Urban Planning Intervention in Coastal Regions of Surat

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Abstract: This study investigates the relationship between various factors responsible and thereby which impose development of urban fringe areas located on City’s Coastline. Coastal Area fairly contributes to social and economic development of community while providing a habitat with rich Flora and Fauna. Dumas seafront of Surat has been envisioned and conceived as a modern-day public space by blending leisure, eco-tourism, entertainment, hospitality etc. and integrating it as a recreational zone of the city by Surat Municipal Corporation. The Tapi river front is also envisioned by Surat Municipal Corporation as recreational development project. Hazira area industrial zone development, Ro - Ro Ferry Terminal, Delhi-Mumbai Dedicated Rail Freight Corridor and other future coastal projects by Gujarat Maritime Board, Gujarat Industrial Development Board and Indian Railways have driven us to focus on the importance of developing the seaside belt. In order to support overall development, the purpose of this study is to propose multiuse land utilize model for upliftment of domestic tourism, residential, sporting, and private purposes. Different proposals will be outlined for chosen coast front territory considering the limit characterized by various local authorities namely SMC (Surat Municipal Corporation), SUDA (Surat Urban Development Authority and GMB (Gujarat Maritime Board) taking into consideration Coastal Regulations Zone (CRZ) limits and other guidelines formulated by local governing authorities.

Keywords - Costal Development, Social and Economic Development, Land Use, Recreational and Tourism.

Abbreviations and Acronyms
Surat Municipal Corporation (SMC), Surat Urban Development Authority (SUDA), Government of India (GOI), Gujarat Industrial Development Board (GIDB), Town Planning Scheme (TPS), Coastal Regulation Zone (CRZ), Ministry of Environment and Forests Climate Change (MoEFCC), Integrated Coastal Zone Management (ICZM), Development Plan (DP), High Tide Line (HTL), Low Tide Line (LTL), Gujarat Maritime Board (GMB), Comprehensive general development control regulations (CGDCR).

1. INSTIGATE

Urban Planning Interventions and Development in coastal areas depending on personal inclination can be triggered considering following parameters.

<table>
<thead>
<tr>
<th>PRIMARY</th>
<th>SECONDARY</th>
<th>TERTIARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation and Eco-Tourism (Domestic)</td>
<td>Floods,</td>
<td>Forest Management and Development</td>
</tr>
<tr>
<td>Land-use Management/Mechanism</td>
<td>Human Actions,</td>
<td>Encroachment – Habitat Improvement</td>
</tr>
<tr>
<td>Land use Mapping /Spatial Distribution in study area</td>
<td>Infrastructure system for electricity, sewage, water pollution and drainage.</td>
<td>Urban Ecological Protection/Restoration</td>
</tr>
<tr>
<td>Land Use – Zoning Planning Rules</td>
<td>Disposal of Sewage – STP WTP</td>
<td></td>
</tr>
<tr>
<td>Urban Expansion</td>
<td>Sanitation – Public Toilets</td>
<td></td>
</tr>
<tr>
<td>Road Network Development</td>
<td>Surface Water Deterioration</td>
<td></td>
</tr>
<tr>
<td>Coastal erosion</td>
<td>Water Supply Treatment Plants</td>
<td></td>
</tr>
<tr>
<td>Coastal Floods</td>
<td>Fisheries and Aquaculture,</td>
<td></td>
</tr>
<tr>
<td>Congestion</td>
<td>Ports, Harbours and Jetties,</td>
<td></td>
</tr>
</tbody>
</table>

2. AIM OF THE STUDY

Protect Preserve and Develop the coastal regions of Surat and its surroundings.

3. OBJECTIVES

Following are objectives that are relevant to the study.

- To understand land-use management/mechanism & planning rules and regulations.
- To identify current status and related attributes of delineated site on coastline.
- Zoning clusters of domestic tourism, leisure and recreational spaces.
- Propose strategies to meet the impact due to congestion, soil erosion, silting and floods in and around the area.

4. SCOPE OF WORK

The research attempts to investigate some significant aspects of coastal waterfront developments from the point of view of the study area. Urban coastal waterfront development and regeneration projects are the means by which areas that have been neglected are given new uses and a new life. The study will be useful for implementation of development plan and land use mechanism.
5. **HYPOTHESIS STATEMENT**

Economic Spin off – ascend in the estimation of properties, going about as an impetus for Re-advancement and Renewal of close by places.

