6.4 New employment opportunities

Direct and indirect tax

Creation of new jobs in new resorts and restaurants, Aquaculture zones boats, aquaculture farms, nature park, water park, tourist complex etc.

6.6.5 Sustainable revenue system

To create a sustainable revenue stream for the local community by introducing coastal tourism taxes, Incentives

Implement a bed tax: Implement a bed tax on hotels, resorts, and other accommodation providers. The revenue generated from this tax can be used to fund tourism-related initiatives and infrastructure development.

User charges: User charges for primary products, taxes on Industries various consumables and durables.

Leverage public-private partnerships: Work with private sector companies to develop tourism-related infrastructure such as marinas, recreational facilities, and tourist attractions.

Promote off-season tourism: Promote off-season tourism by offering discounts and other incentives to visitors who travel during the low season.

Tax incentives: Incentives to re-use of existing structures for tourism related activity. Incentives to re-use of existing structures for coastal tourism related activity.

6.7 Environmental pillar

6.7.1 Waste bin check point

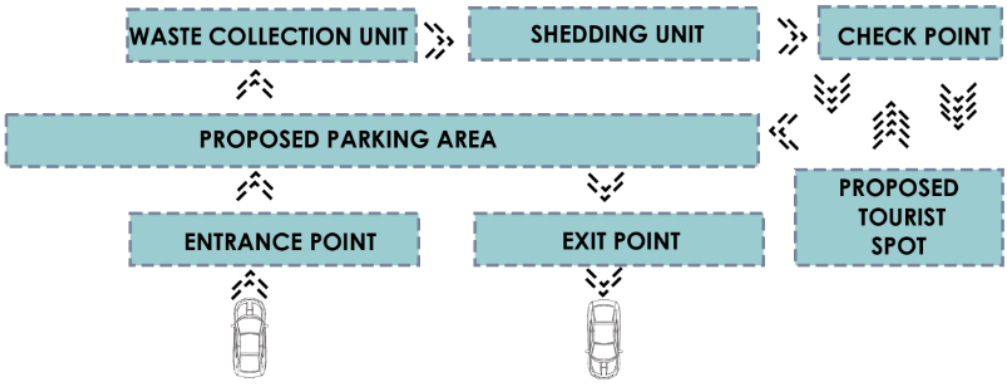


Figure 7. 8 Proposed waste bin check point illustration

Source: Author generated

1. Proposal deals with providing Waste collection point before accessing the coastal spot (Starting from Kollam beach to adjacent beaches).
2. This procedure deals not only for Tourist but also for the locals.
3. This improves the environment condition and also to develop the SeassideTourism. The procedure points from the Entrance to the Exit of the spotted area.

Collection Point: To collect the waste from the tourist before entering to the tourist spot. Each waste then separated based on their material condition that can plastic, paper, or food waste etc.

Shedding units: are provided near collection units in order to shed the plastic waste, where the materials can be re-used after the procedure.

Checkpoint: This is made by appointing a proper staff at these points, by charging a nominal fee to the passengers on visiting the spot. After spending quality time, when they return to the checkpoint, they are given a provision to deposit the waste products at the E-Bin.

6.7.2 Living shoreline

6.7.2.1 Protected shores - seawall

(Mundakkal - Thanni)

The coastal stretch along Mundakkal-Thanni resulting in an ecologically enhanced version that can be used both in open coastal locations as well as lower energy sheltered shorelines to prevent erosion of the bank and reduce wave energy.

Figure 7. 9 Proposed seawalls at Mundakkal- Thanni

Source: Google image

Proposal: Green belt development

To establish a green belt along the coast can act as a buffer zone between the built-up area and the coastline, helping to prevent erosion and protect against storm surges and other hazards.

1. To protecting the environment, a green belt could also provide recreational opportunities for local communities and visitors.
2. Buffer area between Beach face and built edge
3. Prohibition of new buildings in the green belt zone.
4. To restore mangroves for greenbelt creation along eroding coasts.

