Innovations

Restoring Mangaluru's Waterfront and Celebrating its Rich Natural and Cultural Heritage

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Abstract

Purpose: *Waterfront development for a city acts as a precinct of interface between the urban and infrastructure development with the water. Waterfront development plays a crucial role in bridging urban and infrastructure growth with water bodies, serving multiple functions, including industrial hubs, trade centers, residential areas, and recreational spaces. The evolution of waterfronts can be categorized into four phases: (a)* ***Emergence of Waterfronts, (b) Growth of Waterfronts, (c) Decline of Waterfronts, (d) Rediscovery of Waterfronts.*** *Mangaluru has already progressed through the first three phases and is now transitioning into the fourth phase. The establishment of a* ***Cultural Hub at Bolar Sea Face*** *will contribute significantly to this transformation. This article explores how a* ***Cultural Hub along the Netravathi Riverfront*** *at Bolar Sea Face can enhance tourism, boost community engagement, generate revenue, and create employment opportunities for the local youth.* ***Design/ Methodology/ Approach:****The research employs a mixed-methods approach, integrating qualitative and quantitative methodologies to holistically address the study's objectives. The approach involves the following key components: (a) Literature Review, (b) Site Analysis, (c) Stakeholder Engagement, (d) Cultural and Historical Analysis, (e) Case Study Approach, (f) SWOT Analysis, (g) ABCD Analysis and (h) Proposed framework for intervention.* ***Findings/ Results:****The study highlights the intricate relationship between environmental, cultural, and socio-economic factors that impact the restoration and development of Mangaluru's waterfronts. Key findings include: (a)****Environmental Degradation of Water Edges:*** *Unchecked urban expansion, pollution, and encroachments have led to significant deterioration of the waterfront areas, (b)****Loss of Biodiversity:*** *Industrial waste and habitat destruction pose a severe threat to native flora and fauna along the riverbanks and estuaries, (c)****Hydrological Challenges:*** *Erratic monsoon patterns*

and inadequate drainage systems have intensified flooding and waterlogging in low-lying areas, (d) ***Cultural and Historical Significance:*** *The waterfronts hold deep historical and cultural value, which needs to be preserved and integrated into modern urban development.* ***Originality:*** *This research offers a unique contribution to urban rejuvenation and heritage conservation by emphasizing the intersection of* ***environmental sustainability, cultural heritage, and smart city initiatives****. Given Mangaluru's rich coastal history and natural legacy, the study presents innovative solutions tailored to its specific urban and ecological context.* ***Paper type:****(a) Case Study Research Paper, (b) Applied Research Paper,(c)Thematic Research Paper on Heritage and Sustainability and (6) Exploratory Research Paper.*

Keywords: *Cultural hub, Promenade, River tourism, Infrastructure, MangaloreWaterfront,Waterfront development, Reclamation of Waterfront.*

1. Introduction:

The city of Mangaluru located in the Dakshina Kannada district of Karnataka, is nestled between two important west flowing rivers namely Netravathi river and Gurupura river. The Western Ghats are located towards the east, from where the rivers originate. Towards the west, the Arabian Sea lies just beyond the Gurupura river and a narrow stretch of coastal alluviam deposits (Kiran, D. A., &Ramaraju, H. K. (2022)[1]). The abundance and variety of natural resources, especially water, is a distinctive asset of the city. Be it the thodu (storm water drain) networks which course through its undulating topography, the two rivers which form its natural extents, the expansive sea just beyond or the beauty of the pouring monsoons – the experience of Mangaluru by dint of its natural resources has somehow been overshadowed with the development and urban expansion in recent times (Dhanaraj, K., & Angadi, D. P. (2021)[2]). The vision for a development project impacting the city will hence need to take in these myriad aspects into account.The city of Mangaluru is influenced by various factors;

1.1 Geographical factors of influence – The city of Mangaluru, surrounded by major geographical factors like South-west monsoon, High Humidity, Seasonal Rains, Western Ghats, Netravathi &Gurupura river, Mangrove Forest, etc. makes it a region which showcases a variety of experiences by dint of its setting (Azeez, A., etal. (2022) [3]). Addressing these factors is extremely important for any proposal whose impact shall be responsible for defining the image of the city in the coming times.