6. **EXPECTED OUTCOME**

The study shall provide planning proposal from design and zoning perspective as primary proposal from land use mechanism perspective which will reinforce the existing envisioned proposals by SMC. And the secondary proposals will identify the current status of various land use thereby bridging the missing gap and provide effective strategies, suggestive measures and recommendations for development of coastal belt.

7. **LITERATURE REVIEW**

**WATERFRONTS ARE FUNDAMENTALLY PUBLIC PLACES** “Developments have been set up along streams, waterway valleys, banks, watersheds, sea fronts, and so forth since forever. The advantages include guaranteeing dependable water imperative for human existence, and addressing the necessities of horticulture, exchange and business, entertainment, disinfection, transportation, and so forth the waters and related biological systems of a district are the absolute most significant assets for any human settlement.” (Macdonald, 2017)

Therefore, Waterfront development using ARCHITECTURE AND URBAN DESIGN should consider following aspects:

- Mixed-use developments;
- Place-making and urban space;
- Community, culture and water.

8. **STRATEGIES FOR COASTAL DEVELOPMENT PLANNING IN THIRUVANANTHAPURAM, KERALA, INDIA (C.K, 2014)**

The main role of this exploration theory intends to examine possible incorporated arranging, the board and reasonable advancement approaches of waterfronts, metropolitan waters and seaside region improvement because of the indispensable association of urbanized regions with beach front territories and propose a metropolitan arranging structure, assess the land utilizes, offices, exercises, and advance all-encompassing systems and vision for compelling coordination for the waterfront and waterfront advancement in TUA.

**Proposed holistic strategies**

- Creating an interconnected green-blue network for TUA;
- Make waterfronts accessible and aesthetic to urban public spaces;
- Built environment at the waterfront with sensitive urban design and planning decisions.

**Inferences**

- Considering the diversity, quantity and wide spread nature of waterfronts, holistic urban planning strategies with water-centric approach might be appropriate.
- Comprehensive waterfront plans and water sensitive urban design (wsud) proposals offer workable solutions.

9. **INTEGRATED COASTAL ZONE MANAGEMENT FOR TUTICORIN COAST, TAMILNADU, INDIA (MUKTHUKRISHNAN, 2010)**

The present research thesis of coastal land evaluation for sustainable development uses physical attribute and socioeconomic data by delineating land mapping units and analyzing their physical attributes. The study aims to drawing up an Integrated Coastal Zone Management (ICZM) for Tuticorin coastal zone in a sustainable manner.

**Proposed Holistic Strategies**

A total of 27 ecosystems were brought under four management zones.

- Management Zone I (CRZ I - Ecological sensitive areas)
- Management Zone II (CRZ II - Terrestrial Developed areas)
- Management Zone III (CRZ III – Undisturbed areas) - coastal zone in the riverine lands, rural areas (developed and undeveloped).
- Management Zone IV (CRZ IV - Agricultural areas)

**Inferences**

- Land suitability evaluation for coastline should be conducted through interpretations of base line information, various thematic maps, satellite images, soil map for developing ecological land unit map.
- The ecological land unit maps should be overlaid with the existing present land use map with consideration of field conditions to produce the recommendation of land use.
10. **SABARMATI RIVER FRONT DEVELOPMENT – ENVIRONMENTAL URBAN REJUVENATION PROJECT**  
(COLLABORATIVE, SABARMATI RIVERFRONT DEVELOPMENT, 1998)

The present case study is a city level intervention and is conceived and being implemented as a pioneering multi benefit project with significant urban transformation potential such as Environmental Improvement, Social Upliftment and Urban Rejuvenation. **Aim – Objectives:** To Revitalize river edge as vibrant urban space, to reclaim the private river edge as a Public asset and restore the city’s relationship with its river, overall environmental improvement, creating network of high quality public open spaces providing adequate access to the river, creating vibrant urban neighborhoods, Enhancing Recreational Activities along the river edge.

![Figure 10.1 Land use Map](source: Collaborative, Sabarmati Riverfront Development, 1998)

**Conclusion-Inferences**
- The project utilized the resources of the river itself, to convert the abandoned land of riverbed into people’s attraction and tourist destination.
- To create infrastructural and recreational facilities to transform the city with more livable with Environmental Improvement and Inclusive Development.

