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LANDSCAPE ARCHITECTURE - II

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River in the Life of a City Yamuna River Front Development - An Endeavor to Revive the Past to ensure a Sustainable Future for Delhi.

1.0 CONCLUSIONS

1. Unlike the historic trends that exhibit positive river-settlement interaction, the epochal decision regarding the location of imperial Delhi away from the river, coupled with the availability of physical infrastructure, shifted the focus of civilization away from the river banks.
2. Depleted river water quantity and deteriorated quality have led to the belief that river front development may remain an unfulfilled dream until the planning approach is wholistic in nature incorporating the drainage system, heritage potential and provisions of social and physical infrastructure.
3. River front development provides an opportunity to develop an extensive urban open space network connecting existing green spaces to those proposed along the river bed.

2.0 AIM

This paper looks at the historic trends and current issues responsible for the non-development of the Yamuna River front. It culminates in a proposal aiming to weave the river, and its contributing channels, as positive spaces, in the urban fabric by reviving their underlying history.

3.0 RIVER YAMUNA - CONTEXT OF STUDY

Originating at Yamnotri, in the Himalayan range of mountains, the Yamuna enters the National Capital Territory of Delhi (NCTD) at Wazirabad and flowing North - South, nearly along the eastern boundary, exits at Okhla. The Ridge escarpment forms the western extent of the catchment draining into the river.

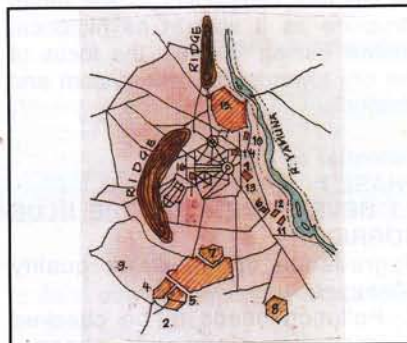
4.0 THE RIVER IN HISTORICAL PERSPECTIVE

As is observed in the history of settlements, most of the 15 historic cities dotting the geography of Delhi originated on the river bank and those that did not eventually moved towards the river due to lack of perennial water supply, fertile agricultural land,

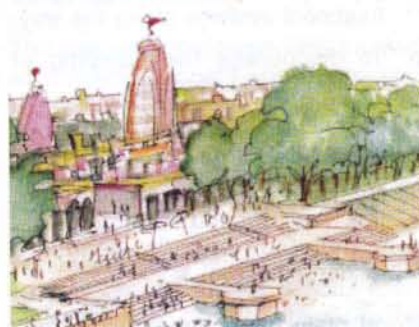
transportation and communication facilities etc.

4.1 RIVER - SETTLEMENT INTERFACE : POSITIVE INTERACTION

Development of religious ghats
Like most traditional Indian river bank settlements, the western bank of river Yamuna has supported a series of steps and terraces (ghats) to enable the worshippers to access the river to pay homage to the rising sun.



Sketch of Cities of Delhi



Sketch of Religious Ghats

Development along the drainage channels.

The historic settlements that emerged on the ridge, for ease of fortification, depended for their water supply on the harvested rain water and damming of the natural drainage channels

Development along the river front

Of the various settlements that came up on the riverbanks, Shahjahanabad (1627 -58 AD) incorporated the river in its development. The settlement, roughly semi circular in form, shaped

like a bow (karmuka) seems to be a manifestation of riverfront settlement as per traditional Indian town planning principles.

This settlement was unique in its system of *Shahjahan* canals and *dinghies* used in the design of myriad water systems for irrigating orchards and gardens; water channels and fountains to cool the palace interiors and courts and along the bustling city streets.



Sketch of Drainage Pattern in NCT of Delhi

4.2 FACTORS RESPONSIBLE FOR NON - DEVELOPMENT OF THE RIVER FRONT THROUGH THE AGES

- a. Worldwide, cities with well developed river fronts, have played the role of commercial / religious centers thus actively involving the river for their functions. Delhi has enacted no such major role in its entire history.
- b. Yamuna, being in the pereplanation stage at Delhi and being a meandering river has been shifting its course since time immemorial; its flooding every monsoon and reduction to a trickle for the remaining period has rendered it useless for riverside activities of agriculture, rural use, water supply, navigation etc. thus discouraging setting up of settlements here.
- c. The eastern bank being lower than the western bank and thus bearing the brunt of floods along with the tendency of the river shifting eastwards, has resulted in the eastern bank of the river remaining undeveloped until recently.

