

DELHI JAL BOARD WATER MANAGEMENT



20.06.2017



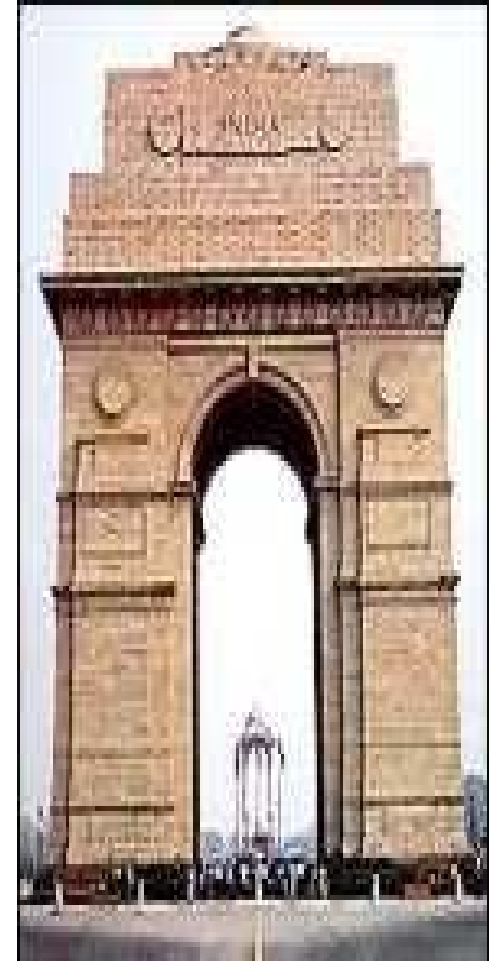


STRUCTURE OF PRESENTATION

1. Demographic detail: Delhi
2. Introduction: What we are & do?
3. Achievements
4. Source of Income
5. Water scenario
6. New Initiatives/ Best Management Practices
7. Challenges

1. DELHI's DEMOGRAPHY: Uniqueness

- Total Area : 1486 Sq Km
- Fully developed Urban area : 525 Sq Km
 - NDMC : 42.7 Sq Km
 - DELHI CANTT : 42.8 Sq Km
- Outer Delhi Area
(Including Urban Ext.) : 961 Sq Km
- Population : 200 Lac
- PROJECTED POPULATION 2021 : 230 lac
- **FLOATING POPULATION** : 15 lac (Approx)
- Decadal population growth rate of 26%
- 50-60 Lac people live in unplanned habitations
- % coverage with water supply network :83**
- % sewerage network coverage :50**
- **Uncovered** : Mainly unauthorized colonies





2. About Delhi Jal Board

- **Delhi Government reconstituted the Water Supply & Sewage Disposal Undertaking into the Delhi Jal Board (DJB) also called Delhi Water Board, with the Minister In charge as Chairperson of the Board in 1998.**
- **The Delhi Water Board Act, 1998 provides for the establishment of a Board to discharge the functions of water supply & sewage disposal within the National Capital Territory of Delhi and for matters connected therewith.**
- **Water and waste water utility for about 20 million people (supplies bulk water to NDMC and Delhi Cantonment Board).**
- **Annual Budget(2017-18) : Rs. 4250 Crore : Plan: Rs. 1755 Crore Non Plan: Rs 2495 Crore**
- **Employees strength : 18000**
- **Consumer base: 2.45 Million**

Some Facts

- **Delhi Jal Board supplies 900 MGD (820 surface water and 80 MGD ground water)**
- **Present demand for 20 million population 1200 MGD & by 2021, for projected population of 23 Million, it will be 1380 MGD.**
- 1. Source of surface raw water: Ganga : 240 mgd, Yamuna : 400 mgd & Ravi Beas:235 mgd Ex -Munak)**
- 2. Functional Water Treatment Plants: 10**
- 3. Ranney Wells & Tube Wells: 16 & 4500 respectively constitute 80 mgd water**
- 4. Primary Under Ground Reservoir & Booster Pumping Stations: 117**
- 5. Water Line net work: 14350 Km.**
- 6. System of tariff : Volumetric**
- 7. DJB was meeting its O & M costs till 2015**

Sewerage Infrastructure:

- **Waste Water Treatment Capacity:36 WWTP at 23 Locations, capacity of 604 MGD.**
- **7000 km of sewer network.**
- **Recycled water use for non-potable purposes i.e. irrigation, horticulture, washing, power plant etc. : 142 MGD**



Some Facts.....

- Delhi has a very diversified growth pattern.
- Broadly development in Delhi can be classified in two categories:
 - ✓ Planned Areas
 - ✓ Unplanned colonies, JJ Clusters & Rural/ Urban Villages
- Delhi has about 50% of unplanned growth where water & sewerage facilities are provided after inhabitation has taken place.
- Providing water and sewerage facilities in unplanned areas is a challenging task because of legal issues, high population density, limited water resources and geographical constraints to provide the water supply and sewerage infrastrucutures.

