Place making as a multi-faceted tool in urban design & planning

– an strategic approach in case of Hubballi City, Karnataka, India

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Abstract

Cities are the main engines of economy attracting influx of population from rural to urban areas. They are the major contributors of global GDP and hold high potential for development opportunities but yet they face many inequalities. These negative effects suppress positive ones if not managed properly. In context to Hubballi (a developing city of North Karnataka), in the past the cultural matrix shared a symbiotic relationship with the green & blue networks that traversed the city in a manner that could be characterized as the urban commons. However, over a few decades, industrialization & changing economic drivers have led to over exploitation of natural resources. Specifically, in the case of Unkal Nullah, a canal which originates from Unkal Lake in the northern end of Hubballi city. The mismanagement of urban development led to self-build practices, poor drainage system and encroachment of low-income houses along the water edges. Lack of maintenance led to waste dumping practices into the canal which was a source of sustenance in the past, to become the backyard or sewer of the city in the present day. This in turn led ecological imbalances which were compromised and neglected to the background. To ameliorate the situation there have been multiple efforts in terms of policies and missions, the most recent one being the 'smart cities mission' which also stresses the sustainable development of Indian cities. This paper is an attempt to fulfill the motive of **"smart cities makes better cities with healthier people"** by assessing Place making as a major tool to configure waterfront dynamics to create public realm, to make people centric approach which contribute to people's **health, happiness and wellbeing**. It is necessary to rethink on the matrix of land & water through urban design & planning efforts in making cities more connected with its **water-land-people**.

Keywords: Place making, people centric design, green & blue networks, smart city mission, urban design & planning

1. Introduction

When city grow in dense, city dwellers contend with increased congestion, waste & water management issues and mobility challenges. All these posed negative impacts directly on surrounding environment affecting people's health if not managed properly. The recent heavy rainfalls in India in the year 2019 and 2020 have highlighted the mismanagement of water in the metro cities which led major issues like over flooding of drains, poor urban drainage system led to chocking of lanes, building collapses, fluvial & pluvial flooding, electrocution and biodiversity loss due to poor planning strategies at regional level and local level in master planning. This calls for immediate attention towards long term urban design & planning strategies for infrastructure development and water management which are the influential factors for the sustainable growth of the cities.

According to UN Intergovernmental Panel on Climatic Change (IPCC) report in 2013 concludes that the climatic changes are real and human activities are the main cause. Over accumulation of ecological problems like air pollution, water degradation, chemical contamination, deforestation, vanishing lakes, waste generations and accumulation (urban infill), land degradation and mismanagement of water calls for urgent environment assessment. Also the recent cataclysmic events of COVID-19 also reflected on ecological disequilibrium due to ever-increasing human incursions. This calls for urgent actions to address the importance of ecological imbalances which are part of the daily life communities & its symbiotic relationship to the surrounding environment. This paper illustrates strategies of place -making as multi-faceted tool in urban design & planning and reflect on the aims of smart city mission by structuring it into three main level; *Firstly, at city level to develop an approach where water is turned into valuable asset which anchors through vibrant experiential spaces; secondly, regeneration of urban voids along the unkal nullah with possible people centric design solutions which benefits community relationships in building sustainable societies and thirdly to shape the waterfronts dynamics according to the disciplines of Urban planning & design to achieve resilient ecological corridor reflected at local level and regional level.*

2. Background:

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Hubballi–Dharwad are the twin cities of Karnataka state, located at the *edge of Western Ghats* popularly known as industrial hub with the establishment of small & large scale industries, trading centers for commodities, and Dharwad is an administrative center. The twin cities are also known for large number of educational institutions, start-up companies & NGOs working towards the upliftment of livelihood of the people. Agriculture system largely prevailed in the region in presence of natural resources like rivers, riverlets, lakes, tanks and traditional methods of ponding system influenced by rainfall & soil type. The Unkal Lake act as catchment area and is the oldest lake in the city and the overflowing water canal is Unkal Nullah (Unkal canal). The *water and land dynamics acted as transition zone* celebrated with cultural production of spaces which can be seen with the presence of many temples, mosques & *asvath kattas* (sacred trees used to pray and meditate) along the Unkal lake and Unkal Nullah. The *Chandramouleshwar temple* is 900 year old present at a distance of 3 km from Unkal Lake, the old city was established around it. The *Banashankari temple* is built during 13th century, present at a distance of 4 km from Unkal Lake. Over the period of time, economic growth **accelerated** rapid industrialization in the region which influenced the growth of the city. The mismanagement of urban development & negligence of urban planning led to the degradation of natural resources disrupting the ecological processes creating **conflicting edge condition**. These *contradicting edge conditions* are also subjected to fluvial floods during extreme rainfall affecting the quality of life of people residing along the Unkal nullah.

