

RECONNECTING / REIMAGINING URBAN OPEN SPACE OF RIVER VRISHABAVATHI



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Abstract

Cities are expanding and eating away the open areas and green spaces which were major drainage points or forests in the past. Unplanned growth and urbanization has drastically changed the drainage characteristics of natural catchment areas or drainage areas, by increasing volume and rate of surface run off. Increasing urbanization has led to momentous changes in the natural systems. During monsoon, river water tends to increase in their flood plain zones. Lakes and wetlands retain excess surface runoff, where forested lands help in soil retention and groundwater recharge. The land use and land cover changes are caused due to urbanization occurring at the cost of buildings on open spaces, green areas and water bodies. Over the past years with the growth of the city, many lakes and the connecting natural drains in Bangalore have vanished because of encroachment and diversion. Focus of the study is to bring this gap to the forefront and attempt to reimagine the previously underused and unappreciated river system and understand how infrastructure is the underlying trigger for the evolution of changes of this relationship through perspective of privatization of Green space, infrastructural changes and urban flooding.

Keywords

Green space; Urbanization; Natural Catchment; Surface runoff; Soil retention; Land use; Land cover; Privatization;

1. Introduction

Practically all large cities are located on or lie next to navigable rivers. Rivers have always served as guides of explorers, pioneers and travellers. The early settlements were directly linked to river. The evolution of the relationship of river with cities infrastructural changes was a critical point of time where it triggered the changes in river and lakes from drinking (from river to lakes to reservoirs to piped water) to modern settlement pattern like how lake, river edge and



green spaces was encroached and misled by urbanization and industrialization which led to major problems like degradation of urban green spaces due to overuse, privatization and urban flooding.

River basins across the world are in pain or suffering from pressures like urbanization, industrialization and population growth, which is leading into river basin overuse or changes.

2. Need for the study

To create a city's identity and also to understand and develop an approach towards citiesriver with the change in its relationship towards infrastructural changes and other thingshappening across it and transforming it into a unique platform with required facilities servingthe city and its people and a sense of place through urban green spaces, recreational andcultural attractions, policies and transportation choices.

The Intent is to solve the conflicts associated with the changes of relationship occurring fromthe trigger of infrastructure, privatization and transformation of river and make the place aviable, likeable and livable in the phase of the today's urbanization.

This generates the need to the following Research Questions :

- Macro-
- Evolution of the relationship in usage of river systems.
- Micro-
- Privatization of public spaces and changes of green space in metropolitan area.

- Flooding of urban rivers in metropolitan cities due to incautious urbanization.
- Infrastructural developments changes across river system.

3. Overview of Urban rivers and Urbanization

During monsoon, river water tends to increase in their flood plain zones. Lakes and wetlands with bodies retain excess surface runoff, where forest lands help in soil retention and groundwater recharge. The land use and land cover changes caused due to urbanization occur at the cost of building on open spaces, green areas, and water bodies. Over the past so many years growth of the city, many lakes and connecting natural drains or nallas in Bengaluru have disappeared because of encroachment and diversion. Many cities in India are expanding and have swallowed the open area which was a major drainage points, green space or forest in the past. We can see this happening in many Indian cities. So, when there are excessive rains, cities are not able to drain the water and hence many areas get inundated.Unplanned urbanization has drastically altered the drainage characteristics of natural catchments, or drainage areas, by increasing the volume and rate of surface run off. Indian drainage systems are not able to cope with increased number of water and are always encountered with the blockage of sewer due to disposal of solid wastes. Encroachment of wetlands, floodplains, etc. Due to vegetation clearing, new housing or industrial developments, urban infill, paving driveways, patios, and new roads etc., so does the amount of runoff. Growing pace of urbanization has led to significant amount of changes in natural systems.



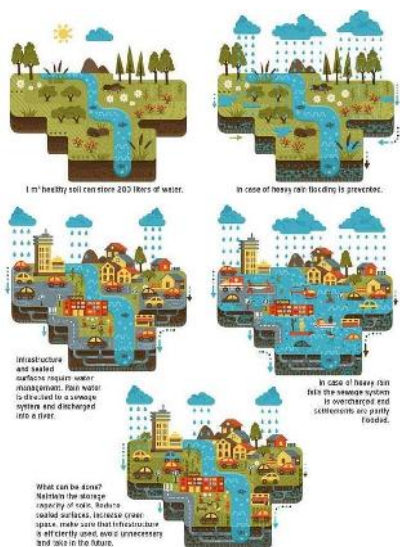


Figure 1 Photos shows Environmental Info graphic about soil, food and flooding

Source: Stella Caraman onbeance

4. River System Before and Now

Before river and its surroundings was used in away were it had green spaces like forest or agricultural activities taking place next to it like both green and blue networks were connected to each other and later stages settlements started to take advantages of river and started to settle next to it in a sustainable manner also river had a connection with cultural and social aspect of the settlements, major cities or villages traditionally if we see are settled next to a water source or river. Also village settlements and their activities used to take place next to the river system like village fairs or santhe's etc. which made a good relationship between each other, so slowly river pattern changed from forest, agriculture land, recreational space, settlements to a urbanized situation where agriculture lands were replaced by industries, high rise buildings, Roads and infrastructure and converted green space next to river into a completely concrete jungle. We can see the transformation of river taking place in the below picture which depicts the

changes of the pattern of river from past to present. Also the quality of water in river is changed due to domestic and industrial waste let into the river.



