

Blue Green Infrastructure: A Toolkit to Urban Resilience

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Resilience is unaccustomed term to adapting the new normal. It is all about reviving from the adversities and putting foot forward towards sustainability, a huge umbrella incorporating multiple mushrooms beneath. The term Urban Resilience itself engulfs a big parcel of mitigating climate change. This article is an attempt to untangle the two major sectors of Urban Resilience i.e. Greens and Blues of any Urban Ecosystem that can lead the agenda of net zero habitats in terms of biodiversity and environment.

We recently had a distressing experience of heat waves and increasing temperatures and now we are going through extreme rains. It has adversely affected the urban ecosystem on social, economic and environmental fronts. Apart from the extremely exposed cities even the robust cities of the country like Delhi, Mumbai were slowed down and juxtaposed with development puffs. This is the scenario where climate resilience sets a foot in. We can clearly notice the disappearing butterflies and sparrows from the urban fabric which is alarming the mass extinction. The deteriorating air quality and sinking carbon sequestration capacity are jeopardizing the survival of ecosystem. All the above adverse circumstances are captivating the interest of climate leaders towards an integrated climate resilience tools like Blue Green Infrastructure which avail the policies of urban greening as well as water management systems.

BGI (Blue Green Infrastructure) is a defined by the European Commission as a “strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem service”. [1]

The phrase 'blue-green' or 'green/blue' infrastructure emerged around the turn of the last decade from a growing awareness of the need for a more integrated systems-approach to the management of Green and Blue Infrastructure.[2]

Urban climate Resilience is for the people and it has to be executed by the people. The role of policy makers is very crucial in this scenario where the initial byelaws of any urban development has to be altered in such a way that they facilitate Blue Green Infrastructure approach. At the same time, public participation is also equally important because

adaptability of citizens is a paramount for any policy or initiative. Citizens are one of the major stakeholders and will be most benefitted in long run. And the governing bodies are another important stakeholders here, there execution and methodology has to be very practical orientated. Post execution and while functioning, the triumph totally depends on citizens. Also these tools create an opportunity for young planners, designers and researchers to experiment their magic wand i.e. research, design and creativity.

Let us understand through a sample city. Taking example of Aurangabad, one of the fastest developing city of Maharashtra with a population of more than 11laks, covering area of around 139 sq.km.[3]The city of gates, resting in the lap of Deccan Traps, Aurangabad is Tourism Capital of Maharashtra. It is Marathwada region's administrative capital and accounts 5% of green cover of the region. Once been as Asia's fastest developing city, Aurangabad has currently only 9% of area as green cover which should be at least 20%[4]. There are around 1200 open spaces in the city[5] but they are not necessarily green spaces or even accessible. On the contrary, the tree to human ratio and per person green space availability are not even close to standard requirements. With growing urbanisation, the current environment scenario is into much havoc and if not looked upon, can turn to worst. Now, it is very interesting to know about ancient aqueduct, Nahar-E-Ambari, which was one of the most preferable and commonly used source of water in Aurangabad city. Nahar-E-Ambari is built by Malik Ambar in 1617 A.D. [6] Along with it, there was a well-integrated network of aqueducts throughout the city which facilitated proper water distribution. Also, they were potential tools for rainwater harvesting. But unfortunately, they are in dilapidated condition currently.

The cities Air Quality Index is in the moderate zone and the temperature was highest in last 50 years. There has also been a socio-political cold war in the city regarding the improper water distribution and management.All the above outline of the city and availability of this kind of volumes of open spaces and network of aqueducts, showcase a strong potential to adapt and mitigate future vulnerabilities.