Figure 1: Map showing the Unkal Lake & Nullah running as backbone to the city.

Figure 2: Lakes & water bodies around twin cities. Source: Bhuvan Maps, Author

3. Research Methodology:

Most of the urban & rural areas of India are agrarian in nature and hence are made up of ponding system like lakes, canals, catchment areas, swamps, ponds, wells which acted as sponge to absorb the rainwater and allow into the ground and later used for irrigation and drinking purposes. Lack of maintenance and degradation of these green and blue networks are isolating the people along the water corridor resulting in **disconnection between human & nature relationships**. The urban transformation of *Hubballi city* led the city to expand in all direction making the Unkal Nullah, acting as a backbone of the city as shown in the *figure 3*. The urban growth patterns of the city have created unpaved edge conditions, traffic congestion, non-porous urban fabric resulting in poor connectivity, and walking is frequently a disjointed & disorienting experience as shown in *figure 4*. Thus it is important to harness the greener future, plan healthier cities and have long term strategies for climatic changes. The study identifies the present issues of Hubballi's green & blue networks and attempt an methodology on urban water management, urban mobility and to build resilient future by adopting a more integrated & holistic approach in urban design & planning solutions.

Problem Field	Urban Water Degradation & Ecological rift	Non porous urban fabric	Transformation led to Change in Urbanisation Pattern	Fragmented Neighbourhood No linkages	Degraded Ecosystem RIVER TURNING ITS BACK
Interdependent	Built form & water system	City & Nature	Old Core & New Core	Formal urban space & Informal urban space	Flooding during Monsoon Pollution
Solutions	Allowing more porosity	Turning water into valuable asset	Urban Regeneration & redevelopment	Placemaking as multi-faceted tool	Resilience for Ecological corridor

3. The significance of Urban Design & planning in building smart & sustainable cities :

Cities are reflection of physical context, water, land dynamics, culture and people which are connected each other by roads, nodes, & open green spaces. These are important factors that influence the image of the city and shared values of the spaces. Many of our water canals, lakes, riverfronts, seafronts, ponds, swamps and water tanks are cultural production of spaces which are largely subjected to exploitation and degradation effecting the ecological metabolism. These natural resources are the valuable assets which needs immediate attention. The recent pandemic crisis and climatic changes highlighted the urban issues like movement systems, water management, & ecological imbalances have emerged as important issues and it calls for an integrated solutions in urban design & planning efforts to reinvent the cities & towns into healthy & liveable cities. Cities are transforming in many ways, people have changing their lifestyle by engaging themselves in walking and cycling, understanding the importance of lakes & ponds which act as sponge absorbing extreme rainfall. In response to this, our government have initiated many urban design challenges like **Streets for People Challenge**, **Cycle4Change Challenge** to promote healthy lifestyle and to reimagine streets as public spaces through the lens of safety, quality of life, and economic regeneration and child/toddler friendly interventions. Various efforts are been made in making our waterfronts more lively and reimagined the edge conditions like **Regeneration of Sabarmati Riverfront project (Ahmedabad)**, **Ganga riverfront Rejuvenation project – Namami Gange** through

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Smart City Mission approach for urban development and ecological protection of our rich natural resources. The waterfronts of many cities, plays a variety of roles in creating public realm, celebrate functions as open space for recreation and tourism offering an integration-model for economic regeneration and providing healthy lifestyle within the cities. These efforts of Smart city mission translate the vision of the government to recognize the multi-sectoral, multi-dimensional and multi stakeholder nature of urban design & planning disciplines in building sustainable cities.

