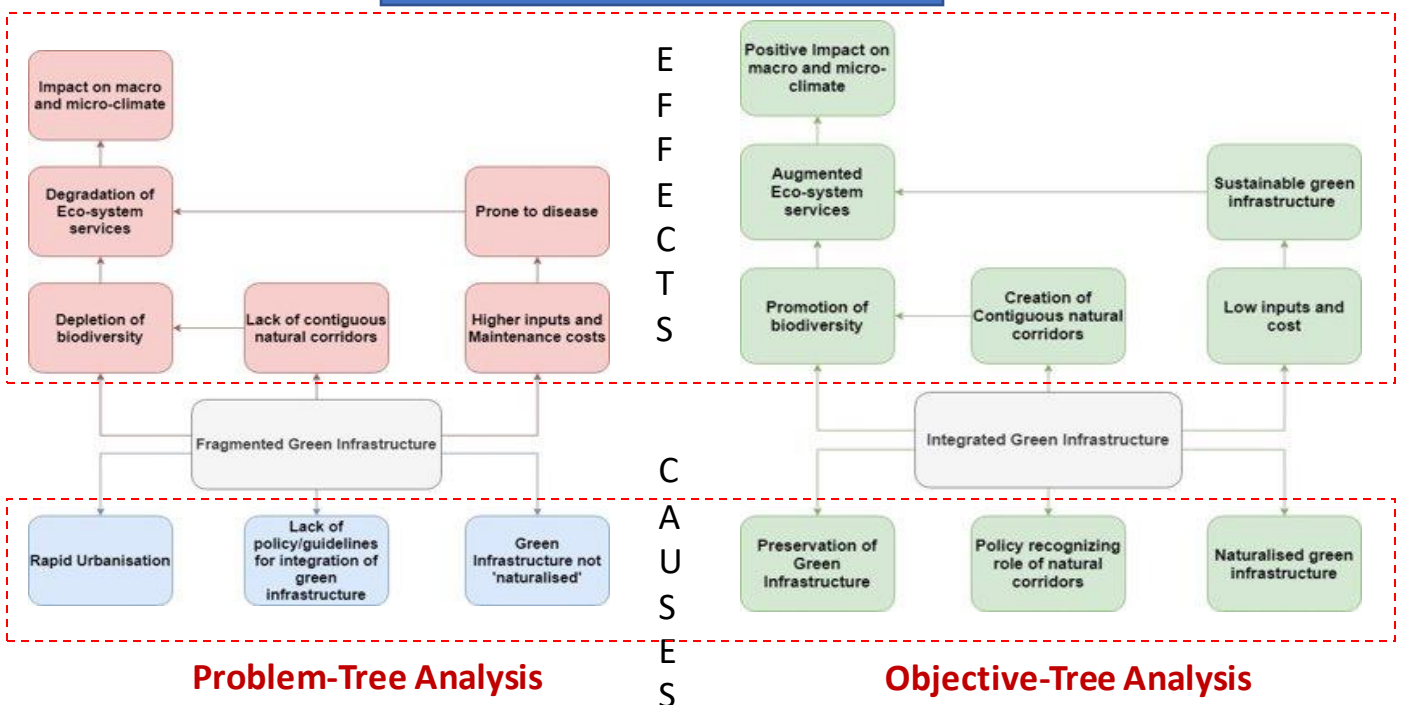


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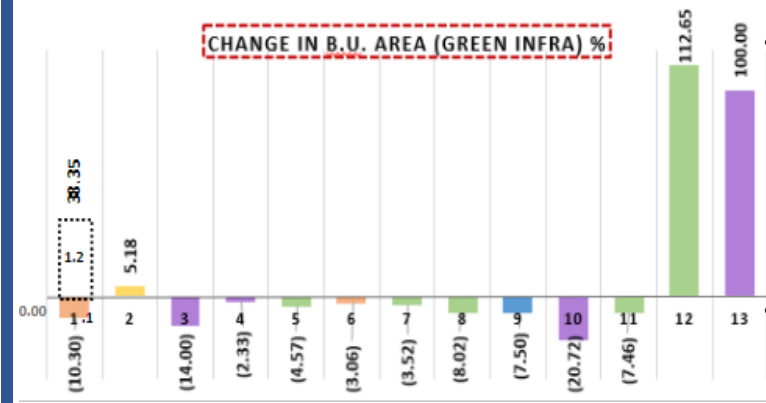
Analysis & Proposals for Urban Ecosystem