3. ACHIEVEMENTS

1. Water production increased from 830 to 900 mgd WTPs at Okhla, Dwarka & Bawana commissioned
2. Reclaimed 45 mgd water from process waste.
3. 117 Under Ground Reservoirs & Booster Pumping Station set up to ensure equitable and rationalize water supply.
4. Awarded in the category 'Water Performance Initiative' in April 2014 at Paris by Global Water Intelligence.
5. Interceptor sewer has been selected as one of 100 prestigious global projects by survey done by KPMG.
6. Water ATM project awarded by Water Digest as a best water management system in water deficit areas.
7. Award for best utilization of recycled water for the year 2015-16.



3. ACHIEVEMENTS

7. By making efficient conveyance system for raw water i.e. CLC & Twin Main, more than 90 mgd raw water has been saved resulting into commissioning of three water treatment plants at Dwarka: 50 mgd, Bawana: 20 mgd and Okhla:20 mgd
8. Revenue Management System in place for online applications related to water bills.
9. M-Seva App introduced for uploading meter reading, creation of water bill and deposit through this app
10. 96 District Meter Areas set up in house for water accounting.
11. Old PSC mains are being replaced for reducing water loss

Consumers facilitation

REVENUE MANAGEMENT SYSTEM:

- 24x7 online services by DJB for consumers to avail facilities of online bill payment, download forms, apply for new connection & mutation etc.
- Consumers can also update their mobile numbers to get SMS alerts for different services.

COMPUTERIZED COMPLAINT MANAGEMENT SYSTEM:

- This is a centralized 24x7 Call Centre, with a Computerized Complaint Management System, to provide quick and speedy redressal to the public grievances.
- Consumers can call at the call centre **toll-free number 1916** and lodge all types of complaints related to water issues, sewer issues or any other problems.
- DJB has launched a unique Mobile Application for the convenience of its consumers. The application comes with a provision to upload suggestions/complaints along with photographs related to Dirty water, Leakage of water, Sewer over-flow, Missing manhole covers on DJB's website.

So what?

1. Gap between demand and supply of water
2. Intermittent and Inequitable water supply
3. High NRW
4. Silt and Sludge disposal, a great problem
5. Water bodies are most polluted in
contamination
of ground water
6. No O&M full cost recovery
7. ERP is yet to be introduced
8. GIS is partly utilized



4. Sources of fund of DJB

1. Funds from Govt. of NCT of Delhi/Govt. of India in the form of Loan and Grants in Plan Head
2. Externally Aided Projects, Loan/Grant from JICA/ADB/World Bank etc.
3. Plan Head, Loan is received for the projects where recovery of user charges to some extent is possible from public
4. Grant is provided in the sector where recovery of user charges is not possible

BUDGET 2016-17

DJB Budget

(4250.63)

Rs. Crore

Plan

(1755.00)

Non-Plan

(2495.63)

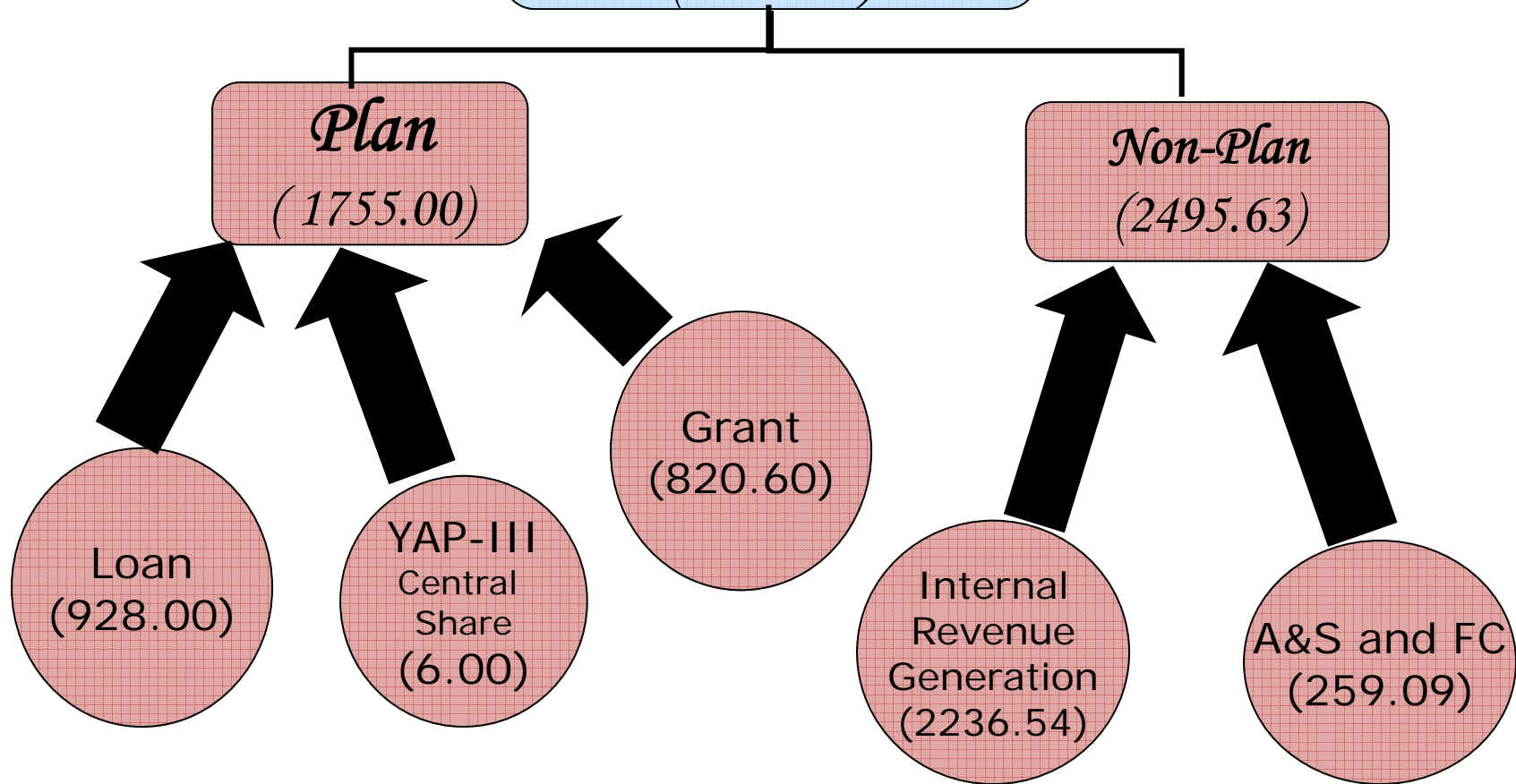
Grant
(820.60)

Loan
(928.00)

YAP-III
Central
Share
(6.00)

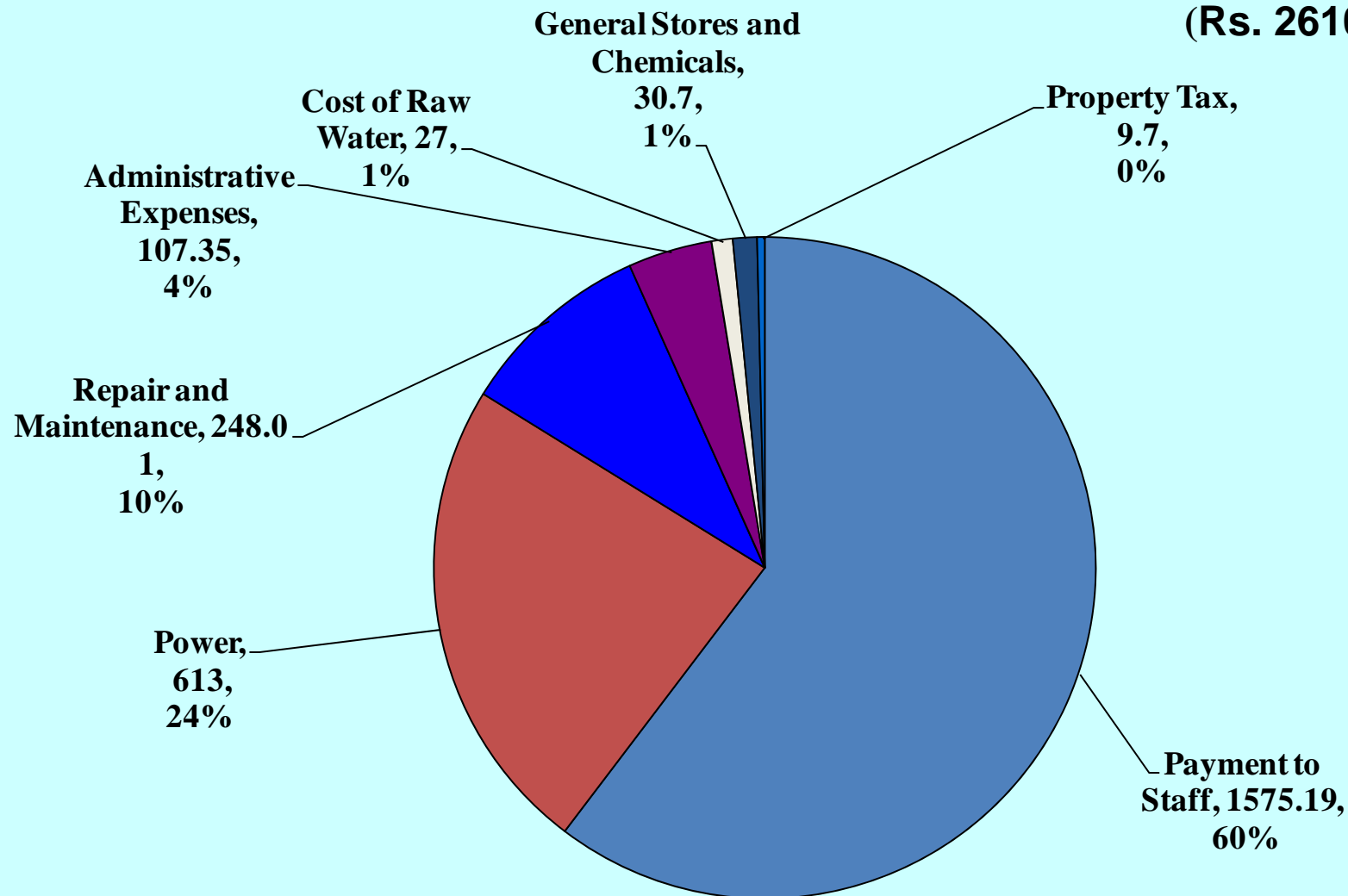
Internal
Revenue
Generation
(2236.54)

A&S and FC
(259.09)



EXPENDITURE 2016-17 (RE)

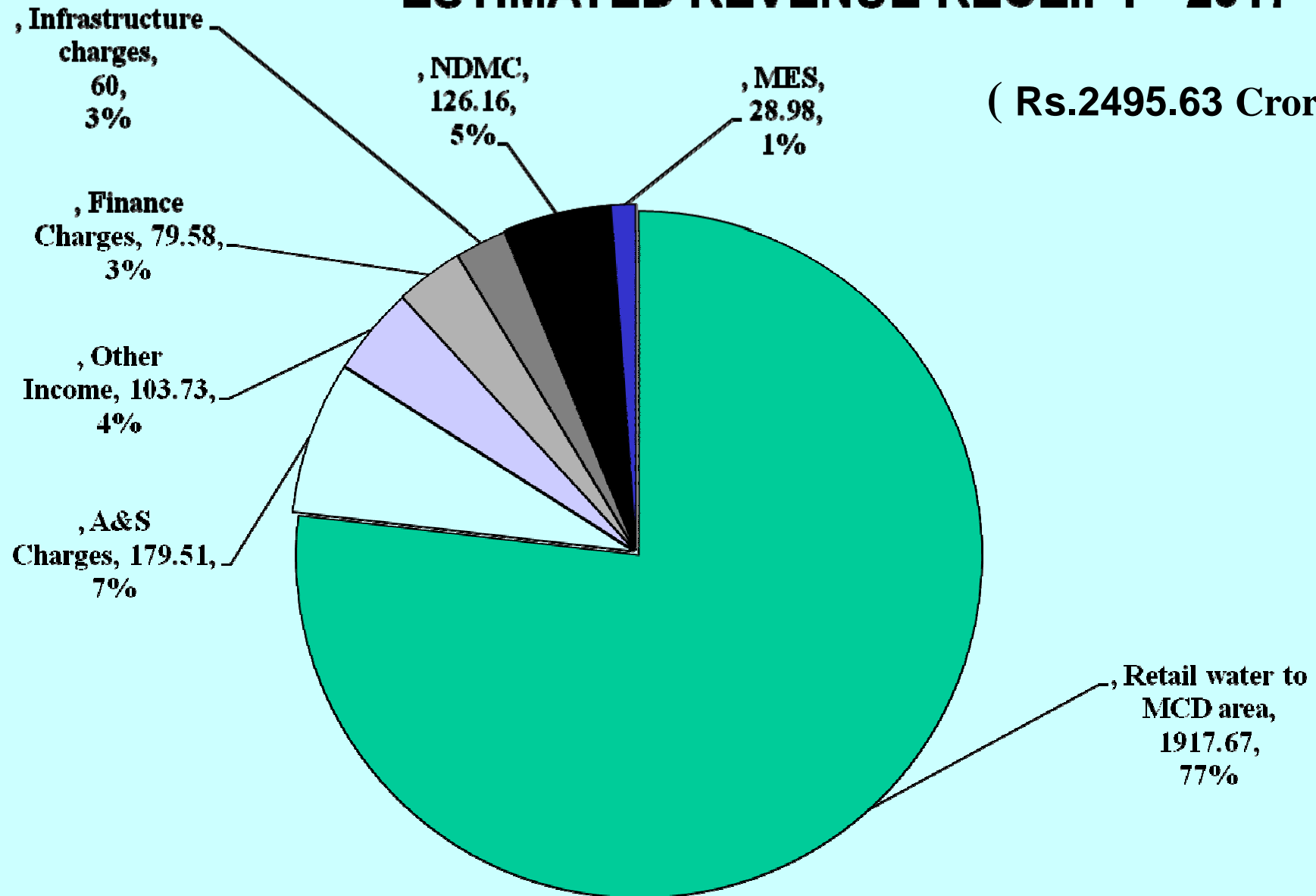
(Rs. 2610.95 crore)