11. **RIVER FRONT DEVELOPMENT ALONG RIVER GANGA IN PATNA, BIHAR** (INTACH, 2013)

The present case study is a Public space and Landscape restoration initiative at the Old City in Patna. The Riverfront Urban Initiative proposes a comprehensive urban design addressing vital civic concerns like safety during festivals, public space, lack of facilities along with environmental awareness and ecological restoration. **Aim - Objectives:** To develop the Ganga River Front area as inclusive as a public space in Patna city, to re-orient the city towards the river, to strengthen the city’s identification with the river, to provide the congested Patna City with green lungs, to prevent the unregulated use of the large parcel of land.

![Figure 11.1 Proposed Development and Implemented infrastructure](source: INTACH, 2013)

**Summary - Inferences**
- Waterfront Development Urban Design & Architecture are interrelated aspects,
- Sustainable strategies addressing to Coastal Rejuvenation, Revitalization and Redevelopment,
- Integrating different Coastal Ecosystems under CRZ management zones,
- Land Use planning for Coastal Regions,
- Environmental Improvement, Social Upliftment and Urban Rejuvenation.
- Recreational and Reviving water edges and water fronts.

12. **DEMONSTRATION SITE PROFILE** ([INDIA, 1881](SMC, 1966) (SUDA, 1976) (WIKIPEDIA, 2001)

Surat is a city in the Indian province of Gujarat. It used to be a huge seaport and is currently the business and monetary focus in South Gujarat, which is popular for its diamonds and textile Industries and as a retail plaza for clothes and adornments. It is the eighth biggest city and ninth biggest metropolitan agglomeration in India. It is the regulatory capital of the Surat area.
13. **LOCATION**

The city is situated on the bank of Tapti River, near Arabian Sea. At scope 21° 12’ N, 72° 52’ E the city of Surat is situated on the bank of river Tapi having adjoining Arabian sea coastline on its west. It is 13m over the mean ocean level. (SMC, 1966) (SUDA, 1976)

![Surat Location Map](image1)

**Figure 13.1 Study Area Location Source:** (WIKIPEDIA, 2001)

14. **STUDY AREA**

Coastal region lies in the south west of the city simply 22.7 KM from the rail line station and 6 KM from Surat Airport. Encompassing the site are Airport, Beach, Hazira Mangroves, Hazira Industrial Town and Magdalla Port. The city is separated in seven zones, for example, Central zone, South zone, South West zone, South East zone, East zone, North zone and West zone. As shown in Figure:3 the study area is located in South West zone.

![Surat Study Area Map](image2)

**Figure 14.1 Study Area Location Source:** (WIKIPEDIA, 2001)

15. **JUSTIFICATION OF STUDY AREA**

Dumas’s sea development project is envisioned proposed project of Surat Municipal Corporation. Along dumas coastline 106 hectares of land is proposed for development of:

- Tourism Park
- Amusement Park
- Hotel
- Restaurants
- Water Sports

![Dumas Project Area](image3)

**Figure 15.1 Gujarat Mitra Publication (Dated- 29th Nov 2020) (Dated- 6th Dec 2020)**
16. METHODOLOGY

This research is coordinated around different chief elements of the waterfront including Common, Public, and Redeveloped Waterfront. The Redeveloped Waterfront, where related land utilizes have as of late changed because of different reasons. The waterfront capacities and significant issues are talked about in the setting audit and the arranging proposition incorporating land utilizes and comprehensive long-haul methodologies expected to manage land use change, arranging, coordination, and public speculation. The investigation means to make a far-reaching vision for the whole beach front area of Surat city.

17. STUDY AREA PROFILE

Study area is situated at western part of Surat city which is connected to the Arabian sea. The study area falls under the jurisdiction of S.M.C (Surat Municipal Corporation). Villages merged in towns and outgrowths as per census 2011, Magdalla(ina), Gavier, Vanta, Dumas, Sultanabad and Bhimpore are part of my demonstration site.