1.2 Cultural factors of influence –Mangaluru has various factors that influenced from the past to present in terms of history, culture and heritage like Kambala (Shetty, N. K., Kamath, S., Patil, A. A., Tejaswi, S. I., Bhat, M., Naik, S. R., &Samrajya, S. (2024)) [4], Coastal food and delicacies (Lakshmi, B. (2020)) [5], Temples (Ramchurjee, N. A., & Suresha, S. (2013)) [6], Dassara Festival, Local Dance, Daivasthana and Kolas, Fishing, etc. These factors can be strengthened further with the development of Mangala Corniche (30 Km stretch of ring road passing along the river front connecting from Kannur (South of Mangaluru) to Gurupura Bridge near Mangalore International Airport). The proposal aims at highlighting

the major factors that has influenced the city physically as well as culturallyD'Silva, P., Crasta, C. L., & Aquinas, P. G. (2008)) [7]. Based on the above the objectives of this study is mentioned below.

2.Literature Review:

2.1. Introduction to Urban Waterfronts Urban waterfronts are critical interfaces between land and water that hold ecological, cultural, and economic significance. The transformative potential of waterfronts in urban regeneration has been widely documented, with examples from cities like Barcelona, Sydney, and Singapore showcasing how waterfront revitalization can enhance urban livability and foster community engagement (Hoyle, B. (2000). Global and local change on the port-city waterfront. *Geographical review*, *90*(3), 395-417).

2.2. Waterfront Development and Sustainability Sustainable waterfront development aims to balance ecological preservation with urban growth. The works of Wong, T.H., Brown et al. (2009) highlight the importance of incorporating green infrastructure and ecosystem services into waterfront planning (Wong, T. H., & Brown, R. R. (2009). The water sensitive city: principles for practice. *Water science and technology*, *60*(3), 673-682). Concepts such as "blue-green infrastructure" (Mell, I. C., Henneberry, J., Hehl-Lange, S., & Keskin, B. (2013). Promoting urban greening: Valuing the development of green infrastructure investments in the urban core of Manchester, UK. *Urban forestry & urban greening*, *12*(3), 296-306) advocate for integrating natural water systems with urban development to mitigate climate risks while enhancing biodiversity.

2.3. Case Studies of Indian Smart Cities The Smart Cities Mission in India has accelerated urban development, including the revitalization of waterfronts. Case studies from cities like Ahmedabad (Sabarmati Riverfront) highlight innovative approaches to reclaiming water edges (Dempsey, N., Velarde, C. M., Samuel, M., Bakshi, Y., & Baradi, M. (2020). From river to Riverfront: How meanings and cultural heritage change. The case of the Sabarmati Riverfront project, Ahmedabad, Gujarat. *Town Planning Review*, *91*(6), 643-666). Mangaluru, under the Smart Cities Mission, presents an opportunity to merge technological advancements with cultural and ecological considerations, a focus that remains underexplored in existing literature.

2.4. Public Participation and Community Engagement Successful waterfront projects often hinge on robust community participation. Arnstein's (1969) ladder of citizen participation (Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of planners*, *35*(4), 216-224) outlines the varying degrees of public involvement, from tokenism to genuine empowerment. In Mangaluru, involving local communities, fisherfolk, and cultural groups could enhance the inclusivity and sustainability of waterfront initiatives.

2.5. The existing literature provides a robust foundation for exploring Mangaluru's waterfront development within the broader context of sustainable urbanization, cultural heritage preservation, and smart city frameworks. However, gaps remain in the integration of ecological, cultural, and technological perspectives in Indian

waterfront projects. This study aims to bridge these gaps by focusing on Mangaluru as a case study, offering insights that can inform similar initiatives across other coastal cities.

