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Geo-architectural Perspectives on Urban Environment in water resource management: A case study

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Abstract

Geo-architecture is a field that examines, among many things, how difference is produced on the earth. Contemporary architectural/geographic engagements extend links between these disciplines that are traceable to at least the 16th century. Today, buildings and architectural concepts often are being represented as territorial processes. Concept to build up on geographical environment is to build up a symbiosis of physical and cultural environment.

The concept also encompasses economic and political/strategic factors. This study on the social context focuses on three interrelated themes:

- a) The role of participatory processes in generating engagement in and commitment to decisions to keep up an amicable environment.

- b) The challenges of communicating scientific information to different audiences.
- c) The understanding of decision architecture and how framing of decisions may favour certain aspects on participatory planning in the context of multiple water uses particularly in and around an urban river channel.

The case study on the urban river in Kolkata has recently shown an architectural menace by constructing surface metro railway pillars right onto its bed. This has not only caused stagnation in the river flow but has almost put it in a coma. The once juvenile river passing through the metropolis has now been transformed into a city's drain carrying only the dirt and filth. Adi Ganga, a heritage river, has the century old Kali temple on its bank and many other historical sites and features that a city can boast of. But today's grim picture unfolds the fact that its neighbourhood settlers are least concerned of their priceless water

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resource and it is their insensitive and indifferent attitude has put the river into a dying condition in addition to the menace created by metro railways. Geo-architecture which encompasses both socio-cultural and economic purview of a transit and its associated features could look after the perceived dichotomies of the squatter residents on the river banks. Parallel to this a revival of architectural aesthetics of the river and its neighbourhood could put concealment, however small it is, on the mismatched unthoughtful erection of the metro railways.

Key words: Geo-architecture | Heritage River | Urban environment | Sustainable development

Introduction

'Geo' term has been used in this discourse to denote 'space' particularly the urban space where architecture plays a major role in maintaining the purposive as well as the aesthetics aspects of the people who are living there. It is often noticed that to fulfill the developmental purpose of a place the aesthetics, heritage and other aspects are being totally ignored either deliberately or inadvertently. At times the priority of the purpose is steered by political strategy and the final decision or verdict does not retaliate on the beneficial perspective of the people in the society. Benefit of the society in a broader sense should comprise maximum number of people. And often quantification overshadows the quality of a larger section of citizens.

Water is a natural resource and here the term 'water resource' has been used to mean a

natural river channel. A river when crosses through an urban space the citizens use it for various purposes. But when a section of people pollute it they misuse it and when the government of the concerned region purposively build up a concrete structure right onto its bed the major essence and purpose of architecture fails.

At this juncture an assessment of the past work is needed to rectify and resurrect the existing water flow of the channel. Architecture over space can play a major role on it. It is extremely necessary to conjoin these two and create a new word 'geo-architecture'. Here the major task of the geographer would be to study about the socio-economic activities of the people related or are associated with the water body concerned. Their past history will act as a backdrop and if necessary to be emphasized with the present problematic situation. The process hopefully can resolve with a long term solution. Architecture cannot ignore and put aside people and do its job. Truly speaking it is a subject which pivots around people only. Geo-architecture therefore to be successful requires peoples' perception and participation. A whole hearted and full-fledged participation from the people can only make a project successful and ongoing.

Hence we can quote Loretta Lees that '*.....architectural geography should be about more than just representation. For both as a practice and a product architecture is performative in the sense that it involves ongoing social practices through which space is continually shaped and inhabited*'.

‘Adi Ganga’- the only urban natural channel in Kolkata:

A river cannot be labelled as urban or rural in its true sense. But as maximum part of the route of Adi Ganga flows through Kolkata urban area it can undoubtedly be termed as an urban river. Adi Ganga, however, had witnessed many transformations in the evolutionary changes of Kolkata. Similarly time has taken its toll on the physical changes of the river too. The river with age has naturally become sluggish, its volume decreased and its flow slowed down. With this urban river Adi Ganga an attempt will be made to assess the interaction between space/land (natural) and architectural build ups (anthropological).