OBJECTIVE MAPPING



DATA ANALYSIS

NEARBY CENSUS TOWN LOCATION	ZONE	2001	2011	Population Growth (%)
Civil Lines	North District	4,79,891	6,70,870	+40
Hauz Khas	South District	9,32,903	12,19,100	+31
Darya Ganj	Central District	3,08,327	2,71,108	-12
Vasant Vihar	S-W District	5,01,574	6,41,666	+28
Defence Colony	S-C District	6,00,556	6,37,775	+6



The sites' population growth rate correlated to the nearest census town gives an estimate of the **expanding or reducing "pressure" factor** on the G.I.

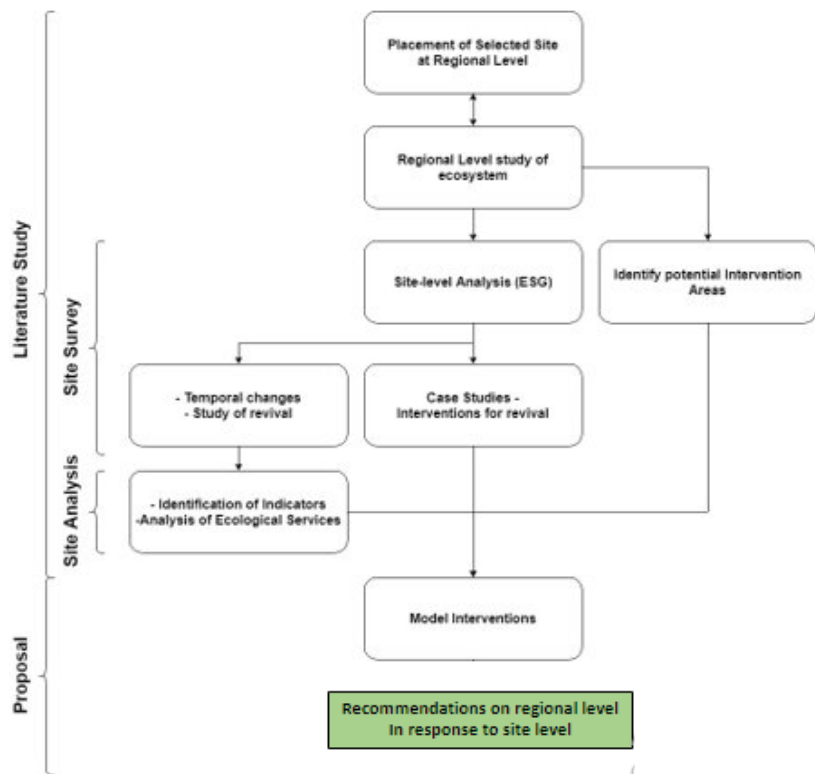
North District site area has witnessed highest population growth rate. The corresponding change in built-up of the GI sites (3,4,10) shows reduction by **-14%**, **-2.33%** and **-20.72%**.

13th site was a new wetland system, not accounted for this.

• 12th site has recently opened and saw an increase in the green coverage whereas all the other sites (5,7,8,11) in South district has observed **reduction in GI B.U.**

• Based on the sample of 11 sites, the relation between population growth and built-up area of G.I. is observed to be **inverse**. In the case of wetland category, 1,2, 2, 12, 13(new) the B.U. increased.

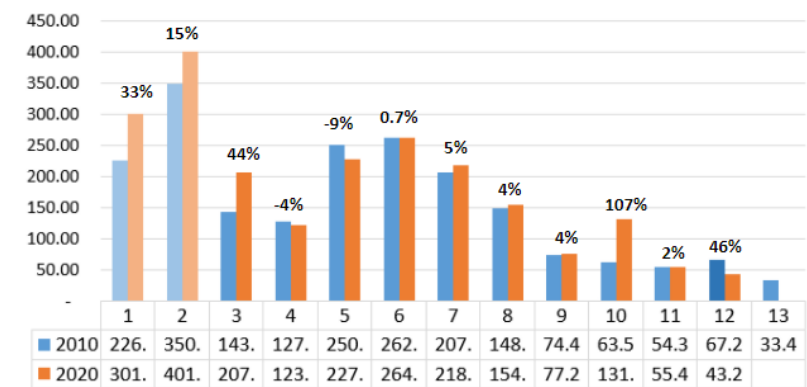
METHODOLOGY



The objectives formulated in the initial stages of the research have been condensed based on the viability of secondary research along with the onset of COVID-19 pandemic peak in India.