3.Research Agenda: Mangaluru being a historically significant coastal city, is facing challenges in managing its waterfront areas due to rapid urbanization, encroachment, environmental degradation, migration and social economic pressure.

The primary question that this paper tries to answer is that, 'How can Mangaluru reclaim its riverfront to achieve sustainable urban and economic development while embracing its natural and cultural heritage'.

This research agenda aims to generate implementable insights into how the city can manage to develop its socio-economic interests while maintaining its cultural identity and ecological balance. By addressing the multifaceted challenges faced by Mangaluru in the present times, the study will help in contributing to the development of sustainable and inclusive strategies for waterfront management and providing a blueprint for similar such initiatives in other parts of India and the World.

4.Objectives of the Study: The objectives of the study is to understand the complexity of the smart city develop with regard to reclaiming of Mangalore's water edge and embracing its natural and cultural heritage. Redefining the water edge – The intent of this project is to aid the city of Mangaluru to rediscover its once glorious water edge. The idea is to follow an ecological and cultural model sensitive to the water and edge conditions, thereby rendering a grey-green dynamic edge which would become the public corridor to the city. The following are the objectives.

(1) To know about the smart city and understand it complexity pertaining to reclaiming of Mangaluru's water edge.

(2) To Understand how it would improve tourism and local economy

(3) To apply new methods of making cities in the smart city model

(4) To analyze current situation of the urban planning and to come out with better infrastructure

(5)To, Synthesize new technologies based on master plan of Mangalore city

(6)To Evaluate and create better sustainable modern cities

Based on the objectives the following design and methodology was followed in developing this case study.

5. Theoritical Framework: The following are the theoretical studies done for this case study:

5.1. Triple Helix Model: Focuses on the interaction between universities, industry, and government to foster innovation in urban settings.Central to the development of knowledge-based economies in smart cities

5.2. Systems Theory: Views the city as a complex system with interdependent parts, such as infrastructure, governance, technology, and social systems.Helps understand how smart technologies can integrate to create more efficient and sustainable cities.

5.3. Sustainable Development Theory: Emphasizes balancing environmental, economic, and social goals in urban planning.Central to the smart city agenda of reducing carbon footprints and enhancing quality of life

5.4. Technological Determinism: Suggests that technological advancements drive societal and urban development.Used to justify the implementation of IoT, AI, and big data in city management

5.5. Resilience Theory: Focuses on the ability of cities to absorb shocks (like natural disasters, pandemics) and adapt.Highlights the importance of creating smart infrastructure and governance models to enhance urban resilience

6. Design/Methodology/Approach:

The design of the study is based on understanding the smart city project in various stages. These stages give us in idea to know the direction of the project in various phases and stages. This helps in course correction accordingly. The stage wise analysis and approach is as follows:

Stage I: Flood Control Development (Grey – Green Infrastructure) – The City needs to identify the flood prone areas and develop few interventions in order to protect the landscape or the river bank activities/parks/recreation spaces which are being planned to be developed in the future (Plate, E. J. (2002)) [8].

Stage II: Parks & Recreational Development – Development of parks & recreational spaces along the vast riverfront/waterfront that the Mangaluru city is having in order to attract the Citizens/Tourists to the rich natural landscapes that the city is blessed with (Vall-Casas, P., Benages-Albert, M., Elinbaum, P., Garcia, X., Mendoza-Arroyo, C., & Rodrigo Cuéllar Jaramillo, Á. (2019)) [9].

Stage III: Ecological Development – In order to have a sustainable development, the City will have to also develop the ecological environment by developing the mangroves and the natural shorelines in order to protect the local flora and fauna habitat that are prevailing in the region since many years (Arthington, Á. H., Naiman, R. J., Mcclain, M. E., & Nilsson, C. (2010)) [10].

