Third Public Webinar

Master Plan for Delhi, 2041

DELHI DEVELOPMENT AUTHORITY

13.07.2021

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Section 6
PHYSICAL INFRASTRUCTURE

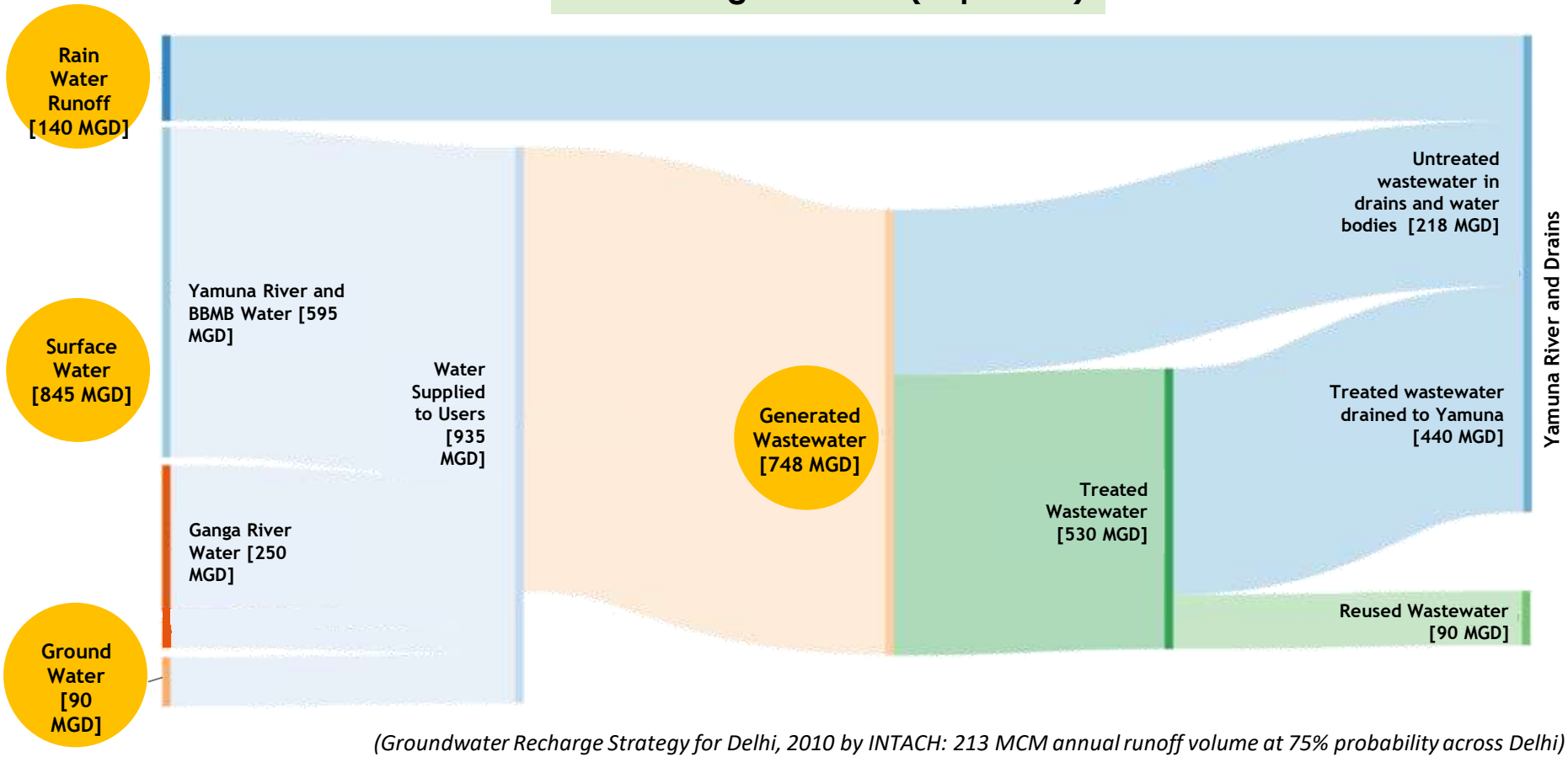
Chapter: INF1

MAKING DELHI WATER SECURE:
Water, Wastewater and Drainage

Reducing the demand for fresh water

- **MGD:** Million Gallon Per Day (1G = 4.5 L)
- **BBMB -** Bhakra Beas Management Board
- Delhi **Annual Av. Rainfall - 642 mm**

Water Budget of Delhi (at present)