18. PROPOSED DRAFT TOWN PLANNING SCHEMES

Nine Town Planning Schemes are part of my demonstration area having approx. 10 Kms of Coastal belts and 5 Kms of Tapi riverfront as focus of development and 2049.8 Hectares (5065.16 Acres/21630071 Sq.Mts.) as impact area which is part of Surat Municipal Corporation.
Table 18.1 List of coastal TPS

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>TOWN PLANNING SCHEME</th>
<th>AREA(Sq.Mts)</th>
<th>AREA(ACRES)</th>
<th>AREA(HECTARES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DRAFT T.P.S NO-31 (GAVIER-MAGDALLA)</td>
<td>1266300</td>
<td>312.91</td>
<td>126.63</td>
</tr>
<tr>
<td>2</td>
<td>DRAFT T.P.S NO-76 (DUMAS VANTA-GAVIER)</td>
<td>3568862.18</td>
<td>850.68</td>
<td>344.26</td>
</tr>
<tr>
<td>3</td>
<td>DRAFT T.P.S 82 (DUMAS)</td>
<td>2576418.14</td>
<td>631.13</td>
<td>255.41</td>
</tr>
<tr>
<td>4</td>
<td>DRAFT T.P.S 81 (DUMAS)</td>
<td>2780148.73</td>
<td>580.42</td>
<td>234.89</td>
</tr>
<tr>
<td>5</td>
<td>DRAFT T.P.S 80 (SULTANABAD-BHIPOR)</td>
<td>3241131.24</td>
<td>795.06</td>
<td>321.75</td>
</tr>
<tr>
<td>6</td>
<td>DRAFT T.P.S 79 (SULTANABAD-BHIPOR)</td>
<td>2463727.88</td>
<td>592.45</td>
<td>214.26</td>
</tr>
<tr>
<td>7</td>
<td>DRAFT T.P.S 78 (DUMAS-BHIPORE-GAVIER)</td>
<td>2490119.9</td>
<td>590.58</td>
<td>239</td>
</tr>
<tr>
<td>8</td>
<td>DRAFT T.P.S 77 (DUMAS-BHIPORE-GAVIER)</td>
<td>2244620.75</td>
<td>542.64</td>
<td>219.6</td>
</tr>
<tr>
<td>9</td>
<td>DRAFT T.P.S 32 (GAVIER-VANTA-DUMAS)</td>
<td>998742.18</td>
<td>232.28</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>21630071</strong></td>
<td><strong>5065.16</strong></td>
<td><strong>2049.8</strong></td>
</tr>
</tbody>
</table>

TOTAL DEMO SITE AREA = 2049.8 HECTARES (5370 ACRE, 2,17,23,275 SQ.MTS.). RESERVATIONS IN SELECTED 9 TOWN PLANNING SCHEMES
The Coastal Regulation Zone planned a warning that controls a scope of exercises along the beachfront stretches on the landward side estimating a width of 500 m from the High Tide Line. The warning applies to seaside stretches of oceans, inlets, waterways, streams, estuaries and backwaters that are affected by flowing activity.

The area under the jurisdiction of the notification is called the COASTAL REGULATION ZONE (CRZ).

CRZ – I: (I) zones are those that are naturally delicate including marine parks, public parks, safe-havens, mangroves, untamed life environments, legacy, generally significant, zones liable to be influenced by a worldwide temperature alteration, and so forth (ii) regions allude to the between flowing zone lying between the low tide line (LTL) and the elevated tide line (HTL).

CRZ – III: zones are those that are generally undisturbed and don’t have a place with either Category-I or II. These remember the seaside zone for rustic zones (created and lacking) and furthermore regions inside city limits or in other legitimately assigned metropolitan zones, that are not generously developed. By definition at that point, all country regions are delegated CRZ – III and some metropolitan zones could likewise be remembered for this classification.

Regulation of permissible activities in the CRZ

CRZ- I: CRZ- I A

These zones are biologically generally touchy and by and large no exercises will be allowed to be done in the CRZ- I A territories, with following exemptions: (I) Eco-the travel industry exercises, for example, mangrove strolls, tree hovels, nature trails, and so on, in recognized stretches zones subject to such eco-the travel industry, outlined with due consultative interaction/formal conference and so on and further subject to ecological protections and safeguards.