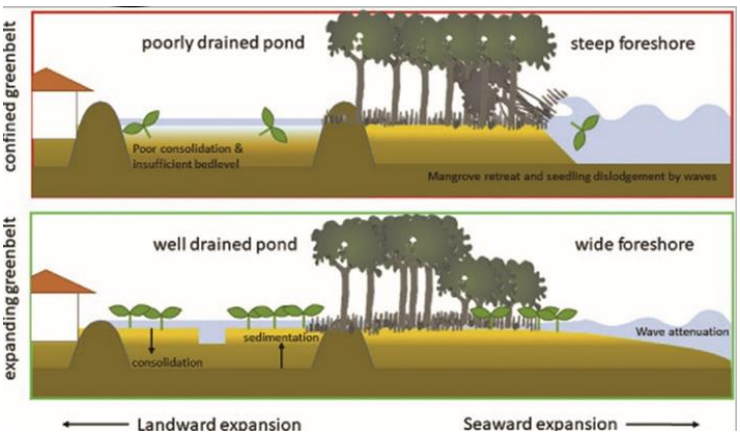


Figure 7. 10 Proposed greenbelt development

Proposal: Reefball
(Thangaserry beach)

Out of the entire costal stretch 3 spots for reef ball placement has been identified in reference with IDDP report 2009. According to the report 2009, absence of quarrel reef is one of the developments Issues.

- Reef Ball living shorelines are a way to enhance our shorelines. This is accomplished by using reef balls just off the shore to reduce wave and current energy while creating reef habit for corals and marine life, such as fishes' crabs and seagrass.
- Can also be utilized for mangrove plantings. Likewise, other elements of the shoreline like marsh and cord grasses, and other native plants and habitats are protected by the offshore Reef Balls.
- Reef ball living shorelines also create unique opportunities for humans, snorkelling, nearshore fishing, and even just viewing nature from the land.

Action Plan

Shoreline Protection - Coral reefs reduce wave energy by 97% before hitting the shore. Beach aesthetics: The reef balls can be designed to blend in with the natural surroundings, providing an aesthetically pleasing view for beachgoers.

Beach aesthetics: The reef balls can be designed to blend in with the natural surroundings, providing an aesthetically pleasing view for beachgoers.

Food Production/Fishing - Well managed reefs produce 5-10 tonnes of fish per km sq./year.

Biodiversity - Home to a quarter of the world’s marine species.

Educational opportunities: Interpretive signs can be placed near the reef balls to educate visitors about the marine life that lives in and around the artificial reefs. This can enhance the visitor experience and provide valuable educational opportunities.

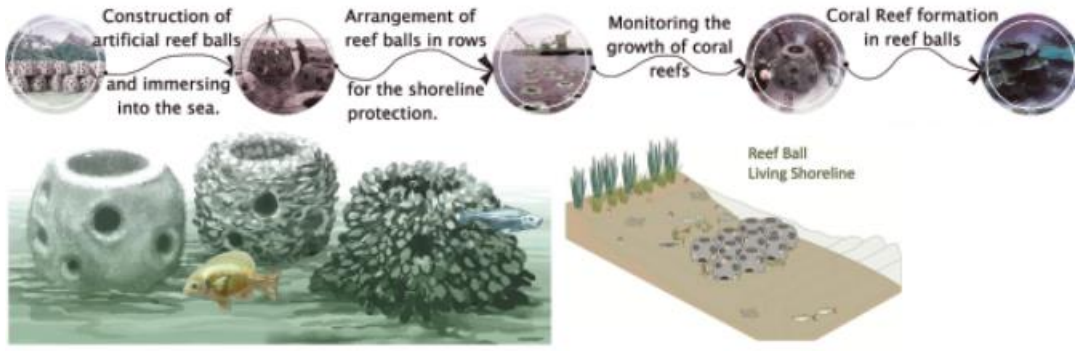


Figure 7. 11 Proposed Reef ball structure

Source: (Google image)

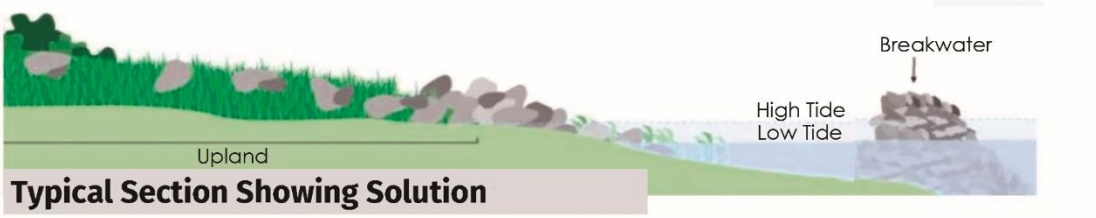


Figure 7. 12 Typical section showing solution

Source: Author generated

Proposal: Headland breakwater (Thanni, Eravipuram Mundakkal, Chillakkal, Kappil Beach)

Enhance shoreline protection by incorporating a) Seawalls,

b) Revetments,

c) Off-shore breakwaters,

d) Groins

e) Off-shore Reefs, and

f) Artificial headlands to reduce wave energy by hitting the shore at Eravipuram, Thanni regions.

