

4 WATER SUPPLY SYSTEM

4.1 General

Water is a precious natural resource for life. The demand of water grows day by day and climate changes reduce the availability of natural source of water in NCT Delhi.

In Delhi; potable water demand outstrips water supply by 50%. A number of private exploitation has been made to meet the demand; with the result groundwater levels continue to fall. Also the new developed city in the state of Haryana is facing the same problem.

In Ghaziabad, two agencies are involved in provision of water supply service in Ghaziabad; while the state line agency Uttar Pradesh Jal Nigam (UPJN) is responsible for development of new infrastructure and all capital works, the Ghaziabad Nagar Nigam (GNN) is responsible for its day-to-day operation and maintenance.

Potable Water: Ground water is the only practicable source of potable water.

Canal based Water Supply This may also be a source of water for the city in future.

Integrated Water Resource Management: As the ground water is only source of potable water it is essential to sustainable management of ground water supply that underlay in the site. It is very rare to get required quantity and quality of water to support life as it is planned. Water cycle need to be managed sustainably to maximize the prevention and availability of water as resource.

There are number of sustainable water saving techniques has been adopted to save main natural resource of water; like rain water, ground water, etc. The aim of any development should be to maximize the use of every drop of water that is available. This can be done by:

- (i) 100% Reclamation, treatment and recycling to waste water
- (ii) 100% Source separation of storm water and sewerage
- (iii) Rainwater reclamation from roof surfaces for Aquifer recharge
- (iv) Reduction in storm water runoff- Maximize on grade storm water system using natural hydrological processes
- (v) No potable water to be used for irrigation from tube wells

Flushing Water: Treated wastewater is proposed to be recycled to meet flushing water demand for residential unit and various amenities like and horticulture, cooling tower etc. Rooftop rain water is stored and recharged to aquifer and remaining runoff will be intercepted by green swales, water bodies etc; this will reduce water requirement from ground and municipal sources and recycled water from STP will reduced potable water requirement as irrigation, flushing water, HAVC for residential units.

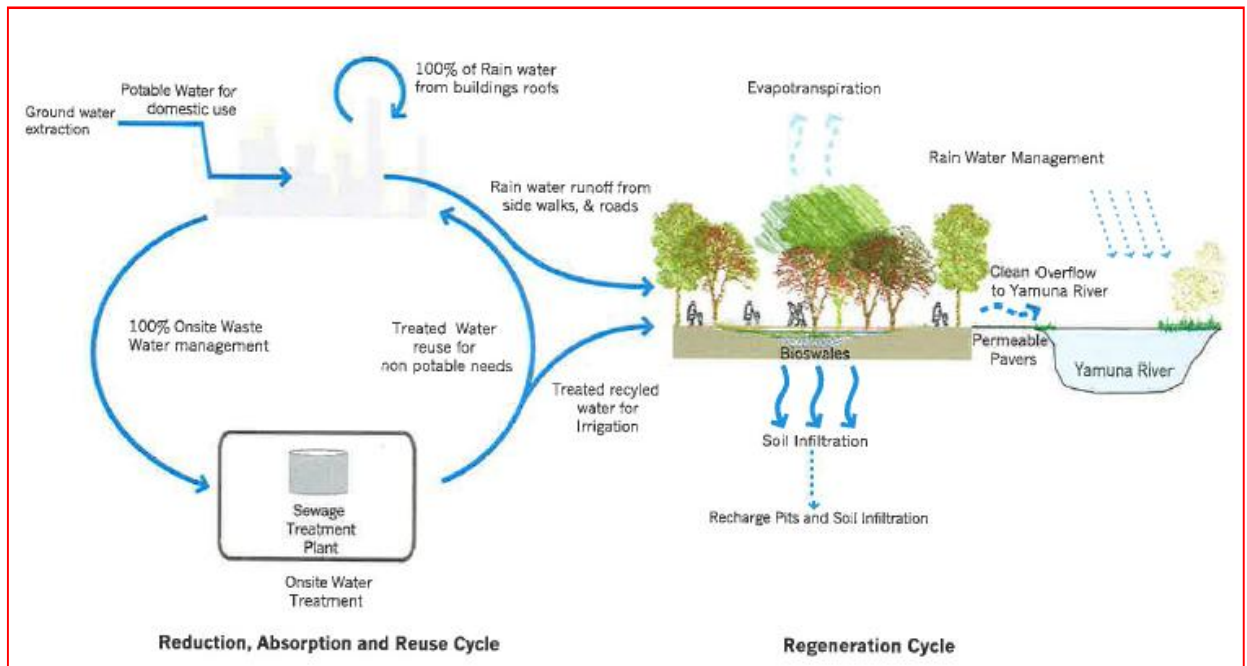


Figure 4.1 – Sustainable Water Balance Cycle

4.2 Water Demand

All communities and new developments need water in some form, whether it is:

- Sustaining life for humans, flora or fauna;
- Potable water demand includes demand for drinking, bathing, washing, cooking and other domestic uses. Potable water will also be supplied to various amenities like retail, offices, hotel, convention centre, etc.
- Flushing water demand includes residential units and various amenities like Horticulture, Cooling Tower, HVAC, etc.

4.3 Water Supply Rates for Mega Cities

Table 4.1 : water demand rate comparison for mega cities /towns

Cities	Rate	Volumetric Representation	Remarks
Europe	100 LPCD		Sustainable with Most efficient system
Delhi	200 LPCD		Moderate
Los Angeles	1000 LPCD		Very High
Wave city Hi-tech Genentech	150 LPCD		Sustainable (Based on Calculations)

4.4 Water Demand Norms for Wave City

Considering CPHEEO Manual, UPJN, MOEFF norms following water use norms considered for water demand estimation is given below ;

Table 4.2 : Water use norms for Wave city

Land use	Unit	Rate of supply
Residential (Plotted, Group Housing)	LPCD	135
Group Housing	LPCD	65/21 (86) *
Commercial /Industrial /Institutional /Recreational	LPCD	15 /30 (45)
Green area	L/ sqm/day	5.0
Road side Green area	L/ sqm/day	3.0
Irrigation of Golf Course area	L/sqm/day	7.0 *
HVAC Demand Commercial and others Make Up Water	litres /TR/hour	8
NRW – Losses		15 %

Reduction in water demand by following methods:

- Public consciousness about the water volume the use and minimize the amount through their behavior
- Introduction of physical measures which will reduce the water demand.
- Introducing number of internationally standard water saving features in the home, offices, public places
- Introducing drought resistant planting, use drip irrigation rather than spray irrigation.
- Using recycled water for toilet flushing, horticulture and cooling tower.

4.5 Water Demand Estimation

The residential developments are varying in terms of different types of usage (middle ended and high ended usage along with the EWS scheme). The water demands are considered mostly as per the CPHEEO, MOEF norms for the middle ended buildings. The high ended buildings are proposed to be provided with high water requirement due to higher density. In GH there shall be provision of dual plumbing system. Hence, the potable water demand shall be reduced for these buildings and this also satisfies the MOEF (Ministry of Environment and Forests) norms.