CRZ- I: CRZ- I B - The inter tidal areas

CRZ-III

Activities as allowed in CRZ- I B, will likewise be passable in CRZ-III, as appropriate. Guideline of exercises in the NDZ: Agriculture, cultivation, gardens, pastures, parks, playfields and ranger service. Foreshore facilities like ports, harbors, Jetties, wharves, quays, slipway, bridges and sea links etc.

Figure 19.1 CRZ drawing as per Moefcc. Source: (India, Office of the Registrar General & Census Commissioner, India, 1881)
**20. INFERENCES AND FINDINGS**

Delineation of site area

**Figure 20.1 Delineation of Site with land use as per DP 2035**

**Figure 20.2 Land Status/Ownership**

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>47%</td>
<td>985804</td>
</tr>
<tr>
<td>Non Revenue</td>
<td>33%</td>
<td>680251</td>
</tr>
<tr>
<td>Private</td>
<td>2%</td>
<td>42752.4</td>
</tr>
<tr>
<td>Forest</td>
<td>18%</td>
<td>366856.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>2075664.2</strong></td>
</tr>
</tbody>
</table>

TOTAL AREA PROPOSED FOR DEVELOPMENT IN DRAFT T.P. SCHEME = 207.6 HECTARES (512.9 ACRES/2075664.52 SQ.MTS)
21. IMPORTANT SPOTS IDENTIFIED/ISSUES

SPOT 1: DARIYA GANESH TEMPLE

Figure 21.1 Dariya Ganesh Temple

SPOT 2: FOREST AREA

Figure 21.2 Non-Revenue Land Around Temple/Forest Area

SPOT 3: AREA AROUND GORUS GAMTAL

Figure 21.3 Area Around Gorus Gamtal
22. GAP IDENTIFICATION - DEVELOPMENT INFRASTRUCTURE NEEDED

<table>
<thead>
<tr>
<th>FACILITY</th>
<th>YES/NO</th>
<th>REMARK</th>
<th>FACILITIES</th>
<th>YES /NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation Facility</td>
<td>Yes</td>
<td>---</td>
<td>Washrooms/ Toilets</td>
<td>No</td>
</tr>
<tr>
<td>Parking facility</td>
<td>Yes</td>
<td>Space is adequate but unorganized</td>
<td>Drinking Water Facilities</td>
<td>No</td>
</tr>
<tr>
<td>Food zone/ restaurants</td>
<td>No</td>
<td>Local vendor stalls along with the beach side</td>
<td>Tourist Information centre</td>
<td>No</td>
</tr>
<tr>
<td>Road Condition</td>
<td>Yes</td>
<td>Good condition of road</td>
<td>Primary Health Centre</td>
<td>Yes</td>
</tr>
<tr>
<td>Green way/Gardens/ Tourist activities</td>
<td>No</td>
<td>Undeveloped Land Parcels in broken chunks</td>
<td>Accommodation</td>
<td>No</td>
</tr>
<tr>
<td>Local shops/ shopping facility</td>
<td>No</td>
<td>---</td>
<td>Bank</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Post Office</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Police station</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 22.1 Gap Identification/Infrastructure Needed

23. LEGAL DIMENSIONS

- Development plan is proposed by urban authority (Suda – Surat urban development authority).
- The implementation of the same by the virtue of GTPUD ACT–1976 applies to the competent authority under the jurisdiction of which the area falls.
- the demonstration site falls under the jurisdiction of surat municipal corporation. so, rules and regulation applicable will be as per comprehensive general development control regulations 2017 (CDGCR - notification no.- gh/v/269 of 2017 / edp – 102016 – 3629 – 1 dated 12th October 2017 has been sanctioned by urban development and urban housing department, govt. of Gujarat, Gandhinagar.)
- Draft T.P.’s has already been proposed & is subject to implementation by town planning department (SMC).
- Private owned land (433842 Sq. Mts) has been acquired as per land acquisition act, 2013 and compensation has been given.
Table 23.1 USE ZONE AND PERMISSIBLE USES

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Conceptualized Use Zone</th>
<th>Code</th>
<th>Permissible Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Residential 1</td>
<td>R1</td>
<td>All uses except Industrial- 1,2,3, 4 and Agriculture-1, 2, 3</td>
</tr>
<tr>
<td>5</td>
<td>Residential 2</td>
<td>R2</td>
<td>Public Purpose Public Utility and Public Institutional.</td>
</tr>
<tr>
<td>39</td>
<td>Forest Zone</td>
<td>FZ</td>
<td>As per the permission of competent authority (Ministry of Environment and Forest (MoEF) Government of India) and subject to Defense and Central Govt. Regulation.</td>
</tr>
</tbody>
</table>

All the conceptual use zone has recreational activities as permissible uses except for forest zone which requires permission for competent authority that is Ministry of environment and Forest (MoEF).