Goals

Short Term Goals

- Optimising the use of natural resources
- Creating awareness among the people as well as the authorities
- Holding the line typically involves shoreline hardening techniques, seawalls , groynes, breakwaters and revetments
- Evacuation vehicles

Mid-Term Goals

- Construct defences seaward of the coast
- Warning system
- Evacuation routes

Long term Goals

Besides constructing seawalls, other hard structures may be constructed.

Figure 7. 13 Proposed headland breakwaters

Source: Google image

Implementing agency: Kerala State Disaster Management Authority (KSDMA): The KSDMA is responsible for disaster management in the state, including natural disasters like coastal erosion. They work on assessing the risks associated with erosion, developing early warning systems, and coordinating emergency response efforts.

Local Municipalities: Local governments, such as city or town councils, often have a role in coastal erosion management. They may enact local ordinances, zoning regulations, and building codes to guide development in coastal zones and mitigate erosion risks.

Scheme/Policies: ***National Coastal Zone Management Program (NCZMP):*** The NCZMP is a centrally sponsored scheme implemented by the MoEFCC. It focuses on strengthening the coastal management framework, capacity building, and promoting sustainable development in the coastal areas. The program aims to address issues like erosion, shoreline *State-Specific Policies:* Various states in India have formulated their own policies and initiatives to address coastal erosion and conservation. For example, the Government of Kerala has introduced the Kerala State Coastal Area Development Corporation (KSCADC) to implement projects related to coastal protection and erosion control in the state. stability, and climate change impacts through integrated coastal zone management.

CONCLUSION

The study was an attempt to provide development plan for coastal tourism planning based on the proposals made through the identified parameters. Despite having a large number of tourist attractions, Kollam receives less visitors than other districts in Kerala, placing it in ninth place overall (9th for domestic visitors and 12th for overseas visitors). The study finds out that it enhances the attractions, accessibility, and infrastructure of coastal tourism along the Kollam Paravur stretch that will balances economic growth with environmental sustainability and benefits the local community. This study found that Foster inter sectoral linkages can foster along the stretch, promoting collaboration between various industries to create a sustainable and integrated destination. The relevance of coastal tourism and identified parameters required to enhance the quality of the environment are studied. The study was conducted to find out the coastal tourism components, and parameters for benefiting the community and coastal tourism.

As the part of the project, secondary data were collected from the various sources. The collected data were studied and analysed to determine the overall characteristics of the study area and to understand the growth potential of the Kollam-Paravur coastal stretch were done using the four-pillar analysis and swot analysis. The primary surveys were conducted to take surveys of the visitor and host populations in order to determine visitor preferences, community expectations. The final proposals for the development of the Kollam-Paravur coastal stretch have been successfully implemented, utilizing the four pillars of sustainability by the parameters based on the infrastructure and nature-based solutions. These proposals primarily focus on enhancing the attraction of the area, improving accessibility, upgrading recreational experience, fostering sectoral linkages and ensuring environmental resilience. Through these initiatives, the region aims to further enhance its natural beauty, create sustainable tourism opportunities, and provide a seamless and enjoyable experience for visitors. The concerted efforts in these areas will undoubtedly contribute to the long-term growth and success of coastal tourism in the Kollam-Paravur region, establishing it as a premier destination for travelers seeking a unique blend of natural and cultural experiences. Coastal Tourism potential of the coastal region can be developed with the proper implementation of the proposals suggested which contributes to the overall development of the study area.

