

## CHAPTER 13

# WATER SUPPLY AND SEWERAGE

Delhi depends on neighbouring states to meet around 50 per cent of drinking water demand of its residents. The city, being located in a semi-arid zone, depends to a great extent on raw waters from the Ganga basin, Yamuna sub-basin, Indus-basin, in addition to its own internal aquifers and its groundwater resources. The water is then treated before distribution. Next, both liquid and solid wastes are generated in large volumes. All liquid as well as solid wastes are expected to be treated and then disposed or recycled. Delhi treats and also recycles both forms of wastes though in limited capacities, and part of the flows to other states. The growth of the city beyond reasonable limits imposes unbearable strain for provisioning of two most basic services: water and sanitation

- 2 The Delhi Jal Board was established in 1998 under an Act of the Delhi Legislative Assembly. The Delhi Jal Board (DJB) is responsible for the production and distribution of potable water after treating raw water. It is also responsible for the treatment and disposal of waste water. DJB has tried to its increase capacity to match the ever-growing demand by laying water pipes; constructing underground reservoirs and water treatment plants; fixing leakages; and the like. The water supply network has been developed to cover both planned and unplanned areas. It now supplies water to 1,153 unauthorised colonies out of a total of 1650 in addition to all the authorised colonies. To meet the demand-supply gap, the Delhi Jal Board (DJB) has consistently been planning to increase water supply and treatment capacity in every Five Year Plan. Efforts are being made by the Government for an equitable and adequate Water Supply in all parts of the NCT of Delhi by laying of new water lines, construction of UGRs, construction of new Water Treatment Plants, etc.
- 3 DJB had managed to improve upon its working and monitoring vis-a-vis water and sewage management. It had an increased revenue collection despite poor economics as the positive outcomes of good governance. DJB has launched “Seva App” for bill generation, online payments and the resolution of inflated bills to deliver efficient and transparent services and to instil more confidence in the citizens of Delhi. Factors attributable to the increased DJB's revenue: are Price of the non-free water was increased by 10%, increase in the number of connections/meters, One-time window was offered to people to clear of their previous dues, several water leakages were fixed. There were several other revenue-generating measures such as ads on water tankers, renting out

property and tap solar power, Innovations/ new schemes like water ATMs, "toilet to tap" and GPS-tracking of DJB water tankers.

**Statement 13.1 (A)**

**DISTRIBUTIONS OF HOUSEHOLDS BY AVAILABILITY OF DRINKING WATER FACILITY AND SOURCE IN DELHI**

S. No.	Source and Availability of Drinking Water	Households (%)
<b>I. Sources</b>		
1.	<b>Piped Water Supply System</b>	<b>81.30</b>
	a. From Treated Source	75.20
	b. From Untreated Source	6.10
2.	Covered Well	0.10
3.	Hand pump	5.30
4.	Tube Well	8.40
5.	Tank, Pond, Lake	1.20
6.	Other Sources	3.70
<b>II. Availability</b>		
1.	Within the Premises	78.40
2.	Near the Premises	15.40
3.	Away	6.20

Source: - Census of India, 2011, Houses, Household Amenities and Assets.

**Statement 13.1 (B)**

**STATUS OF WATER SUPPLY IN DELHI IN 2018**

S. No	Components	2018
1	Projected Census Population (Total) (million)	18.75
2	Projected Demand for Water (mgd)	1140
3	Projected Supply of Water (mgd)	935
4	Water Supply in Un-served Areas (Length of water line in km)	1127
5	Households with Access to Tap Water (%)	83.42
6	Households with Access to Hand pump/tube wells (%)	12.30
7	Households with Access to Water Tankers (%)	4.28
8	Households with Access to Water within Premises (%)	83.42

S. No	Components	2018
9	Households with Access to Water near Premises (%)	12.30
10	Households with Access to Water away from Premises (%)	4.28
11	Households with Access to Tap Water from Treated Sources (%)	83.42

Note: Mgd – million gallons daily, *Based on per capita supply norm: Planned areas: 50 gpcd (228 lpcd), NDMC area: 75 gpcd (320 lpcd), Outer Delhi: 35 gpcd (160lpcd), Gpcd = gallon per capita daily, lpcd = litre per capita daily*

4. About 83.42% households of Delhi now have access to piped water supply. Water production during the summer season is being maintained at 895 MLD per day consistently. Water is supplied to about 18 million population of Delhi through existing water supply network comprising of 14355 km long pipelines and more than 107 underground reservoirs (UGRs). Besides, a total of 407 new water tankers with stainless steel containers fitted with GPS have been engaged in improving the water tanker supply delivery system in the city. Apart from 400 M.S hired tankers, 250 newly purchased SS tankers are being added to the existing fleet to supplement water supply in water deficit areas.
5. Water supply distribution network has been developed to cover both planned and unplanned areas. Water supply is made available to 1318 unauthorized colonies up to October 2018.

## 6. Water Requirement

- 6.1 Based on the norm of 60 Gallon Per Capita per Day (GPCD) as per Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Urban Development, Government of India, the total requirement of water in March 2011 was 1020 MGD. The water requirement norms for various usages are presented in Statement 13.2.

