CHAPTER 13 WATER SUPPLY AND SEWERAGE

Access to safe, adequate and affordable potable drinking water, accessible and hygienic sanitation is the basic public services required to be ensured by the Government for its citizen for a healthy life. Government has been consistently trying to ensure 24X7 clean water supply to all households, treatment of both waste water and solid waste to a high proportion of the volume generated, treatment of all industrial effluent. One of the important Sustainable Goal under SDG-6 is "Availability and sustainable management of water and sanitation for all".

- 1.2 The Delhi Government ensured free lifeline water of up to 20 kilolitres to every household having metered water connection and around 21.39 lakhs consumers have been benefitted under this scheme since its inception. Board vide Resolution No. 1187 dated 26.10.2021 has approved the policy of installation of new water connection of 15mm service pipe connection including water meter, O&M of existing water connection by DJB along with meter wherever required (except ITRON and ARAD water meter installed by water division having 07 years O&M).
- 1.3 Further, Board has decided that:
 - (i) Installation charges of water connection shall be divided category wise as per categorization of colonies for property tax by MCDs as under:
 - For domestic connections:

S.No.	Colony Category	New Connection charges for water
1.	A,B,C	₹ 4000/-
2.	D&E	₹ 2000/-
3.	F,G,H, & Rural Villages	₹ 1000/-

- For commercial connection charges shall be double of the domestic charges in respective colony category.
- (ii) Sewer connections will be approved automatically with the approval of water connections. No separate sewer connection charge will be levied.
- (iii) Defective water meter will also be changed by DJB (except ITRON and ARAD water meter installed by water division having 07 years O & M).
- (iv) Infrastructure Charges wherever applicable will be levied and no other charges, advance, security, RR Charges, meter security etc will be levied in new connection bill.
- 1.4 Priority areas of GNCTD in water and sanitation sector is to augment water supply

from sources outside Delhi such as: Renuka Dam in Himachal Pradesh, and Kishau Dam and Lakhwar-Vyasi Dam in Uttarakhand getting underground-water from Yamuna flood plains by way of recharging the ponds, augmenting internal sources including through recycling of water, water harvesting, plugging leakages of water, reducing non-revenue water through proper water accounting, installation of bulk meters etc. In a remarkable achievement, GNCTD has been able to provide the regular water supply to the under-served areas and has covered unauthorized colonies, which is about 96% of total un-authorized colonies (excluding 113 colonies under forest/ASI/no exist/not feasible/not traceable) in Delhi and very soon, the remaining un-authorized colonies will also be covered.

- 1.5 There are still many issues in Water and Sanitation sector that needs focused attention: depleting groundwater level due to excessive exploitation, a high concentration of fluoride and salinity at some places, distribution losses in water supply estimated at about 58 percent (Non-Revenue Water), wider implementation of rain water harvesting etc. Inadequate sewage treatment capacity: uneven flow of sewage waste to pumping stations: non availability of land for constructing new infrastructure: inter-mixing of sewage pipes with storm- water drain etc.
- 1.6 Delhi depends on neighboring states to meet around 90 percent 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. Growth of the city beyond reasonable limits imposes unbearable strain for provisioning of two most basic services: water and sanitation.
- 1.7 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 instill 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, and 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.

1.8 About 93% households of Delhi now have access to piped water supply. Water production during summer season is being maintained at 956 MGD consistently. Water is supplied to about 20 million population of Delhi through existing water supply network comprising of 15383 km long pipelines and more than 117 underground reservoirs (UGRs). Besides, a total of 397 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 approx. 596 M.S. hired tankers (during peak summer), 250 newly purchased SS tankers are being added to the existing fleet to supplement water supply in water deficit areas.

2. Water Requirement

2.1 Based on the norm of 60 Gallon Per Capita per Day (GPCD) the total requirement of water for NCT of Delhi in March 2021 is 1260 MGD for the projected population of 21 millions .The per capita water requirement norms for various usages are presented in Statement 13.1.

STATEMENT 13.1

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 liters 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
	Total	274 LPCD(60 GPCD)

Source: Delhi Jal Board (LPCD-Liters Per Capita Per Day & GPCD- Gallon Per Capita Per Day)

- 2.2 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 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.
- 2.3 The estimated demand of water in Delhi based on the norm of 60 GPCD by 2021 is 1260 MGD to meet the requirement of population of about 210 Lakhs as per the DDA's MPD- 2021.

3. Water Supply Capacity

STATEMENT 13.2 INSTALLED CAPACITY OF WATER TREATMENT PLANTS: 2009-2022

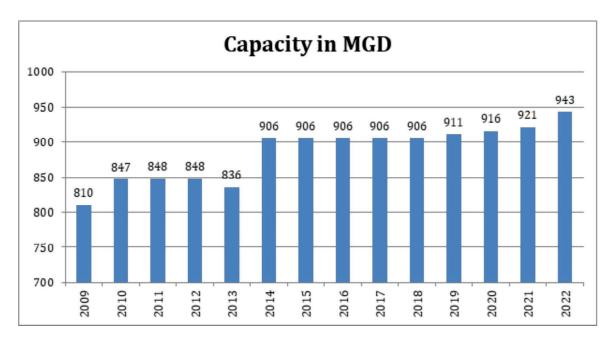
(As on 31st March 2022)