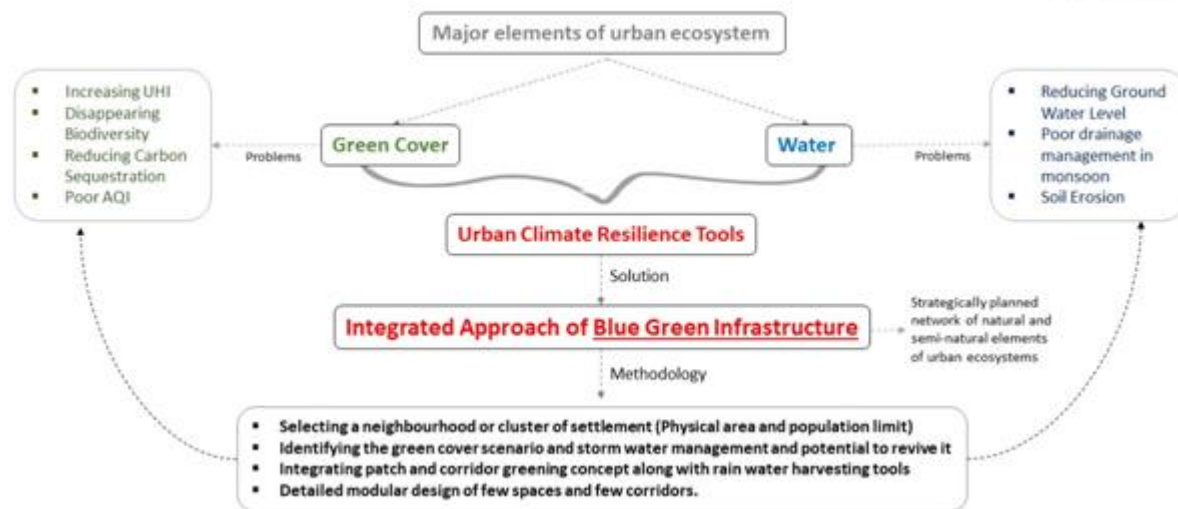


Figure 1: Understanding the Approach

Articulation of the Blue Green Approach demands to have a clear perspective on impact factors and their measurability along with consideration of various parameters. Blue Green approach focuses equally on green spaces and water bodies. It is important to understand the inter-relationship between the parameters. The measurable parameters are Change in temperature i.e. Heat Island Effect, the Ground water levels and Air Quality Index. Other parameters are biodiversity, Soil erosion, and drainage management. In order to formulate a modular policy and understand the challenges of it, we can take a sample spaces of a neighbourhood or cluster of neighbourhoods.

Delhi is the first city in India to include blue green infrastructure policy in its masterplan for 2041. Being the city known for poor air quality, it will now work intensively on the available open spaces and open corridors to convert them into breathing lungs for the city. Also they are working

on formulating a proposal for reviving all the nullahs (drainage canals) to have a smooth water flow. [7] To take some learnings from abroad countries, Vancouver is a great example of “Rain City Strategy”. It created a solid network of spaces where the flow of water and parcel of land is designed in such way that it replicated the natural functions of an ecosystem and also brings people closer to nature. Overall, it creates a climate resilient piece of city. [8]

Coming back to Aurangabad, if we come down to actual measures and plans to formulate, the first step has to be identification of potential spaces which can facilitate patch and corridor intervention. We need to carefully curate the positioning of landscape patches and interconnectivity between them to recover from lost biodiversity. The second initiative would be understanding the rainwater runoff and making a cohesive network for its flow and percolation throughout the neighbourhood.



Figure 2: Patch and Corridor Approach for Butterflies

With the developing cities, retrofitting is comparatively easier as people are in the phase of adaption and physically

also it is easy to alter the urban ecosystem on developing stage. Thus, it is important to make the additions right from

the policy making which will help to execute these climate resilient interventions.

BGI being the new fancy term in market of climate change, it needs to be understood with a very practical approach. The budding planners, designers and policy makers are now ethically bounded to consider climate resilience and concepts like Blue Green Infrastructure need to be considered as an important toolkit for sustainability. We have to think in multi-dimension where the ecosystems are revived socially as well as ecologically. In order to make any ecosystem net zero, self-sufficiency in all aspects is required primarily.

References

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