4.3 RIVER SETTLEMENT INTERFACE - HYPOTHETICAL INTERACTION

The imperial capital of New Delhi planned by Edwin Lutyens incorporated the traditional settlement in an abstract manner. The Raisina hill, a site away from the river was chosen for the siting of the imperial capital, due to its positive drainage. A visual link was established with the Juma Masjid (mosque of Shahjahanabad) and Purana Qila (an even older fortification) but physically the imperial and traditional cities were separated by a green buffer.

5.0. RIVER - SETTLEMENT INTERFACE - NEGATIVE INTERACTIONS

Land use, activity related component

- In the absence of an organized sewerage, the household, industrial and other harmful effluents are being inserted into the 17 major storm water channels which finally empty their contents, untreated, into the river.
- Lack of foresight, on the part of planners, has resulted in the location of thermal power stations, fly ash ponds, landfill sites and other such harmful land uses along the river.
- The Ghats - used exclusively for bathing, or cremation or public washing further adds to the river pollution.
- Lack of physical accessibility to the river have resulted in the mushrooming of squatters.

Ecological component

- The high BOD levels as a direct fallout of the insertion of pollutants in the river result in the disturbance of the ecological balance
- Due to excess extraction of water, north of the city for purposes of water supply and irrigation, the river is reduced to a trickle and is unable to regenerate its water quality.

Historical / cultural component

- Monuments that are sited close to the river are in no way incorporated in the riverfront development.
- The storm water channels that originally recharged a series of wells, baolis (step wells) and tanks on their way have now ended up polluting these secondary sources of water supply.

5.1. RIVER - SETTLEMENT INTERFACE: POSITIVE INTERACTIONS

- Location of memorial spaces along

the river banks is a positive attempt but unfortunately no link has been provided to the river.

- Location of a large recreational park on the river bank and provision of a green belt along the river near the sub urban township of NOIDA are positive measures.

6.0 BRIEF ANALYSIS OF THE GOVERNMENT POLICIES REGARDING THE RIVERFRONT

- Channelization of the river all along its stretch is the NCT of Delhi in its present state would lead to the destruction of the river ecosystem and aggravate the flood menace.
- The approach lacks strategies for including the historic monuments in the riverfront development

7.0 CONCEPTUAL FRAMEWORK FOR RIVER FRONT DEVELOPMENT

This concept visualizes the river to be an inherent component of the urban structure as it was in its historical context aiming to direct the focus of the city towards the river system and channels.

Potential of the area :

PHASE I

7.1 DEVELOPMENT OF THE BLUE CORRIDOR

Upgradation of the water quality Strategies

- Pollution needs to be checked upstream along the channel network by establishing low capacity traditional/ecology based treatment systems along the way.
- To discourage the dumping of waste into the channels.
- To ensure adequate quantity of water in the river.
- Measures to be adopted to ensure that their ground water remains unpolluted and is regularly recharged.

Flood plain management

- In place of incorporating the typical technique of channelization a composite section, the 'double profile', is proposed, wherein a main channel is created with a single trapezoidal section designed for a capacity corresponding to 5yr. flood levels.
- This method caters for the retention of existing trees on the riverbanks.
- The flood plains are proposed to support a vegetation cover that comprises of water tolerant species to ensure soil binding even during floods.

Regulation of the river side, channel side land use / activities

- Polluting riverside land uses like thermal power stations, landfill sites to be part of a long-term rehabilitation plan.
- Polluting activities like cremation ghats to be moved downstream and religious bathing ghats to be retained upstream with a separate provision of a dammed reservoir or tank for ablutions so as to treat the water before inserting it into the river.
- In a regional context, these ghats and their surrounding areas may be developed as centers of religious and cultural activity thus attracting pilgrims.
- Slums and squatters, along the riverbank, need to be relocated to more suitable sites and those along the channels may be incorporated into the urban development using schemes such as 'slum networking' etc.

7.2 DEVELOPMENT OF HERITAGE ZONES

Prioritizing of historic sites for development

- Dependent upon the historical context, tourism potential and site location, certain historic sites may be delineated for development.
- In the first phase, only those sites that enjoyed a link with the river at some point in history be undertaken for development.
- Historic Baolis (step wells), wells and tanks to be revived as active water harvesting systems and incorporated in the heritage zones.

Recreating the lost aura

- Using landscape and conservation skills and techniques to recreate, with authenticity, the environment that existed in and around these historic sites.
- Various disappearing concepts, like that of the existence of sacred groves may be incorporated around the religious /historic sites.

Incorporating socio- cultural activities.

- For making this venture financially viable these zones are envisaged to play a major role as tourist centers.
- To cater to the tourist influx expected, the supporting activities (in the formal as well as informal