### Statement 13.2

#### DETAILS OF WATER REQUIREMENT NORMS - DJB

S. No.	Details	Requirement of Water
1	Domestic	172 LPCD
2	Industrial, Commercial and Community requirement based on 45000 litres per hectare per day	47 LPCD
3	Fire protection based on 1% of the total demand	3 LPCD
4	Floating population and special uses like Hotels and Embassies	52 LPCD
	<b>Total</b>	<b>274 LPCD (60 GPCD)</b>

Source: - Delhi Jal Board

- 6.2 Master Plan of Delhi - 2021 prepared by Delhi Development Authority proposed water requirement with the norm of 80 Gallon Per Capita Per Day (GPCD), out of which 50 GPCD is for a domestic requirement and 30 GPCD for non-domestic purposes. The domestic water requirement of 50 GPCD comprises of 30 GPCD for potable needs and 20 GPCD for non-potable water.

### Statement 13.3

#### WATER REQUIREMENT NORMS- AS PER MPD 2021

S. No	Norms	Quantum (GPCD)		Sources of Non-potable Water
		Potable	Non-potable	
1.	<b>Domestic @50 GPCD</b>	<b>30</b>	<b>20</b>	--
	Residential	30	20	Recycling & Permissible Ground Water Extraction at Community Level
2.	<b>Non-domestic @30 GPCD</b>	<b>5</b>	<b>25</b>	
	a. Irrigation, Horticulture, Recreational, Construction, Fire @ 6.65 LPCD	-	10	Recycling from Sewerage Treatment Plants (STPs) and Permissible Ground Water Extraction
	b. Public, Semi-Public, Industrial and Commercial	5	15	Recycling from Common Effluent Treatment Plants (CETPs)
	<b>Total @ 80 GPCD</b>	<b>35</b>	<b>45</b>	

Source: Delhi Jal Board

6.3 The estimated demand of water in Delhi based on the norms of MPD 2021 will be around 1140 MGD based on the norm of 60 GPCD to meet the requirement of a projected population of 190 lakhs up to March 2018.

## 7. Water Supply Capacity

### Statement 13.4

#### INSTALLED CAPACITY OF WATER TREATMENT PLANTS: 2009-2018

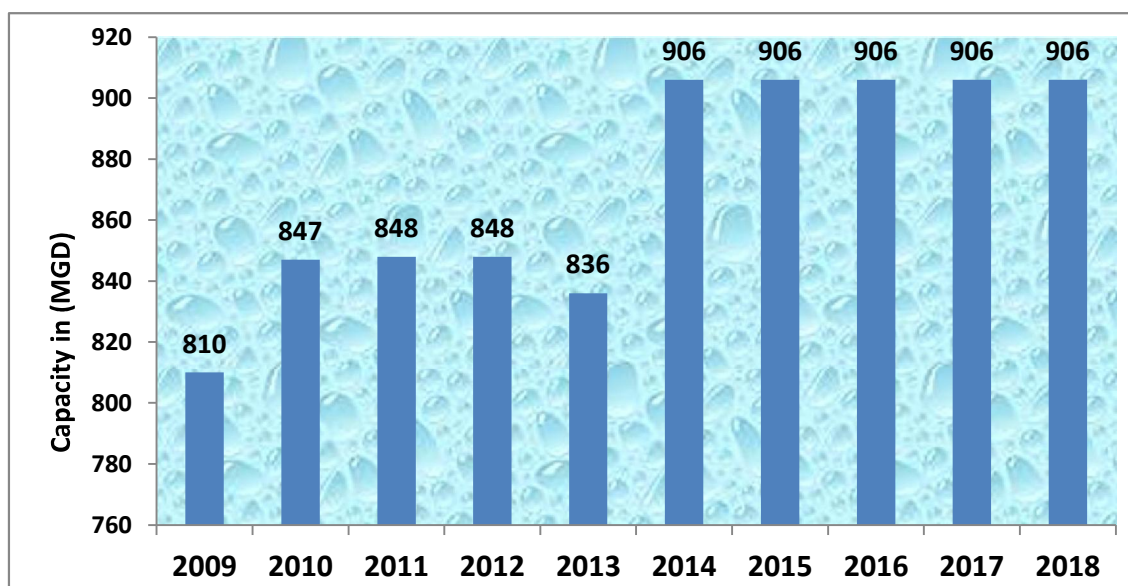
(As on 31<sup>st</sup> March 2018)

S. No	Name of Plants	Capacity (MGD)									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1.	Chandrawal Water House No. I & II	90	90	90	90	90	90	90	90	90	90
2.	Wazirabad I,II & III	120	120	120	120	120	120	120	120	120	120
3.	Haiderpur	200	200	200	200	200	200	200	200	200	200
4.	North Shahdara (Bhagirathi)	100	100	100	100	100	100	100	100	100	100
5.	Bawana	20	20	20	20	20	20	20	20	20	20
6.	Nangloi	40	40	40	40	40	40	40	40	40	40
7.	Sonia Vihar	140	140	140	140	140	140	140	140	140	140
8.	Ranney Wells & Tube Wells	100	100	100	100	80	80	80	80	80	80
9.	Recycling of Water at Bhagirathi, Haiderpur & Wazirabad	--	37	37	37	45	45	45	45	45	45
10.	Commonwealth Games Village	--	--	1	1	1	1	1	1	1	1
11.	Okhla	--	--	--	--	--	20	20	20	20	20
12.	Dwarka	--	--	--	--	--	50	50	50	50	50
	<b>Total</b>	<b>810</b>	<b>847</b>	<b>848</b>	<b>848</b>	<b>836</b>	<b>906</b>	<b>906</b>	<b>906</b>	<b>906</b>	<b>906</b>