3.1 Hubballi under Smart city project actions:

In 2016, Hubballi-Dharwad was selected for solar city/ Green city master plan by the government of India. In 2017 under *Smart City Mission*, it was selected for Area Based Development (ABD) which includes redevelopment of 992 acres within the city, a flagship scheme which impacts the overall population of the twin cities. Hubballi is the 4th largest city in Karnataka & 2nd highest revenue generator as industrial hub. It is one of the 49th Metropolitan clusters selected by *McKinsey & Company* as growth hotspots in India. The main challenges of Indian cities face are multi sector governing bodies, assessing the conditions of urban agglomeration within certain region and to connect with productive network is difficult. The assessment of these agglomeration needs a methodology which are driven by the concepts of smart city mission as key element. The Smart city mission represents technology based solutions in city management, making comprehensive approach in the infrastructure development and global strategies to tackle city challenges which are reflected in a holistic approach. The strategy of Smart city projects establishes a well-balanced urban model in addressing ecology, economy, governance, mobility, people and quality living provided in comprehensive response to the needs of the city. As a whole, the framework of Smart City project is integrated system aimed to have innovative technology based solutions in urban planning & design and to establish smart-partnership between local government and private in order to achieve sustainable development. Focusing on the Hubballi's waterfront, the study is an attempt to arrive at many integrated solutions by adopting Smart city mission model and implement *placemaking design tool* to create a character, identity & connect people back to nature. It helps in establishing collaborative process with municipality based partnership, multi stakeholder engagement and people participation to make our cities smarter and vibrant to *live, learn and work*.

3.2 Place making & People Centric Design approach:

Placemaking is people centric approach in urban design, planning & management of public spaces. It emphasizes particular community to discover their needs and aspirations to connect easily to where they live, work and play. It creates an opportunity for the community to feel their ownership, custodianship & catalyzes public realm which contribute to *people's health, happiness and wellbeing*. It creates an opportunity for shared use spaces which attracts diverse people to improve their economic, social, and ecological issues. It challenges urban designers & planners to incorporate green thinking and adapt natural technology into their designs to promote sustainability and healthier environs. Common problems like traffic-dominated streets, unmaintained parks, isolated waterfronts sit empty devoid of public realm and vibrancy. This needs to be addressed by *embracing a model of placemaking where a place is viewed entirely rather than zeroing in on isolated components*. Place making approaches focus on achieving sustainable cities, by empowering communities, creating a safe & healthy society and help in building a bridge between culture & values of a place. In India, the land is often managed by local municipal corporations, the mismanagement of urban land in past years led the process of development to become more institutionalized and community stakeholders rarely have a chance to voice their aspirations about the place they inhabit. *People Centric approach* in place-making is an interaction design methodology focused on understanding and engaging individuals in ways that are useful, useable, and desirable. It helps the local government in examining the issues & understand perceptions of the citizens using analytical skills, identify site potential and capacity to change which is achieved through stakeholder engagement & Citizen Participation. It establishes collaborative relationship with diverse people in creating strategic scale to project area and convey design strategies through vision statement. People centric design approaches help bringing out the design alternatives which are functional, user centric, ease to use, accessible, brings new investment to the city.

PLACE MAKING DESIGN INTERVENTIONS, MAKING WATERFRONT MORE VIBRANT TO CREATE PUBLIC REALM WITHIN THE CITY

4. Water & the City nexus:

The twin cities Hubballi-Dharwad are served with many lakes & tanks serving the drinking & irrigation purposes as shown in *figure 5*. The natural beauty and serene atmosphere played a key role in the becoming an integral part of its culture & source for many ecological inhabitants. In 1962, Hubballi – Dharwad had 101 water bodies connected with 152 canals, presently only 19 major water tanks are in Hubballi which are not fit for consumption. Some of the important lakes are *Neersagar, Nuggikere, Kelgeri, Navalur, Unkal Lake, Tolankere, and Rayanal Lake*. The Unkal Lake in Hubballi is believed to be more than 100 years old, present at north part of the city and under the supervision of *Sir. M. Vishweshwaraya*, Unkal Lake dam was constructed in 1893 for the supply of drinking water to the city. Water supply from Unkal Lake was stopped owing to deteriorated water quality. Later, water was drawn from *Neersagar Lake* built in 1969 but failed to meet the requirement of the city population. At present, additional water is supplied from *Navilatirtha Dam constructed across the Malaprabha at Savadatti in Belagavi District, Karnataka*.