Figure 2 Picture shows changes in pattern of river and transformation taking place next to river

Source: scribd.com

5. Degradation and Privatization of Urban Green Spaces

Bengaluru is known as a garden city but if we see the evolution of Bengaluru from 1973 to till present green cover is drastically changed and have been depleted to maximum extent, in present situation we can see very less green cover present in core of the city and also in outskirts region of the city .This explains that there are very less urban green spaces and the only open spaces left out now are rivers lakes parks etc. Also the remaining open spaces like rivers and lakes are also in bad shape, degradation of urban green space are taking place due to over use. Parks area now restricted to only few people and charge entrance fees to enter the park which is leading to privatization of public spaces and not only the parks are privatized but many open spaces or open lands are allotted to private entities who are privatizing the space



and not allowing people or the public to use it, which makes the open space to be altered for other purpose or uses. Many open spaces in the city are shrinking due to negligence and no proper maintenance by the authority that are either privatizing the open space or letting others to encroach the place or degrading open space by overusing it.

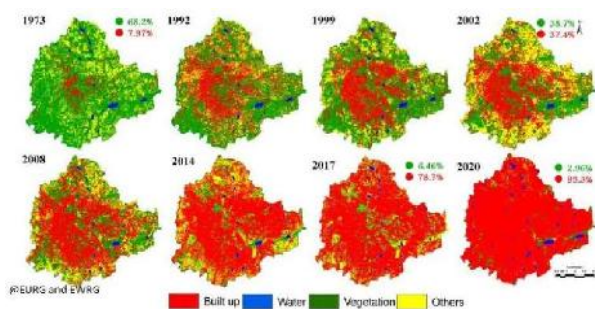


Figure 3 Satellite images showing green cover of Bangalore reducing

Source: IISc Bangalore

6. Urban Rivers vs. Urbanization

Rivers in urban areas are neglected where they are either in polluted stage or have shrunk into small nallas with no buffer zone next to it, as all buildings have been built till the edge of the river which is leading to urban flooding and over flow of water from the rivers .Instead of proper planning , inappropriate drainage system these type of flooding are caused but authorities are constructing retaining walls to prevent water entering roads or houses which is unscientific and a short term solution, there are many reports on urban rivers overflowing in recent times in Bengaluru.Due to heavy rains retaining walls also have been collapsed.With lack of flood controlling in early stages of urban development, law enforcement, regulation, public participation problems could have been solved and planning flood control during early stages of urban development has minimum or less cost

compared to this control when city is already developed. Rivers floods due to encroachment or change in its flood zone which is also called as riparian buffer, these are a very important feature of a river along with flood plain, ridges, Valleys and wetlands. If all these components are neglected during urban planning or development it leads to a conflict between urbanization and rivers. Low lying areas in Bengaluru city are one of the affected areas by urban flooding, due to improper intervention by authorities at right time these developments are affected during heavy rains in monsoon times. Urbanization has become so rapid all these factors mentioned above were neglected and now because of unplanned or unorganized development now as the city grows these problems have come in frontage.

7. Overview of Bangalore and Vrishabavathi River

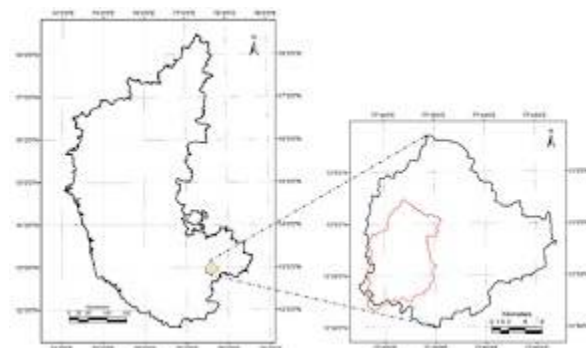


Figure 4 Picture showing Location of Bangalore in Karnataka map along with Vrishabavathi Valley

Source: IISc Bangalore



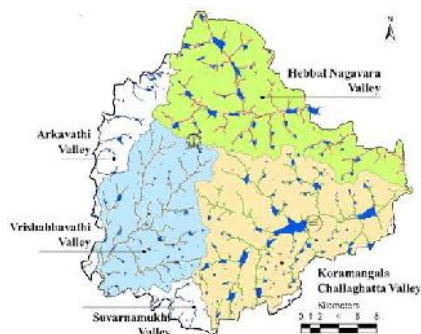


Figure 5 Different Valleys of Bangalore showing different lakes and rivers across it

Source: IISc Bangalore

Bangalore also known as Bengaluru was founded by Kempegowda in 14th Century and Bengaluru urban district was formed in 1986 is the capital city of Karnataka which is central point for running the state administration with extent of 850 square kilometer. Bengaluru is the fastest growing city in Asia, which was also known as city of lakes and Garden city but due to rapid urbanization and industrial development city has lost its green cover and lung space.