Source: - Delhi Jal Board

7.1 The installed treatment capacity of Water in Delhi during 2006-18 is depicted in Chart 13.1. The installed capacity of DJB has been augmented by 12% during the last 10 years. The capacity, which was 810 MGD in 2009, has been increased to 906 in 2018.

**Chart 13.1**  
**INSTALLED TREATMENT CAPACITY OF WATER TREATMENT PLANTS**  
**DELHI- 2009-2018**



- 7.2 Two new Water Treatment Plants constructed at Dwarka (50 MGD) and Okhla (20 MGD). Raw water for these two plants has been made available with the commissioning of the pucca parallel channel from Munak to Haiderpur. Further Bawana Water Treatment Plant (20 MGD) has been constructed but will be commissioned after the availability of raw water.

## 8. Water Consumption

- 8.1 Water supplied and billed to various categories of consumers by Delhi Jal Board during 2016-17 and 2017-18 is presented in Statement 13.5.

**Statement 13.5**  
**CATEGORY-WISE WATER CONNECTIONS, SALES AND**  
**PERCENTAGE OF SALES**

S. No	Category	Connections (in lakh)		Sales (MGD)		% of Sales	
		2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
1.	Domestic	20.85	21.62	382.78	386.29	90.94	91.72
2.	Commercial & Institutional	0.80	0.80				
3.	Supply to NDMC & MES	02+02=04 (Bulk Connections)	02+02=04 (Bulk Connections)	38.13	34.88	9.06	8.28
	<b>Total</b>	<b>21.65</b>	<b>22.45</b>	<b>452.15</b>	<b>421.17</b>	<b>100.00</b>	<b>100.00</b>

Source: - Delhi Jal Board

- 8.2 The information regarding water consumption in Delhi, the total number of connections, domestic, commercial and industrial consumption is presented in Table 13.1.

## 9. Sources of Water Supply

The water supply treatment plants of Delhi Jal Board treated 833 MGD surface water and 80 MGD groundwater as on March 2018. The water resources of the Delhi Jal Board are indicated in Statement 13.6

### Statement 13.6

#### WATER RESOURCES OF DELHI JAL BOARD

(As on March 2018)

S. No.	Resources	Quantity (MGD)
1	Yamuna River	375
2	Ganga River	240
3	Bhakra Storage	218
4	Ground Water/Ranney well/ Tube well	80
Total		913

Source: - Delhi Jal Board

## 10. Ground Water

- 10.1 The decreasing groundwater level in Delhi has become a matter of serious concern. At some places in South and South West Delhi, the water level has gone 20-30 meter below the ground level. The quality of underground water is deteriorating in several places. It has been found to be unfit for human consumption. The salinity of groundwater is increasing in South-West and North-West Delhi. In some areas of Shahdara and Kanjhawala, Nitrate content has been found not more than 500 mg/litre. Fluoride and chemical concentrations, more than prescribed limits, have also been found in groundwater at various locations in Delhi. To tackle these problems, the Central Ground Water Board has taken steps to regulate the number of tube-wells being commissioned in Delhi.
- 10.2 As on March 2018, Delhi Jal Board has 4234 functional Tube Wells and 08 Ranney Wells. The Floodplains downstream of Wazirabad and the area adjacent to Najafgarh Lake are being explored for extraction of water on a

sustainable basis. Pre-feasibility studies for groundwater recharge through the abandoned Bhatti Mines and Canal system in the North Western region of Delhi have also been taken.

- 10.3 Deepening of old lakes and other water bodies, preserving and developing the forest area in Delhi, construction of check dams at Asola Wild Life Sanctuary and plantation of trees, are some of the steps being taken to improve groundwater resources by custodian department.

## **11. Parallel Channel from Munak to Haiderpur**

About 30-50 per cent of the raw water discharged from Tajewala Head works is lost through seepage during transit in the present water carrier system comprising of Western Yamuna Canal system and River Yamuna. To minimize the en-route losses, a parallel pucca channel has been constructed from Munak to Haiderpur by the Haryana Govt as a deposit work on behalf of Govt of Delhi. Commissioning of CLC has resulted in increased availability of water of Delhi within the existing releases at Munak and WTP at Dwarka and Bawana have been commissioned.