The Unkal Lake is spread over 262 acres and with average depth of 2.5m and maximum depth of 6.0 m, & the total water holder capacity of the lake stands at around 26,50,785 cubic meters. The total coverage area of the lake is less than 3% of the catchment area and thus, Unkal Lake behaves as a detention tank. The main source of water is from seasonal rivulet *Shalmala (flowing from north part of Dharwad district)* & surface drainage flowing from the South part of Dharwad & moving towards the catchment area of *Unkal Lake*. The overflow of water from the waste weir of Unkal Lake is called as *Unkal nullah* (also known as *Rajnullah/ Hirenullah*), it joins *Bedthi River* near *Kalaghatgi* (about 30km away from Hubballi) and later joins the *Gangavali river** finally meets the Arabian Sea as shown in *figure 6*. The Unkal Lake defines as origin for *Bedthi River* and on its course towards the Arabian Sea, the river falls from a height of 183 km at *Magod* known as *Magod falls*. The river is covered with dense evergreen & semi evergreen forests along its path.

Figure 5: Map showing lakes and water networks in Hubballi and Dharwad City

Figure 6: Map showing important river networks, dams & lakes at regional level (not to scale). Source: Bhuvan maps, Author

5. Ecological indicators to design and assess green & blue networks:

The below table helps to arrive at desirables goals of urban design & planning interventions to create smart integrated solutions:

Category	Indicators	Outcomes
Health of the Lake	Built Environment – Unkal Lake is catchment area acting as sponge to absorb rainwater. Due to lack of maintenance & water mismanagement, drain water is let directly into the lake, making it unfit to drink. Entire lake is covered with hyacinth and silty clay sediments as shown below. The phosphate content varies from 187-327 ppm.	Multifunctional & Green Edge - The lake acts as eco-sensitive area where the edge condition is unpaved & unprotected. To have controlled flooding in the nullah the possible solution is to have detention tanks or a buffer zone which will hold the surplus water & cascading system in the water management which helps in aeration of the water.

Unkal lake covered by carpet of water hyacinth (source: Deccan Herald Newspaper, July 2019)

Rainwater lashing out of the Unkal Lake waste weir during extreme rainfall of August 2019

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Category	Indicators	Outcomes
Water Quality assessment	Public Health - The contamination of the water in Unkal nullah is mainly from the domestic wastes coming from adjoining neighbourhoods, Dhobi ghats (laundry services), small scale industries and slaughter houses impacting the water quality, soil, health & hygiene that calls for urgent environmental measures. The unhygienic surrounding have affecting the health of the inhabitants and are subjected to vector borne diseases like typhoid, cholera, jaundice, Malaria, dengue and chikungunya. These issues are due to absence of proper environmental norms and water management in master planning process as shown in figure 7 & table below.	Environment & water assessment - Water quality tests were carried at four locations namely Unkal Lake, Islampur, near cotton mill, and Gousiya town and inference as per IS 10500:2012 standards within the desirable limits for tested parameters except TDS, TH and Chloride, the water is unfit & unhealthy with reference to the Bactiriology. City is provided with sewerage collection system covering an area of 202 km and treatment facility which are less comparatively. The heavy rainfall in 2019, most of the drain pipelines laid along the nullah were broken (only 24% pipelines are remaining) resulting direct discharge of sewage water. Hence it is important to establish drain pipeline & sewer treatment plant at possible location , than the treated water can be introduced into main nullah to have continuous flow for all seasons.

THE CITY	
Municipal area (HDMC)	202 sq km
Population (2005)	0.9 million
Population (2011), as projected in 2005-06	1.2 million
THE WATER	
Demand	
Total water demand as per city agency (KWSSB)	135 MLD
Per capita water demand as per KWSSB	159 LPCD
Total water demand as per CPHEEO @ 150 LPCD	128 MLD
Sources and supply	
Water sources	Neerasagar, Malaprabha; borewells
Water sourced from surface sources	98%
Water sourced from groundwater	2%
Total water supplied	111 MLD
Per capita supply	131 LPCD
Leakage loss	35%
Actual supply (after deducting leakage losses)	72 MLD
Per capita supply (after leakage losses)	85 LPCD
Population served by water supply system	NA
Per capita supply in the served area	NA
Demand-supply gap (after leakage losses)	63 MLD
Treatment	
Number of WTPs	2
Total treatment capacity	114 MLD
Actual treatment	111 MLD
Future demand and supply	
Demand (2011), as projected in 2005-06	183 MLD
Augmentation needed to meet the demand	72 MLD
Required increase in supply	65%
THE SEWAGE	
Generation	
Sewage generated as per CPCB	107 MLD
Sewage generated as per city agency	60 MLD
Collection	
Length of sewerage network	412 km
Population covered by sewerage network	NA
Area covered by sewerage network	30%
Treatment	Nil
Disposal	Hire and Biratikal nullahs