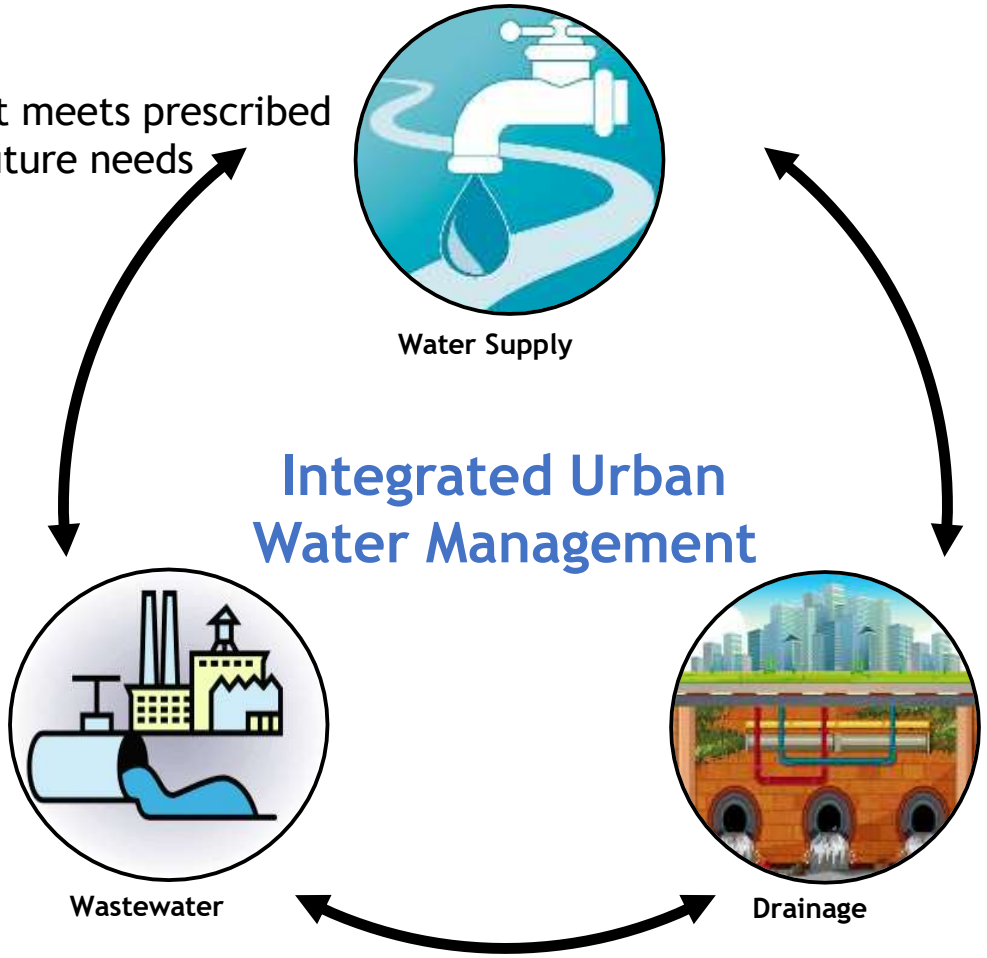
(Groundwater Recharge Strategy for Delhi, 2010 by INTACH: 213 MCM annual runoff volume at 75% probability across Delhi)

Achieve Water Security

Sustained availability of adequate water that meets prescribed quality standards for fulfilling current and future needs

Strategies

1. Reducing the demand for potable water
2. Optimizing bulk reuse of wastewater generated in the city
3. Maximizing retention of storm water
4. Improving efficiency of supply system



Reducing demand for potable water

Water Supply to be reduced from 60 GPCD to 50 GPCD by rationalizing and earmarking fresh water supply only for potable uses.

This will help achieve almost **50% reduction in additional water demand by 2041 (reduction in total estimated demand** from 1746 MGD to 1455 MGD)

Following norms will apply for various development projects:

- **Land Pooling Areas:** Water supply to be restricted to 40 GPCD
- **Green Development Area:** Majority of demand to be met by treated wastewater
- **TOD and Regeneration projects:** No additional water to be supplied except for vacant land within scheme.

Ensure 100% treatment and maximum reuse of wastewater

- ✓ Mandatory decentralized wastewater treatment and installation of water efficient fixtures in all new development / projects (as per UBBL)
- ✓ Mandatory dual piping systems in new developments – DJB to ensure dual piping before providing any new water connection
- ✓ Existing government, PSP and commercial buildings as per UBBL (except local facilities) to be retrofitted as per feasibility for decentralized treatment and water efficient plumbing
- ✓ Built structures created for installing such facilities to be free from FAR and ground coverage norms

Bulk reuse of treated wastewater

- ✓ Rejuvenation of lakes / water bodies
- ✓ Maintain regular environmental flow in the river Yamuna
- ✓ Ground water recharge through the use of treated wastewater at different recharge sites, aquifer recharge ponds, integrated within large city-level greens
- ✓ Treated wastewater to be used for horticulture, irrigation, cleaning of bus/metro/etc., industrial processes, and as far as possible for firefighting.

Maximizing retention of storm water

- ✓ In all new developments, **parks and gardens to be located in low-lying areas**
- ✓ **Rainwater harvesting** in all new development/regeneration projects.
- ✓ **Large scale storage and direct use of storm water** encouraged in GDA
- ✓ **Bio – drainage** to be used for designing buffers along water bodies
- ✓ Improvement of pervious surfaces throughout the city by adopting **Water Sensitive Urban Design (WSUD)** elements for all new layout plans and area improvement projects