Capacity (MGE					GD)										
S. No.	Name of Plants	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1.	Chandrawal Water House I & II	90	90	90	90	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	120	120	120	120
3.	Haiderpur	200	200	200	200	200	200	200	200	200	200	200	200	200	200
4.	North Shahdara (Bhagirathi)	100	100	100	100	100	100	100	100	100	100	100	100	100	100
5.	Bawana	20	20	20	20	20	20	20	20	20	20	20	20	20	20
6.	Nangloi	40	40	40	40	40	40	40	40	40	40	40	40	40	40
7.	Sonia Vihar	140	140	140	140	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	85	90	95	117
9.	Recycling of Water at Bhagirathi, Haider- pur & Wazirabad		37	37	37	45	45	45	45	45	45	45	45	45	45
10.	Common-wealth Games Village			1	1	1	1	1	1	1	1	1	1	1	1
11.	Okhla	-					20	20	20	20	20	20	20	20	20
12.	Dwarka						50	50	50	50	50	50	50	50	50
	Total	810	847	848	848	836	906	906	906	906	906	911	916	921	943

Source: Delhi Jal Board (MGD-Millions Gallons per day)

3.1 The installed treatment capacity of Water in Delhi during 2009-2022 is depicted in Chart 13.1. The installed capacity of DJB has been augmented by 13% during last 10 years. The capacity, which was 836 MGD in 2013, has been increased to 921 in 2021. This has further increased to 943 MGD in the year 2022.

CHART 13.1
INSTALLED TREATMENT CAPACITY OF WATER TREATMENT PLANT DELHI2009-2022



3.2 Three new Water Treatment Plants constructed at Dwarka (50 MGD), Bawana (20 MGD) and Okhla (20 MGD) have been commissioned in 2015 with the savings in raw water availability on account of commissioning of new CLC (Carrier Lined Canal) having 5% conveyance losses against the 30% in cold DSB canal.

4. Water Consumption

Water supplied and billed to various categories of consumers by Delhi Jal Board during 2020-21& 2021-22 is presented in Statement 13.3.

STATEMENT 13.3

CATEGORY-WISE WATER CONNECTIONS, SALES AND % OF SALES

S.	Category	Connections (in lakh)		Sales (MGD)		% of Sales	
No.		2020-21 2021-22		2020-21 2021-22		2020-21	2021-22
1.	Domestic (Active)	24.98	25.80				
2.	Commercial & Institutional (Active)	0.79	0.82	425.44	418.95	93.08	93.02
3.	Supply to NDMC & MES (Active)	-	-	31.63	31.44	6.92	6.98
	Total	25.77	26.62	457.07	450.39	100.00	100.00

Source: Delhi Jal Board

5. Sources of Water Supply

- **A.** Delhi Jal Board receives raw water from Haryana through CLC, DSB canals and river Yamuna Course as per detailed below:
- 1. CLC: 719 cusec releases at Munak/683 cusec receipt at Delhi.
- 2. DSB: 330 cusec at Delhi
- 3. Yamuna River Course 120 cusec

Total = 1133 cusec (612.5 MGD)

B. Ganga water is supplied through Ganga Canal/Murad Nagar Regulator for Bhagirathi (200 cusec) and Sonia Vihar (270 cusec) water treatment plants.

Total = 470 cusec (254.08 MGD)

C. 117 MGD ground water is supplied through Ranney Wells/Tube wells installed in Yamuna Flood Plains and other areas at Delhi.

6. Ground Water

- 6.1 To meet increasing demand of water, limited surface water sources and frequent pollution in raw water sources at Wazirabad, dependence on Groundwater sources has increased in city and augmentation of new tube wells is planned to meet the demand by blending Ground water with surface water to achieve the permissible limits for drinking purpose. However, deterioration of Ground Water quality is still being observed. All efforts to stop further deterioration as suggested by Monitoring Committee constituted by Hon'ble NGT in OA- 496/2016 which include revival of water bodies and sealing of illegal borewells are being done by concerned divisions. Quality Control Division of DJB regularly monitors the ground water quality to ensure it fitness for drinking purposes.
- 6.2 Apart from in-house testing, Delhi Jal Board, further confirmed Ground water quality through Independent agency NEERI (National Environmental Engineering Research Institute) Ministry of Science & Technology, Govt. of India.
- 6.3 Delhi Jal Board has 4919 functional tubewells in various parts in Delhi. In addition, there are 11 functional Ranney Wells along Yamuna River. The Flood plains of River Yamuna and the area adjacent to Najafgarh Lake are being explored for extraction of water on sustainable basis. Further, the status of in progress and proposal of tube well is as follows:-

Location	No. of proposed tube wells	Remarks
Barapullah Clover,Noida Mod	7 nos	Tube wells completed. Permission is awaited for lying of water line from PWD.
Akshardham	8 nos	Tube Wells completed. Work of Water line held up for want of permission from GAIL for crossing IGL gas pipe
Bawana WTP Complex - 15 tube wells (3.0 MGD)	Bawana WTP Complex - 15 tube wells	Work is in progress.
Nilothi (100 nos)& Najafgarh(50 nos)	150	Nilothi: Work is in progress. Najafgarh: Permission from I&FC department still awaited
Okhla WTP	7	Under process of award of work.
Bhalswa lake	150	 i) Ratification of estimate and award of work is to be taken from Delhi Jal Board. ii) E& M wing yet to decide the capacity of pumps. iii) Subject to availability of land/ permissions from land owing authorities.
Rohini WWTP-	85	i) Ratification of estimate and award of work is to be taken from Delhi Jal Board. ii) E& M wing yet to decide the capacity of pumps iii) subject to availability of land/ permissions from land owing authorities
Okhla WWTP	85	-do-
Dwarka WTP	45	-do-
Chilla	35	-do-

Pre-feasibility studies for ground water recharge through the abandoned Bhatti mines and Canal System in the North Western region of Delhi have also been taken.