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ANNEXURE

HOUSEHOLD SURVEY FORM

1. Name of the respondent:

2. Occupation:

3. Education:

4. What are your major sources of income?

5. What are the positive economic impacts of tourism development in your area?

Sl No	Variables	Very High	High	Medium	Low	Nil
1	Improves infrastructure facilities, (i.e., roads, bridges, transportation facilities, and communication facilities)					
2	Creates new business opportunities					
3	Availability of more facilities and a range of choices					
4	Better standard of services by shops, restaurants, and other commercial centres					
5	Increase in income and standard of living, if yes, the details:					
6	Value appreciation of local resources					
7	If any other, specify					

6. What are the negative economic impacts of tourism development in your area?

Sl No	Variables	Very High	High	Medium	Low	Nil
1	Increases the price of goods and services					
2	Increases price of land and housing					
3	Increases cost of living					
4	Jobs may pay low wages					
5	Seasonal tourism creates high-risk and under or unemployment issues, if yes, specify					
6	If any other, specify					

7. What are the positive environmental and socio-cultural impacts of tourism development in your area.

Sl No	Variables	Very High	High	Medium	Low	Nil
1	Protection of natural environment or prevention of further ecological damage					
2	A 'clean' industry image					
3	Improvement of the area's appearance					
4	Preservation of historical buildings and monuments					
5	Promotion of cultural exchange					
6	Preservation of community gathering space					
7	Increase in the availability of recreation facilities and opportunities					
8	Tourism knowledge provision to community					
9	Maintenance of coastal scenery attractiveness					
10	If any other, specify					

8. What are the negative environmental and socio-cultural impacts of tourism development in your area.

Sl No	Variables	Very High	High	Medium	Low	Nil
1	Pollution of					
	a. Air					
	b. Water					
	c. Noise					
	d. Solid waste					
2	Destruction of sand dunes,					
3	Socio-cultural problems (like crimes, conflicts between host & guest, overcrowding,)					
4	Loss of open space					
5	Feeling of loss of control over community's future (caused by outsider development)					

VISITOR SURVEY FORM

1. Name of the respondent:
2. Location:
3. Age Group:
3. Y<18
4. 18-30
5. 31-50
6. 51-60
7. Y>60
4. Name of your nationality:
    1. Foreigners
    2. Domestic
5. Educational Qualification:
    1. Up to 10th std
    2. 12th std
    3. Graduation Post
    4. graduation
    5. Above
6. Occupation of respondent:
    1. Student
    2. Gov servent
    3. Self employed
    4. Professional (specify)
    5. Executive
    6. Retired
7. Annual Income
    1. Below 10,000
    2. 10,001- 20,000
    3. 20,001-30,000
    4. 30,001-40,000
    5. 40,001-50,000
    6. Above 50,000

8. Source:
    6. Travel agency
    7. Internet
    8. Family friends
    9. Travel guides
9. Duration of the stay
    1. 1 Day/Not staying
    2. 2 Days
    3. 3 Days
10. Quality of accommodation
    1. Excellent
    2. Good
    3. Average
    4. Poor
11. Water quality:
    1. Excellent
    2. Good
    3. Average
    4. Poor
12. Attractions:
    5. Beaches
    6. Water sport facilities
    7. Historical sites
    8. Natural attractions
    9. Shopping areas
    10. Local cuisine
    11. Entertainment venues
13. Mode of travel
    1. Car
    2. Public transport
    3. Taxi
    4. Bike

14. Level of Satisfaction
    4. Excellent
    5. Very good
    6. Good
    7. Average
    8. Poor
15. Dislike/Could be improved
    1. Crowding
    2. Environment issues
    3. Availability of public restrooms and other amenities
    4. Accessibility for people with disabilities
    5. Availability of information signages
    6. Safety and security
    7. Cleanliness of beaches and water
    8. Availability of public transportation
    9. Quality of accommodation
16. Suggestions
    5. Water sports
    6. Beach Activities
    7. Cycling or Biking
    8. Fishing or Boating
    9. Trying local cuisine and food specialities
    10. Protecting natural and cultural resources
    11. Reducing the level of commercial development
    12. Offering more information or signage for tourists
    13. Increasing safety and security measures
    14. Reducing single-use plastics
    15. Improving public transportation options
17. Have you ever been in Kollam as a tourist? If yes, when, and which were the places visited during that trip? If yes, what are the changes you feel now as compared to the previous visit? Positive/Negative: Explain:
18. Any disaster in the area: