

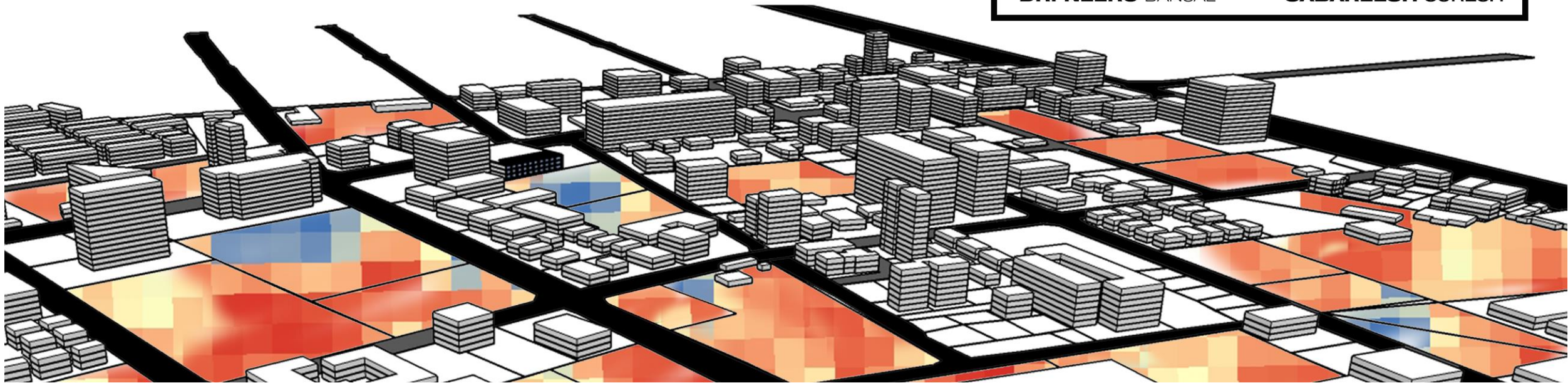
P A P E R P R E S E N T A T I O N

BENEFITS OF A
CUMULATIVE EIA
IN PROMOTING
**LOCALIZATION OF
SDGs**

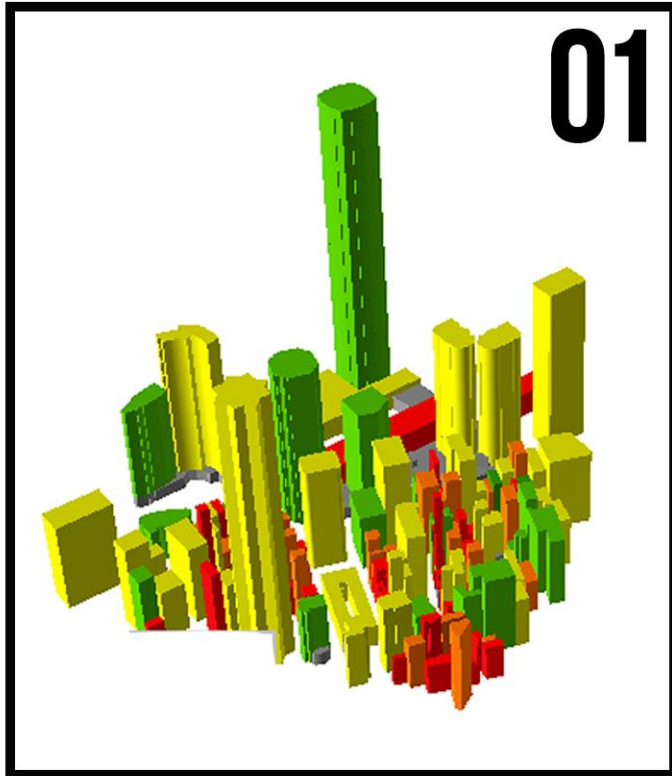
A CASE OF CONSTRUCTION PROJECTS IN INDIA

DR. NEERU BANSAL

SABAREESH SURESH



FOCUS OF THE PAPER



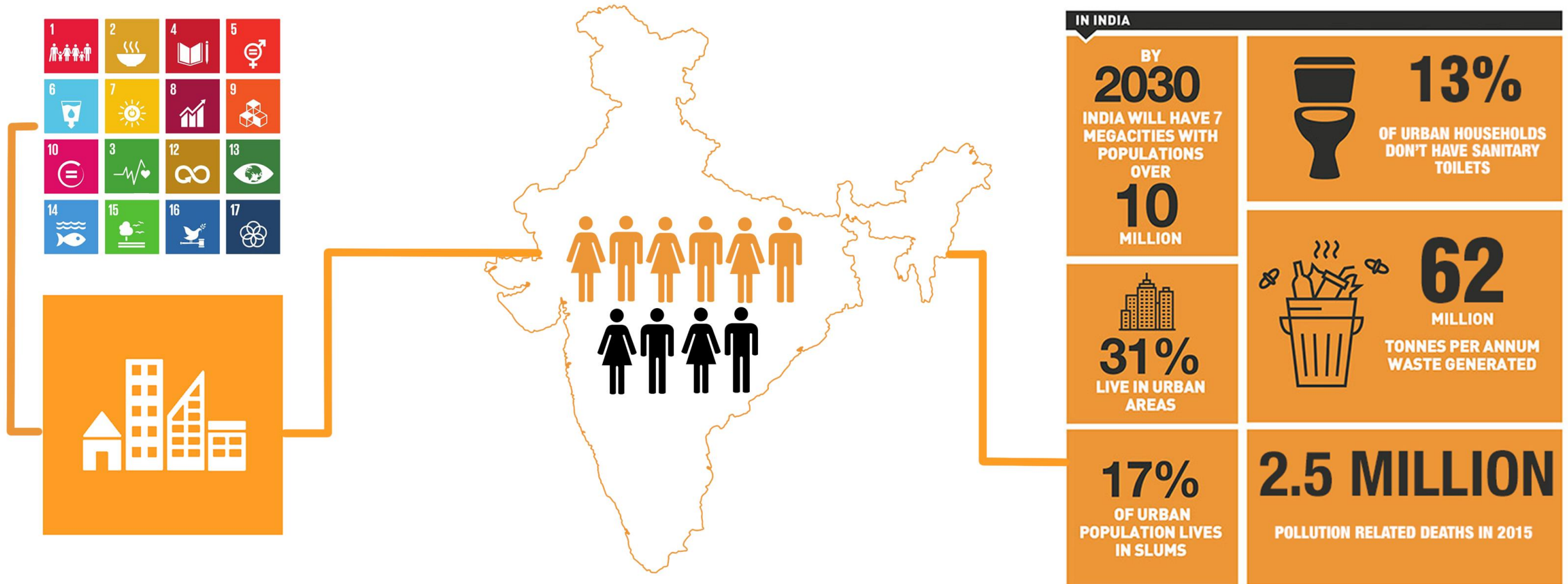
Cumulative impacts of construction projects and the need for looking beyond the purview of projects that need Environmental Clearance (EC)

Construction projects- **Compliance patterns** and extended observations for additional recommendations



Contribution to the global discussion of SDGs by illustration of an area based **Sustainable EMP** and the advantages of their incorporation in the **development process** (DP/TP/GDCR)

SDG 11 - SUSTAINABLE CITIES AND COMMUNITIES



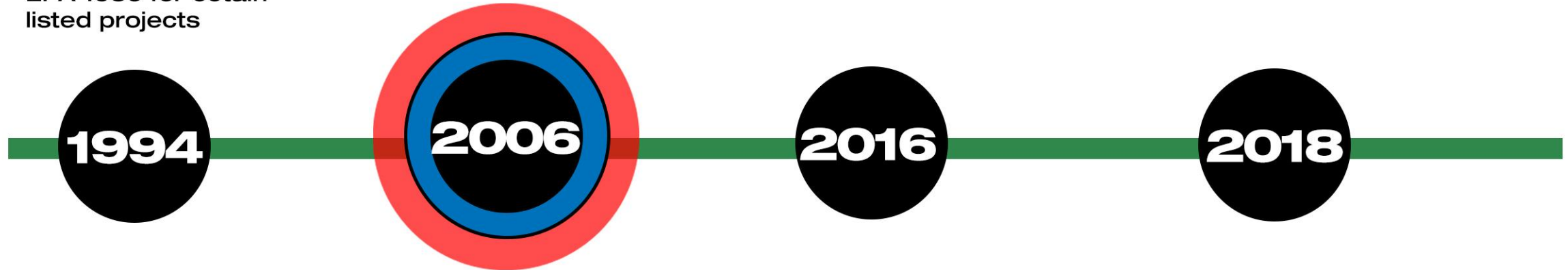
Source: UNDP India ; infrastructure deficiencies

In the Indian context, presently the largest democracy has the second largest urban population in the world at 377 million (31.7%), after China (749 million, 2014), with the urban numbers having increased up to **429 million in 2016**, and have been further projected to rise to **600 million(40%)** by 2031 (High Powered Expert Committee Report, 2011).

A World Bank Report (September 2015) characterises India's urbanization process as "**hidden**" - because the share of India's population living in areas with urban-like features in 2010 stood at **55.3%**

AMENDMENTS

EIA as a mandatory requirement under EPA 1986 for certain listed projects



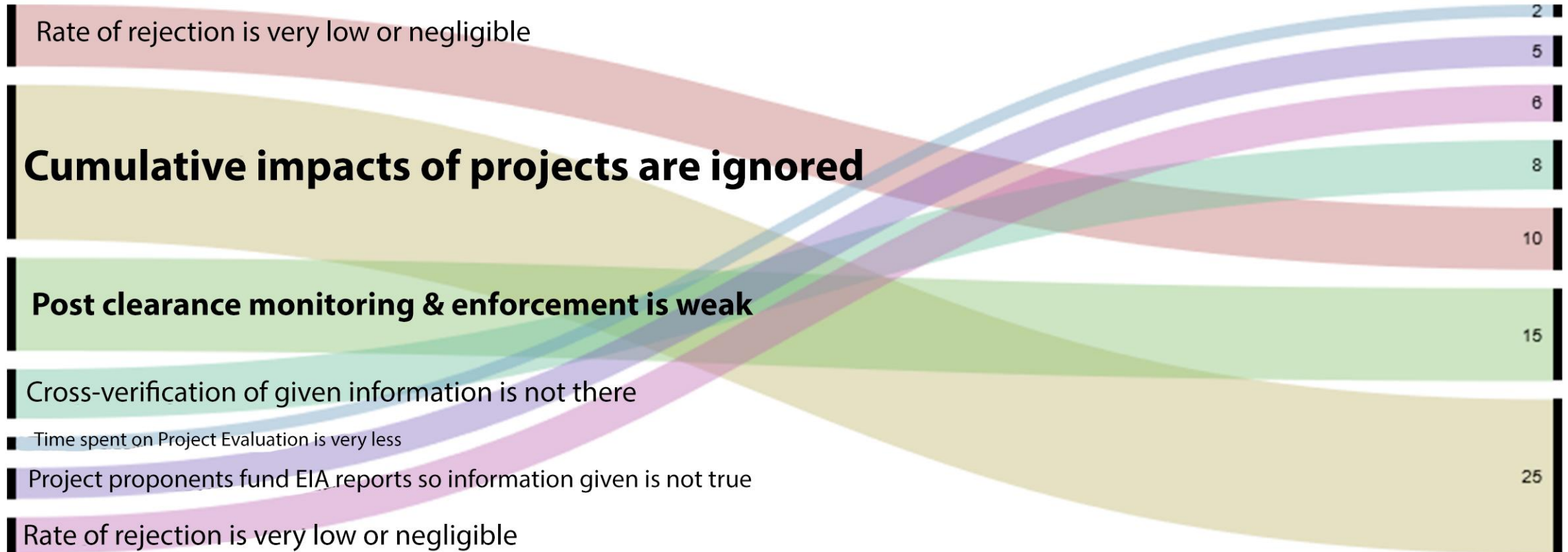
SEIAA	8 (a)	Building and Construction Projects ≥20000 <u>sq.mtrs</u> and <1,50,000 <u>sq.mtrs</u> of built-up area*
	8 (b)	Townships and Area Development Projects Covering an area ≥50 ha and or built up area ≥1,50,000 <u>sq. mtrs</u> **

ULB	≥20000 <u>sq.mtrs</u> and <1,50,000 <u>sq.mtrs</u> of built-up area*
SEIAA	1,50,000 <u>sq. mtrs</u> to 3,00,000 <u>sq.m</u>
MOEF	> 3,00,000 m ²

Quashed by NGT on 8 Dec 2017

ULB	20,000 <u>sq.m</u> and <50,000 <u>sq.m</u>
SEIAA	>50,000 <u>sq. mtrs.</u> & <1,50,000 <u>sq.m</u> of <u>builtup</u> area
SEIAA	1,50,000 <u>sq.m</u> of <u>builtup</u> area and or covering an area 50 ha.

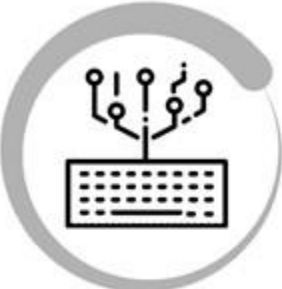
Stayed by Delhi HC on 26 Nov 2018



sources / / /

Effectiveness of Environmental Management Plans : Construction Projects in India by S.Toor & N.Bansal ; From Impact Assessment to Clearance Manufacture by M.Menon & K.Kohli)
Curse of the urban boom by Subhrangsu Goswami & Vidula Kulkarni; Effectiveness of Environmental Management Plans : Construction Projects in India by S.Toor & N.Bansal)
(source : Conducting Environmental Impact Assessment for Developing Countries by Prasad Modak and Asit K Biswas)

SITE SELECTION PROCESS



FILTER 01

MoEF	6710
SEIAA	



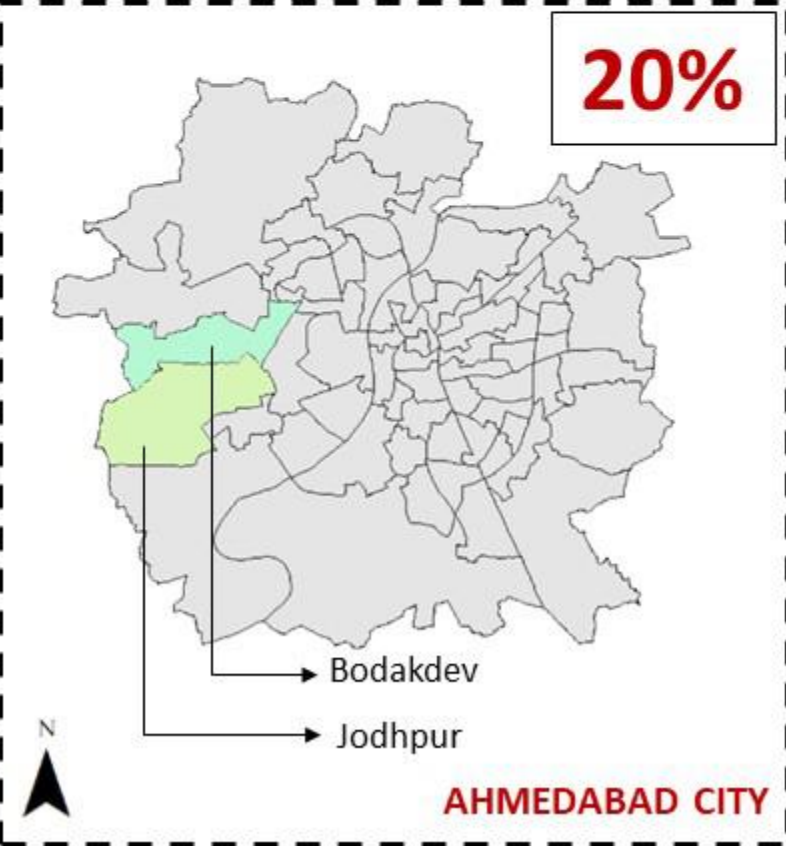
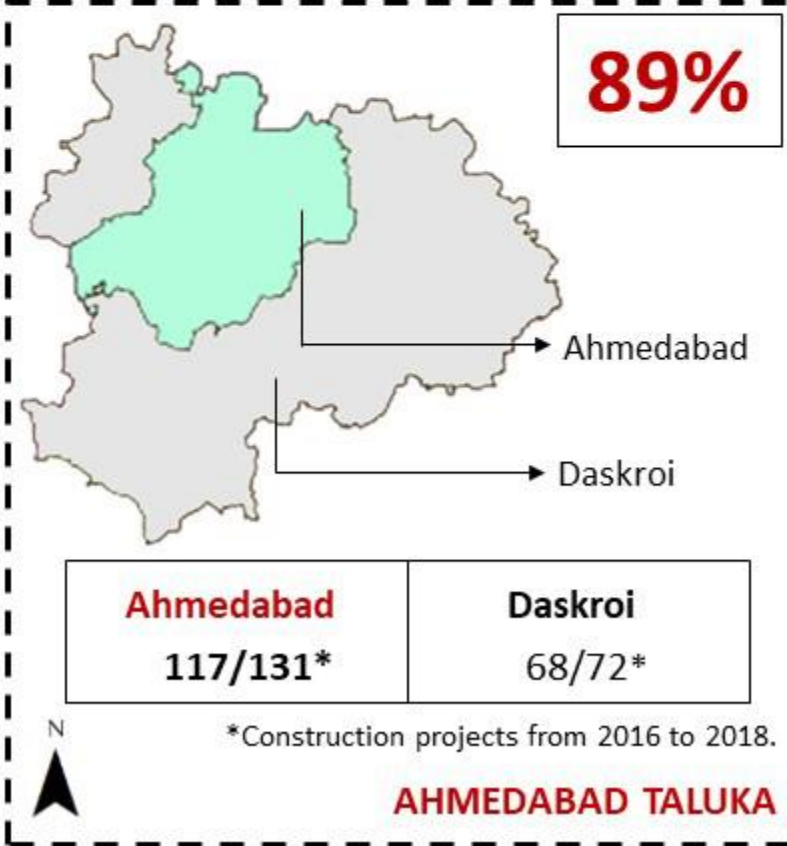
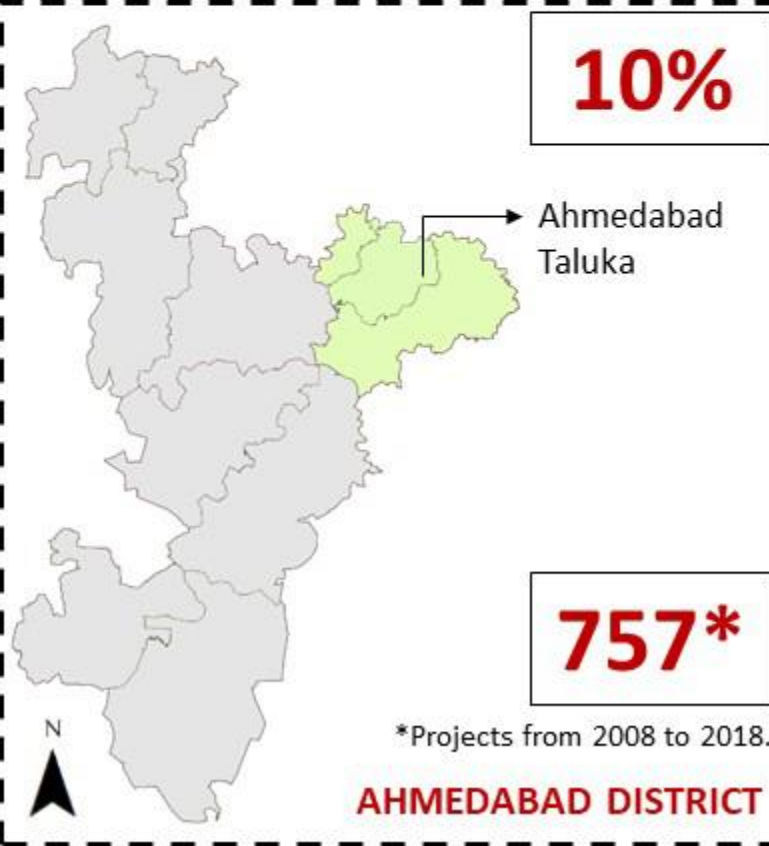
FILTER 02

Ahmedabad	360
Daskroi	315

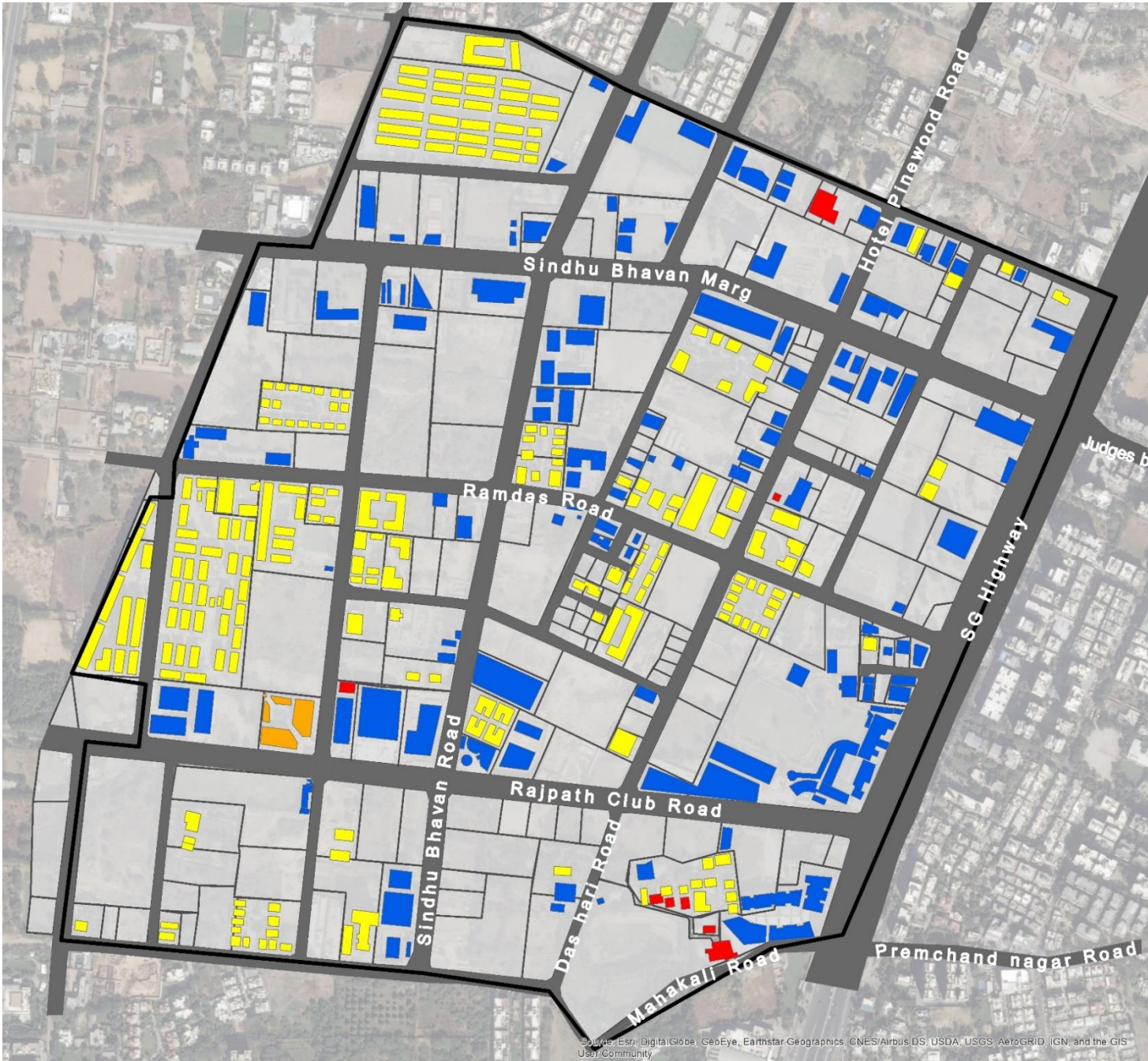


FILTER 03

Bodakdev	15
Jodhpur	10



SITE PROFILE & CHARACTER



Legend

Site Area

Roads

Built Use

Commercial

Residential

Institutional

Mixed

Plot Boundary

0 0.05 0.1 0.2 0.3 0.4 Km

Population Estimation

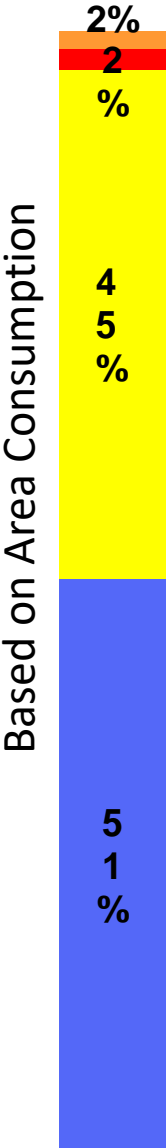
1 Dwelling Unit – 5 persons

Commercial – 10 sqm/person

Institutional – 4 sqm/person

Site Population – 93173

10% Residential
90% Floating

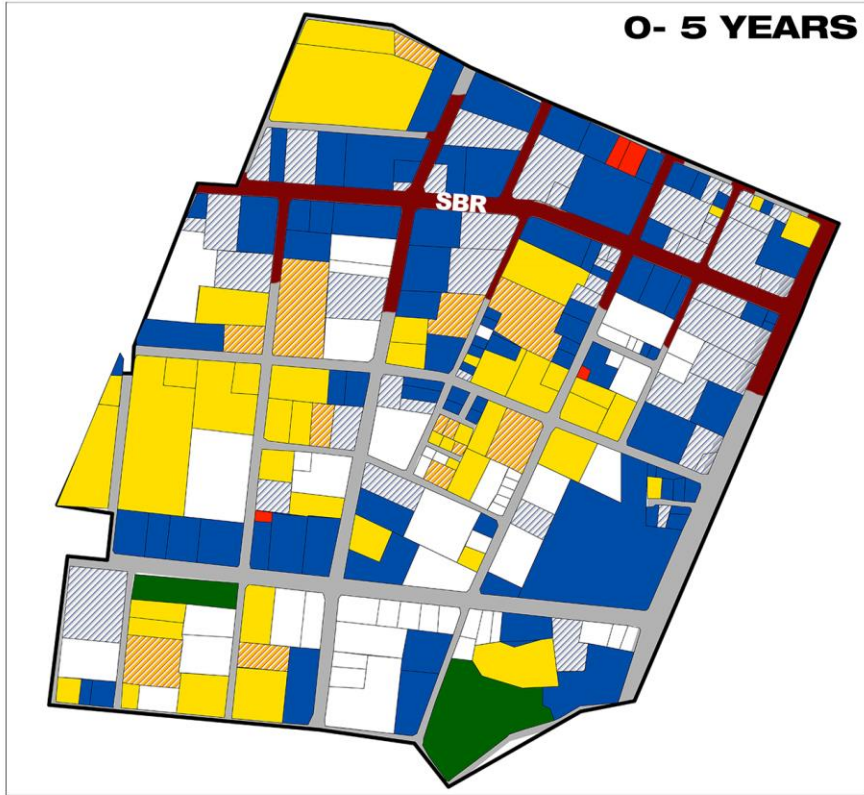


Based on Area Consumption

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DEVELOPMENT PROJECTIONS

0- 5 YEARS

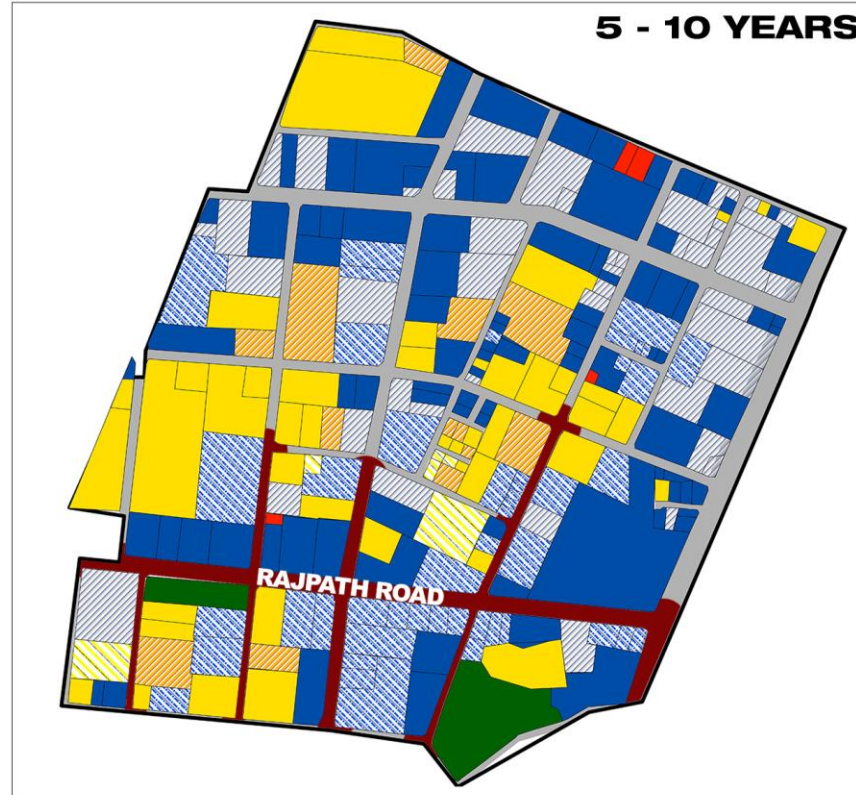


Existing population in 2018 93170
 Commercial population in 5 years 101988
 Residential population in 5 years 2185
TOTAL POPULATION IN 5 YEARS - 197343

 Dwelling unit
5 per unit

10%

5 - 10 YEARS



Existing population in 2023 197343
 Commercial population in 10 years 104333
 Residential population in 10 years 596
TOTAL POPULATION IN 10 YEARS - 302272

 Commercial
10 sq./person

 Institutional
4sq./person

90%

A projection methodology tabulated by the Delhi water revenue committee based on the building type was followed to get the future projections.

After stakeholder consultations and interviews with the real estate sector we have come to an understanding the area would purely turn into a commercial habitat in the coming years

Assumption :The area's land bank would saturate within the next 10 years . 0-5 Development around sbr , 5-10 Development around Rajpath Road.

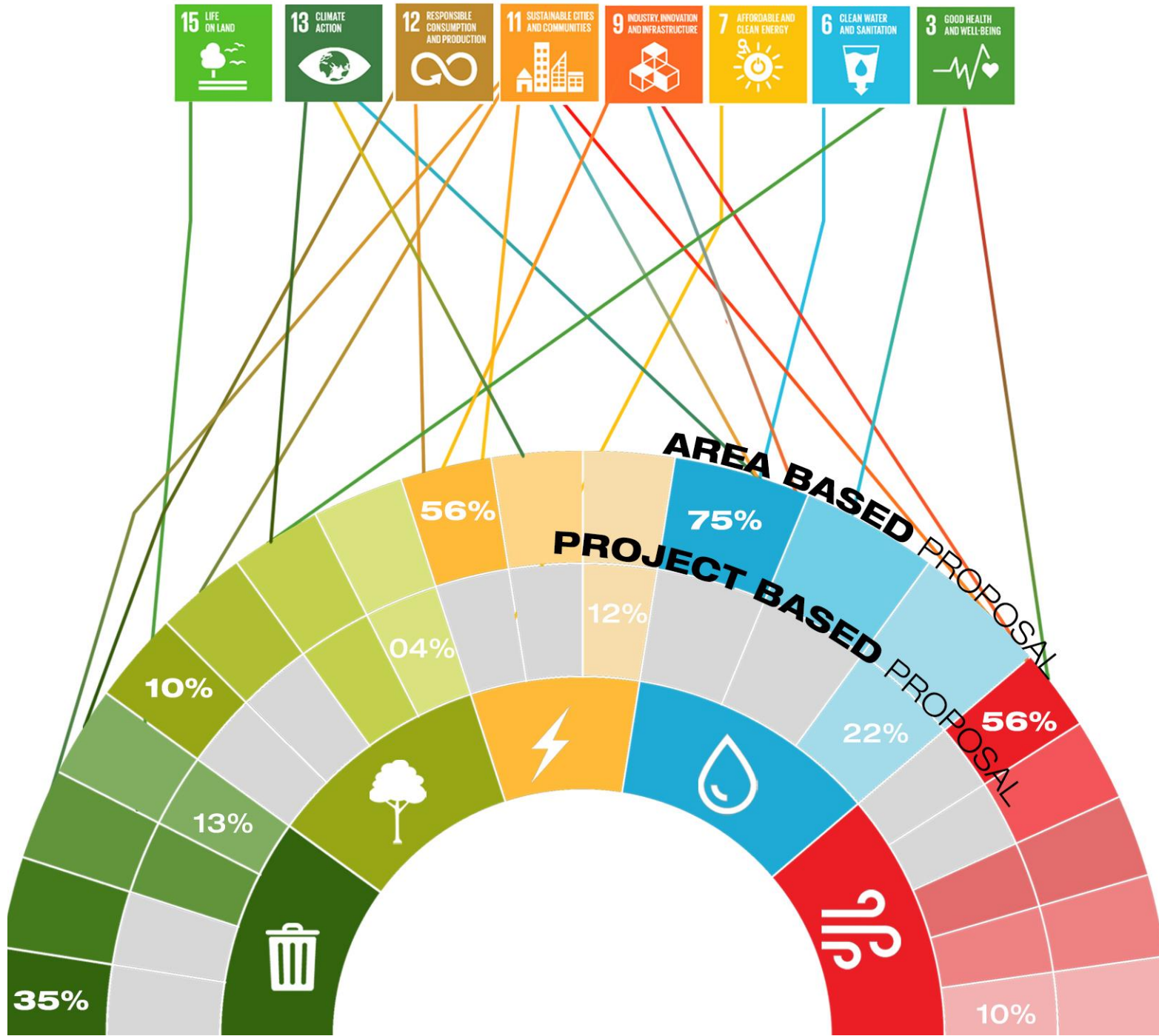
FOCUS SECTORS

The focus sectors that were taken into consideration were

- AIR**
- WATER**
- ENERGY**
- GREEN AREAS / LAND**
- WASTE MANAGEMENT**

There exists an enormous potential when strategies are incorporated at the area level.

The area based approach will also make possible the localization of the sdgs to be met at the city level. Indirectly contributing to the global discussions through local actions



AIR QUALITY MATTERS

TARGET 11-2

AFFORDABLE AND SUSTAINABLE TRANSPORT SYSTEMS

TARGET 11-6

REDUCE THE ENVIRONMENTAL IMPACT OF CITIES

1 ton of carbon dioxide per minute!

That Is City Vehicles' Daily Emission: Report

Parth Shastri@timesgroup.com

Ahmedabad: Our dependence on vehicles to travel even short distances leads to injecting of approximately 1,500 tons of carbon dioxide daily — or 1 ton every minute — into our respirable air! Our collective carbon footprint is the highest among tier-2 Indian cities and we share this honour with Pune.

A recently released study titled 'Urban Commute' by ranks Ahmedabad and Pune as the sixth highest carbon dioxide emitters among 14 mega and metropolitan Indian cities. Ahmedabad is ahead of Kolkata, Jaipur, Kochi, Lucknow and Chandigarh.