* This is excluding of Interest on loan Rs. 3059.41crore payable for 2016-17 and LPSC Rs. 249.07crore

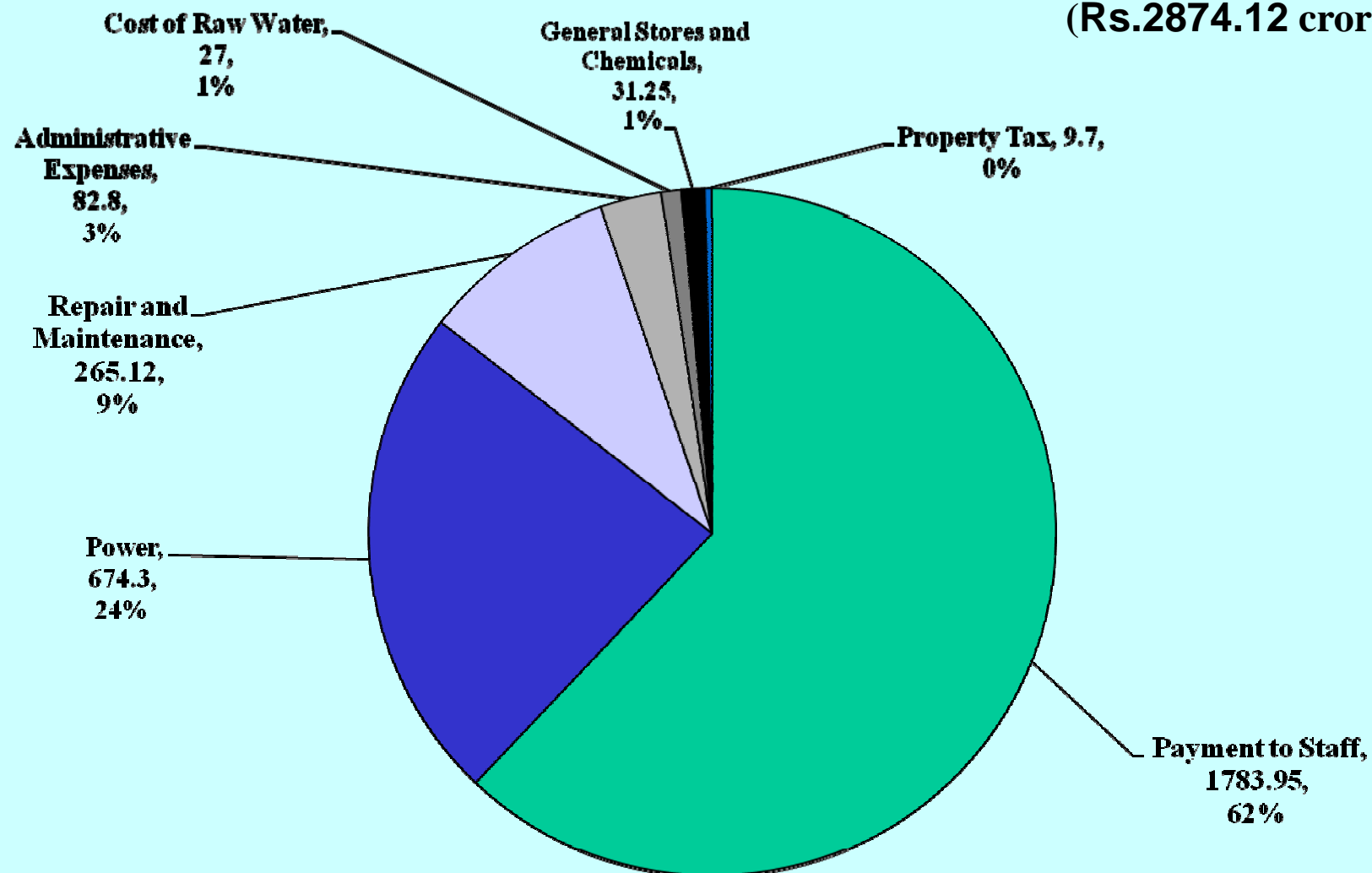
ESTIMATED REVENUE RECEIPT 2017-18

(Rs.2495.63 Crore)



ESTIMATED EXPENDITURE 2017-18

(Rs.2874.12 crore)



* This is excluding of interest on loan Rs. 3155.01 cr payable for 2017-18 .