### **11.1. Reservoirs**

Renuka Dam, Kishau Dam and Lakhwar Vyasi Dam are proposed to be constructed so that Delhi gets its share in Yamuna water as per Yamuna Water Sharing Agreement signed in May 1994. The approved allocation of Yamuna water to each state is presented in Statement No. 13.7. About 275 MGD water will be available to Delhi from Renuka Dam. Delhi will also get 372 MGD water from Kishau reservoir and 135 MGD from Lakhwar Vyasi reservoir. The agreement on water sharing for construction of Renuka Dam, Kishau Dam are signed by the basin states & the agreement for construction of Lakhwar Vyasi Dam has also been signed by the Basin States.



### Statement 13.7

#### APPROVED ALLOCATION OF WATER FROM YAMUNA RIVER TO STATES

S. No.	States	Allocation (BCM)			Total (BCM)
		July to Oct.	Nov. to Feb	March to June	
1	Haryana	4.107	0.686	0.937	5.730
2	Uttar Pradesh	3.216	0.343	0.473	4.032
3	Rajasthan	0.963	0.070	0.086	1.119
4	Himachal Pradesh	0.190	0.108	0.080	0.378
5	Delhi	<b>0.580</b> (Consumptive 1926+495 return flow) or <b>2421</b> cusec	<b>0.068</b> (Consumptive 231+495 return flow) or <b>726</b> cusec	<b>0.076</b> (Consumptive 255+495 return flow) or <b>750</b> cusec	<b>0.724</b> (Consumptive 806+495 return flow) or <b>2350</b> cusec

Source: - Delhi Jal Board; Note: - BCM Billion Cubic Meter.

- 11.2 **Present Status of Renuka Dam:** In the 51<sup>st</sup> meeting of Upper Yamuna River Board (UYRB), representative of HPPCL apprised the Board that out of an amount of ₹ 446.96 crore Central Assistance released in 2016, a sum of ₹ 238.68 crore has already been disbursed by the Land Acquisition Collector, HPPCL up to 01.09.2017 and land measuring 534.39 ha has been acquired against this amount. Award of land measuring 23.85 ha has been announced and compensation amounting to ₹ 8.02 crore shall be disbursed by 31.10.2018
- 11.3 Further, it was apprised that project proposal has been accepted in 132<sup>nd</sup> meeting of TAC subject to certain conditions, including Stage-II Forest Clearance. It was informed that DFO, Renukaji has raised a demand of Rs. 488.72 crores (₹ 502.39 crores - ₹ 13.67 crores already deposited) which needs to be deposited for processing of stage-II Forest Clearance. Accordingly, HPPCL has requested to grant above amount from Govt. of India for the purpose. It was also informed that the proposal for Investment Clearance is being framed and would be submitted shortly.
- 11.4 Rehabilitation & Resettlement clearance obtained from the Ministry of Tribal Affairs. Environment clearance has been accorded by MOEF in October 2009 1<sup>st</sup> stage Forest Clearance accorded. NOC/Consent from NCT of Delhi & Rajasthan has been received.
- 11.5 Chairman UYRB stated that Central Assistance could be provided only after the investment clearance and approval of Cabinet. Meanwhile, he urged the beneficiary States to deposit the seed money for the execution of the project.

## 12. Water Accounting and Auditing

- 12.1 At present, the Delhi Jal Board was using an old system for measuring the quantity of raw water available at water treatment plants and the quantity of treated water supplied by treatment plants for distribution. The position at underground water tanks, reservoir and booster pumping stations was similar. Due to this system, the Delhi Jal Board was not able to assess the exact amount of water distribution losses.
- 12.2 Assessment of water distribution losses through proper water accounting and auditing system has been given top priority by DJB. Delhi Jal Board has started a comprehensive programme for installation of bulk meters at all water treatment plants and about 302 bulk meters have already been installed. Delhi Jal Board has also decided to install bulk meters on all distribution mains, underground reservoirs and booster pumping stations for correct measurement of water supply from these points up to different localities/consumer points.
- 12.3 Complete and correct water supply accounting could not be maintained by the Delhi Jal Board. As on 1st April 2017, there were 1.79 Lakh un-metered connections. (Table 13.1)
- Around 4.00 lakh meters were defective or non-functional.
  - Fixing of the maximum average of 20 KL/30 KL per month (as the case may be) for domestic consumers, if water meters are non-functional and till defective water meter is replaced.
- 12.4 Delhi Jal Board has streamlined its system for obtaining water meters for metering of unmetered supply of water. The existing system of supply of water meter along with sanction of water connection has been amended and now consumers can purchase water meters of approved specifications from the open market. The consumers having Delhi Jal Board's defective meters have been allowed to get the defective meter replaced with private water meter and have been given option either to get the refund of meter security or get the same adjusted towards water charges in future.

## 13. Water Tariff

- 13.1 The tariff is based on the principle of “use more pay more”. Present water tariff policy acts as a deterrent for consumers consuming excessive water or having wastage of water. DJB had collected ₹ 1719.81 crore against the estimated

revenue collection of ₹ 1841.25 crore with a collection efficiency of 93.4% during 2017-18.