- 6.4 Delhi Jal Board, is carrying out rejuvenation of 67 numbers of Water Bodies out of which rejuvenation work at 42 number of water bodies has been completed and tender for 25 number shall be called shortly. The work of creation of water body at Timarpur oxidation pond, Dwarka, Pappankala, Rohini, Nilothi, revival of Roshanara Lake is being taken up.
- 6.5 The aim of the prestigious project of rejuvenation of water bodies is to clean the existing Water Bodies, restoring its Ecological values and putting in management regimes that are sustainable for long term.
- 6.6 The process to implement the proposals was started in September 2018. The awarded works amounting to ₹ 92.73 Cr. for revival of 42 water bodies is in progress and the awarded cost of 16 number artificial lake, Roshanara Lake, Timarpur Oxidation Pond is ₹ 98.00 Cr.

7. Parallel Channel from Munak to Haiderpur

About 30-50 per cent of the raw water discharged from Tajewala Head works got 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 (CLC) 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 180 cusec raw water for Delhi within the existing releases at Munak and WTP at Dwarka (50 MGD) and Bawana (20 MGD) & Okhla (20 MGD) have been commissioned.

7.1 Upstream Storages on River Yamuna-Renukaji, Lakhwar-Vyasi & Kishau Dam Projects:

Delhi Jal Board has planned for augmentation of water resources for Delhi. A twin – pronged strategy has been adopted, which focuses on the augmentation of both, ground-water and river (surface)-water resources, while also emphasizing the need for enhanced water conservation measures, rainwater harvesting initiatives, restoration of water bodies etc. While augmentation of ground water resources are in the hands of Delhi only, outcome of initiatives/proposals for augmentation of river (surface) water resources by Delhi is entirely dependent on cooperation and constructive collaboration from the neighboring states and the Union Government. Additional availability of raw water to the National Capital from the Upstream Storages on the river Yamuna is paramount for its planned and orderly development

Three upstream storages namely, Renukaji, Lakhwar and Kishau Dam Projects are proposed to be constructed on the river Yamuna and its tributaries. These multipurpose dam projects have been declared as national projects. Renukaji Dam is to be constructed on river Giri, a tributary of the river Yamuna, at Dadhau in Sirmour District in Himachal Pradesh. Main works in the projects are likely to be taken up from May, 2023. Kishau Dam is proposed to be constructed on river Tons, also a tributary of the river Yamuna, in Dehradun District of Uttarakhand & Sirmour District of Himachal Pradesh. Lakhwar Dam is being constructed on River Yamuna in Dehradun District of Uttarakhand.

Delhi is pursuing for early and time bound implementation of the upstream storage projects. Since these projects have been declared as national projects, the central government will bear 90% of the water component costs in these projects and basin states have to bear only 10% of the water component costs for these projects in proportion to their annual water allocations in the Yamuna water as per the MOU of 12.05.1994.

Annual and interim seasonal allocations of Yamuna water to each basin state as per the MOU of 12.05.1994 are given here under and are governed as per the provisions in the MOU.

	Table									
		All	Annual							
S. No.	States	July to Oct.	Nov. to Feb	March to June	Allocation (BCM)					
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	0.580 (1926 cusec)	0.068 (232 cusec)	0.076 (255 cusec)	0.724 (809 cusec)					
Total		9.056	1.275	1.652	11.983					

Source: MOU of 12th May, 1994.

Note: Out of annual allocation of 4.032 BCM earmarked for Uttar Pradesh, tentative annual allocation among the States of Uttar Pradesh and Uttarakhand is 3.575 BCM and 0.457 BCM respectively. (BCM: Billion Cubic Meters)

The MOU of 12th May 1994 provides that in a year when the availability is less than the assessed quantity, first the drinking water allocation of Delhi will be met and the balance will be distributed amongst the other basin states in proportion to their allocations and also include that allocation for drinking purposes is for consumptive drinking water requirement.

The interstate agreements on Lakhwar and Renukaji Dams have been signed on 28.08.2018 and 11.01.2019 respectively. Delhi had conveyed its consent for the circulated interstate draft agreement on Kishau Dam Project. All basin states except Himachal Pradesh and Uttarakhand had agreed to the earlier circulated draft agreement on the Kishau MPP. This upstream storage project is being executed through M/s Kishau Corporation Ltd. (KCL), a JV between Govt. of Himachal Pradesh and Uttarakhand, which was constituted on 16.01.2017. Both the states of Himachal Pradesh and Uttarakhand have raised issues on funding and bearing the power component cost in Kishau Dam Project and matter is under deliberations for its amicable resolution.

Total live storage capacity in the three projects is proposed to be about 2168 Million Cubic Meters (1301Million Gallons per Day) comprising of about 514 MCM (309MGD), 330MCM (198MGD) and 1324MCM (724MGD) in the Renukaji, Lakhwar and Kishau Dam Projects respectively. Delhi has already paid ₹214.84 crores to Himachal Pradesh for Renukaji Dam Project. Delhi has also paid ₹7.79 crores and ₹8.10 crores for the Lakhwar and Kishau Dam projects respectively, towards part of seed money against its proportionate water component costs in the these projects.