Historical significance and deterioration of Adi Ganga

‘Adi (old) Ganga’ is a ‘heritage’ tidal river in the state of West Bengal in India that fulfills a long cultural and economic heritage of the region. It has branched out (distributory) from River Bhagirathi-Hughli (which itself is a de-branched channel of River Ganga or Ganges). The upper part of this Adi Ganga channel was known as Tolly's *Nullah* in the later period of mid-eighteenth century after it was re-sectioned by Major William Tolly to open up a trade route in 1775-1777. This tidal creek joining the estuary of the Saraswati River with the Bhagirathi impaired easy shipment of goods. At present, this channel serves the south-west metropolitan city of Kolkata (erstwhile Calcutta). After originating from Hastings Point on the left bank of Hughli River

(lower reaches of the Bhagirathi River) it flows past (or flew) Kalighat, Tollygunge, Kundghat, Bansdroni, etc. and turns south to connect with Bidyadhari River at Samukpota or Tarda port to end up about 20 km long journey into Bay of Bengal near Sagar Island. After the easterly flight of the main flow as River Ganga the river has gradually transformed into a moribund or palæo channel.

It is the human activity that had once rejuvenated this heritage river from its moribund condition in the past and ironically it is the varied detrimental human activities that have victimized the river to the present undesirable condition by constructing metro railway pillars right onto its bed. In the name of ‘*development*’ and ‘*transport*’ the people now are losing a cheaper mode of transport, a checkered cultural landscape, an ecological balance of the region and above all the aesthetic fervor of its surroundings.

Common peoples’ perception and action on Adi Ganga

The channel was navigable till the first half of the 20th century, after which encroachment, siltation, garbage dumping and ‘*development*’ slowly decreased its drainage capacity. This channel unlike the other artificial canals in and around Kolkata is a natural drainage system and despite having a long glorious past has turned into a city’s drain where death is its only destiny. Today, people are perhaps waiting to mourn the ‘*heritage river*’ to die out of a man-imposed death sentence.

Location of ‘*Kali*’ temple on the bank of Adi Ganga in Kalighat since the mediaeval age was a sacred place to *Hindus*. Following the

common belief that the sacred water of River Ganga is flowing through this channel the pilgrims of 'Kali' (Goddess Kali) temple in Kalighat used to take a sacred bath in the supposedly holy water of Adi Ganga prior to their visit in the temple. Even the place of cremation is located near this temple. The irony of this custom is that even today the polluted water of the channel is considered as 'holy' by many people.

Despite the fact that the people who live by the side of Adi Ganga identify it as sacred and use the water for 'puja' (worship) purposes individually at home or in the Kali temple located nearby for hundreds of years there is a dichotomy on their perception and action over it. The 'holy' water, at present, due to their detrimental and profane activities has turned so polluted that the river can now be felt like a filthy drain flowing through the supposedly 'kallolinitilottomamahanagar' (throbbing beautiful metropolitan city) as attributed to designate the city of Kolkata.

From the laboratory experiments under different parameters it is deciphered that when the water enters the channel from the main river at the time of full tide during post-monsoon it deteriorates partly due to the reduction in volumetric flow of water and partly due to the plumbing effects of the contaminates. According to the version of a social activist it is "a 15-km toilet dispenser". *The canal that extends from the city's port area of Hastings right up to suburban Baruipur touching most of south Calcutta is today an unbroken river of sludge,*

stink and toxins.(India Today).

During ebb tide condition when the water flushes out of the channel to river Hughli the water quality level changes from medium to good. During the monsoon period rain water from the adjoining areas of the channel various pollutants drain down resulting in the deterioration of the water quality.