- 13.2 DJB has provided Rain Water Harvesting in its 166 no installations. The Rain Water Harvesting Cell of DJB provides technical assistance to individuals/institutions for providing Rain Water Harvesting. DJB has provided information regarding Rain Water Harvesting on its website for public facilitation.
- 13.3 As per DJB amended tariff Regulations (March 2016) rebate of 10% in the water bills is provided for having functional RWH system and non-provision will make water bills increased by 1.5 times till functional RWH system is installed. These provisions are applicable for plots of 500 sqm and above.
- 13.4 Special subsidy in water charges has been allowed to resettlement colonies and rural areas where water charges are being recovered on an assumed average of 10 KL per month per floor. Salient features of existing water tariff are as under:
- Existing water tariff has two parts. One is Service Charge and other Volumetric Water Consumption Charge applicable w.e.f. 1.12.2004 and 1.4.2005 respectively.
  - 60 per cent of water consumption charges are recoverable towards Sewerage Maintenance Charge from such colonies/areas where sewerage services have been provided/maintained by the Delhi Jal Board.
  - In case of bulk connection for a colony/group housing society serving a number of residential premises, water charges will be worked out as per residential unit-wise at the domestic rates applicable from time to time.
- 13.5 Water Tariff for Un-metered Connections in JJ Resettlement Colonies and Rural Areas: Water charges are applicable on the assumed average of 10 KL Per month per floor for unmetered water connection in JJ resettlement colonies. For unmetered water connections in case of Rural areas assumed an average of 25 KL per month per connection is charged. Water consumption rates and service charge are levied slab-wise. Sewerage maintenance charge is also recoverable if sewerage services are being managed by Delhi Jal Board. Besides above, water cess is recoverable from all consumers at the rates determined by the Central Government from time to time.
- 13.6 All domestic consumers of Delhi Jal Board consuming water up to 20 KL per month and having functional water meters are being given 100% subsidy and fully exempted from payment of water bill including all components namely,

water charges, sewerage maintenance charge, service charges, meter rent (wherever applicable) and cess w.e.f 01.03.2015.

#### 14. Rain Water Harvesting

14.1 DJB has provided Rain Water Harvesting in its 151 no. installations. DJB has provided financial assistance to the tune of ₹ 82 lakh for 172 cases in the institutional category for providing Rain Water Harvesting Systems. The Rain Water Harvesting Cell of DJB provides technical assistance to individuals for providing Rain Water Harvesting. DJB has provided the information regarding Rain Water Harvesting on its website [www.delhijalboard.nic.in](http://www.delhijalboard.nic.in) for public facilitation. 2 no. of NGOs have been engaged by DJB to create public awareness and promote community participation to implement Rain Water Harvesting.

14.2 The following provisions have been made in the Delhi Water & Sewer Tariff and Metering Regulations, July' 2012 for promoting Rain Water Harvesting:

(A) Regulation 8 (d) of Chapter II provides that for Category D consumers, the following rebate is given in tariff for the provision of Rain Water Harvesting, Waste Water Recycling or both:-

- i) Such plot/properties which have an area of 2000 square meter or more and having installed functional rainwater harvesting system or wastewater recycling system, shall be granted rebate of 10% in the total bill amount and 15% if both the above systems have been set up and functional.
- ii) If the Rain Water Harvesting system is adopted by a society, then the individual member of that society will be entitled to the abovementioned rebate in the water bill.
- iii) The area Zonal Engineer or such other suitable agency as authorized by the board will provide a functional certificate in respect of the above systems mentioning therein that substantive portion of the plot/property has been covered as far as Rain Water Harvesting is concerned. Similarly, he will certify that a substantive quantity of the wastewater generated has been recycled by the consumer. A certificate will be issued after every six months.

(B) Regulation 50 of Chapter V provides that rainwater harvesting is mandatory

- i) The consumer of the Board having a plot/property of size 500 sq. metre or more shall make provision for rainwater harvesting covering the entire plot area, within one year, in case of commercial/industrial property and within three years for residential property from the date of coming into force of these regulations under intimation to the area ZRO.
- ii) In case, the consumer fails to comply with the above provisions within the time limit the tariff as applicable for the consumer respective category will be increased by 1.5 times until the provision is installed.
- iii) Board has deferment the implementation of Rain Water Harvesting penalty up to 30.06.2018.

### **14.3 INCENTIVE:**

- (i) Such Plots/ properties having an area of 500 sqm or more having installed functional RWH system or Waste Water Recycling shall be granted rebate of 10% in total bill amount for having RWH system and 15% if both the systems have been set up and are functional.
- (ii) Consumers having a plot area between 100 sq meter to 499.999 sq. meter and a functional Rain Water Harvesting facility will get a rebate of 10%.
- (iii) The area Zonal Engineer or such other suitable agency as authorized by the Board will provide a functional certificate in respect of the above systems mentioning therein that substantive portion of the plot /property has been covered as far as Rain Water Harvesting is concerned. Similarly, he will certify that the substantive quantity of the wastewater generated has been recycled by the consumer. A certificate will be issued after every SIX months.

**14.4 Penalty:** For all the consumers irrespective of their consumer category Rain Water Harvesting penalty at an enhanced tariff of 1.5 times will be applicable if they have plot area 500 sq meter or above and do not have a functional rainwater harvesting system.