A project of this scale has many aspect of measurement in the form of numbers or data. This data helps us to know the performance and is as follows:

7. Data Assimilation and Data Collection:

Major landmarks & connectivity: The Rego Tile Works land is a potential plot for development as it opens out into a neighbourhood level temple street that culminates with Bolar Sea Face. The site has good connectivity to the existing city transport network and the proposed promenade development along the

waterfront (Guides, I. (2017)) [11].Land Use Map 2021:Site suggests the conversion of unused industrial land into public use that ends up in a public node at Bolar Sea Face. This conversation would add greater value to the proposed promenade and waterfront development (Suhura, S., Nithyapriya, B., Revanth Reddy, L., Philipose, N., Manisha, M., &Dwarakish, G. S. (2018)) [12].Contour Analysis:Negotiating between smaller contour intervals leaves scope for a public utility space at Rego Tile Works land. The Bolar Sea Face existing projection is ideal for public decks (Kumar, A., Narayana, A. C., &Jayappa, K. S. (2010)) [13].Coastal Regulation Zone:The footprint of Rego Tile Works opens out a construction possibility in the CRZ area that would house a public function that could also act as a revenue generator (Dwarakish, G. S., & Natesan, U) [14].

Table No: 1 Area Statement related to the Smart city Project

Sl. No.	Component	Area (sqm) / No.
1	Site Area	3147 sqm
2	Multi Purpose Hall	325 sqm
3	Canteen with kitchen and seating area	125 sqm
4	Black Box theatre	230 sqm
5	Open Air Theatre	1245 sqm
6	Four Wh eeler Parking	12 Nos.
7	Two Wheeler Parking	50 Nos.

Source: Author's secondary source [DPR from MSCL]

8. Analysis of the Data:

Mangaluru as cultural confluence – Being one of the most articulate cities in the state of Karnataka, Mangaluru has been in the forefront of heritage, art and trade with a diverse social and ecological layer to boost about. The cultural centre revolves around the idea of capturing the essence of the same. Bolar Sea Face is an existing neighbourhood level node being an active fishing point and evening spot for the area. The cultural hub intends to become an extended community space to celebrate the cultural vibrancy of the city.

8.1Development Proposal:

Assumptions made:The site considered for the Cultural Hub (which is private ownership) would be acquired or would be developed on Public Private Partnership (PPP) model (Yan, M. R., Chi, H. L., Yang, J. Y., & Chien, K. M. (2019)) [15].

Land requirement:0.8 acre out of the 5 acres of private land near Bolar Sea Face is required for the development of Culture Hub.

Proposed development & programs:The Cultural Hub aims to become a neighbourhood level node to celebrate the cultural activities of the city. The target would be local communities who would end up using it as an everyday space that

caters to the basic space requirements of the community. The programs included in the Cultural Hub are:Multi Purpose Hall, Canteen with kitchen and seating area, Black Box Theatre ,Open Air Theatre, Parking, Landscaping

Statutory regulations applicable: Master Plan 2021 Mangaluru – The Master Plan provides planning and development guidelines for the perspective population of 2021 of Mangaluru city. The Zonal Regulations and their enforcement stipulated in the Master Plan ensure proper land use and development control and form an integral part of the Master Plan for Mangaluru. It also ensures solutions to problems of developments under local conditions [29].

Coastal Regulation Zone Notification 2019 – The purpose of this regulation is to conserve and protect the coastal areas and marine waters. Mangaluru has regulations that fall under the classification of CRZ IA, CRZ IB, CRZ II, CRZ IVA and CRZ IVB [30].

NBC, India – The standardised norms in the NBC guide construction of most types of buildings and lead to safe and orderly development of buildings. A building code is a set of norms that govern constructions of buildings by stipulating minimum standards. The codes are intended to further safety, welfare and health of the residents of a building.