On completion of the three upstream storages, seasonal allocation of Yamuna water

will be revised by the Upper Yamuna River Board and Delhi will get its share in Yamuna water from these storages as per the MOU of 12th May 1994 and interstate agreements on these National Projects. Delhi has agreed to bear 90% of the cost of power component in the Renukaji Dam project. Accordingly, allocation for drinking water needs of Delhi has been prioritized in interstate agreement on the Renukaji Dam Project and Upper Yamuna River Board is being pursued to intimate enhanced allocation of Yamuna water to Delhi as per the agreement for Renukaji Dam Project. The agreement on Renukaji Dam Project includes that;

- Govt. of NCT of Delhi has agreed to bear 90% of the cost of power component for the project.
- In respect of hydro power, if Himachal Pradesh desires, Power generated and cost thereof can be shared with other beneficiary State (s) through mutual/multilateral agreement to be entered separately.
- Additional water available due to construction of storage as result of implementation of Renukaji Dam Project shall be regulated by UYRB (Upper Yamuna River Board). The additional water available due to construction of this dam will be made available to Delhi on priority to meet the drinking water needs of Delhi as worked out by UYRB. The arrangement will be only until other storages viz. Lakhwar and Kishau MPPs (Multi Purpose Projects) in upper Yamuna catchment are created at which stage releases from Renukaji Dam shall be carried out keeping in view the overall annual allocation of Yamuna water as per MoU dated 12.05.1994 between the States. Interim seasonal allocations given in the said MoU shall be modified accordingly by UYRB and put up to Upper Yamuna Review Committee (UYRC) for approval.

8. Water Accounting and Auditing

- As per JICA report of 2011, assessed NRW was 64.80% in year 2010-11 and JICA had proposed to subdivide entire DJB network into a total 1010 DMAs (of size 1500 2000 connections) to improve the system & reduce NRW. DJB is now moving ahead in implementing the DMAs works in entire DJB network comprising of 1010 DMAs as per JICA report. Status of same is as under:
 - Improvement works including creations of DMAs & reduction of NRW are in progress in 3 PPP areas of Malviya Nagar, Nangloi and Mehrauli/Vasant Vihar areas comprising 82 DMAs as per JICA. All 9 DMAs in Malviya Nagar, 20 DMAs out of total 35 DMAs in Nangloi and 5 DMA in Vasant Vihar have been completed and further works are in progress. NRW in Malviya Nagar PPP area reduced from 67% to 33%, Nangloi from 79% to 53%, Vasant Vihar from 24% to 8%.
 - DJB started in-house Phase-I of DMAs creation in 2016 and 33 (restructured 39) DMAs were taken up, which were further increased to 96 (restructured 102) DMAs.

- 170 DMAs in Chandrawal WTP command areas are planned in JICA funded project.
- For improvement of infrastructure and creation of DMA works in rest of Delhi, DJB has engaged Consultants to prepare Detailed Project Reports (DPRs). All these DPRs have been received and it is proposed to implement these reports in phases. Delhi will be divided into following three parts and the tender will be released for each part separately:
 - (i) Trans-Yamuna Area (East Delhi i.e. East and North-East Zone)
 - (ii) North Delhi (West and North-West Zone)
 - (iii) South Delhi (South and South-West Zone)

The contractor shall be responsible for Infrastructure improvement, Operation, Maintenance, SCADA for water supply network, reducing NRW, formation of District Metered Areas (DMAs) & Management of Water Supply Networks including UGRs & BPSs, billing and collection of revenue etc. and all other services related to consumers. The command area of proposed 24x7 contracts is extended from inlet of Primary UGRs up to House Service Connections.

Tenders for the project work of "Providing 24x7 water supply and sewage network improvement with long term operation & maintenance on Hybrid Annuity Model (HAM) in Trans Yamuna area were invited, but no response received. NIT conditions are being modified for re-invitation of tenders.

In addition, Delhi Jal Board has now taken over the maintenance of house service connections to reduce NRW and replacement of the consumer water meter including replacement of existing defective consumer meters for better water accounting.

- 8.2 Delhi Jal Board has initiated projects of installation of flow meters for water auditing. Delhi Jal Board is installing about 3285 nos. bulk flow meters in the primary and secondary system, which comprises of sizes of 100 mm dia to 1500 mm dia. About 3236 nos. flow meters have been installed. One Data/SCADA Center has been established at Jhandewalan, where online data is being received on real time basis. This is helping in real time monitoring and optimum distribution of water.
- 8.3 Complete and correct water supply accounting could not be maintained by Delhi Jal Board. As on 1st April 2019, there were 1.54 Lakh un-metered connections (Table 13.1). Fixing of 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.
- 8.4 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.

9. Water Tariff

- 9.1 The tariff 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 has collected ₹ 1530.60 crore during 2021-22.
- 9.2 DJB has provided Rain Water Harvesting in its 594 installations. The Rain Water harvesting cell of DJB provides technical assistance to individuals/institutions for providing Rain Water Harvesting. DJB has provided the information regarding Rain Water Harvesting on its website for public facilitation.
- 9.3 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 100 Sqm. and above. However, levy of penalty has been deferred up to 31.03.2023.
- 9.4 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 01.12.2004 and 01.04.2005 respectively. 60 percent 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 Hosing 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.