### **14.5 Exceptions:**

1. If the consumer lives in the area which has rocky ground or it is on the banks of Yamuna River then Rain Water Harvesting penalty will not be imposed if the consumer does not install Rain Water Harvesting system in his premises.

2. If the consumer lives in the area which has rocky ground or it is on the banks of Yamuna River and has a working rainwater harvesting facility in his/her premises then applicable rebate @10% will be given to such consumer.

## **15. Water Conservation**

- 15.1 Delhi has a network of about 14000 Kilometers of water supply mains, of which, a significant portion is as old as 40 to 50 years and prone to higher leakage losses. Normally, water losses are calculated by water billed or consumed subtracted from the water produced. In the case of Delhi, water billed or consumed and leakage losses, therefore, cannot be calculated exactly as a majority of houses do not have working meters. According to the estimates of Delhi Jal Board, the total distribution losses are of the order of 40 per cent of the total water supplied. These are quite high as compared to 10-20 per cent in the developing countries. The distribution losses include losses due to (a) leaking pipes and (b) theft of water through unauthorized connections.
- 15.2 Delhi Jal Board has taken several steps to minimize leakage losses. To address this problem, leak detection and investigation (LDI) cell was set up. The Board has replaced about the 1200-km length of the old, damaged and leaking water mains during the last five years. As a result of these initiatives, the Board expects to bring down the distribution losses to 20 per cent level in the near future.
- 15.3 Delhi Jal Board has formulated a programme for recycling of backwash water in four major water treatment plants at Haiderpur, Bhagirathi, Chandrawal and Wazirabad. The work for commissioning of recycling plant at Haiderpur, Bhagirathi, Wazirabad recycling plant has been completed. About 45 MGD water supplies will be available without any additional raw water from these four plants.

## **16. Sewage Treatment Capacity**

- 16.1 Adequate sanitation is essential for the protection & promotion of individual's and community health. Various schemes are being implemented by the DJB to improve sanitation conditions. Sewage treatment capacity of Delhi Jal Board increased from 402.40 MGD in 31<sup>st</sup> March 2001 to 607.26 MGD in 31<sup>st</sup> March 2018. The information regarding the sewerage treatment capacity and percentage of utilization is presented in Statement 13.8.

### Statement 13.8

#### SEWERAGE TREATMENT CAPACITY AND ITS UTILIZATION

(MGD)

S. No.	Name of Sewerage Treatment Plants (STPs)	Capacity		Actual Treatment as on 31.3.2018	% of Utilization
		31.3.2001	31.3.2018		
1.	Okhla	140.00	140.00	101.76	72.68
2.	Keshopur	72.00	72.00	64.36	89.38
3.	Coronation Pillar with Oxidation Ponds at Timarpur	46.00	30.00	22.33	74.43
4.	Rithala	40.00	80.00	58.71	73.38
5.	Kondli I, II, III, IV	45.00	70.00	63.01	90.01
6.	Yamuna Vihar I,II	10.00	35.00	17.77	50.77
7.	Vasant Kunj	5.00	5.20	2.66	51.15
8.	Ghitorni	5.00	5.00	00	00
9.	Pappankalan	20.00	40.00	33.81	84.52
10.	Narela	10.00	10.00	1.75	17.50
11.	Najafgarh	5.00	5.00	2.10	42
12.	Delhi Gate	2.20	17.20	17.55	102.03
13.	Sen Nursing Home	2.20	2.20	2.27	103.18
14.	Rohini	--	15.00	5.37	35.80
15.	Nilothi	--	60.00	32.36	53.93
16.	Mehrauli	--	5.00	3.48	69.60
17.	CWG Village	--	1.00	0.18	18
18.	Molarbad	--	0.66	0.54	81.81
19.	Kapeshera	--	5.00	1.92	38.40
20.	Chilla	--	9.00	9.07	100.77
	<b>Total</b>	<b>402.40</b>	<b>607.26</b>	<b>441</b>	<b>72.62</b>

Source: - Delhi Jal Board

- 16.2 It is evident from the above statement that the percentage of utilization of sewerage treatment plant in Delhi as on 31<sup>st</sup> March 2018 was about 73 per cent. The sewerage treatment plants are not functioning up to their optimum level due to various reasons such as the low flow of sewage to STPs, trunk and peripheral sewer lines still to be connected to these STPs, Rehabilitation of Silted and settled Truck Sewer Lines yet to be completed, etc. The sewage generation, at present, is estimated to be around 720 MGD = (900 water production x 0.8) and treatment is around 441 MGD only.

- 16.3 Delhi Jal Board has a network of branching, peripheral sewers of about 7700 km. Also, there is a network of 200 km of trunk sewers. The rehabilitation/de-silting has been completed in a trunk sewer and is in progress in the peripheral sewer.
- 16.4 The consultant for World Bank funded, "Delhi Water Supply & Sewerage Project" estimated 5259 MLD water supply requirement for Delhi in 2021 and wastewater generation from this level of water supply will be about 3760 MLD. The information regarding the same is presented in Statement 13.9.