Gravel Filters


Vegetated Filters


Pervious pavements


Detention ponds


Rain Garden


Bio Swales

Improving efficiency of water supply and sewerage systems

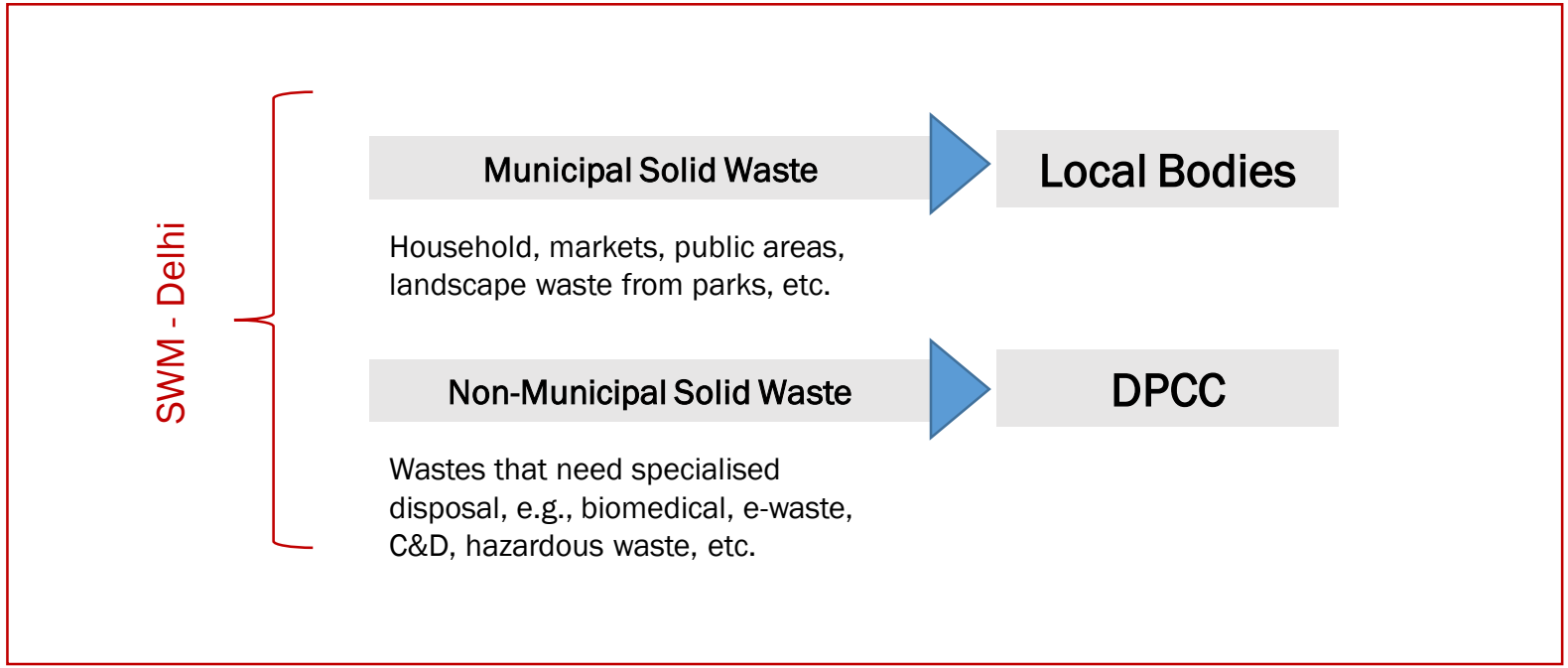
- DJB's existing efforts for **24X7 supply** and **SCADA** to be scaled up. Wastage of water NRW to be reduced systematically.

- **Telescopic pricing** beyond a basic sustenance threshold will be critical for regulating wasteful water usage. **House-level metering** will be critical and this shall be mandatory even in UCs for obtaining layout plan approvals.

- **Increasing coverage of sewerage network and services** – options of decentralised sewerage systems in dense colonies with proper faecal sludge management protocol to ensure regular cleaning and treatment of sludge.

Chapter: INF2

MANAGING SOLID WASTE EFFICIENTLY


SWM - Delhi
Municipal Solid Waste
Local Bodies
Household, markets, public areas, landscape waste from parks, etc.
Non-Municipal Solid Waste
DPCC
Wastes that need specialised disposal, e.g., biomedical, e-waste, C&D, hazardous waste, etc.

Managing Solid Waste Efficiently

1. Managing solid waste locally

- Facilitating Minimum Waste Localities (MWL) - residential areas, housing societies, colonies, apartments, markets, etc., where all the wet MSW is managed through eco-friendly solutions (**all new projects to be MWLs**)
- Space for composting within mid and large sized parks

Targeting:

- waste is managed in **closest proximity** to where it is generated:
- better control over **segregation at source**;
- Stronger **integration of informal waste workers**;
- Widespread **engagement of local communities & RWAs.**
- Catalysing **circular economy**

- Dhalaos can be repurposed as local Material Recovery Facilities (MRFs) : Dedicated MRF space both sub-city and city level with semi-automatic and automatic operation systems.
- Dedicated dhalao/space (at least one every ward) for intermediate storage of C&D waste
- Identification of bulk-waste-generators (hotels, restaurants, malls etc.), for collection of wet waste to authorised composting plants.

2. Minimizing environmental impact

The Environmental impact of waste due to landfill sites, un-authorised dumping etc is to be reduced through following interventions:

- Reducing dependence on landfill sites – by 2041, only 1 operational engineered landfill site and other temporary sites permitted.
- Existing legacy waste to be salvaged and recycled in a phased manner as per the Guidelines for Disposal of Legacy Waste (Old Municipal Solid Waste) by CPCB (2019) – EDMC has already started this at Ghazipur Landfill.
- Redevelopment of reclaimed land from existing landfill sites for public green spaces etc.
- Efficient management and strict compliance to MoEFCC-2016 guidelines for non-municipal waste under the vigilance of DPCC.
- Use of inert material to be explored and actioned

3. Optimizing Waste as a resource

- Large scale composting farms encouraged in the Green Development Area (GDA) for composting of bio-degradable waste.
- Maximizing use of C&D waste by-product in new government and redevelopment projects.
- Developing a robust waste-to-wealth eco-system – encouraging repair and recycling as industry and employment options; promoting market for recycled and upcycled products; facilitating citizens/ local enterprise in waste management
- Facilitating waste to wealth eco-system through quality monitoring, green rating, common web portal for auctions etc., for Delhi as well as regional market for waste by-products.