According to NBC India, workmanship and the materials used in construction should confirm to the Bureau of Indian Standards specification. Buildings should be certified for safety against natural disasters by architects and structural engineers. The building code of India also promotes the usage new and innovative materials and methods in building technology [31].

BIS, India – Bureau of Indian Standards is the National Standard Body of India established under the BIS Act 2016 for the harmonious development of the activities of standardisation, marking and quality certification of goods and for matters connected therewith or incidental thereto. BIS has been providing traceability and tangibility benefits to the national economy in a number of ways – providing safe reliable quality goods; minimising health hazards to consumers; promoting exports and imports substitute; control over proliferation of varieties etc. through standardisation, certification and testing [32].

The Bolar Sea Face is an existing community node with a small park space that bustles in the evenings with a decent crowd which comes down for gathering and leisure fishing. The street that connects the Sea Face back to the city is dotted with some temple structures and local settlements (Kumar, A., & Singh, A. (2022)) [16]. The idea of the Cultural Hub was to take cues from this organic settling and enhance the neighbourhood's everyday life by providing a community facility near the Sea Face.

The temple street would in a later phase be developed into a heritage corridor that culimates in the proposed Cultural Hub which later opens out to the improved Bolar Sea Face.

The programs are arranged along a linear block with a landscaped Open Air Theatre (OAT) dropping down to the Sea Face side. A performance space or black

box theatre is tucked in the first floor for special performances / studio recordings.

The ground floor houses community facilities that can cater to the daily activities of the neighbourhood. The café/restaurant provides employment opportunities to the locals. All the spaces provided are rentable spaces and therefore aid in revenue generation (Richards, G. (2007)) [17].

9. Observations and Significance:

Socio-economic impacts of proposed Cultural Hub at Bolar Sea Face:

The river facing Bolar Sea Face edge has great potential of being an active public node. The Cultural Hub would become a neighbourhood level community space to celebrate the cultural uniqueness of Mangaluru. The place would contain spaces for exhibitions, small gatherings, community functions, festivals and would become an everyday spot for the local community and neighbourhood.The Hub and the associated Temple Street could become the cultural corridor connecting back to the city. Bolar Sea Face edge and the promenade associated with it would become an everyday space for the community around and also an evening spot for the city.Rentable spaces in the form of shops, community halls, cafes, restaurants would provide scope for revenue as well as employment opportunities for the local youths and residents.

10. Existing and Projected Scenarios, Expected Outcomes:

10.1. Accessibility:

Existing – Majority of water edges have limited or no public access though most of them have the potential to be activity nodes of the city. Bolar Sea Face is an existing community level node with the tip being open to public. The connector road is however not strong enough thereby cutting off the connection to the city network.

Projected/Proposed –Realignment and widening of the major as well as the access roads are required in various parts of the city. The proposed Cultural Hub at Bolar Sea Face intend to be neighbourhood level node with improved connections to the city transit networks. The Temple Corridor Connector from the tip to the city reminiscing the vernacular architecture and cultue of Mangaluru would enhance the urban character of the proposed node at Bolar.

10.2. Land Use:

Existing – The natural water edge of the city is marked with private developments, mainly industries and residences. With a very limited option to access and no recreational spaces along the water edge, the city has turned its back towards the water.

Project/Proposed – Provision of public recreational spaces along the water edge will provide a breathing space for the city. Moving from southern edge

to the north of the city gives a better opportunity to be developed as a planned city with green spaces. Across roads connecting the major public landmarks to the inner city would have been envisioned in this proposal. The Bolar Sea Face Cultural Hub is one such public node placed along the waterfront development.

11. Development Options:

For the Cultural hub at Bolar, the model of operation considered is that of a Developer who will subsequently manage it as a landlord. This is assumed to be managed directly by the ULB Administration / Development Committee.
The table mentioned below summarises the features of the operating model.