Nearly 65% of Ahmedabadis depend on private vehicles for their daily commute — which is the third highest among metro cities. In Chandigarh, the dependence is 80%; while Lucknow's dependence is 70%.

Delhi's Centre for Science and Environment (CSE),

TOXI CITY

AHMEDABAD

▶ Continued on P 2

OVERALL AIR QUALITY INDEX

Ahmedabad	Delhi	Mumbai	Pune
310	278	82	79



MOST POLLUTED IN INDIA			MOST POLLUTED IN CITY	
Area	City	AQI	Area	AQI
▶ Satellite	Ahmedabad	333	▶ Satellite	333
▶ Mathura Road	Delhi	282	▶ Bopal	319
▶ Bandra Kurla	Mumbai	181	▶ Gift city	317
▶ Shivajinagar	Pune	119	▶ Airport	311
			▶ Lekwada	309

Quality MATTERS

Major pollutants

According to the presentation by Dr B Sengupta, former member secretary of Central Pollution Control Board (CPCB), the AQI primarily identified PM10 and PM2.5 (Particulate Matter of the size of 10 and 2.5 micrometres respectively) along with NOx (mono-nitrogen oxides), CO (carbon monoxide), O3 (ozone), PAH (polycyclic aromatic hydrocarbon) among others as the core problems. Ahmedabad specifically has high PM2.5 and O3 levels, which have severe health implications such as toxicity, allergic effects, bacterial or fungal infection and fibrosis

EXPERT OPINION

Vehicular pollution

- ▶ Existing PUC system should be made more authentic and reliable or replaced by a comprehensive inspection and maintenance system which is user friendly.
- ▶ Promotion of clean fuel like CNG and LPG. BS III norms for fuels and vehicles implemented all over the state and BS IV and V for cities.
- ▶ Use of concrete roads in place of tar road to avoid maintenance and dust emission.
- ▶ Provide timers at all traffic points where movements of vehicles are high. Fully ensure that it works 24x7.
- ▶ Encourage and provide public transport

Industrial Pollution

- ▶ Identify toxic pollutants emitted by pesticides industries, dye and intermediates, petrochemicals
- ▶ Link air pollution with energy efficiency in coal/oil/gas/biofuel fired boilers
- ▶ Create more awareness about environmental clinics among small scale industries

'65% prefer private vehicles to commute'

2-Wheelers The Most Dominant Mode: Study

Parth Shastri@timesgroup.com

Ahmedabad: The daily congestion on city roads and longer commuting hours for the city is thanks to ever-growing vehicular population — increasing by about 10% annually. Can a stronger public transport system be an answer?

A report by New Delhi-based Centre for Science and Environment titled 'The Urban Commute: And how it contributes to pollution and energy consumption 2018' authored by Anumita Roychowdhury and Gaurav Dubey, throws light on the impact of vehicles in 14 tier I and II Indian cities.

The report mentions that Ahmedabad ranks lowest among eight tier II cities when it comes to air quality. However, it mentions that the city has reported improvement in modal share for public transport over the last decade thanks to initiatives in AMTS and BRTS. Overall growth in travel and motorization in driving the emissions and energy consumptions are up, it mentioned.

According to the report, the current travel matrix includes 35% use of public transport, 12% of intermediate transport such as auto rickshaws, 46% of two-wheelers and 7% of cars.

'Ahmedabad, Lucknow, Vijayawada, Pune and Jaipur are at an inflection point. Their pollution levels may increase or decrease, depending on their mobility policies over the next years and decades,' mentioned the report.

Two-wheelers dominate the transport matrix of the city — the kilometres travelled by two-wheelers is about five times that of commutes by cars and ten times that of bus and other modes of transport — such as autorickshaws — combined together.

The CSE study points out that vehicular traffic alone pumps nearly 400kg of particulate matter (PM) daily into the city's breathable air. This amount is at par with that of Mumbai and higher than that of eight other cities, the CSE report says. Rutul Joshi, associate professor of Cept University, said that the study highlights a very important aspect for cities like Ahmedabad. "They are at an inflection point where their per trip emissions are in middle of the spectrum — they can go up or down," he said.

HAZE HANGOVER

Total particulate emission load from urban commuting (select cities) (kg per day)

City	Emission
Delhi	1100
Pune	550
Ahmedabad	350
Mumbai	350
Kolkata	200

TOXI CITY

AHMEDABAD

City	Rate
Pune	18.3%
Bhopal	15.2%
Bengaluru	14.9%
Chennai	12.8%
Ahmedabad	11%
Mumbai	9.9%
Hyderabad	6.5%

Average annual growth rate of vehicles (select cities)

City	Rate
Pune	18.3%
Bhopal	15.2%
Bengaluru	14.9%
Chennai	12.8%
Ahmedabad	11%
Mumbai	9.9%
Hyderabad	6.5%

Average trip length for A'bad

10 km	7.5 km
6.5 km	

GOOD RANGE AQI | 0 to 30

Source: SAFAR

Transport matrix for Ahmedabad

- ▶ Public Transport | 35%
- ▶ Intermediate Transport* | 12%
- ▶ Two-wheelers | 46%
- ▶ Cars | 7%

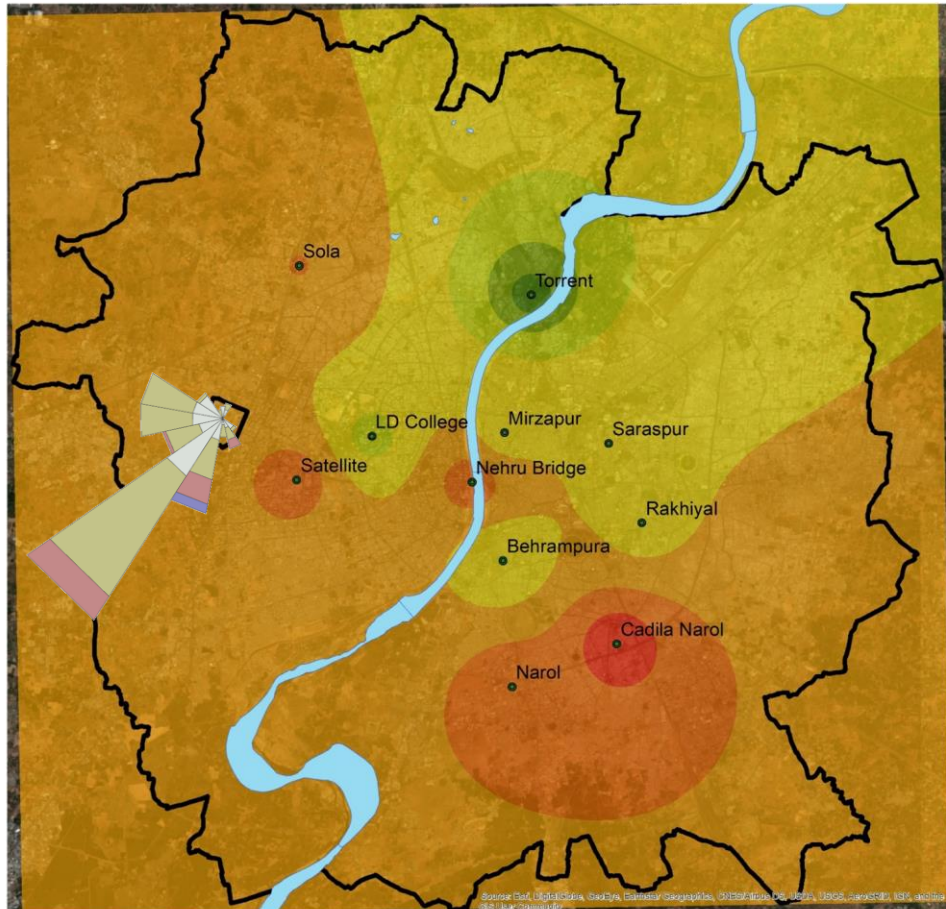
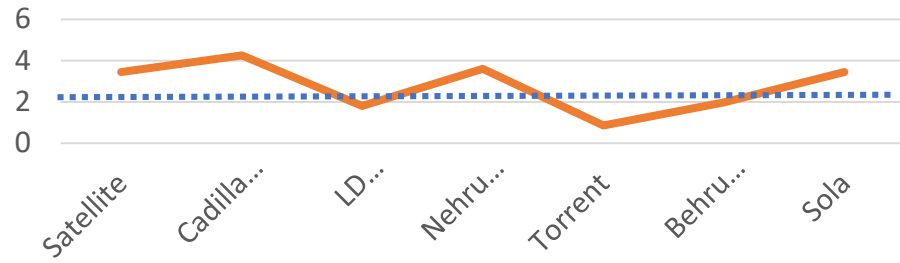
*Includes auto rickshaws, taxis & other modes