Some people are of the opinion that rapid siltation is caused due to immersion of idols after the *puja* (worship) is over. As per news report of *India Today* – '*For the south Calcutta families who immerse their idols in the Adi Ganga because of tradition or proximity this last stage of the festivities is now an annual headache. The canal, which is only 10 feet deep, has a 5-feet bed of alluvium. It's been a decade since it was dredged (work on the first 1.5 km was begun in 1998, but stopped for want of an appropriate dredger) and with immersions every year the silt bed only rises.*'

Architecture and its impacts on Adi Ganga

Rapid population growth and increasing economic activities have resulted in movement of people. In Kolkata intra-city transport system is mostly served by roadways. Compared to other metropolises of India road density is quite low here (only 6% when a modern city demands about 20%-30% of the city area) and does not fulfill the necessity. The space available for extension and expansion of roadways seems impossible. Hence, encroachment on the banks of the channel is not surprising.

It is a matter of despair that a channel in a city could have given it a face lift from an aesthetic

point of view and could have solved some of its vital problems by offering a cheaper mode of transport across the suffocating congestion of a metropolis. Instead ‘*development*’ in the form of elevated construction of metro railways along its bed laid the last nail on the coffin lid.

Due to insufficient road space, later, an underground metro railway was constructed. Initially it stretched underground from Dum Dum to Tollygunge. Increasing demand and jeopardized transport led it to a further extension by 8.5 km on an elevated track upto Garia, a place further south of the city. It is laid over a row of concrete pillars constructed on the bed of Adi Ganga. Irrigation and Waterways Department has given no objection with the consent of Urban Development Department to the construction of around three hundred pillars at a distance of only 20 metre on the canal itself for Metro Railway expansion of about 8 km, which has been highly detrimental for the canal’s flow. The canal’s width on an average is only 10 metre so if three hundred pillars of 2 metre diameter are constructed at such a short interval then 20% of the water flow will be affected was feared by many eminent hydrologists and geologists.

Perhaps this could save Metro Rail from the difficult task of evacuating and paying compensation to the squatters from the banks of the channel. But this will exterminate the river, robbing its role as a navigable river.

Architectural space management to save the river and the people

Space management is urgently needed to save

the river and the people. The lower reaches of the river beyond Tollygunge is the mostly affected stretch for the construction of Metro Railways. This is no doubt an *architectural menace*.

a) Space wise the *first sector* under planning and review begins from its source. From its source at Hastings point on Bhagirathi-Hughli (commonly called as Ganga) at least up to Tollygunge metro station both banks and the adjacent areas of Adi Ganga has a huge potential task of restoration for the archeologists, geographers and planners. Not only the land use pattern and its socio-economic character but also the degraded quality of water needs an urgent restoration too. This will not only improve the aqua-ecology but also would certainly improve the general health condition of the people around. Stagnant water in the dry season is a favourite breeding ground of mosquitoes, the carrier of malaria disease. Truly speaking, the densely populated areas around Kali temple has already shown people infected by the disease. Clogging of the river with heavy silt often causes inundation in the surrounding congested residential areas and streets at the time of high tides.

In this sector, hence, the task of management is mainly twofold i.e. to keep the river pollution free and to manage, modify, transform the adjacent land use pattern. This cannot be successfully done solely by the administration. A bottom-up approach is the ultimate solution to it. The bank dwellers belonging to all castes and creeds, of all economic and educational level, all commercial and non-commercial

organizations and institutions are to be convinced about the basic utility and beneficial outcome of real maintenance of a once juvenile stream. The benefits will percolate and reach every section of people in the society by creating tourism industry, fresh water supply, solution to inundation of streets and buildings, cheaper mode of transport, healthy environment for people of all ages etc.

Any decision of work or erection of a structure from the administrative authority may be done by investing large amount of peoples' money but whether or not that will give out benefit to people is dependent on the perception and future action of the people only. Perspectives and retrospectives need to be made clear to the public. Transparency always pays and peoples' participation with the whole gamut with the present will shape out its future success.

b) The *second sector* covers the rest part of the channel from Tollygunge Metro station to its culmination point. Though, in this sector, the channel has traversed for a long distance through rural and agricultural fields. Beyond Tollygunge Metro station, from where the metro rail turns into a surface transport system, the planning should mainly concentrate on the volume and flow of water passing through the channel. Architecture can do its job by easing out the existing transport system and by adding beautification to the congested suburban landscape.