Table 2: Features of the operating model

Sl. No.	Operating Model / Project Component	Development and Operations by Authority –Landlord Model
1	Infrastructure Developent	Government Authority / Public Private Partnership (PPP) model (Sarmento, J. M., &Renneboog, L. (2016)) [18].
2	Operations and Management	Government Authority / O&M Agency / PPP Concessionaire
3	Revenue sources to Authority	(a) All the four key assets namely Multipurpose Hall, Dining Area, Blackbox Theatre and Open Air Theatre are assumed to be let out for which the Tariff would be fixed by the Authority time to time. (b) The O&M Agency which will be appointed by the Authority after the construction will be paying a yearly revenue to the Authority as per the terms of Contract. (c) The Public Private Partnership (PPP) concessionaire will be paying a yearly revenue to the Authority as per the terms stated in the Contract at the time of Bidding [22].

4	Stipulating User fee	Government Authority / O&M Agency / Public Private Partnership (PPP) Concessionaire.
5	Role of Private Sector	In case of appointing an O&M Agency / Development of project through Public Private Partnership (PPP) model.

Source: Author

12. Swot Analysis:

SWOT analysis is a tactical planning tool used to identify the Strengths and Weaknesses, along with Opportunities and Threats. Strengths indicates the areas of advantage, while weaknesses point out limitation and challenges. Opportunities identifies the areas for growth, and threats indicates the factors that could jeopardize success. By analysing these four components, we can develop approaches to enhance strengths, mitigate the weaknesses, capitalize on the opportunities, and address the potential threats.

Strengths:

a) Prime Location: Proximity to both the river and the sea, attracting both locals and tourists (Marale, S. M., & Mishra, R. K. (2011)) [19].
b) Cultural Diversity: Mangaluru's rich heritage offers a variety of cultural programs, workshops, and events which can be utilized in popularizing the space.
c) Community Engagement: This space will create a Potential to encourage local involvement and support from residents and cultural organizations (Sharma, A., & Hasti, C. (2024)) [20].
d) Economic Enhancement: Can enhance the local economy through increased tourism and creation of jobs to the local youths (Ashley, C., De Brine, P., Lehr, A., & Wilde, H. (2007)) [21].

Weaknesses:

a) Challenges in securing funds: Since the initial investment may be significant, there might be difficulties in securing funds (Angelevska-Najdeska, K., &Rakicevik, G. (2012)) [22].
b) Operation & Maintenance Costs: Operation and maintenance costs could be huge leading to insufficient resource to maintain the resource (Angelevska-Najdeska, K., &Rakicevik, G. (2012)) [22].
c) Seasonal Variability: Footfalls may reduce during monsoon, impacting sustainability.
d) Non Availability of Land: Since the land required for the project belongs to private holdings there are chances of him not co-operating.

Opportunities:

a) Development of tourism: Attracting more tourists through cultural festivals, art exhibitions, and workshops.

b) Collaboration: Collaborating with local artists, schools, and cultural institutions to increase the popularity.
c) Digital Marketing: Utilizing social media and online platforms to reach the modern generation audience and to promote events that will be scheduled from time to time (Kaur, G. (2017)) [23].
d) Educational Workshops / Programs: Hosting educational / cultural workshops and courses to engage youth and promote cultural education.

Threats:

a) Environmental Impacts: Coastal location may be susceptible to change in the climate and natural disasters, impacting the various infrastructures that will be developed in the space (Hall, C. M., & Lew, A. A. (2009)) [24].
b) Resistance to Change: Some members in the local community may be hesitant to embrace new cultural initiatives that will be planned in these locations (Hall, C. M., & Lew, A. A. (2009)) [24].
c) Demographic Shift: Shifts in local population and their interests might affect the engagement and relevance of the programming of the space from its intended use (Hall, C. M., & Lew, A. A. (2009)) [24].