The city is not blessed with any Major River but it has 3 major valleys that is Hebbal Nagavara valley, Vrishabhavathi valley and koramangala challaghatta valley. Other 2 minor valleys are Arkavathi valley and suvarnamukhi valley. Due to absence of major rivers in Bengaluru it is compensated by lakes in the city. Bengaluru south has 166 lakes/tanks and Bengaluru north has 98 lakes/tanks along with 166 lakes/tanks in Anekal which was used for drinking and agriculture purpose in earlier days.

Vrishabhavathi River is one of the minor rivers in bengaluru which flows in the southwestern part of Bengaluru Urban District .The River was used for agricultural and drinking purpose before but know due to domestic waste and industrial pollutants being left into the river, it has lead the river polluted

and not recommended for human use. Vrishabha in vrishabhavathi refers to bull and the river is originated at the feet of a bull in big bull temple,basawanagudi and it also has a second source from Kadu malleshwara temple at malleshwaram and it flows through areas like mantra mall , srirampura , magadi road and then it joins to the first source from big bull temple and becomes sangama near Gali Anjaneyaswamy temple in mysore road and proceeds to kengeri and it becomes a reservoir as vrishabhavathi reservoir in bidadi ,it later joins to arkavathi river in kanakapura as a tributary .The river passes through 96 wards in BBMP jurisdiction. There are many temples through the course of river like Dodda Ganesha temple, Dodda Basava Temple , Gali Anjaneya Temple , Gavi Gangadhareshwara temple and Kadu Malleshwara Temple. Gali Anjaneyaswamy temple was constructed by sri vyasaraya of channapattana in 1425 who was rajaguru of vijayanagar kingdom and the temple is 600 and more years old which is constructed on banks of sangama of 2 rivers that is Vrishabhavathi and Paschimavahini river.

Table 1: Table showing different Valleys with type of drains and its length in km

Valleys	Primary drain length in km	Secondary drain length in km	Length in km
Challaghatta Valley	16.50	16.50	33.00
Koramangala Valley	23.50	47.50	71.00
Hebbala Valley	26.00	26.00	52.00
Vrishabavati Valley	32.50	57.50	90.00

Source:IISc Bangalore



8. Conclusion

Before rivers were active when temples, village settlements other cultural activities were zoned next to it but later due to rapid urbanizations industries and different types of buildings were zoned next to river, neglecting edge of the river which has led to conflicts in recent times like Privatization and degradation of public spaces, urban flooding and how rivers were used then and now. Conflicts can be prevented and the detrimental effects can be avoided and reduced by good planning and design. So here is a Model where it can solve all these conflicts by planned or organized development through urban design process, strategies and proposals like Creating Vibrant street life, Redevelopment of settlements along river, Recapture value of abandoned and underused sites, with a model development planning like a local area plan along the river. By temporal analysis in different scales, inference from analysis, development program, structure plan and design intervention at site level, using policy guidelines, Acts and Legislations.

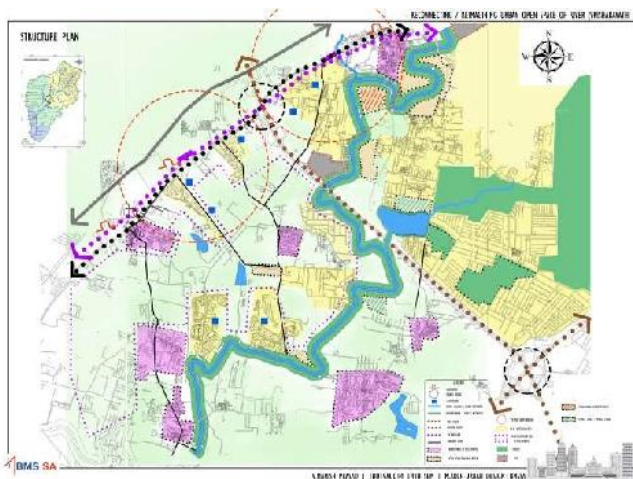


Figure 6 Structure Plan for selected stretch of Vrishabavathi River area

Source: Author



Figure 7 Design intervention showing Local area plan and Street design with plan and sections of it

Source: Author

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