Chapter: INF3

PROVISION OF POWER, GAS, TELECOM & DIGITAL INFRASTRUCTURE

Shifting to renewable energy and sustainable power consumption

- Encouraging **Solar farms** within Delhi's green belt in line with the "**Agriculture-cum-Solar Farm Scheme"** of GNCTD (utilising 300 sunny days/year)
- Leveraging on Delhi's **canals for generation of solar energy**
- All **government buildings** above **500 sqm** to **install solar panels.**
- **Large scale public facilities** such as airports, metro stations, inter-state and city-level bus stations/depots, stadiums etc., may progressively **meet majority of their power.** DIAL and DMRC have already adopted this strategy. This can also be adopted by ISBTs/ bus stands, large commercial establishments, shopping malls and work centres etc.
- **Transp**

Shifting to renewable energy and sustainable power consumption

- **smart metering and strategies for managing peak hour demand** to monitor the quality of power supply on a real time basis and help in predictive maintenance and infrastructure planning.
- **Re-rationalising Sub station area demands with new methods of managing peaks like battery storage** to improve grid efficiency based on cost benefit analysis
- **Encouraging compatible mix of uses for lowering multiple peak locations**
- **Green buildings norms** (green roofs, natural light, solar use, energy efficient fixtures) to be adopted and **energy efficient buildings** promoted
- Gas insulated sub-stations shall be promoted by DISCOMS (50% lesser space requirement)
- Overhanging electrical wires in dense areas are a fire hazard- have to be taken care of on priority basis; 11 KV power lines shall be integrated underground within the road cross sections in new development.

A digitally enabled and connected city

Current Scenario

57 Million total connections

93% wireless connections

254.49 overall tele-Density of Delhi (as compared to 91.64 at India level)

31.14 million internet subscribers

Private Sector extensively servicing the city

Progressive national policies for improving digital infrastructure (per capita connectivity and ROW norms)

Policy Suggestions

1. Provisioning of adequate infrastructure provisions to support the advent of higher service levels like network of 5G and above, full city fibre coverage.

2. The highly equipped and digitally **smart unified command and control centre**s set up by the local bodies can be the key drivers for effective urban management of Delhi.

3. Adoption of the "Fibre First Initiative" of NDCP 2018 and regulations of ROW Policy 2016 will facilitate augmentation of telecom infrastructure. ULBs and other agencies to plan for shared infrastructure through collaborative models.

4. **Smart poles** in public areas, comprising of CCTV cameras, air pollution monitoring sensors, telecom antenna, Wi-Fi hotspots/ microcells etc.

Improving infrastructure for gas supply

Current Scenario

8.4% of the area within NCT is planned to be connected with PNG.

Approx. **25%** of the total **HH** are connected by piped gas network

Delhi currently has **7,677 km** of Medium-density polyethylene (MDPE) pipeline network and **666 km** of Steel Pipeline Network

There are **5** city gate stations supplying gas to Delhi (Desu, Bawana, Maruti, IFC 3, Mayur Vihar).

approx. **50%** of Delhi **"technically not fit"** for PNG network (dense unplanned areas)

Policy Suggestions

- Future gas **pipelines shall be integrated within the road sections** following all safety precautions mandated by the concerned authorities.
- Availability of **minimum RoW** for laying trunk gas network (i.e. 30 m.)
- UCs under TNF category for gas line shall be connected at time of regeneration scheme on priority and shall continue to be served by LPG gas network in the mean time.
- PNG shall be encouraged in all the IGL covered areas and new developments

Chapter: INF4

DISASTER PREPAREDNESS AND RESILIENCE

Building resilience and preparedness for natural disasters

Delhi disaster vulnerability

Delhi is in **Seismic Zone IV & V**

The Yamuna crossed its danger level (fixed at 204.83m) **26 times during the last 35 years**

Very high risk areas - Yamuna and its flood plain

level of most of the drains is **4.46** metres lower than the average flood level

9 major flood in last **120** years

75,000 fire incidents in last 5 years esp. in unplanned areas

Exposed **overhanging cables**

- Increased vulnerability in UCs, slums and JJ clusters due to poor construction and high density
- Only 20% building stock in Delhi is safe (DDMA) – earthquake hazard
- Frequent water logging reported by PWD and Delhi traffic police

Building resilience and preparedness for natural disasters

- Dedicated Structural Audits across the city (as per the dedicated protocol/s established by DDMA)
- Emergency response plans by all infrastructure owning and service providing agencies
- Dedicated evacuation spaces and refuge spots (in regeneration schemes and newly developed areas)
- DDMA shall set up a state of the art ICT enabled Delhi Disaster Response Force (DDRF) for effective response at the time of a disaster or an unpredictable event - to be supported by government departments and agencies as well as hospitals, CSOs etc.

- Joint action by DISCOMS and ULBs to ensure:
  - electrical safety in identified vulnerable areas (overhanging cables, short circuits etc)
  - mandatory retrofitting of the buildings identified by DDMA as vulnerable to risk of fire
- Piped gas supply infrastructure to be promoted to avoid fire due to LPG and kerosene.

- Maintaining clear and green drain buffers to ensure no hinderance to flow (encroachment or dumping of solid waste)
- Identification of local parks to double up as flood retention ponds.

Spatial Development Framework:

- Dev 1 : Land Pooling Policy
- Dev 2 : Green Development Area Policy
- Dev 3 : Transit-oriented Development Policy
- Dev 4 : Urban Regeneration Policy