Not a pleasant SAFAR in city

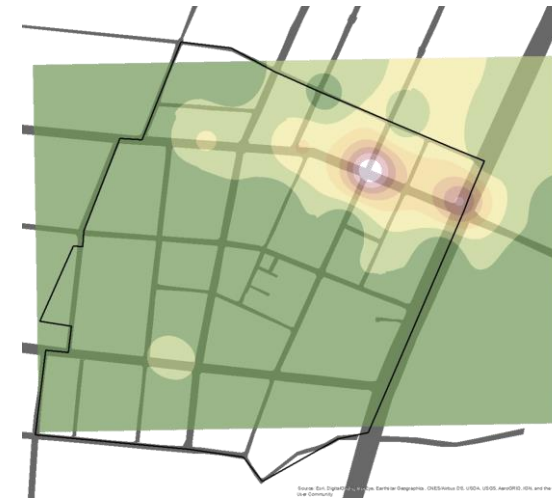
▶ Continued from P1

AIR QUALITY- MONITORING AND EVALUATION

Exceedance Factor



S. no	Station Name	PM 10 Value
1	Satellite	345
2	Cadilla Narol	425
3	LD College	181
4	Nehru Nagar Bridge	360
5	Torrent	86
6	Behrumpura	198
7	Sola	345



S.N	Parameter	Concentration of Pollutants	Desired Norms
1	PM ₁₀ (µg/m ³)	207.64	100 2.0x
2	PM _{2.5} (µg/m ³)	114.28	60 1.9x
3	SO _x (µg/m ³)	8.96	80
4	NO _x (µg/m ³)	39.56	80
5	CO (PPM)	7.0	---

ON SITE OBSERVATION



Uncovered transportation of excavated sand and materials



Earth work, Soil excavation, Mobile plant e.g.. Bulldozer, crane, crushers for site clearance work



Unpaved roads

COMPLIANCE PATTERN OF EC ORDERS



- Temporary wind shield shall be done to prevent dust emission spreading outside the project premises. Barricade of adequate height shall be provided on the periphery of construction site with adequate signage **(In compliance)**



- Regular sprinkling will be done to control fugitive emission **(Not in compliance)**



- Material shall be covered during transportation **(Not in compliance)**



- Uniform piling and proper storage of sand **(Not in compliance)**
- Noise levels will be kept within prescribed levels by providing noise control measures including acoustic insulation, hoods, silencers, enclosures vibration dampers **(Not in compliance)**

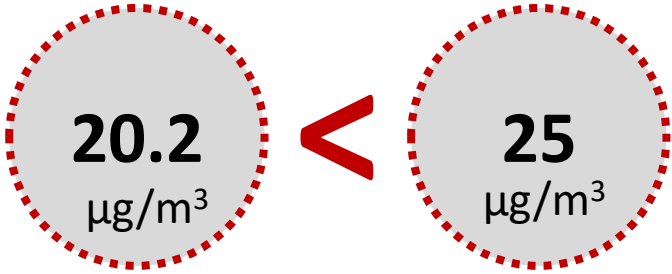
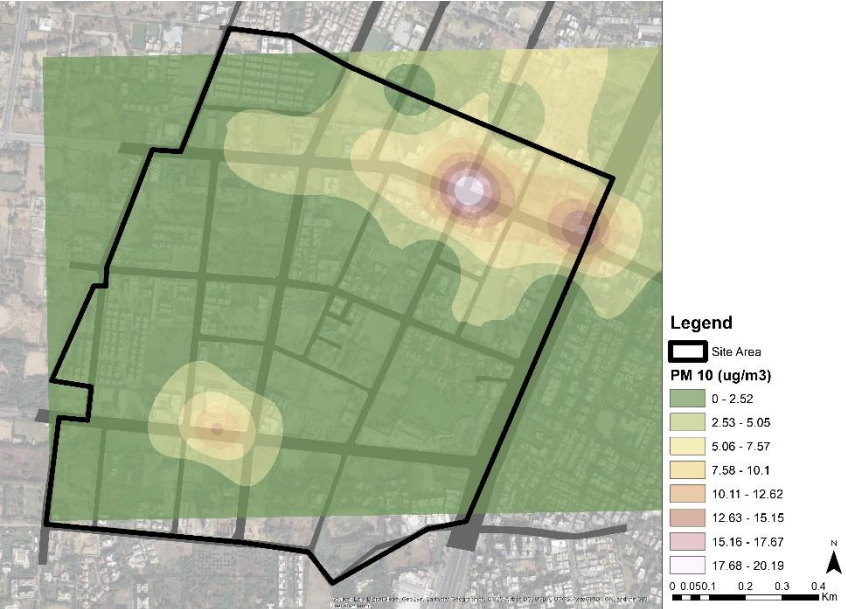


- Noise generating equipment shall not be used during night hours **(Not in compliance)**
- Construction debris and materials shall be properly stored to avoid public nuisances by blocking the roads and public passages **(Partially In compliance)**

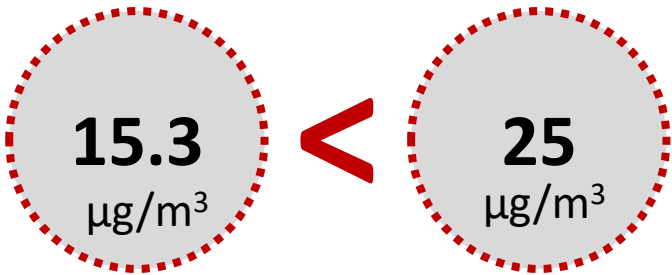
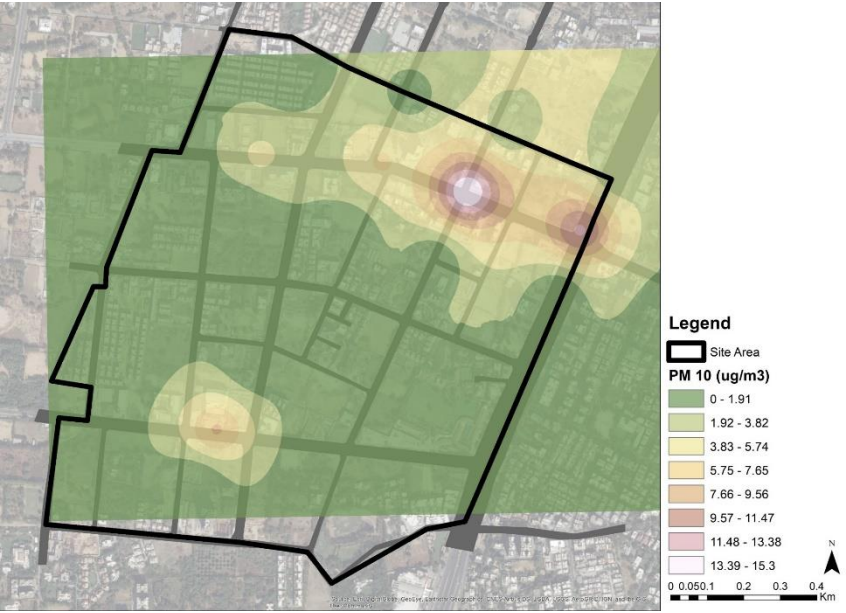
Apart from Non compliance these measures really don't contribute towards the improvement of air quality

STRATEGIES TO IMPROVE THE

Scenario 1
20% Shift



Scenario 2
80% Shift



WATER - GLOBAL CONCERNS

Sustainable Development Goals



3%

Only 3 % of the world's water is fresh (drinkable) & humans are using it faster than nature can replenish it.

40%

Global population affected by water scarcity.



80%

Untreated wastewater from human activities is discharged into waterways.