### Statement 13.9

#### WATER SUPPLY REQUIREMENT AND WASTEWATER GENERATION ESTIMATED

S. No.	Details	Volumes (MLD)				
		2004	2005	2006	2011	2021
1.	Total water demand	2685	3763	4090	5181	6272
2.	Total net water supply	2265	2362	2461	3573	5259
3.	Waste water generated	1812	3010	3272	4144	5017
4.	Treated at CETP	200	217	234	346	755
5.	Proportion not sewered	14%	13%	13%	10%	5%
6.	Outside sewered area	254	302	302	294	210
7.	Net generated waste water	1358	1722	1798	2218	3242
8.	Infiltration	518	518	518	518	518
9.	Gross Wastewater to treatment	1876	2240	2316	2736	3760

Source: - Delhi Jal Board

## 17. Expenditure Incurred on Water Supply and Sewerage Programmes

- 17.1 The expenditure incurred on water supply and sewerage programmes in Delhi during 2007-18 is presented in Statement 13.10.



### Statement 13.10

#### EXPENDITURE INCURRED ON WATER SUPPLY AND SEWERAGE PROGRAMMES IN DELHI DURING 2007-2018

(₹ Crore)

S. No.	Details	Water Supply	Sewerage	Total
1.	<b>Approved Outlay (2007-2012)</b>	<b>4361.50</b>	<b>3132.50</b>	<b>7494.00</b>
2.	Fund Released			
	a. 2007-08	962.01	383.96	1345.97
	b. 2008-09	1015.17	441.73	1456.90
	c. 2009-10	1080.35	568.55	1648.90
	d. 2010-11	1080.14	527.93	1608.07
	e. 2011-12	1033.02	528.02	1561.04
	<b>Total (a+b+c+d+e)</b>	<b>5179.69</b>	<b>2450.19</b>	<b>7620.88</b>
3.	<b>Approved Outlay (2012-17)</b>	<b>6087</b>	<b>4913</b>	<b>11000</b>
4.	Fund Released			
	a. 2012-13	964.97	752.40	1717.37
	b. 2013-14	796.77	753.23	1550.00
	c. 2014-15	854.50	934.50	1789.00
	d. 2015-16	646.50	1077.43	1723.93
	e. 2016-17	850.15	534.50	1384.65
	<b>Total (a+b+c+d+e)</b>	<b>4112.89</b>	<b>4052.06</b>	<b>8164.95</b>
5	<b>Revised Outlay 2017-18</b>	1023.00	813.50	1890.00
6	Fund Released 2017-18	999.50	730.50	1730.00

17.2 It may be observed from Statement 13.10 that the fund released for water supply and sanitation to DJB increased from ₹ 1346 crore in 2007-08 to ₹ 1730 crore in 2017-18.

#### 18. Re-use of Waste Water

18.1 The major reuse of treated wastewater in and around the city is for irrigation, horticulture and industrial use. There is now demand for use of treated wastewater for cooling in the power stations. Other options include groundwater recharge, return to be a raw water source, and the treatment and reuse of treated wastewater, for flushing of toilets, i.e. use for non-potable purposes like the washing of Railways, Buses, Construction industry.

18.2 Presently, Delhi Jal Board supply about 89 MGD of treated wastewater to the Irrigation Department, Power Plants and for irrigation purposes by CPWD and in Rohini area by DDA & Flood Control and Irrigation Department. Efforts are being made to increase the treated wastewater supply from 89 MGD to 210 MGD in subsequent years. Treated water supply to various purposes in Delhi is presented in Statement 13.11.

**Statement 13.11**

**TREATED WASTEWATER SUPPLY FOR VARIOUS PURPOSES**

S. No.	Details	Units (MGD)
1.	Treated effluent supplied from Keshopur STP for Irrigation, horticulture purpose	5.5
2.	From Okhla STP to the CPWD and Irrigation department for horticulture/Irrigation purpose	37.00
3.	From Coronation Pillar STP for DDA Golf Course at Bhalswa, Gammon India for construction purposes. Minor Irrigation Department at Palla	19.02
4.	From Rithala STP to PPCL for their plant at Bawana and NDPL for their owner plant at Rohini, DDA & horticulture	6.15
5.	From Vasant Kunj to Sanjay Van	3.70
6.	From Mehrauli STP to Garden of Seven Senses	3.40
7.	From Delhi Gate and Sen Nursing Home STP to PPCL	4.80
8.	From Nilothi STP to Irrigation & Flood Control Deptt. for Irrigation purposes	0.50
9.	From Papankalan STP for Irrigation purposes to DDA	1.33
10.	From Commonwealth Games Village STP to DDA horticulture	0.18
11	From Yamuna Vihar to STP's horticulture	3.0
12	From Narela to Pvt. Agency for washing of vehicle	0.05
13	From Najafgarh to WTP Dwarka for Horticulture	0.07
14	From Chilla STP to Internal Horticulture of STP	1.00
15	From Kondli STP to DDA, PPCL & Horticulture	3.0
<b>Total</b>		<b>89 MGD</b>

Source: - Delhi Jal Board.