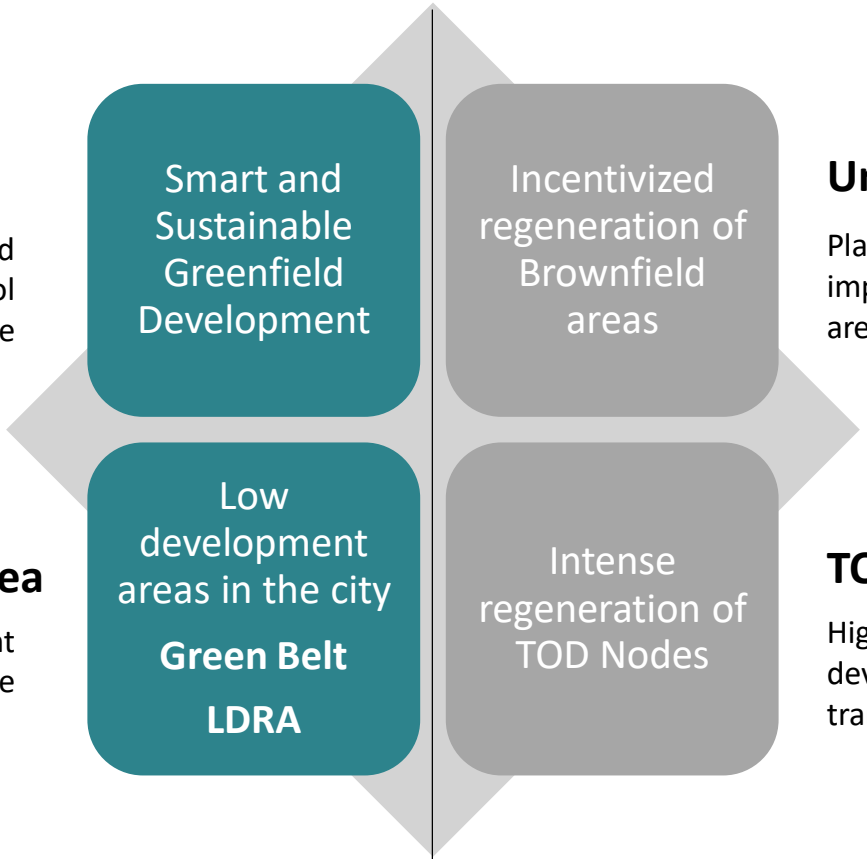
Delhi will be shaped by 4 spatial development policies in the next plan period

Land Pooling

Facilitates private landowners and developers to voluntarily pool their lands and undertake planned development.

Green Development Area

Low FAR, green development within designated areas of the city



Urban Regeneration

Planned regeneration and improvement of existing developed areas in the city.

TOD

High-density mixed-use walkable developments around strategic transit stations

DEV 1: Development of new areas through **Land Pooling**

Implementation support for spatial policies

DDA shall develop the following

- **Online single window mechanisms** to support smooth implementation of the various spatial development policies of the Plan. The portal shall act as a one-point facility for making applications, participating in schemes, tracking the status of approvals, etc. (Landpooling portal)

- **Online citizen portal** for submitting respective proposal schemes, providing information on a regular basis, as well as for responding to queries made by the citizens.

- **Associated plans and schemes:** Sector plans; DE Schemes; Integrated Green Development Area plan/ GDA Schemes; IZP, TOD Schemes; Regeneration Plan, Regeneration Scheme, UC Regeneration Scheme

- **List of Applicable Charges:** EDC, infrastructure upgradation, GDA charges, TOD charges etc.

Land Pooling Zones

SMART GREENFIELD DEVELOPMENT

- **6 Zones** – Notified villages in zones PI, PII, N, L, J and K-I
- Last stretch of land available to ensure planned expansion of the city
- Different from earlier land acquisition model followed by DDA
- **Important to ensure that new development is safe, walkable and environmentally sustainable**

A **dynamic online GIS Map** that can be zoomed down to area/ scheme level development plans and proposals in Land Pooling Zones

A number of landowners have expressed interest in participating in the land pooling policy on the portal.

DDA is facilitating implementation

FLEXIBLE PLANNING OF SECTORS

1

- **Varying FAR loading**:
  - will give good mix of typologies – plotted, towers in park, green layouts, etc.
  - higher FAR can be located strategically – maximise locational advantages
  - consortiums can be compensated in case less than 60% land is returned – full FAR as per 60% can be consumed on lesser area
- DEs can vary FAR loading on provided that the overall FAR limit is not exceeded.
- FAR limit to be calculated for each land use