2030 Targets

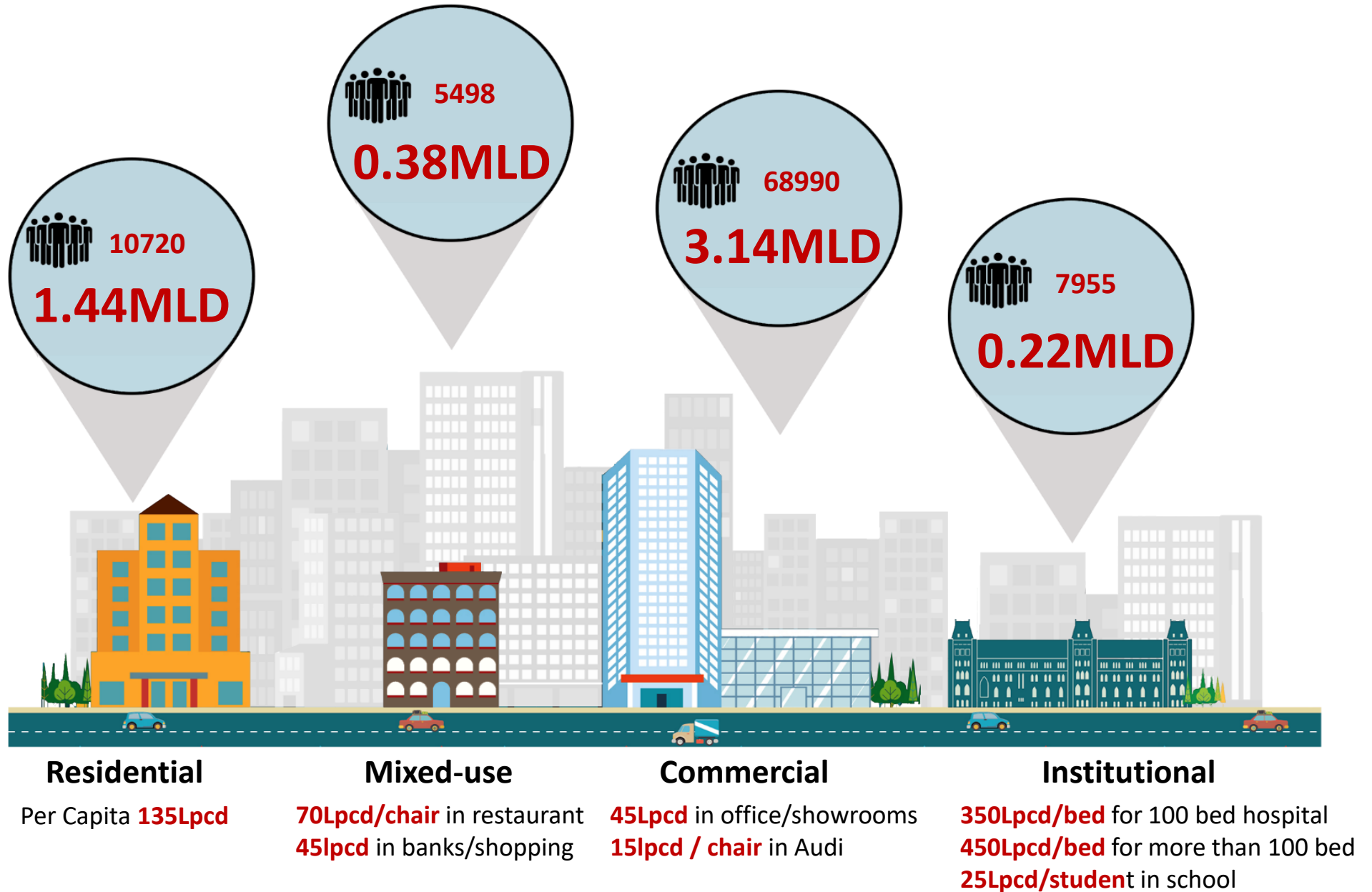
Improve water quality by reducing pollution, eliminating dumping & minimizing release of hazardous chemicals & materials, **halving the proportion of untreated wastewater & substantially increasing recycling** & safe reuse globally.

Substantially **increase water-use efficiency** across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity .

Capacity-building support to developing countries in water & sanitation-related activities , including **water harvesting, , wastewater treatment, recycling & reuse technologies.**

” By 2030, achieve the **sustainable management & efficient use of natural resources.** ”

EXISTING WATER DEMAND



*Based on CPHEEO standards.

AREA BASED EIA IN ACHIEVING SDG'S

CURRENT PRACTICES :

NEED FOR AREA BASED APPROACH :

In the current system the EC order takes note of the **building level consumption of water & their source**, which becomes **negligible** when we **compare it with the area level** usage.

The area level EIA captures the **overall consumption & prime source of water**. This helps in formulating EMP at a larger scale as **water sources cannot be dealt in isolation**.

The GDCR specifies, that **RWH** is only compulsory for buildings **above 1000 sq.m built-up area/ 4000 sq.m plot area**.

RWH can be more efficient when practiced across an area, **irrespective of the built-up area**. Mandating such a tool will help enhance water management, especially in places like Gujarat.

Most EIA reports fail to address **storm water run-off**.

The **run-off conservation is not a building level topic** as it requires area level understanding. This **cannot be ignored** while the EC orders are issued.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