18.3 Estimates for many reuse projects are being framed. Besides, Sewerage Treatment Plants of Delhi Jal Board treated wastewater is available from Common Effluent Treatment Plants in industrial areas being maintained by

DSIIDC and Mini Sewerage Treatment Plants of Delhi Urban Shelter Improvement Board (DUSIB).

- 18.4 For abatement of pollution in river Yamuna, DJB is executing the project of laying of interceptor sewer along three major drains (Najafgarh, supplementary & Shahdara). Sewage to the tune of 93 MGD has already been trapped. Present progress of work is 89% and the project is targeted to be completed by next year March 2019. Commissioning of interceptor sewer will trap a total 242 MGD of sewage which presently flows into drains. This will significantly improve the quality of wastewater flow in the major drains.
- 18.5 Delhi Development Authority is responsible for 4,451 hectares of open spaces, all of which are irrigated via tube wells. There are also irrigation open spaces of Delhi Municipal Corporations, Central Government properties, private parks and properties, road verges, sports stadiums etc. The information regarding the green areas being maintained by the various agencies is presented in Statement 13.12.

### Statement 13.12

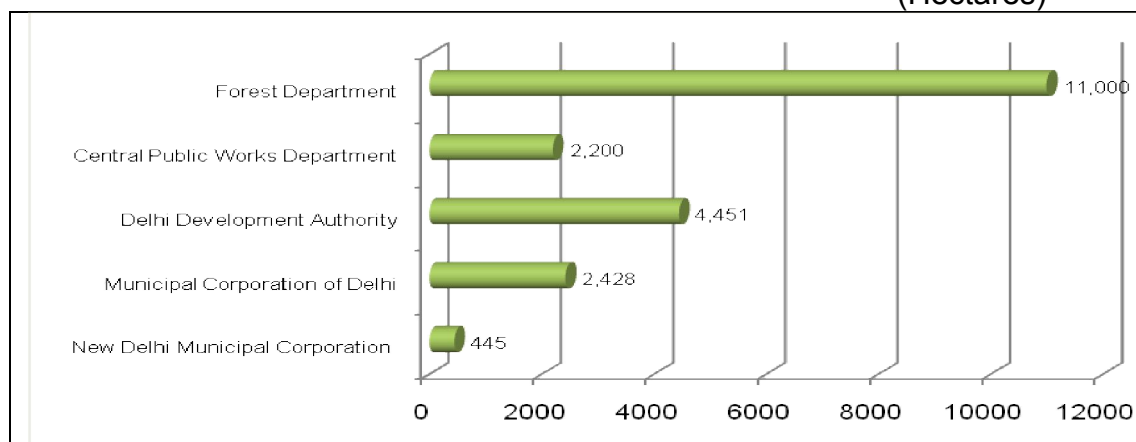
#### GREEN AREAS MAINTAINED BY VARIOUS AGENCIES

S. No	Agencies	Green Areas (in hectares)	% age
1.	New Delhi Municipal Council	445	2.17
2.	Municipal Corporations of Delhi	2,428	11.83
3.	Delhi Development Authority	4,451	21.69
4.	Central Public Works Department	2,200	10.71
5.	Forest Department	11,000	53.60
	<b>Total</b>	<b>20,524</b>	<b>100.00</b>

Source: - Delhi Jal Board

- 18.6 The green areas maintained by various agencies in Delhi are depicted in Chart 13.2.

**Chart 13.2**  
**GREEN AREAS MAINTAINED BY VARIOUS AGENCIES**  
(Hectares)



18.7 The colonies/category wise progress of the sewerage system is given in statement 13.13.

**Statement 13.13**

**COLONIES/CATEGORY WISE PROGRESS OF SEWERAGE SYSTEM**

S. No	Colonies / categories	Total no of colonies	Colonies with Sewerage System
1.	Un-authorized Regularised Colonies	567	541
2.	Urban Village	135	130
3.	Rural Villages	219	54
4.	Un-authorized Colonies	1639	265
5.	Resettlement Colonies	44	44

**19 Challenges for Water Supply & Sanitation**

19.1 Depletion of Ground Water: The falling groundwater level due to the excessive drawing of groundwater in Delhi is a concern. The water level has sunk to 20-30 metres below the ground level in many places. In a few zones, the nitrate content has been observed to be more than 1,000 mg/litre in the groundwater. A high concentration of fluoride more than the recommended limits has also been found. Large areas have salinity in the groundwater. All of these are unhealthy for human consumption.

- 19.2 Unsustainable Approaches to Water Use: An official DJB estimate of 2016 showed that the total distribution losses were at about 40%; this is in contrast to losses in the 4-20% range in some other countries. There are large water losses at different stages of the water supply system, ranging from 30-50% in the treatment plants, conveyance systems and distribution systems, apart from leaks and pilferage.
- 19.3 Wasteful Approaches: People use Reverse Osmosis (RO) systems for water filtration since the tap water is not potable. RO causes water wastage of about 40-60% of the water used.
- 19.4 Neglecting natural resources: During the rainy season, Delhi experiences water-clogged roads and overflowing sewers. There is little rainwater harvesting, resulting in wastage of a precious resource.
- 19.5 Public Awareness: Public awareness and their role in water conservation and scientific use are presently unsatisfactory.