9.5 Water Tariff effective from 01.02.2018:-

CATEGORY-I (DOMESTIC CONNECTIONS)

Monthly Consumption	Service Charge	Volumetric Charge
(in Kiloliter)	(in ₹)	(Per Kiloliter in ₹)
Upto 20	146.41	5.27
20-30	219.62	26.36
>30	292.82	43.93
Plus Sewer Maintenance Charge :60% Water Volumetric Charge		

CATEGORY -II (NON DOMESTIC CONNECTIONS- COMMERCIAL/INDUSTRIAL

Monthly Consumption (in Kiloliter)	Service Charge (in ₹)	Volumetric Charge (per Kiloliter in ₹)
0-06	146.41	17.57
06-15	292.82	26.35
15-25	585.64	35.14
25-50 1024.87 87.85		
50-100	1171.28	140.56
>100	1317.69	175.69
Plus Sewer Maintenance Charge 60% of Volumetric Charge		

9.5.1 Simplification of procedure for sanction of New Water Connection

Procedure for sanction of new Water/ Sewer Connection in all areas of Delhi has been simplified. Now, water / sewer connection may be sanctioned easily. Only last 3 month Electricity Bill will be required along with one Identity Proof and self declaration/ undertaking for domestic connections. Further, only online applications for water & sewer connection will be accepted w.e.f. 06.10.2020.

9.5.2 Provision of Rain Water Harvesting / Waste Water Recycling System

- i. Ground water resources in many parts of the city are over exploited. The extent of replenishment of ground water is much less than what the city as a whole is withdrawing due to its rapid urbanization. There is need to preserve ground water resources and to take effective measures for its sustainable availability.
- ii. Therefore, Rain Water Harvesting is considered as a simple, viable and ecofriendly method of conservation of water and a simple solution for ground water recharge. Ministry of Urban Development and Poverty Alleviation (Delhi Division), Government mandatory in all new buildings on plots of 100 Sq. Mtrs. and above and Waste Water Recycling System for horticultural purposes, in buildings having a minimum discharge of 10000 Ltrs. and above per day.
- iii. To ensure proper implementation of Rain Water Harvesting and Waste Water Recycling norms, following amendments in Regulation 50 of Delhi Water and Sewer (Tariff & Metering) Regulations 2012, has been approved by the Board vide Resolution No.829 dated 19-08-2019 for plots/properties size 100 sq.m. to less than 500 sq.m. except para (iv) & (v) below:
- iv. It will be mandatory for plots/properties having area of 100 Sq. Mtrs. or more to have functional Rain Water Harvesting System, even if the property is constructed prior to 28-07-2001. Such plot/property owning consumers would be required to

install functional Rain Water Harvesting System within one year from the date of issue of Public Notice in this regard i.e. upto 25.09.2020 (Public Notice issued on 19.09.2019 and 26.09.2019). In case consumers whose construction was before 28-07-2001, fails to comply with the aforesaid mandatory provision within the time limit prescribed, the tariff as applicable for the respective consumer category will be increased by 1.5 times, till the system is installed and intimated to the respective Zonal Revenue.

- v. Further, in case of properties having area of 100 sq.m. or more, constructed after 28-07-2001 who have not intimated about the Rain Water Harvesting provision made to the respective area ZRO, may also inform the area ZRO by 31st March 2020 which was extended up to 30.09.2022 and now further has been extended up to 31.03.2023 failing which, tariff as applicable for the respective consumer category will be increased by 1.5 times, till the system is installed and intimated to the respective Zonal Revenue.
- vi. Besides (i) & (ii) above, Board may disconnect water connection of all consumers who fail to install functional Rain Water Harvesting System or intimate area ZRO within prescribed time limit. This provision will, however, be applicable in case of all properties having area of 100 sq. mtr. and above but after timelines provided in both the aforesaid cases is over.
- vii. New water/sewer connection to the existing and newly constructed properties having installation of functional Rain Water Harvesting System. Functionality / Adequacy shall be checked by Zonal Office and thereafter Adequacy certificate shall be issued by the Rain Water Harvesting Cell.
- viii. New water/ sewer connection to newly constructed properties/ buildings having a minimum discharge of 10000 Ltrs. and above per day will be sanctioned by the respective Maintenance Division.
- ix. Implementation of (iv) above for plots/properties having area of 100 Sqm and above but below 500 Sqm. would be applicable after timelines provided in (i) and (ii) above are over.
- x. In cases where installation of Rain Water Harvesting System is not technically feasible, for any reason, CEO, DJB may take appropriate decision in respective case, on merits.

9.6 Water Tariff for Un-metered connections in JJ Resettlement Colonies and Rural Areas: -

For unmetered water connections in JJ resettlement colonies and unmetered water connections in case of rural areas, assumed average @25 KL per month per connection is charged. Water consumption rates and service charge are levied slabwise. Sewerage maintenance charge is also recoverable, if sewerage services are being managed by Delhi Jal Board.

9.7 All domestic consumers of Delhi Jal Board consuming water upto 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) w.e.f 01.01.2014 to 31.03.2014 and thereafter w.e.f. 01.03.2015 onwards.