Additional Income Resources

1. Achieved 70,000 unit per day thereby revenue saving of Rs. 8 crore in the current financial year.
2. 142 locations selected for installation of Solar Panel to generate additional 20 MW solar power generation . Rs. 38 lac per month saving in energy bill is estimated.
3. Rent received Rs 1.21 Cr for 98 locations for mobile towers in phase I. For second phase case is also in process.
4. To rent Office Buildings.
5. To Rent out Vacant Premises for ATMs/Bank Branches case is also under process

New Policies introduced by the Delhi Govt. which has reduced income

- 1. Free water supply :-** The Domestic consumers of Delhi Jal Board consuming water upto 20 KL per month will be exempted from payment of water bill w.e.f. 01.01.2014 for functional meters.
- 2. Water & Sewer Development Charges:** reduced from Rs 494/- to Rs 100/- per sq. m.
- 3. Penalty for unauthorized connections:** Penalty for regularization of water connection has been reduced from Rs 33000/- to Rs 1800/- only
- 4.** For ease of doing business, the water & sewerage infrastructure charges for commercial use have been reduced drastically .
- 5.** Old arrears upto November 2016 has been exempted

5. Scenario

Current status:

From surface: 820 MGD

From ground : 80 MGD

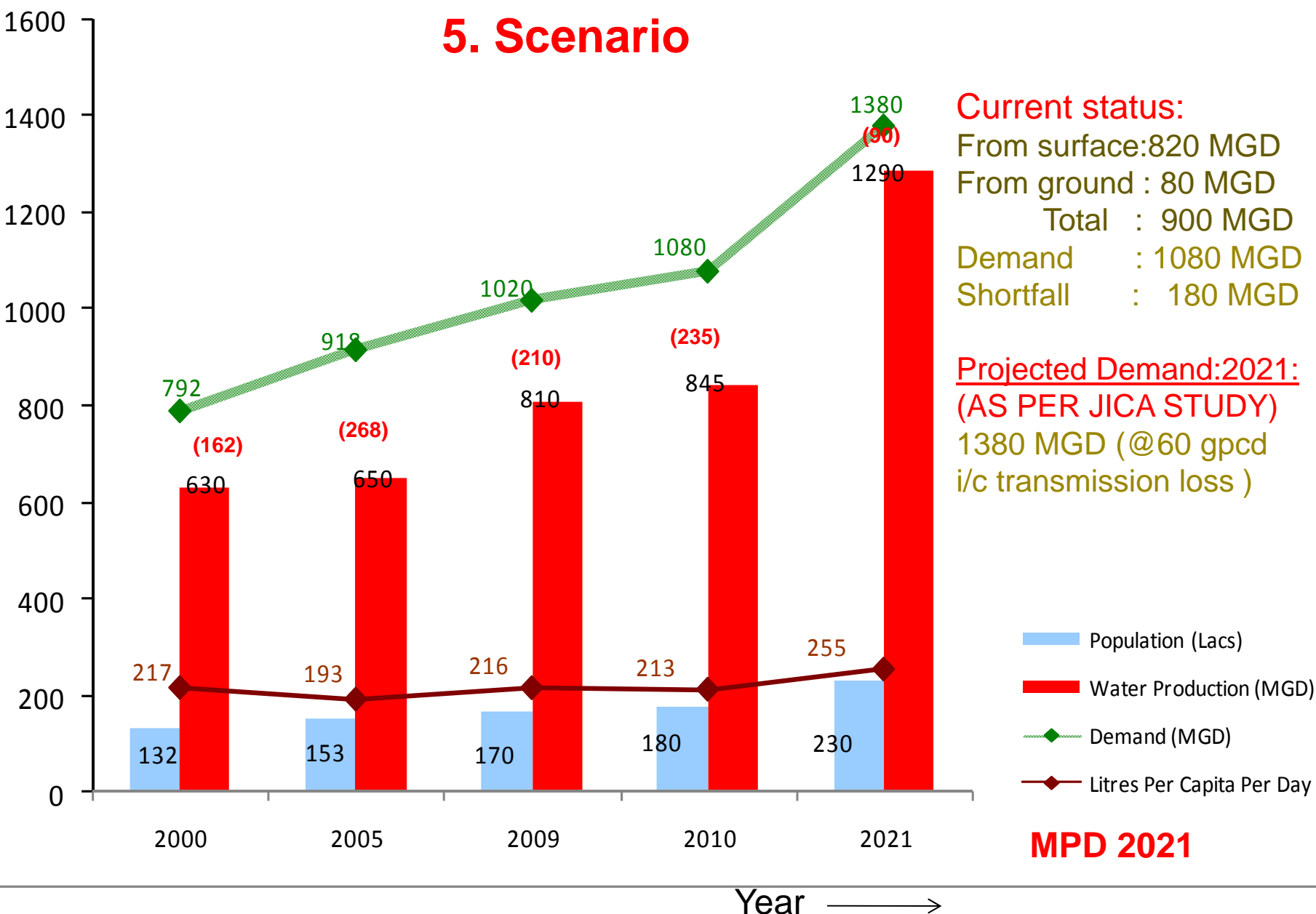
Total : 900 MGD

Demand : 1080 MGD

Shortfall : 180 MGD

Projected Demand: 2021:
(AS PER JICA STUDY)

1380 MGD (@60 gpcd
i/c transmission loss)



Where are we?