A sample of 13 sites including primary site, **Sanjay Van (Green) + Neela Hauz (Wetland)** were selected, based on different scales and categories. *Sites were assessed on data collected against **identified indicators** for the changes on a temporal scale. * Analysis was drawn with their potential correlations. Based on the results, spatial and regulatory connections were assessed on these scales and other recognizable green infrastructure (G.I.) in the region.

Recommendations for their **recharge and integration** were proposed.

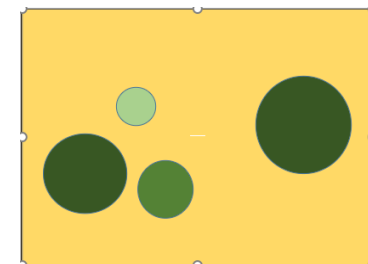
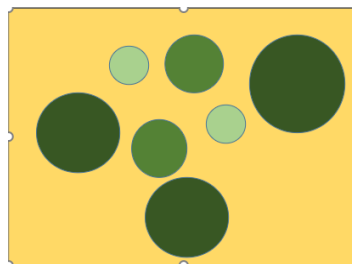
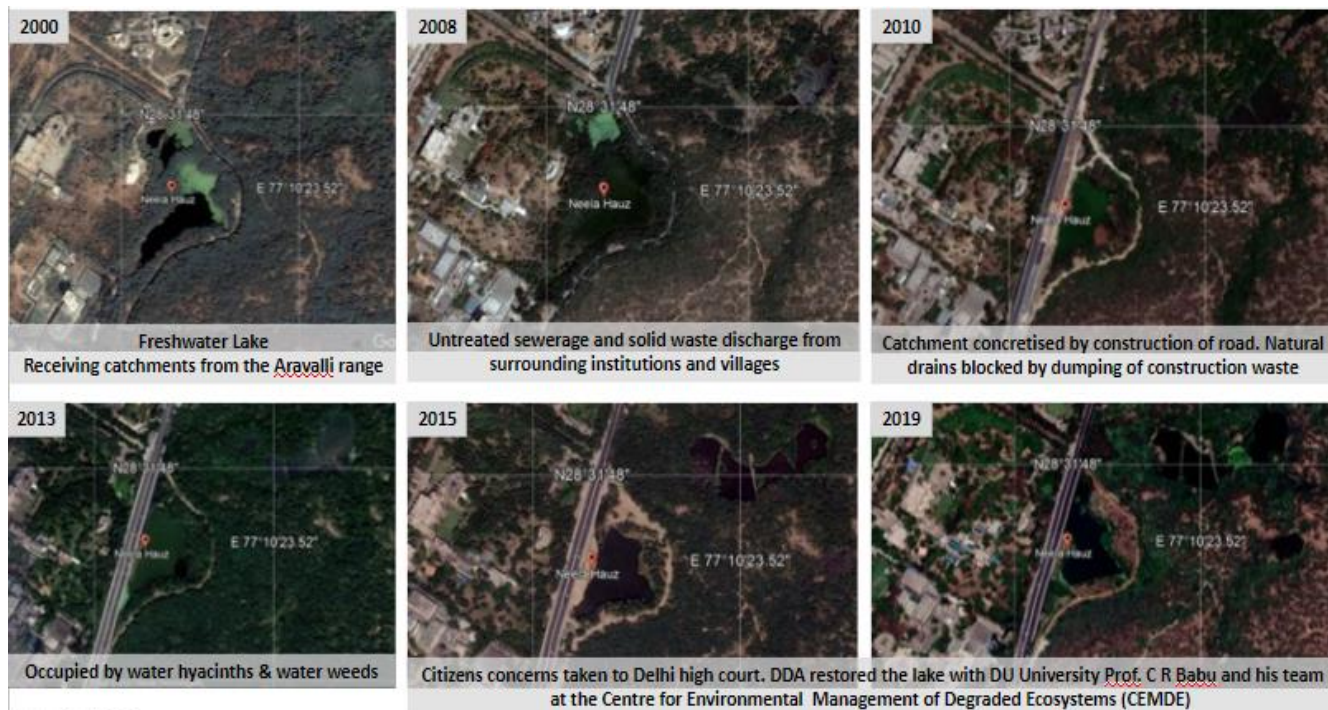


The increase in Area-Perimeter Ratio from 2010 to 2020 despite the **reduction in Absolute Area of G.I. sites** and Perimeter as well suggests - Although, there are evident encroachments in the G.I. sites (Fig. 1-4), the **no. of edges might have increased** of the built-up of surrounding areas, making them more **irregular and fragmented**.