10. Rain Water Harvesting

- Ministry of Housing and Urban Affairs, GOI has issued guidelines for Urban Water under Jal Shakti Abhiyan. Thrust areas include Rain Water Harvesting (RWH), For Rain Water Harvesting, the guidelines include that ULBs should ensure that all government buildings (Central/State/ULB) must have RWH structures. The guidelines also include that ULBs should ensure that in future all building permissions granted must have RWH structures incorporated, as per building bye laws, and same. Therefore, in urban areas, ULBs have to play major role in ensuring implementation of Rain Water Harvesting systems.
- 10.2 Roof top rain water harvesting has been made mandatory for plots size of 100 sqm and above as per notification issued by the Govt. of India. To promote its implementation Delhi Jal Board has made provisions in its tariff regulations for rebate and penalty in water bills for implementing and non-implementing Rain Water Harvesting Systems.
- 10.3 The following provisions have been made in the Delhi Water & Sewer Tariff and Metering Regulations, July' 2012 for promoting Rain Water Harvesting:
 - Regulation 8 (d) of Chapter II provides that for category the consumers, the following rebate is given in tariff for provision of Rain Water Harvesting, Waste Water Recycling or both:
 - i. Such plot/properties which have an area of 100 square meter or more and having installed functional rain water harvesting system, shall be granted rebate of 10% in the total bill amount and 15% if both rain water harvesting and waste water recycling 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 above mentioned rebate in water bill.
 - iii. Functionality inspection of every rain water harvesting system will be conducted by the Zonal Engineers before reviewing the certificate every two years.
 - iv. Delhi Jal Board has implemented rain water harvesting system in all of its 594 Nos. premises wherever feasible and more are being targeted for implementation of rain water harvesting. Rain Water Harvesting Systems have been implemented in 4144 schools/colleges out of the 4779. Further in 404 schools /colleges the rain water harvesting systems are either under construction or being taken up for implementation of Rain Water Harvesting system and in the 231 schools and colleges, implementation of RWH system is not feasible due to various reasons

i.e. shallow ground water level up to 5.0 m or non availability of space.

- v. People are being sensitized for the judicious use of Potable water for the demand side management through public outreach program. There is a dedicated Rain Water Harvesting cell in DJB which is providing technical assistance to facilitate the public in implementation of Rain Water Harvesting system. It also has a dedicated telephone numbers (011-23541223 and 011- 23558264) to guide the callers who seek assistance.
- vi. As per the Delhi Government Cabinet decision 2709 dated 02.07.2019 all Govt. departments have to make provision of RWH in their buildings. Delhi Jal Board has been assigned to implement Rain Water Harvesting Systems in Government Building installations which are not maintained by the PWD, GNCTD. For Delhi Government buildings which are maintained by PWD, GNCTD, the implementation of Rain Water Harvesting System is to be carried out by PWD, GNCTD itself.
- vii. To sensitize the citizens of Delhi a continuous process of disseminating information on Rain Water Harvesting through platforms like print, electronic, visual, workshops, exhibitions, seminars, booklets, pamphlets etc. have been done by Delhi Jal Board. Jal Shakti Kendras have been created in each Revenue District of Delhi where anyone can visit for information /guidelines for the implementation of Rain Water harvesting system in their area. These Jal Shakti Kendras are manned by technical person for the facilitation of the public at large regarding information on various initiatives taken by DJB for the implementation of rain water harvesting system and penal provision in case of non implementation. Details of the Jal Shakti Kendras are available on DJB website.
- viii. Delhi Jal Board also empanelled the service providers /consultants for facilitation of the public /people for implementation of rain water harvesting system. The list of the service providers /consultants is available on DJB website.

10.4 Incentive:

(i) Such plot/properties having functional installed Rain Water Harvesting System (RWH), rebate in water bills is given to extent of 10% to the consumers of Delhi Jal Board and is applicable on plots size of 100 sqm. and above. Year wise rebate is given as under:-

S. No.	Period	Amount (₹ in Cr)
1.	01.07.2017 to 31.03.2018	13.6
2.	01.04.2018 to 31.03.2019	21.44
3.	01.04.2019 to 31.03.2020	23.32
4.	01.04.2020 to 31.03.2021	27.88
5	01.04.2021 to 31.03.2022	20.22
	Total	106.46

(ii) Functionality inspection of every rain water harvesting system will be conducted by the Zonal Engineers before reviewing the certificate in every two years.

10.5 Penalty:

For all the consumers irrespective of their consumer category Rain Water Harvesting penalty as enhanced tariff of 1.5 times will be applicable if they have plot area 500 sq. meter and above and do not have a functional rain water harvesting facility w.e.f. 01.07.2017 (in case of Dwarka sub-city, penalty on account of non-provision of RWH system is applicable w.e.f 01.11.2018). Rain Water Harvesting penalty is deferred till 31.03.2023.

10.6 Exceptions:

RWH through artificial ground water recharge structures is not recommended where post monsoon ground levels are shallower than 5 Mtrs. Penalties as per the Delhi Water and Sewer (Tariff & Metering) Regulation, 2012 will not be levied on DJB consumers for non-provision of RWH System in such areas. However, in such areas Rain Water Storage for its use in no-portable purposes after required treatment may be carried out as a voluntary option.

10.7 Water Conservation

- i. Delhi has a network of about 15383 Kilometers of water supply mains, of which, a significant portion is as old 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 at about 58% 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.
- ii. Delhi Jal Board has taken several steps to minimize leakage losses. To address this problem, a leak detection and investigation (LDI) cell was set up. The Board has replaced about 1432-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.
- iii. Delhi Jal Board formulated a programme for recycling of backwash water at Haiderpur, Bhagirathi, Chandrawal, Wazirabad and Nangloi water treatment plants. On commissioning of recycling plant at Haiderpur, Bhagrathi, Wazirabad, Chandrawal and Nangloi about 47 MGD has been added water

supplies without any additional raw water from these five plants. Recycling Plant at Bawana is also proposed for 2 MGD.

11. Sewage Treatment Capacity

11.1 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 31st March 2001 to 632.26 MGD in 31st March 2022. The information regarding the sewerage treatment capacity and percentage of utilization is presented in Statement 13.4.