Performance Indicator	Benchmark (CPHEEO: MoUD)	Current Status DJB
Coverage	100%	82 %
Per Capita Supply of Water (lpcd)	135	204
Extent of Metering	100%	65%
Efficiency in Complaint Redressal	80%	73 %
Extent of Non-revenue Water	15%	45%
Quality of Water Supplied	100%	99%
Cost Recovery	100%	100%

Water Treatment Capacity and Source

S. No.	Name of WTP	Installed Capacity /Production i/c Rec. Plants (MGD)	Source of Raw Water
1.	Sonia Vihar	140 / 142	Upper Ganga Canal
2.	Bhagirathi	100/107	Upper Ganga Canal
3.	Chandrawa-I&II	98/95	River Yamuna
4.	Wazirabad- I,II&III	120/135	River Yamuna
5.	HaiderPur - I&II	220/226	Yamuna and BBMB
6.	Nangloi	40 /42 (Cum. Total- 718)	BBMB
7.	Okhla	20/20	Raw water from Munak Canal
8.	Bawana	20/15	
9.	Dwarka	50 /44	
10	Commonwealth games village	1/1	Ranney well
11.	Recycling Plants	45 (Cum. Total- 853)	Process waste water in the existing plants
12.	Ranney Wells & Tube Wells	80 (Cum. Total- 933)	Ground water

Overview

1. Delhi Jal Board supplies bulk water to NDMC (28 mgd) and Delhi Cantonment Board (8-10 mgd) and further distribution is made by these authorities under their respective jurisdictions.
2. 100% population has access to safe drinking water in Delhi in one form or the other through water network, tube wells and water tankers.
3. 82% households have access to piped water supply. Remaining population is served through tube-wells, hand-pumps and water tankers services.
4. 50% of the total area of NCT of Delhi is sewerred.



Future source of water

- Yamuna basin has not been optimally utilized.
- 75% of the water flows during the monsoons are wasted due to lack of adequate storage.
- The proposals for following dams have been pending for years for want of clearances.
 - a) Renuka Dam (River Giri-Himanchal Pradesh).
 - b) Kishau (River Tons-Uttarakhand).
 - c) Lakhwar Vyasi (River Yamuna-Uttarakhand) .
- These dams have been declared as National Projects which are monitored by Ministry of Water Resources, GOI.

6. NEW INITIATIVES/PROJECTS

1. Water Improvement projects through PPP projects
2. External aided projects for water improvement.
3. Revival of water bodies for ground water recharge
4. Comprehensive Plan of Cleaning and uplift of Drains and River
5. Additional water resources by creating new water bodies and storing treated effluent of high quality almost drinking standard
6. Water audit
7. Water ATM & e-pios
8. Use of treated effluent for non drinking purposes.



PPP PROJECTS...best practices

- In 2012, DJB has implemented three pilot projects based on PPP model by out-sourcing management in the command areas of Malviya Nagar UGR, Nangloi WTP and Mehrauli-Vasant Vihar group of colonies.
- In these pilot projects, KPIs (Key Performance Indicators) related to improvement in services have to be achieved in fixed time lines and they are aimed at transforming the present intermittent supply into continuous supply system, reduction in NRW & electricity consumption & quality of water.
- These projects are of 10 to 12 years duration and this year with the improvement in services the water shortage complaints particularly in the PPP project domain areas have come down significantly.

External Aided Projects

JICA funded Project:

1. Command area: Chandrawal Water Treatment Plant: North-Central Delhi
2. Total Population: 2 million
3. Total Funding : Rs 2000 Lac
4. Total completion period: 5 years + water management for 10 years.

ADB Funded:

1. Command area: Wazirabad Water Treatment Plant: North-West Delhi
2. Total Population: 2.2 million
3. Total Funding : Rs 2200 Lac
4. Total completion period: 5 years+ water mgt for 10 years

Revival of Static Water Bodies



Before



After

Revival of Flowing Water Bodies





Decentralized Water Disbursing Units

- Bore-well water is passed through pre-filtration unit (a carbon cartridge filter) and then through a micro filtration cartridge. It is further passed through RO unit filtration using higher pressure. The last part of the treatment procedure is disinfection using ultraviolet (UV) rays.
- Water dispensing units are run by Solar Energy. Hence, no electricity is required
- Purified water is then transported to Water dispensing Units through Stainless Steel Water Tankers. If bore well has high TDS, Filter water is transported to WDU





Water ATMs

- R.O. Plants installed on Bore wells for treatment of ground water in water deficit areas.
- Filtered water is filled up in 1000 litre capacity O.H Tanks.
- ATM Cards are distributed to the residents.
- Water is dispensed through ATM by swiping card maximum up to 20 litres at a time or part thereof.
- Water is charged @ Rs. 0.20 per litre against market rate @ Rs.10 per litre.