Source: Anon 2011, 71-City Water-Excreta Survey, 2005-06, Centre for Science and Environment, New Delhi

Notes: HDMC: Hubli-Dharwad Municipal Corporation; KWSSB: Karnataka Urban Water Supply and Sewerage Board

Figure 7: Collective mapping of Unkal Nullah near old Hubballi area (The old Hubballi area developed with establishment of Cotton factory & further with growing neighbourhoods of traders, labourers, manufacturer of small-scale industrial commodities - Karwar Road).

Urban water Management

Accessibility & service provided - Hubballi gets rainfall about 722 mm which is 28.4 inch in monsoon season (July to September). The Unkal nullah width varies from min 7m to max 35 m with 11 sub nullah joining natural sloping towards the main nullah. As the channel is unpaved as shown in figure 8 and uneven, sewage water logging problem occurs at various occasions of rainfall which creates foul odour issues and over flow of water into the houses residing alongside of the nullah as shown in figure 9.

Movement Corridor - During 2019 flood rains, excessive rise in water level in main Unkal nullah damaged most of the roads, pathways, old bridges, drain lines, & accessing across the nullah was difficult. The possible solution is to create **paved embankment as a protected barrier at the edge of the nullah** to hold water current flow and to build proper pedestrian & cycling corridor along the edge of the canal for easy commute during heavy rainfall.

Urban Design & planning strategy – The framework should reflect integrated solutions and people centric approach to build sustainable societies. The aim of the interventions should be **proper embankment, separate drain pipelines, pedestrian accessibility, walkability, sustainable & multifunctional functions, environmental maintenance & green cycling corridor.**

Sustainable development - The natural resources are valuable assets which need to be protected and well designed. Our green & blue networks are great service providers for the city in terms of healthy environment, increase liveability, social inclusion, identity of place, & sustainable shared spaces for the development of communities.

The timeline explains the effects of rapid urbanisation and mismanagement of development process with respect to the growth of the city, the edge condition along Unkal Nullah & the changes in ecosystem:

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Conclusion from the analysis: Every city/town/village are flourished along the water for the basic needs of drinking & cultivation proposes and the inhabitant have configured the resources available accordingly to the use & functionality. The interference of human as part of polluting the ecosystem is resulting in difficult situation to live and work. The study calls for urgent attention towards guarding and protecting the blue & green networks which are basic commodities of our daily lifestyle through proper framework in master plan.

Pictures of existing edge condition of the Unkal Nullah. Source: Author

8. Unkal Nullah – a Blue & Green strip in the city & its Challenges:

8.1 Spatial Organisations :

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Figure 10: Map showing city linkages to all important nodes & downstream areas affected by monsoon floods.

Figure 11: Map showing spatial organisation along unkal nullah with adjoining neighbourhoods in 2km radius.

Water has played a pivoted role in shaping urban life with community, Economy and Ecology sharing symbiotic relationship around them. A stream, which was once a place for social cohesion today has become paradoxically a place for low income houses who are deprived from basic amenities and also prone to floods during heavy monsoon as shown in figure 10. Thus it is important to change the land & water dynamics of the city to improve quality of life for human well-being. Lack of overlaps of all important nodes make blue & green networks looks blur in the city form, forcing it to behave as backyard losing its visual connectivity. The present urban form identifies current connections, services, population density, centrality & ecosystem which have high potential for development activities and also to generate new investments along Unkal Nallah as shown in the figure 11.

8.2 Urban Connectivity:

Figure 12: Map showing city linkages (primary, secondary & tertiary) along the Unkal Nallah.