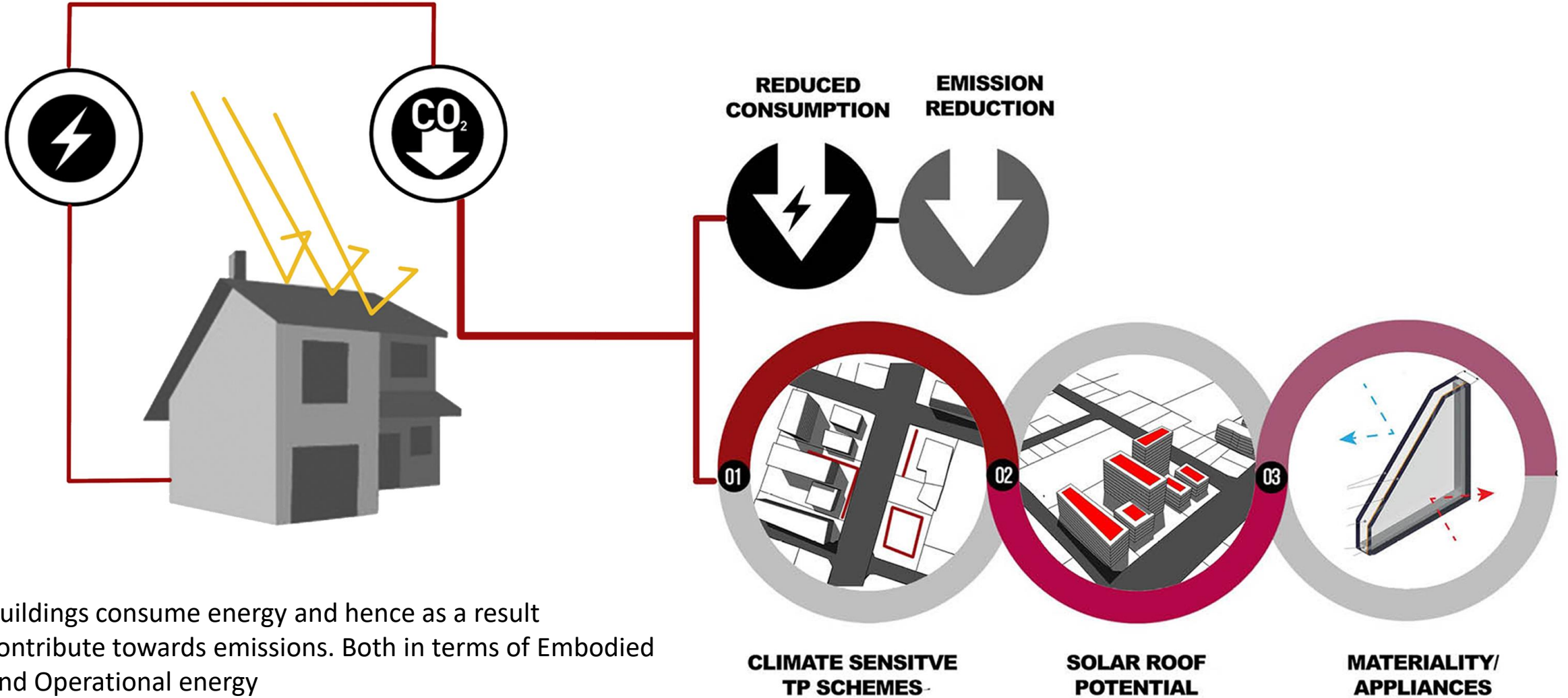


SUSTAINABLE DEVELOPMENT GOALS

6 CLEAN WATER AND SANITATION



IDEATIONS - REDUCED EMISSIONS

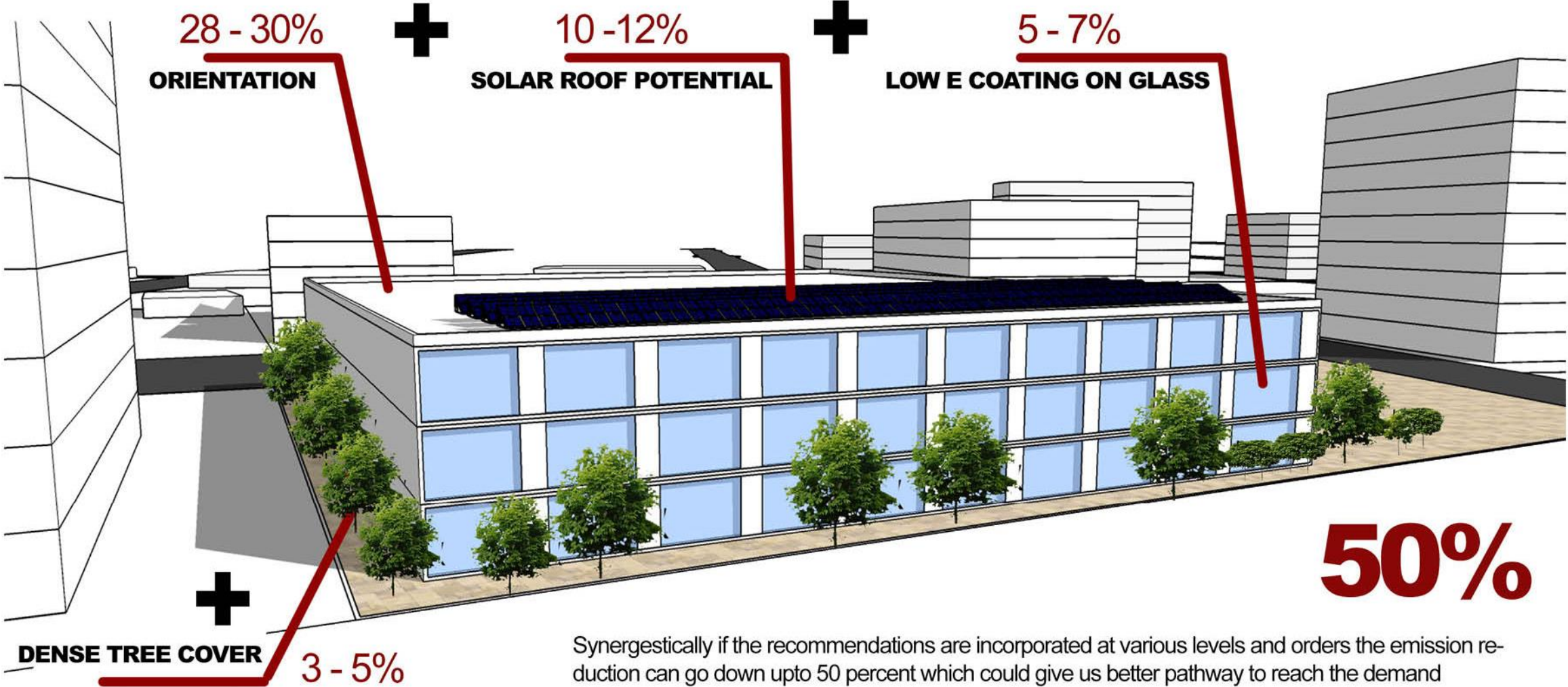


Buildings consume energy and hence as a result contribute towards emissions. Both in terms of Embodied and Operational energy

The fundamental idea is to reduce the energy gain in buildings or to meet them from a renewable source.

Strategies are incorporated at different levels in order to reduce the energy gains in buildings.

SYNERGESTIC REDUCTIONS






Synergistically if the recommendations are incorporated at various levels and orders the emission reduction can go down upto 50 percent which could give us better pathway to reach the demand

REDUCED EMISSION SCENARIO

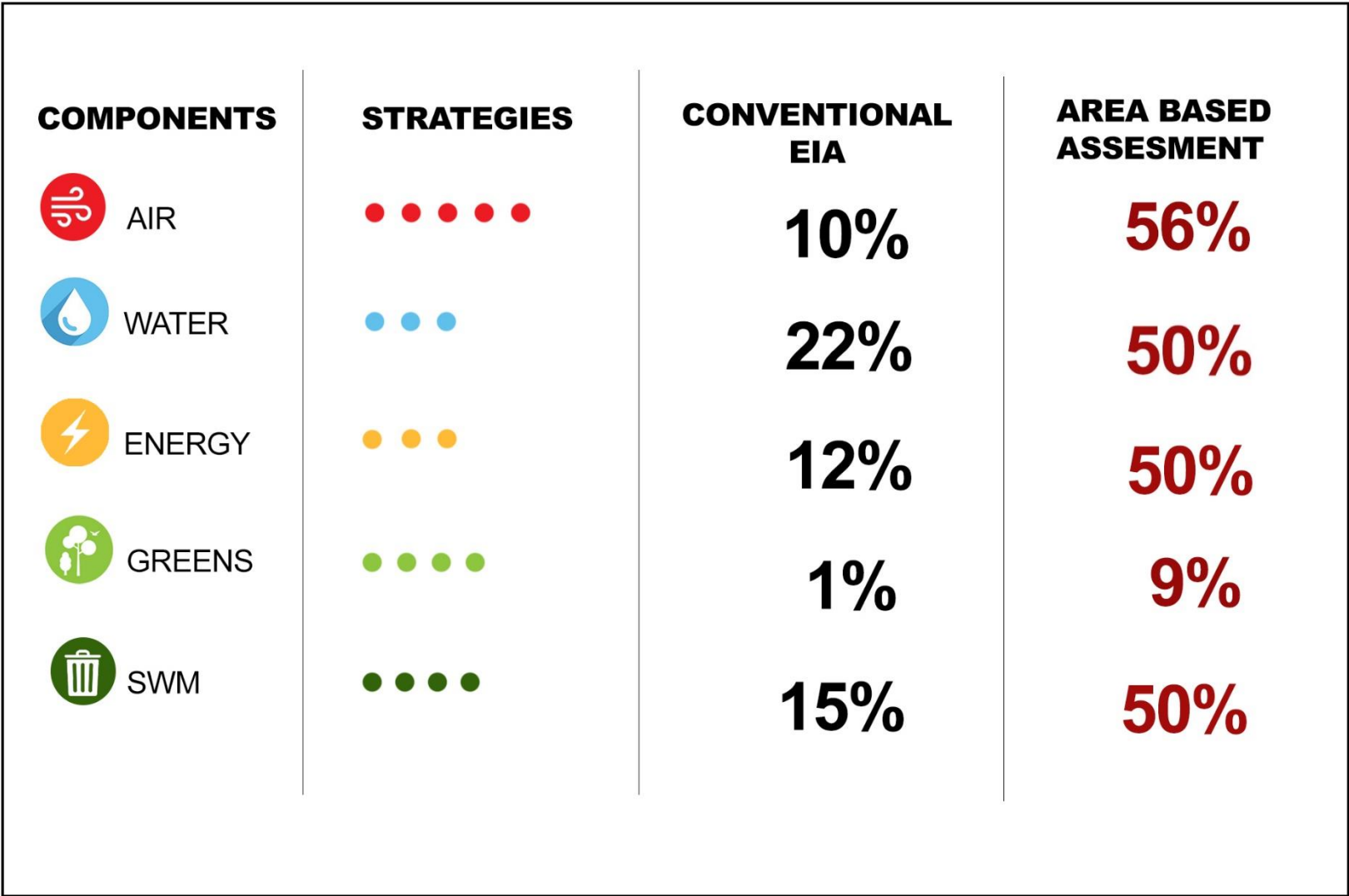
If the prescribed ideations are projected to the city scale by then there is possibility of reducing the emissions and further the energy demands can be met by renewable sources.

12% - **50%**



	 2018	 2023	 2028
Population	93170	197343	302272
Energy demand Associated CO2 emissions	25.43 Gwh 8942	32.07 Gwh 11275	58.15 Gwh 20701
Energy demand based on observed patterns Associated CO2 emissions	1.5x 38.14 Gwh 13410	1.7x 55.02 Gwh 19343	1.5x 84.66 Gwh 29988
Demand based on the stratergies	1.2x 31.785 Gwh	1.3x 43.545 Gwh	1.2x 71.405 Gwh

Gains with Area Based Approach



Tabulating all the strategies of different components one would see that on a traditional EIA method the harnessing potential is inadequate or in miniscule amounts.

Area based assessment has a huge potential to reduce or mitigate the effects.

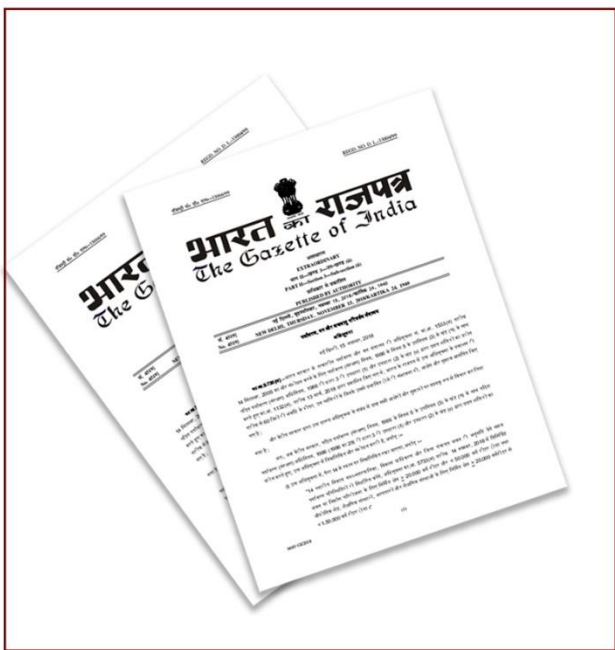
The area based approach has also made possible the localization of the sdg's to be met at the city level. Indirectly contributing to the global discussions through local actions



New Amendment & the way forward

NOTIFICATION :14 NOV 2018

CONCERNS - INSTITUTIONAL CAPACITY



Local bodies such as **Municipalities**, shall stipulate environmental conditions while granting building permission, for the **Building or Construction projects** with built-up area \geq 20,000 sq. mtrs and $<$ 50,000 sq. mtrs as specified in Notification S.O. 5733(E) dated 14th November, 2018



Augmentation of fewer plots wouldn't make any big difference to this whole process.

The whole process of linking environmental benefits with the development agenda is going to be only possible if the EIA exercise is going to be carried out an area based situation (TP scheme level , ward level etc.)