STATEMENT 13.4

SEWERAGE TREATMENT CAPACITY AND ITS UTILIZATION

(MGD)

	Name of Sewer-	C	apacity (MG	D)	Actual	Actual	
S. No.	age Treatment Plants (STPs)	31.03.2001	31.03.2021	31.03.2022	Treatment as on 31.03.2021	Treatment as on 31.03.2022	% of Utili- zation
1	Okhla	140.00	140.00	140.00	120	115.4	82.43
2	Keshopur	72.00	72.00	72.00	72	71.4	99.16
3	Coronation Pillar	46.00	30.00	90.00	27	69.41	77.12
4	Rithala	40.00	60.00	40.00	54	40	100
5	Kondli I, II, III, IV	45.00	70.00	65.00	70	56.7	87.23
6	Yamuna Vihar I,II	10.00	45.00	45.00	45	44.64	99.20
7	Vasant Kunj	5.00	5	5	3	3.39	67.80
8	Ghitorni	5.00	5.00	5.00	1.20	1.50	30
9	Pappankalan	20.00	40.00	40.00	40	40	100
10	Narela	10.00	10.00	10.00	4	6.61	66.10
11	Najafgarh	5.00	5.00	5.00	3	5	100
12	Delhi Gate	2.20	17.20	17.20	17.69	18.92	110
13	Sen Nursing Home	2.20	2.20	2.20	2.50	2.42	110
14	Rohini	0.00	15.00	15.00	5	7.93	52.87
15	Nilothi	0.00	60.00	60.00	50	58	96.67
16	Mehrauli	0.00	5.00	5.00	4	4.63	92.60
17	CWG Village	0.00	1.00	1.00	0.11	0.11	11
18	Molarband	0.00	0.66	0.66	0.50	0.54	81.81
19	Kapashera	0.00	5.00	5.00	2	5	100
20	Chilla	0.00	9.00	9.00	9	9	100
	Total	402.40	597	632.26	530	560.6	88.67

- 11.2 It is evident from the above statement that the percentage of utilization of sewerage treatment plant in Delhi as on 31st March **2022** was about **89 percent**. The sewerage treatment plants are not functioning up to their optimum level due to various reasons such as low flow of sewerage to STPs, trunk and peripheral sewer lines still to be connected to these STPs, Rehabilitation of Silted and settled Trunk Sewer Lines yet to be completed, etc. The sewage generation, at present, is estimated to be around **784 MGD = (980** water production x 0.8) and treatment is around **560** MGD only
- 11.3 Delhi Jal Board has a network of branching, peripheral sewers of about **9300 kms**. Also there is network of 200 kms of trunk sewers. The rehabilitation/ desilting of trunk sewer and peripheral sewer are in progress.
- 11.4 The estimated water supply requirement and waste water generation for Delhi is presented in Statement 13.5.

STATEMENT 13.5
WATER SUPPLY REQUIREMENT AND WASTE WATER GENERATION ESTIMATED

S.	Details	Volumes (MLD)								
No.		2004	2005	2006	2011	2021	2022	2023		
1.	Total water demand	2685	3763	4090	5181	6272	5700	5856		
2.	Total net water supply	2265	2362	2461	3573	5259	4540	4540		
3.	Waste water generated	1812	3010	3272	4144	5017	4560	3632*		
4.	Treated at CETP	200	217	234	346	755	Does not per- tain to DJB	Does not per- tain to DJB		
5.	Proportion not sewered	14%	13%	13%	10%	5%	21%	19%		
6.	Outside sewered area	254	302	302	294	210	210	210		
7.	Net generated waste water	1358	1722	1798	2218	3242	4560	3632		
8.	Infiltration	518	518	518	518	518	1140	908		
9.	Gross Wastewater to treatment	1876	2240	2316	2736	3760	5700	4540		

^{*80%} of net water supply as per CPHEEO norm

Expenditure incurred on water supply and sewerage programme

The Expenditure incurred on water supply and sewerage programme in Delhi during 2007-08 to 2021-22 is presented in Statement 13.6

STATEMENT 13.6

EXPENDITURE INCURRED ON WATER SUPPLY AND SEWERAGE PROGRAMMES IN DELHI DURING 2007-2022

(₹ in Crore)

S. No.	Details	Water Supply	Sewerage	Total
1.	Approved Outlay (2007-2012)	4361.50	3132.50	7494.00
	Fund Released			
	a. 2007-08	962.01	383.96	1345.97
	b. 2008-09	1015.17	441.73	1456.9
2.	c. 2009-10	1080.35	568.55	1648.9
	d. 2010-11	1089.14	527.93	1608.07
	e. 2011-12	1033.02	528.02	1561.04
	Total (a+b+c+d+e)	5179.69	2450.19	7620.88
3.	Approved Outlay (2012-17)	6087.00	4913.00	11000.00
	Fund Released			
	a. 2012-13	964.97	752.40	1717.37
	b. 2013-14	796.77	753.23	1550.00
4.	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
	Total (a+b+c+d+e)	4112.89	4052.06	8164.95
5.	Approved Outlay (2017-18)	939.00	816.00	1755.00
5.	Fund Released (2017-18)	999.50	730.50	1730.00
6.	Approved Outlay (2018-19)	1258.00	1092.00	2350.00
0.	Fund Released (2018-19)	1271.37	1044.61	2315.98
7.	Approved Outlay (2019-20)	1463.40	906.60	2370.00
1.	Fund Released (2019-20)	1340.65	1018.85	2359.50
8.	Approved Outlay (2020-21)	1624.40	2379.60	4004.00
0.	Fund Released (2020-21)	1319.40	2264.60	3584.00
9.	Approved Outlay (2021-22)	1251.42	1700.01	2951.43
Э.	Fund Released (2021-22)	769.50	1123.26	1892.76

(Excluding Namami Gange Project, Mukhyamantri Muft Sewer Connection & YAP-III State Share)

11.4 It may be observed from Statement 13.8 that the fund released for water supply and sanitation to DJB increased from □ 1346 crore in 2007-08 to □ 1893 crore in 2021-22.