Figure 13: Map showing negative effects of the nullah with adjoining neighborhoods in 2km radius. Source: Master Plan by HDUDA, Author

With many industry & trade networks, prosperity in commerce prevailed in the region resulting in parcelling of road networks based on its use and connectivity. The paths & circulations across the Unkal nullah is connected by 18 bridges as shown in the figure 12. The unpaved edge condition creates negative effects which also suppress the positives ones as shown in the figure 13. As city grow dense, it puts pressure on the natural system,

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resulting increased traffic on the roads and discomfort to the users to connect with live, learn & work places. The study suggests an approach towards the edge condition of Unkal nullah by making it a paved corridor by introducing proper walkway & cycle lanes with landscaped spaces to connect to all important nodes of the city. The integrated commute system with BRTS corridor running along the nullah by 1km apart and Public Bicycle sharing stations (project by Hubballi-Dharwad Smart City Limited) also gives an opportunity to reach education, bussiness hub and other desired destinations for the commuters.

8.3 People Demography:

The urban patterns is observed in terms of where people learn & work comparing children, students, the working age, and retired people use the urban networks as shown in figure 14. The social production of spaces can be seen along Unkal nullah with the presence of temples, mosques & institutions as shown in figure 15. The unhealthy & unhygienic condition of the nullah resulted in the lack of diversity within the social environment. To succeed in socially sustainable & vibrant places, it is essential to overcome this lack of complexity by creating places that mix people of all ages and background.

Figure 14: Map showing diverse mix of people along the Unkal Nullah & BRTS corridor (with 250m walking circle)

Figure 15: Map showing cultural nodes like temples, mosque and other institutions present along the Unkal nullah. Source: HDUDA Master plan, Author

8.4 SWOT ANALYSIS:

Figure 16: City Level Analysis through cognitive mapping explaining the site condition. Source: Derivatives by author

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Based on cognitive mapping described by Kevin Lynch in his book “image of the city” & “Managing the sense of the region” similar exercise was undertaken during the time of site visit as shown in figure 16. The main **strength** is centrality of Unkal nullah connecting very easily to work, learn & live spaces. Its close proximity to BRTS & Railway corridor makes it a potential node to have infrastructure development. The **weakness** are the poor quality and accessibility of the pedestrian environment making it blur edge condition. The lack of connectivity between nodes results in undefined, disconnection, disoriented, boring, blurry, and loss of visual connectivity. The development along the water edge gives **opportunities** to the adjacent neighborhoods & institutions to access, connect & use making it a unique city. The core **threats** are the unpaved area & closed off areas contributing to negative urban spaces which correlate to high threat spaces. The close proximity of the low income houses along the nullah is also **threat** because of flood effects.

8.5 Collective Memory Mapping of Hubballi, Karnataka:

Figure 18: Memory mapping of Hubballi & Unkal Nullah of past & present situations through stories & interviews shared by residents, neighbours & family member. Source: Illustration by Author

The Illustration 1 gives a mental picture of the city Hubballi in the past & its activities, identity & character of the place. Unkal Lake was source of water for the whole city. Agriculture prevailed along the water stream, was used for irrigation & drinking purposes. *Temples, mosques & muttas* (religious learning centres) marked the educational & cultural significance of the place. As the city grew dense many neighbourhoods were formed depending on the occupation like weaver's colony (*Nekarnagar*, the famous *Illakal saree* of North Karnataka is weaved by *Nekar Community*), Maldar Oni (Basket knitting), Byali Oni (pulses market), Gousiya town (making of copper & steel utensils) and many more as shown in illustration 2. This led to the development of many industrial infrastructure along the water edge which ultimately left their wastage into the Unkal nullah, resulting in degradation surrounding ecosystem.

9. Theoretical Basis:

Looking at the examples of Urban renewal projects like *Cheonggyecheon, Seoul, South Korea* and *Sabarmati Riverfront Project, Ahmedabad, India*. Both the projects were restoration of massive urban renewal projects worked with multi-partners and multi-stakeholders which aimed to reorganise and plan systematically for long-

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term development of infrastructure for the city. *Cheonggyecheon* was implemented with the total cost of \$900 million by Government and multi-partner funded scheme. The aim of the project was revitalise the downtown area and reimagine the green corridor in the middle of hustle bustle of the city. As part of the planning process, citizens were involved in decision-making through an electoral process, which enabled active communication and consensus formation between the government and its citizens. The key elements of the project of the project were *removal of elevated highway concrete structure and create an extensive new open space along the day lighted stream, adapting placemaking approaches like pedestrian amenities, recreational spaces and construction of new bridges by reconnecting the urban fabric to many more*. This urban renewal and revitalization through placemaking as a tool benefitted the city and the citizen in economic growth and added value for tourism, created flexible public access to the river for fishing & bathing, educational resources and cultural values reflected in the design proposal, highlighted ecological, air & water quality improvement.