24. PROPOSAL

VISION & MISSION

It started as exchange and transportation center point however because of different reasons, waterfront edge is declining accordingly, losing its significance. A decent waterfront improvement is advancement that thinks about variety, local area commitment, wellbeing and security, climate and maintainability. Inventive scenes in waterfront improvement will perform works in giving light, air and "helpful" green spaces. Implanting these kinds of green foundation highlights into walkways, roads and open space can make physical, noticeable and calculated associations in waterfront zone. The principal objective of green framework is to build up a sound green edge to waterfront by expanding waterfront access and use with different differentiating sporting alternatives.

25. PROBLEM STATEMENT

Present investigation deals with the land piece located in city of Surat near the coast, delineated in south west zone. The current situation expresses that regardless of the potential and accessible framework, the waterfront zone is seen with heavy disintegration and it has gotten important to give seaside security/improvement from different viewpoints.

26. THESIS/VISION STATEMENT:

The formulation for the proposals of coastal region of Surat will be shaped in a way which will help to create a landmark destination acting as an anchor point of the city benefitting the local community accelerating the development in various sectors and serve as source of revenue generation boosting the economy.

27. COASTAL PLANNING AND MANAGEMENT ZONE

To ensure the seaside local area, from the different aggravations and spreading the regular securing frameworks like mangroves, coral reefs, manors different coordinated waterfront zones and techniques has been recommended for beach front insurance plan proposed by CRZs or Coastal Management Zones.

**Management Zone 1 (CRZ I - Ecological sensitive areas)** - This zone including National Parks, Sanctuaries, Reserved Forests, Mangroves, Estuaries, Coral reefs, zones near favorable places of fish and other marine life, zones of remarkable regular magnificence.

**Management Zone III (CRZ III – Undisturbed areas)** - This will remember waterfront zone for the riverine lands, country zones (created and lacking) and regions inside income limits where significant improvement has not occurred.

**TOTAL AREA PROPOSED FOR DEVELOPMENT IN DRAFT T.P. SCHEME = 207.6 HECTARES** (512.9 ACRES/207664.52 SQ.MTS)

**GOVERNMENT LAND = 1395413.2 SQ.MTS. (67%) NON-REVENUE LAND = 680251 SQ.MTS. (33%)**

**ECOSYSTEM BASED COASTAL ZONING - 5 DISTINCT ZONE HAS BEEN PROPOSED**
Figure 27.1 5-Distinct Proposed Zone

28. CRZ-I ECO SENSITIVE PUBLIC ZONE (30%)

TOTAL AREA OF SELECTED LAND PARCEL = 601338.25 SQ.MTS.
GOVERNMENT LAND = 154586.47 SQ.MTS. (26%) NON-REVENUE/BIN NUMBER1 LAND = 446751.78 SQ.MTS. (74%)
ACTIVITIES IN ZONE - MANGROVE TRAILS, TREE GROVE, NATURAL TRAILS, TENT AREA & HUTS
ECO SENSITIVE PUBLIC SPACES - BIRDS HAWKING ZONE, WATER SPORTS ACTIVITIES, EVENT LAWNS, CAMPING SITES, BARBEQUE PITS, CYCLE TRACK, KIOSKS, VENDOR SHACKS, PROMENADE, UTILITY, CHANGING ROOMS, PUBLIC RESTROOMS, PARKING

Figure 28.1 CRZ-I COSENSITIVE PUBLIC ZONE (30%)
29. CRZ-I ECO SENSITIVE FOREST ZONE (10%)