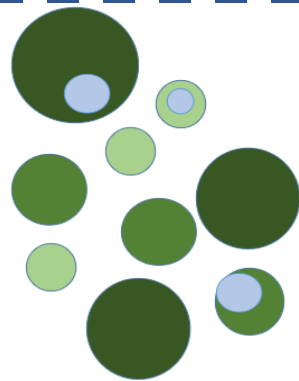
SITE
1 1.1 Sanjay van + 1.2. Neela Hauz
2 Rajokri
3 Kamla nehru ridge
4 Hauz Rani City Forest
5 Tughlaqabad village
6 Aravalli Biodiversity Park
7 Jahangpaha City Forest
8 Nehru Park
9 Indraprastha Park
10 Lodi Garden
11 Kalindi Kunj Park
12 Garden of Five Senses
13 Dhirpur Wetland

* Categories : Wetland, Green Areas, Combined
Scale of Green Areas : Park, Forests; Temporal Scale: Decadal (2010-20)

RESULTS



A loose connection of the different G.I. and increased distance would have an affect on **increased built-up vulnerability** in the collective ecosystem.



- A **combined ecosystem** has helped in conserving the G.I. around it, and has led to **recharging, purifying enhancing** (by increasing quality – reducing of pollutants).
- In other cases, a new wetland has also led to creation of fresh (new) green coverage around it by means of **proliferation of aquatic flora** and supporting plants around it.



Fragmentation by infrastructural networks or by increased irregular boundaries of encroachments has a **multiplier effect** on all scales. And disturbance in lower scale can affect the upper.

RECOMMENDATIONS

Whether the ecosystem can be returned to a better status or not depends on **controlling the “pressure” factor layers** and on the **response** of ecosystem managers when faced with those pressures (Stoyek et al., 2011; Zhu et al., 2012; Setoyama and Sasai, 2013; Heneberg and Řezáč, 2018).

Recommendation	Description	Ecosystem Service Linked
National Funding Opportunities for wetland management	• Efforts to reduce threats on small scale green infrastructure as they form an important part of micro eco-system and indirectly balances the macro eco- system.	Regulatory Services
Policies and legislations inclusion of smaller scale of G.I.		
Income or Payments from Ecosystem Services (PES)	• There is potential for a proportion of the value of ecosystem services to be transferred to or realized by local communities. • Livelihood impact on local community	Regulatory Services
Creation of value capital from the natural capital	• Occupation options like traditional fishing, natural medicines generation, maintenance etc.	
Planning around the primary base of natural ecosystem	• Planning of infrastructural networks at all levels – national, regional, neighbourhood – (highways, arterial roads etc.) to take their location based on the fixed placement and least change to the natural ecosystem.	Regulatory Services (Planning – Zoning, Urban Infrastructure, Financial)
Cost Implication factor on change to the natural ecosystem	• EIA Assessments to also take cognizance of the same.	
Integrating social Infrastructure with Green Infrastructure	• Wetland filled or drained as a result of highway construction must be replaced by alternative land as agreed to by both local and state agencies. • Introducing policies and techniques for the replacement of wetland habitats lost through construction infrastructure and creation of new.	Regulatory Services (Wetland protection, Expansion)
Community based management of wetland resources	• Social inclusion and community interaction with local authority to increase social capital and improve natural cultural heritage. • Creating social presence via website, Facebook, etc.	Cultural Service (Education, awareness and engagements)
Eco- Tourism Enhancement	• Attracts visitors or tourists • Sightseeing route or cycle/walking trail • Nature walks, talks, discussions	Cultural Service (Education, awareness and engagements)



Planning around the primary, and crucial base of natural ecosystems and their Green Infrastructure