Lesson learnt from the implementation of the project:

The massive urban project proved as global best practice example of implementing successful urban greening in a densely populated area. Provided a template for planning across South Korea and around the globe. It is an example of a metropolitan scale, multi-partner project benefitting millions of population.

Sabarmati Riverfront development project, Ahmedabad:

The Sabarmati Riverfront Development project is an environmental improvement, social uplift & urban rejuvenation project that renewed Ahmedabad. The project was developed by the Sabarmati riverfront Development Cooperation Ltd. (SRFDCL), a company wholly owned by the Ahmedabad Municipal Corporation. Sabarmati River was important source of water, it provided a backdrop to cultural and recreational activities. Untreated sewage flowed into the river through storm water outfalls and dumping of industrial waste posed a major health and environmental hazard. Slowly, the city turned its back towards the river. The project was reclaimed approximately 200 hectares of land from the riverbed. The first phase of construction started with 11 km followed by 22 km with waterside pedestrian realm, open parks, Laundry Campus, river promenade, elevators, blocks, public washrooms, play areas, exhibitions spaces and flower garden was made available for public use in January 2014. The key elements of the project was to *reconnect the city with the river place making approaches and positively transform the neglected aspects of the riverfront. Also to safeguard the city and prevent untreated sewage from flowing into the river with proper water retention and recharge tanks. The project also highlighted the rehabilitation and resettlement of riverbed dwellers and activities by providing socio-cultural amenities.*

Lesson learnt from the implementation of the project: The Riverfront project presented a great opportunity to people to reconnect and establish a relationship with nature. Traditional users of the river like vendors, washer men were provided organised facilities to utilise. The collective memory of the riverfront was brought into life and transform the city more liveable in terms of environmental improvements, infrastructure development and inclusive opportunities. The paved embankments provided with wide walkways, green space with tree canopy and other amenities making it more diverse place to use and celebrate the vibrancy of spaces.

10. Evolution from Ideas: Possible design solutions & Master Plan Strategies

The focus of the research is to develop a conceptual framework & assessment methodology for Smart city project in Hubballi along Unkal canal & urban voids in an strategic planning approach. Implementation phase entails translating the vision statement for long-term change, understanding the complexities of the city and its symbiotic relationship & interdependency between **Community, Economy & Ecology**. This phase includes possible solutions, design recommendations and planning strategies that are viable, sustainable and can exist through multiple stakeholder engagement, explained as shown in the *figure 19*. The study highlights the importance of water management, having **controlled water flooding & storm water** into the main nullah, protecting the natural habitat by **laying & separating drainage pipelines** entering into main nullah & sub-nullahs. Introducing the **treatment technology plants to treat sewerage water** produced by the city and the treated water will be left in the main nullah for continuous flow (specially during summer seasons). Creating vibrant edge conditions through **place making components** like paved embankments provided with wide walkways, green cycle lanes with tree canopy and other amenities, making it more diverse place to use, celebrate the vibrancy of spaces and play their roles in building sustainable communities. And thirdly, with the clean & treated water in the Unkal Nullah, it will be contributing the good health of surrounding environment which makes it possible to have **urban agroecology - model for sustainable urbanization**.

Vision statment: Building inclusive, healthy, functional & productive city to promote place making as multi faceted tool aim to improve the public open spaces & ecological corridor, to build sense of place, identity and associated culture & values, facilitate social capital and community revitalization.

MASTER PLAN INITIATIVE :

10.1 Possible solution and Design Interventions along Unkal Nullah:

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PRINCIPLES & GUIDELINES :

The above master plan is worked on the guiding framework of urban design and planning strategies for Unkal canal on three design principles as explained below.