13. ABCD Analysis:

It is a method of analysing system and processes in an organization. A stands for Adavantages, B stand for Benefits, C stands for Constraints and D stand for Disadvantages.

A – Advantages:

a) Picturesque Location: The Netravathi riverfront background provides an attractive natural background, enhancing the aesthetic appeal of cultural events.
b) Access to Nature: Propinquity to the river allows for outdoor activities and events, attracting nature fanatics.
c) Cultural Significance: The region has aenriching cultural heritage, providing a diverse display of art forms and traditions to showcase.
d) Civic Involvement: Potential0for strong local participation, with prospects for locals to involve in and support cultural initiatives (Cheng, T. M., Wu, H. C., Wang, J. T. M., & Wu, M. R. (2019)) [25].

B – Benefits:

a) Development of Tourism: A vibrant cultural hub can lure tourists, enhancing local business and the economy of the local residents.
b) Educational0Initiatives: Offers a podium for educational and research programs, workshops, and cultural0exchange, profitinginstitutions and local establishments (Rinaldi, C., Cavicchi, A., & Robinson, R. N. (2022)) [26].

c) Social Amalgamation: Boostscivicconnection and inclusivity through cultural events, nurturing social bonding (Macbeth, J., Carson, D., & Northcote, J. (2004)) [27].
d) Environmental Consciousness: Promotes gratitudetowards the local environment,0potentially including environment friendlypractices in programming.

C – Constraints:

a) Funding Constraints: Safeguarding sufficient funding for initial startup and ongoing operation and maintenance can be challenging.
b) Regulatory Problems: Compliance with environmental guidelines and local zoning laws may pose challengestowards implementation.
c) Infrastructure Necessities: Development of necessary facilities and infrastructures (e.g., performance stage, toilets, kiosks) may require substantial investment.
d) Seasonal Variability: Weather conditions and seasonal variations may influencefootfall and event scheduling.

D – Disadvantages:

a) Ecologicaland Environmental Risks: Being adjacentto the Netravathi River, the site could be vulnerable to flooding and other environmental0issues.
b) Operation and Maintenance Costs: Operation and Maintenance of infrastructure and programming may require constant financial fundings and resources.
c) Parking facilities: Since the land belongs to mostly private owners, the vehicle parking arrangement closer to site will be a challenge.

14. Scope for Further Research:

(a) **Way forward for the City:**

Over the years, Mangaluru has expanded radially, and then along the north-south directions beyond the rivers as newer establishments came up. Within the landmass circuited by the Netravati and Gurupura Rivers, City is gradually expanding towards the eastern extents which are hilly, with changing topography.

While the riverfront development towards the western side shall harness and conserve the City's natural and manmade resource networks, the concept needs to extend further towards the eastern direction as the settlements expand gradually into more critical terrain.

Ecologically sensitive areas like Pilikula also need to be integrated into the larger strategy of the development such that the urban extents can manage its resources holistically in the future with newer developments coming up.

15. Conclusion:

(a) Summary Statement:

Design takeaways –

The larger intent of the waterfront development project are the following:Pedestrian friendly corridors.City resilience plan.Reclaiming City's water edge.Celebratory spaces for the City.Connecting the City to its Water bodies.Adaptive re-use of heritage buildings.Water sports and recreation zones.Community centric planning and design.Marking City's identity in Global map.Enhancement of public interaction through the various programs proposed.A congregational space for the area.A Community space for the neighbourhood.Direct access to the waterfront promenade project.Better employment opportunity to the local communities.A space to celebrate the culture of the City.Direct visual and physical connect to the Bolar Sea Face.Revenue generation from the rentable spaces (Gant, A. C. (2015, August)) [28].

The Cultural Hub at Bolar Sea Face in Mangaluru will help in linking the citizens of Mangaluru back to the rivers which have always been a point of trade, recreation, amusement, cultural exhibitions through out the history of Mangaluru which was lost in the recent times.

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