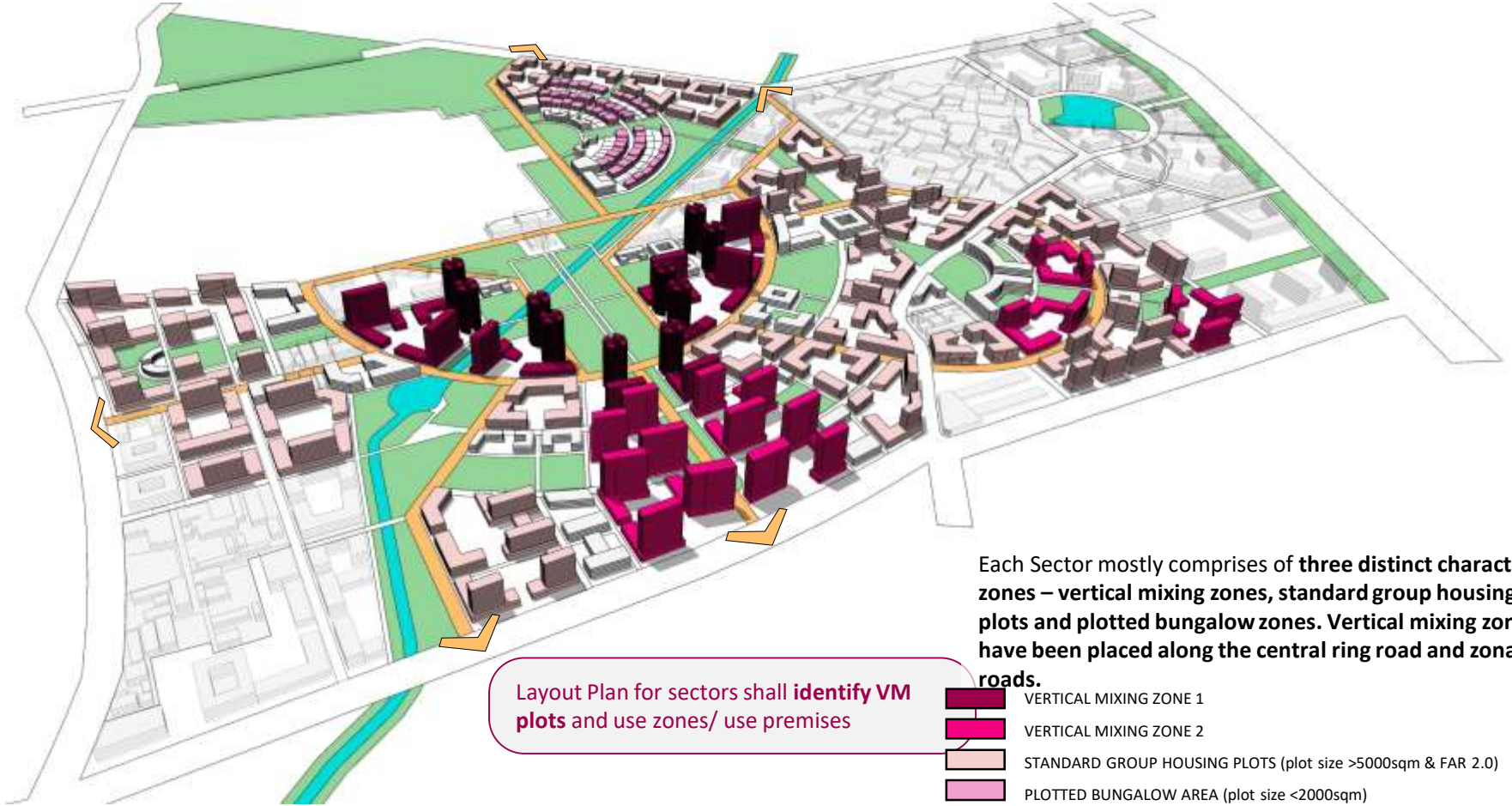
2

- **Higher FAR** only allowed on specific **Vertical Mixing (VM) plots**
- VM plots to be pre-approved by DDA and designed for higher FAR – more infra., 24m road frontage. Max. **FAR limit of 400 on VM plot** (to ease infra. planning)
- Loading of same use or mixing of compatible uses permitted, provided total sector-level FAR limits are not exceeded
- Incompatible uses, uses that cannot be brought under VM specified.
- **Surplus land can be used for greens, urban farming etc.**

3

- Sectors can **swap/ exchange land uses** to create **customised mixes**
- Consortium – **increase commercial or PSP by 30% with corresponding reduction in residential area**
- DDA - **exchange of up to 30% between industrial and PSP**
- Overall **total FAR to remain constant** – only mix allowed to change as per need

VARIABLE FAR



Layout Plan for sectors shall **identify VM plots** and use zones/ use premises

Each Sector mostly comprises of **three distinct character zones – vertical mixing zones, standard group housing plots and plotted bungalow zones. Vertical mixing zones have been placed along the central ring road and zonal roads.**

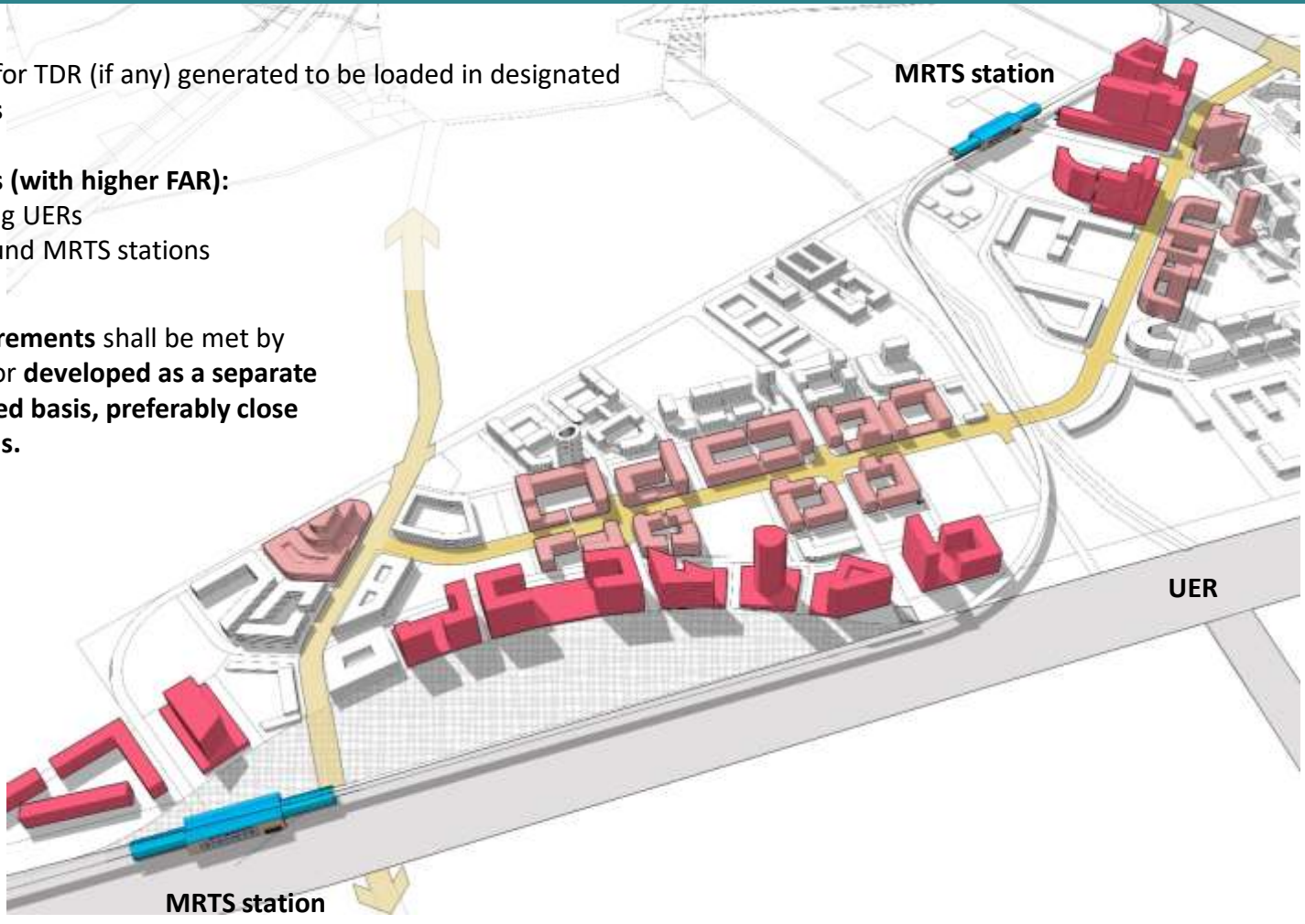
- VERTICAL MIXING ZONE 1
- VERTICAL MIXING ZONE 2
- STANDARD GROUP HOUSING PLOTS (plot size >5000sqm & FAR 2.0)
- PLOTTED BUNGALOW AREA (plot size <2000sqm)