TOTAL AREA OF SELECTED LAND PARCEL = 199963.09 SQ.MTS.
ACTIVITIES IN ZONE - FOREST TOURISM
BIRD WATCHING CENTRE, NATURE INTERPRETATION – WELLNESS SPA CENTRE, BAMBOO FARMING, COMMUNITY ORGANIC FARMS, VIEWING DESKS, EXHIBITS, FLOWER SHOW AND EXHIBITIONS, ACQUATIC FLORA AND ANIMALS, LIGHT SHOWS, BAMBOO & ROCK GARDENS, SAND PIT, BOI PONDS, LILY AND FROG PONDS, ADVENTURE ACTIVITY ZONE, UTILITY, CHANGING ROOMS, PUBLIC RESTROOMS, PARKING

Figure 29.1 CRZ-I ECOSENSITIVE FOREST ZONE (10%)

30. CRZ-I ECO SENSITIVE RECREATIONAL ZONE (26%)

TOTAL AREA OF SELECTED LAND PARCEL = 538245.77 SQ.MTS.
NON-REVENUE LAND = 173707.83 SQ.MTS.
ACTIVITIES IN ZONE - RECREATIONAL TOURISM
PEDESTRAIN WALKWAYS, SPORTS ACTIVITIES & VIBRANT PUBLIC SPACES, BIKE AND TRAM ORIENTED STREET, KIDS PLAY AREA, AMUSEMENT PARK, FAMILY RAFTING, WATER SPORTS, BUNGEE JUMPING, GIANT WHEEL, MULTIPURPOSE GROUND FOR EXHIBITION & FOOD JOINTS, PROMENADE, CYCLE TRACK, RETAIL AND COMMERCIAL OUTLETS

Figure 30.1 CRZ-I ECOSENSITIVE RECREATIONAL ZONE (26%)

31. CRZ-III YATCH ZONE (16%)

TOTAL AREA OF SELECTED LAND PARCEL = 330828.85 SQ.MTS.
NON-REVENUE LAND = 59791.42 SQ.MTS.
ACTIVITIES IN ZONE - WATER ACTIVITIES
PORTS, HARBOURS, JETTIES, WHARVES, QUAYS, SLIPWAY, BREAKWATERS, LIGHTHOUSE ETC., BOAT CLUB, RECREATIONAL PLAZA, WATER FRONT ACTIVITIES, RIVER RAFTING, MEASURES FOR CONTROL OF SOIL EROSION, STORM WATER DRAINS, HATCHERY AND NATURAL FISH DRYING, UTILITY, CHANGING ROOMS, PUBLIC RESTROOMS, PARKING

Figure 31.1 YATCH ZONE (16%)
32. CRZ-III HERITAGE ZONE (18%)

TOTAL AREA OF SELECTED LAND PARCEL = 364527.96 SQ.MTS
ACTIVITIES IN ZONE – PHYSICAL BUILT
HISTORY CELL, INFORMATION CENTRE, FOREST MEDICINE CENTRE, INTERPRETATION CENTRE, LOCAL MARKET, 3-D STUDIO THEATRE, LIBRARY/READING ZONE, UTILITY, CHANGING ROOMS, PUBLIC RESTROOMS PARKING

Figure 32.1 CRZ-III HERITAGE ZONE (18%)

33. INTERCONNECTED BLUE-GREEN BELT ALONG THE EDGE OF RIVER & COASTLINE

- Since we have already seen in theoretical framework that urban design & architecture are interrelated aspects of waterfront planning and development
- A belt connecting the entire waterfront edge will enhance the recreational aspect and will provide a platform for social interaction

34. STRATEGIES FOR COASTAL REJUVENATION REVITALIZATION AND HOLISTIC DEVELOPMENT

As the study region is situated on water edge, any arranging and metropolitan plan system for waterfront advancement arranging should incorporate the accompanying unmistakable, however interrelated plans. these can possibly support the imperativeness of waterfronts, yet additionally make earth dependable, stylishly satisfying shared public spaces and delicate regular environments.

Addressing Ecological Impacts on Waterfronts

Primary effects of urbanization were spread out in Chapter 7 to recognize basic issues being looked by waterfronts all over the examination zone in Surat. From the conversation of the investigation region, it is obvious that the examination territory of Surat is vitally attached to the bigger locale and to the whole district containing different watersheds with streams, streams, feeders, and other related streams. The contamination or fumble of these waters and its effects on the waters in the investigation region are influencing the encompassing Eco-touchy zones, and surprisingly the nature of the climate.