12. Re-use of Waste Water

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

12.2 Presently, Delhi Jal Board supply about 89 MGD of treated waste water 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 waste water supply from 89 MGD to 210 MGD in subsequent years. Treated water supply to various purposes in Delhi is presented in Statement 13.7.

STATEMENT 13.7TREATED WASTE WATER SUPPLY FOR VARIOUS PURPOSES

S. No.	Details	Units (MGD)
1.	Treated effluent supplied from Keshopur STP for Irrigation, horticulture purposed	5.5
2.	From Okhla STP to 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	21.52
4.	From Rithala STP to PPCL for their plant at Bawana and NDPL for their owner plant at Rohini, DDA for horticulture	7.15
5.	From Vasant Kunj to Sanjay Van	3.40
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 Flood Control & Irrigation Deptt. For Irrigation purposes	0.50
9.	From Papankalan STP for Irrigation purposes to DDA	1.83
10.	From Commonwealth Games Village STP to DDA horticulture	0.12
11.	From Yamuna Vihar to STP's horticulture	0.50
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	0.20
15.	From Kondli STP to DDA, PPCL & Horticulture	3.0
	Total	89 MGD

12.4 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 properties, road verges, sports stadiums etc. The information regarding the green areas being maintained by the various agencies is presented in Statement 13.8.

STATEMENT 13.8

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
	Total	20,524	100.00

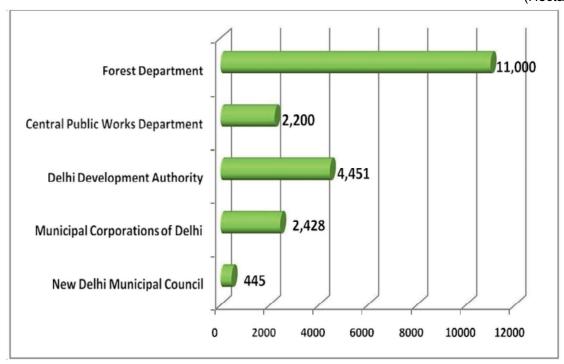
Source: Delhi Jal Board

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)



12.4 The Interceptor Sewer Project (ISP) has been conceptualized for abatement of pollution in the River Yamuna. Under Interceptor Sewer Project, 108 Nos of the drains are trapped and provision of trapping of about 242 MGD flow is being made. Out of proposed 242 MGD, provision for trapping of 238 MGD (98.35%) has already been made. Out of this, about 220 MGD wastewater is being trapped and treated at the various STPs in the command. However, the physical works under ISP is almost

completed and facility of trapping 242 MGD will be in place, but the actual treatment of this entire quantity of sewage will be done only after the completion of the Rithala and Kondli STPs.

The colonies/category wise progress of sewerage system is given in statement 13.9

STATEMENT 13.9 COLONIES/CATEGORY WISE PROGRESS OF SEWEAGE SYSTEM

S. No.	Colonies / Categories	Total No. of Colonies	Colonies with Sewerage System	Colonies with Water Sup- ply
1.	Un-authorized Regularized Colo- nies	567	557	567
2.	Urban Village	135	130	135
3.	Rural Village	219	55	193
4.	Un-authorized Colonies	1799	721	1630
5.	Resettlement Colonies	44	44	44

13. Challenges for Water Supply & Sanitation

- 13.1 **Depletion of Ground Water:** The falling groundwater level due to 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.
- 13.2 **Unsustainable approaches to Water use**: As per Outcome Budget (Q3 of 2022-23) of DJB, the total distribution losses are at about 58%. These are quite high as compared to 10-20% in developing countries. There are large water losses at different stages of water supply system in the treatment plants, conveyance systems and distribution systems, apart from leaks and pilferage.
- 13.3 **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.
- 13.4 **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.
- 13.5 **Public Awareness:** Public awareness and their role in water conservation and scientific use are presently unsatisfactory.

CHAPTER AT A GLANCE

- The Delhi Government ensured free lifeline water of up to 20 kilolitres to every household having metered water connection and around 21.39 lakhs consumers have benefitted under this scheme since its inception.
- The installed capacity of DJB has been augmented by 13% during last 10 years. The capacity, which was 836 MGD in 2013, has been increased to 921 in 2021. This has further increased to 943 MGD in the year 2022.
- Delhi Jal Board, is carrying out rejuvenation of 67 numbers of Water Bodies out of which rejuvenation work at 42 number of water bodies has been completed and tender for 25 number shall be called shortly.
- ▶ DJB has provided Rain Water Harvesting in its 594 installations.
- Delhi Jal Board has set up a leak detection and investigation (LDI) cell to minimize leakage losses which helped to replace about 1432-km length of the old, damaged and leaking water mains during the last five years.
- Sewage treatment capacity of Delhi Jal Board increased from 402.40 MGD in 31st March 2001 to 632.26 MGD in 31st March 2022. Delhi Jal Board has a network of branching, peripheral sewers of about 9300 kms. Also there is network of 200 kms of trunk sewers.
- Delhi Jal Board supply about 89 MGD of treated waste water 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 waste water supply from 89 MGD to 210 MGD in subsequent years.