TRANSFERABLE DEVELOPMENT RIGHTS (TDR)

- Policy provides for TDR (if any) generated to be loaded in designated **Receiving Zones**

- **Receiving Zones (with higher FAR):**
  - 500m along UERs
  - 500m around MRTS stations

- **EWS block requirements** shall be met by DEs individually or **developed as a separate area/s on a shared basis, preferably close to transit stations.**



WALKING AND CYCLING NETWORK

OTHER CONTROLS

- **Walking and cycling plans mandatory**
- **Active Frontage**
- **Mandatory Public Plazas**

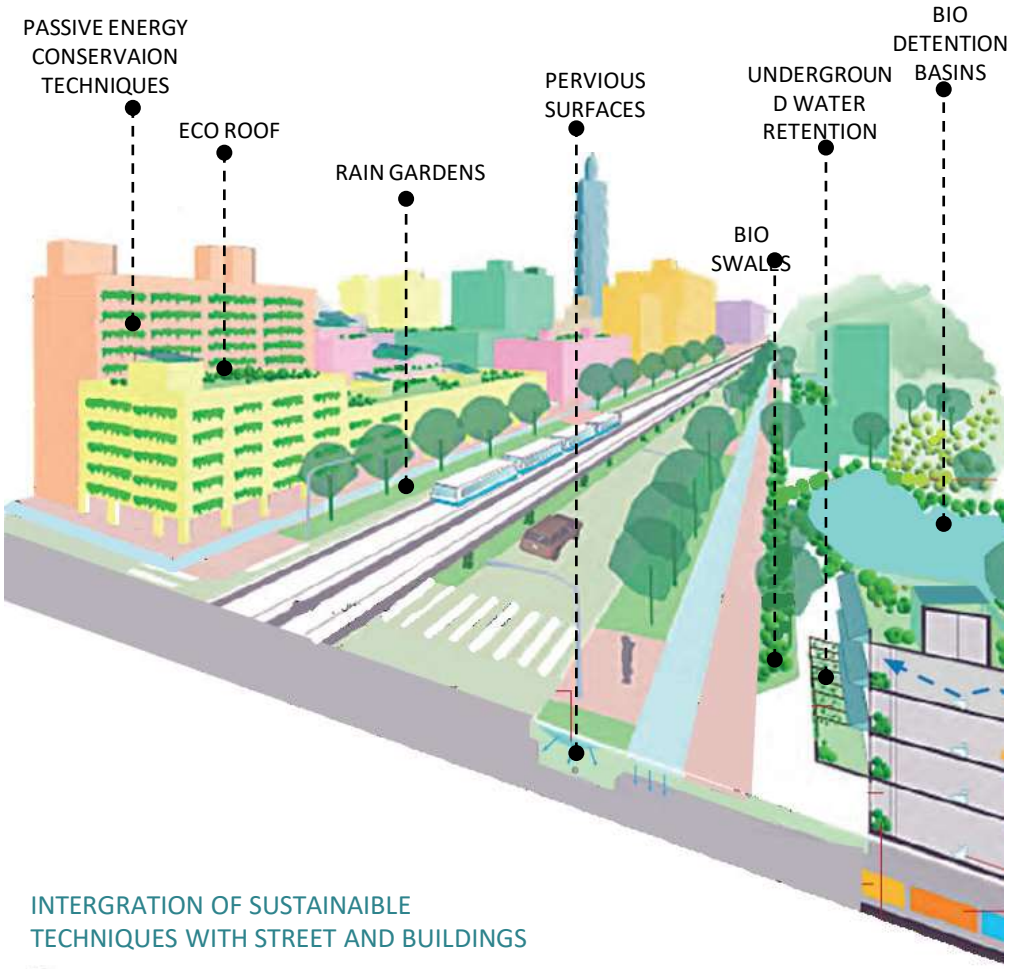
- Integration of surrounding context:
  - Improvement of phirni roads to create shared access, restrict abadis and provide infra.
  - Alignment of major roads with existing networks in planned/unplanned areas

- Buffers to be maintained for natural drains – can be used for creating local parks - will ensure active use and upkeep of such buffers.