1. Sewage and Water supply framework: The sewage framework requires refreshed plans and creative administration methodologies.

2. Urban Waste administration: The administration of all classes of squanders including strong waste, biodegradable and manure squander, clinical waste, sewage, electronic waste, and so on require quick consideration.

3. Industries around waterfront: Hazira Industrial Zone the economical backbone to Surat city is located adjacent to the site area and directly discharges its waste into surrounding waters, forming creeks in and
around the site area creating a lot of hazards contaminating the water and the environment. Plans and technologies have to be identified to address problems of this nature. Industries also have to be relocated away from any urban water body.

35. **Planning for the Waterfronts to be Accessible to Public Sector**

Public access to the waterfront is recognized by different writing as one of the critical components for effective waterfronts. Resident commitment, mindfulness and conversations are vital to address the issues and conquer something similar with different activities coming about into stylish metropolitan public spaces. Rather than developing embellishing railings or dividers, conventional plan of extended lengths of steps, boat piers and ship moors, moor yards and boat administration yards, strolling ways and waterside trails, and so forth can be planned.

36. **Water-Sensitive Urban Design (WSUD)**

Explicit WSUD techniques can be distinguished for the real activity plans and tasks for execution dependent on the sort of improvement (greenfield/brownfield/infill), the kind of waterbody at the area/ward level (waterway/lake/stream/lake/shoreline), and the populace/land use it serves (traveler/private/mechanical/business/farming/institutional). After this, suitable metropolitan plan highlights can be proposed to empower biologically delicate metropolitan turns of events.

37. **Water-Sensitive Policies**

Regardless of a scope of true plans and strategies, the decay of seaside waterfronts has endured. In spite of undeniable degrees of instruction, a negligence for water bodies and their environs seems conflicting. Online resident gatherings appear to be very much educated and effectively occupied with the arranging measures. To accomplish a portion of these, coordination between every one of the included and applicable offices is required. Contending plans and spending assignments must be likewise planned towards a typical waterfront vision.

38. **Suggestions & Recommendations**

This finishing up chapter presents ideas and explicit proposals for this examination dependent on every one of the conversations and investigation in the past slides. Around the world, waterfront improvements have been an element of urban areas with characteristic harbors, built ports, safe streams, deltas, and so on the waterfront, or, the 'BLUE-GREEN EDGE' as characterized by this examination, is the space where water meets land. This edge is fundamental not just for the economy and advancement openings for human settlements, yet in addition for the strength of human and marine life, the nature of common habitats, and for issues concerning social and ecological equity. Contamination and crumbling of this edge, and of the whole water body gigantically affects existing networks, future turns of events, and territorial economy. The ideas offer specialists at different levels of the public authority, local gatherings, and every single concerned resident, an expansive arrangement of activities to embrace with respect to THE DEVELOPMENT AND PLANNING OF WATERFRONTS IN SURAT. A significant number of these don't need official supports, yet will require official collaboration.

- Education and Public Awareness Campaigns
- Approaches to the Physical Development of Waterfronts
- Industrial Compliances for Waterfront Development (HAZIRA INDUSTRAIL ZONE)
- Planning and Implementation
- Public Engagement
- Urban Ecological Protection/Restoration

39. **Limitations**

Although primary survey which requires collection of data in form of drawings, maps, filed visits required for this type of study, considering the present situation and limitation of time they might or might not be included for this study purpose and the study will be carried out relying on the secondary available data. Foundation, construction and Financial Costs are not considered in formulation of planning strategies.

40. **Conclusion & Way Forward (Scope of Further Extension)**

The urban arranging outline work in this exploration has been detailed to control future architects, organizers and leaders in tending to the issues of seaside districts of Surat. The casing work has been advanced essentially manage metropolitan waterfront improvements in the investigation region. The rules, techniques, ideas and chose suggestions has been detailed in a manner with the goal that it permits a specific level of adaptability in proposing explicit arranging arrangements. The proposals may not be simply the last arrangements, however rules that can be considered by metropolitan organizers. Since these depend on rules that have worked in effective instances of metropolitan waterfronts around the world; and on set up standards for economical turn of events and environmental standards.

**THE RESEARCH WILL BE USEFUL FOR IMPLEMENTATION OF DEVELOPMENT PLAN 2035**

41. **References**


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