Architecture over space and people participation

The '*holy*' river is a silent victim of the people carrying the '*unholy*' and almost still water

through it. The revered pilgrimage, the Kali temple is perhaps the silent observer of its transformation from a navigable trade route to a dirt filled drain of a metropolitan city. The question arises on the attitude of people. Whether they possess a great tolerance or they are completely indifferent and ignorant of its glorious past. The question also arises whether at the present moment these people are nothing from its existence. Old photographs of Kalighat area show the presence of bathing *ghats* or big trading *bajras* (large boats). There was a deep interaction of the river with the society and people. *New architectural outlook needs to create and nurture this preexisting bondage of people and the river.* There are some steps that could be built up following the characteristics of the locality.

The physical and social significance of the river can be represented and analyzed on the following scales.

1. Regional scale: Looking at policies related to the channel on a regional/city scale.
2. Reach scale: Land use /demography (the urban fabric) to be analyzed with reference to the urban neighbourhood adjacent to the channel.
3. The channel scale: Immediate banks of the channel to be prioritize for any kind of implications.
4. Sectional scale: The typical and atypical sections (across the channel) to be looked at.

The *socio-cultural dimensions* have to be given due importance. An analysis on the existing dichotomy between religion and pollution etc.,

identification of other complexities of the landscape also to be prioritized before building up of any kind architectural design. Colonial policies regarding treatment of water resources and building up of new road ways and railways needs to be evaluated and if necessary to be abandoned or modified. For instance metro railways was initialized and completed on the channel bed following a verdict based on an age-old legality.

Social taxonomy and religious nuances covering existence of temple, masjid and churches over space are sensitive pockets and from architectural point of view to be paid importance. For instance social texture of the Kolkata port area and Bhawanipore in south Kolkata are not the same. Port is a gateway of trade that also suffices the pre-existing commercial belt of Bhawanipore area. Still at present the streets and *paras* (locality) of Bhawanipore are known by the profession of the people as '*kansaripara*', '*telipara*', '*potuapara*' etc. The perception of people is different from that of the Khidirpore area. Based on these the architectural perspective of space management along with the water resource (Adi Ganga) management has to be collated. Architecture can bring changes over space but with social restoration over a religious landscape that is living there for more than three hundred years.

Thus, whatever artificial construction in the form of development is done has to be oriented towards restoration and not inversion of historical or social or religious or some other broader aspects. The main focus would be conjugation of people on both sides of the

banks by building up bridges across, evacuation of migrated people after partition of India living in squatter shabby illegal settlements along the banks using the drainage as drain, building up concrete walk – a – way or foot paths connecting frequent construction of greenery or parks, construction of jetties and subsequent ferry and boat services to ease a cheaper mode of water transport, development of water sports and tourist interest services including the visit of heritage sites like the Kali temple, the Greek Orthodox church or the residence of the last *nawab* of Mughal empire in Khidirpore etc.

The prime and pertinent question of investment of capital arises at this point. If development of the river itself and face-lift of its adjacent land can generate opportunities of employment the local people could be made convinced of their secured future which in the long run could fetch a caring maintenance from them. Apart from the government various other institutions, organizations even the schools and colleges who are located adjacent or are associated with the river in some way or the other could be actively made part of the whole gamut at least at the initial stage. The capital investment may be in the form of money or in the form of voluntary services (as part of the social responsibility) or in any other form of individual and collaborative gesture.

Conclusion

Myopic visions seeking cheap popular techniques can only invite temporary relief but with no permanent solutions. Perspectives of people changes along with their expectations and achievements. A bottom-up approach of

planning collaborating people, public and private authorities need to be corroborated.

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