- Building orientation towards natural drains

- Net-Zero developments –

- **100% grey water treatment and maximum reuse,**
- **100% green waste reuse,**
- **Meeting 10% of the sector's energy demand through renewable sources like solar;**
- **Optimum retention of storm water for direct reuse and recharge of groundwater as per applicable norms.**



INTERGRATION OF SUSTAINAIBLE TECHNIQUES WITH STREET AND BUILDINGS

DEV 2: Green Development Area

GREEN DEVELOPMENT AREA

The Plan encourages **'green development'**, characterised by **low FAR and large mandatory wooded areas**

Will facilitate:

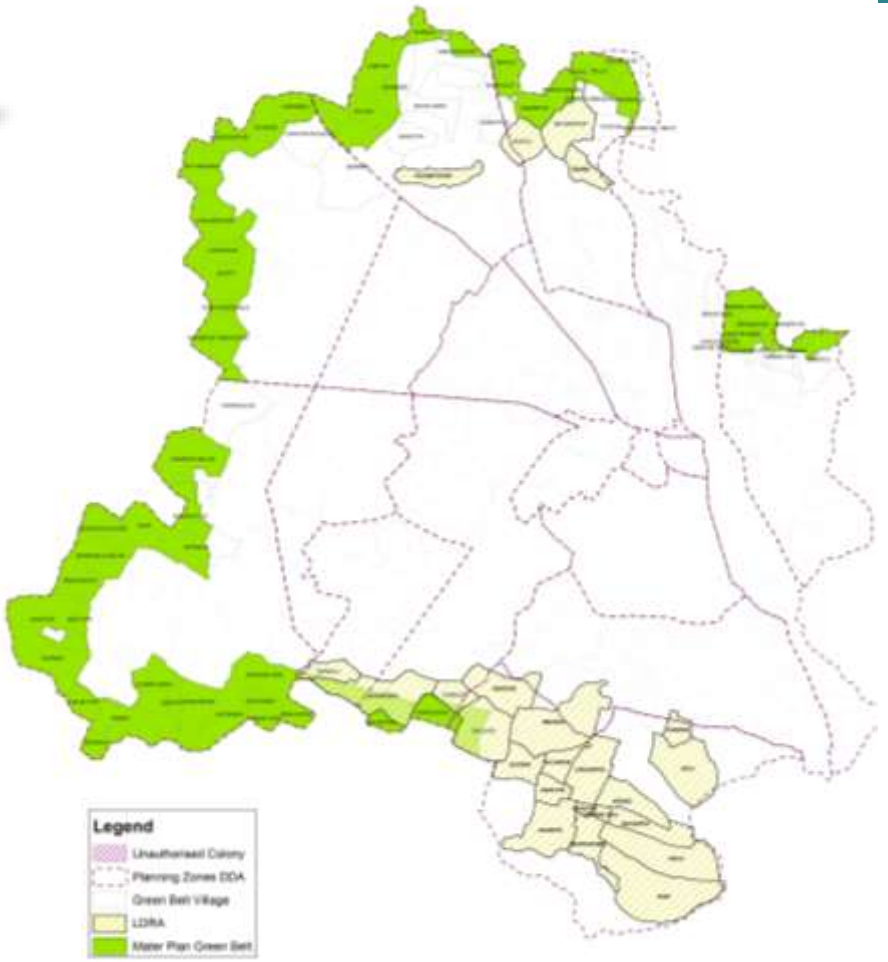
Foster city-level hubs for green living and recreation, and create green economies and jobs.

Encourage production of food and other natural produce to improve food security and meet horticultural needs.

Create a regional environmental buffer to reduce impacts of air and noise pollution, urban heating. Over a longer term such an environmental buffer may also help in improving predictability of rainfall and combating threat of desertification.

- Provides expanded development options for landowners: GDA Policy provides **an array of development options that are remunerative but where economic returns are not based on maximising built space.**

- Helps prevent unauthorised development



GREEN DEVELOPMENT AREA POLICY

3 categories of uses defined - Depending upon the greening impact; extent of negative externalities like traffic, waste generation, access requirements, built up area required etc.

GRADE 1

- FAR: 5 (min. built area 30 sq.m and max. 200 sq.m); **GC: 5%**
- No mandatory wooded area requirement
- **Examples of Uses:**

Agriculture, Horticulture, Floriculture, Forestry ,Smriti vans, Burial Grounds, Cemeteries and Crematoriums, Composting facility, Natural wastewater treatment facility
Solar fields and other renewable energy installations

GRADE 2

- FAR: 20 (Additional 10 FAR purchasable)
- 15% plot area as mandatory wooded area
- **Examples of Uses:**

LDRP, Open air markets, Zoological parks and Aviaries
Sports facilities, Primary and secondary education facilities, Healthcare facilities (including veterinary facilities), Resorts and clubs, Storage facilities for non-inflammable goods, showrooms and repair workshops/ service centres (only on 18m Row and above), all Grade 1 uses

- Min. green ratings of GRIHA 3 star or equivalent

GRADE 3

- FAR: 60 (Additional 20 FAR purchasable)
- 45% plot area as mandatory wooded area
- **Examples of Uses:**

Higher education campuses (including vocational training)
Non-polluting work centres like cyber and knowledge industry, Research & Development,, Agro processing and packaging, cold storage, Convention and exhibition centres
Concert Spaces, stadiums, cultural performance spaces, museums, art galleries, Amusement parks (water parks will not be permitted), Facilities for assisted living for the elderly and people with special needs and old age homes, all Grade 1 and 2 uses

- Min. green ratings of GRIHA 3 star or equivalent

GREEN DEVELOPMENT AREA: Illustrative examples

GRADE 1

GRADE 2

GRADE 3

GREEN DEVELOPMENT AREA

Landowners free to choose ANY grade, provided they meet all conditions. Mixing of grades on same plot permissible

Mandatory Grade 1 use in identified environmentally sensitive areas

Promoting amalgamation, integrated planning and consolidated green cover

Regularisation of existing farmhouses as Grade 2

All schemes to be designed as ecologically self-sustaining units –

- 100% decentralized treatment and maximum reuse of wastewater.
- 100% on site processing of all green waste and animal waste.
- 30% of the on-site energy requirements are met through renewable energy.
- Optimum on-site trapping of storm water through mandatory rainwater harvesting, unlined storage ponds and reservoirs as part of landscaping and urban design

Integrated GDA Plan (IGP) will be prepared for ensuring connectivity and facilitating infrastructure provision and protection of ecologically sensitive areas