Figure 19: Typical cross section across with design Unkal stream canal with protected barrier & place making components to establish public realm (at 20- 30 width of the Nullah)

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Figure 20: Typical cross section across with design Unkal stream canal with protected barrier & place making components

Design Principle 1: ENHANCING + CONNECTED + CONTEXT – REDEVELOPMENT OF UNKAL LAKE

The Unkal Lake is landmark marked by park & temple precinct & also upcoming hotels/restaurants around as shown in figure 21. Lake is protected by buffer of 35m, the edge of the lake is designed with series of levels of gaban walls with planter box to protect the over flow of the water during heavy rainfall & enhance the overall experience. The cascading system helps the surplus water flowing from the lake into the Unkal canal in aeration. The Biodiversity Park with horticulture & botanical garden helps to revitalize the defunct agricultural department at Unkal Lake.

Figure 21: Details of Unkal Lake with amenities like pedestrian, seating, culture spaces, protection barrier with various levels of gaban walls with planter box. Biodiversity park to revitalize with horticultural gardening spaces, the sampling are sold in the market spaces created in temple precinct.

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Design possibility 2: DIVERSE+CONNECT+EXCELLENCE – CORRIDORS & WALKABILITY ROUTE NETWORKS

The Urban planning strategy is to provide flexible land use for possible components like Exhibition space, Weekly market & Business centre which is also closer to BRTS Bus Terminus making easy to commute for **Work, Play & Shop**. These provided incentives create job opportunities & generate new investments which will help to uplift the livelihood of the people around.

Focus area 2: Provided with IT industry, Exhibition Gallery & weekly Market spaces with close proximity to BRTS terminus

ISOCARP
Knowledge for Better Cities

56th ISOCARP World Planning Congress in Doha, Qatar
International Society of City and Regional Planners

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Design Principal 3: ENGAGEMENT+CUSTODIANSHIP+POSITIVE CHANGE – REINVENT CITY & ITS FUNCTIONS

Reviving the defunct factory land into Skill Development centre/Research Centre to generate job opportunities & skilled people. At downtown area (Islampur & Gousiya town) were closely packed houses reside along nullah are more prone to floods, the design aims to provide affordable vertical housing for the low income class with workshops for community as shown below. Unkal nullah is separated by proper embankment of gabion wall to prevent from flooding, separate drain pipelines & community gardening for healthy & better smart city.

Conclusion:

The waterfront are the vessels of interface between city, people, and nature which needs careful assessment interms of design interventions, policy frameworks and futuristic planning strategies to build susutainable & resilient future. Hubballi have a good ability to develop in a unique open space environment based on its rich cultures, ethincs, tradition and history of North Karnataka. The study concludes by understanding the indicators & outcomes of the city and making an attempt to rethink on city's image, livability, and productivity of blue & green corridor through place making as multifaceted tool in urban design & planning. The possible design

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interventions along the Unkal Nullah are multidimensional and integrated system to benefit the users and ecological corridor of the region. The design intent of the project is to solve urban problems in an efficient way to improve water management, sustainability of the city & quality of life of its inhabitants. The design interventions aim to develop an approach where water is turned into valuable asset which anchors by **revitalizing of unpaved & urban voids into useable space**, identifying the **gaps in spatial continuity and transforming the green & blue corridor** to a **networked movement corridor connecting various work centers in the city** and **interconnecting the open-space opportunities that will generate new investment**.

Indian cities are complex, equipped with urban issues & various governing algorithm bodies which needs to evoke on the present issues of climatic changes, population, global warming & pandemic crisis. The urban infrastructure development, urban transportation and smart city projects are integration of government with multi-stakeholders, & municipality based partnership to provide effective solutions & generate new investments both at local level & region level. These works need a combination of multisectoral frameworks which can be achieved through integrated decision making and people centric approach (citizen participation). An overwhelming people participation includes public surveys, planning workshops for local policy initiative, & design workshop to benefit the voice of the local stakeholders & communities to develop or test design options with user groups. These initiatives not only benefit the nature of the project but also enhances the democracy, social, political & economical context in which it is being designed. The study concludes the potential of place-making as a multi-faced tool to enhance the sense of community, human & nature well-being to build sustainable cities with innovative & technology based solutions. The climatic changes are real and every city needs to plan a long term-strategy within the disciplines of master planning at local & regional level to protect the health of its people & surrounding environs. The results of these multi-sectoral frameworks & multistakeholder engagement when managed properly will definitely have positive change to build a smart city, a better city for the well-being of its citizens.

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