Water audit

1. Macro Level: From WTP to the local reservoirs. Bulk flow meters are being installed at all rising mains emanating from each WTP and their all branches
2. Micro Level: From reservoir to individual house service connections which require bulk flow meters and domestic meters. District meter areas are being formed. District meter areas are being formed. Total 1010 DMAs are proposed.

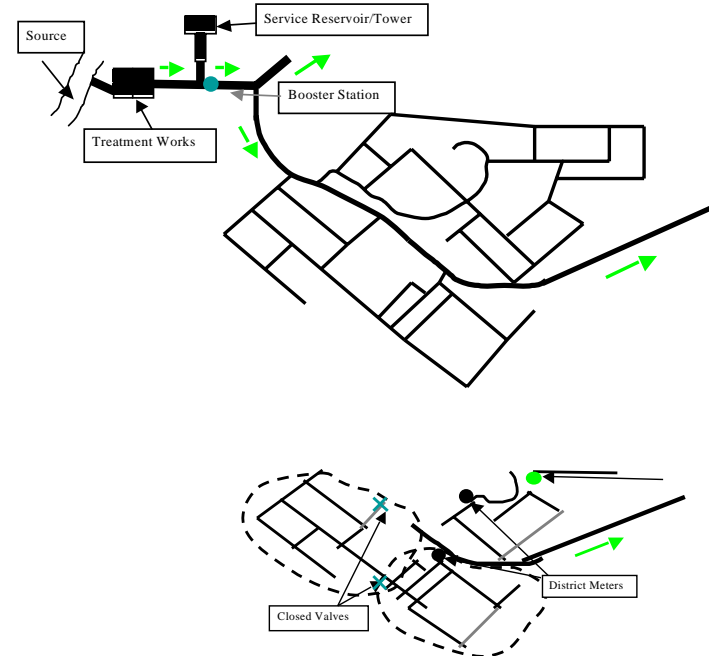
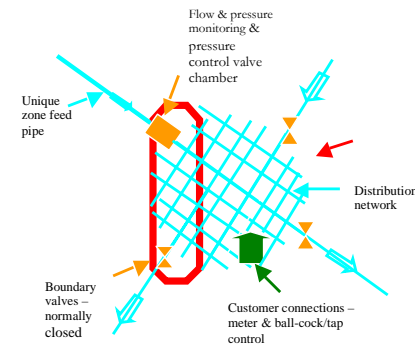


Figure 4.2 – Proposed Distribution System



POTENTIAL USE OF TREATED EFFLUENT

The main opportunities for reuse of treated wastewater in and around the city are considered to be:

1. Irrigation and horticulture.
2. Use as cooling water in the power stations.
3. Industrial use.
4. Construction industries
5. Fire fighting
6. Groundwater recharge,
7. Water bodies
8. Return to the raw water source, and
9. For flushing toilets & washing etc.: Dual pipe system
10. Drinking purpose to some extent as in Singapore-NEW Water (may be Psychologically unaccepted in India)

REUSE OF TREATED EFFLUENT

PRESENTLY USE OF TREATED EFFLUENT: 142.40 MGD

- | | | |
|----|---|------------|
| 1. | Keshopure for irrigation deptt. | : 20.0 MGD |
| 2. | Okhla for CPWD & Irrigation deptt. | : 42.0 MGD |
| 3. | Coronation Pillar | : 35.0 MGD |
| 4. | Delhi Gate & Sen Nursing Home (PPCL) | : 4.4 MGD |
| 5. | Rithala STP for DDA Japanese Park,
Bawana Power Plant & NDPL | : 32.0 MGD |
| 7. | Water bodies under DDA | : 8.0 MGD |
| 8. | Commonwealth Games Village | : 1.0 MGD |

PROPOSAL FOR USING TREATED EFFLUENT: 69.20 MGD

- | | | |
|----|------------------------|------------|
| 1. | Pappan Kalan By DDA | : 20.0 MGD |
| 2. | Okhla Industrial Area | : 2.2 MGD |
| 3. | Power Plant at Bamnoli | : 16.0 MGD |
| 4. | Delhi Cantt. | : 8.0 MGD |
| 5. | MCD for parks | : 3.0 MGD |
| 6. | CPWD for NDMC area | : 20 MGD |

More studies for improvement water resources



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- ▶ Study is being conducted by M/S WAPCOS for reviving of Bhati Mines by taking River water during rains and treated effluent from Okhla STP round the year
- ▶ Storing water in abandoned canals in North & North West district.
- ▶ Proposal of reviving water bodies by channelizing storm water towards water bodies.
- ▶ Setting up sewage treatment plant at the mouth of drains before water bodies and treated water to be stored in water bodies.
- ▶ Promoting Rain Water Harvesting in all over Delhi by incentivize the consumers in water bills



Other Reform Projects

1. Replacement of Old PSC rising mains to reduce water loss
2. Revamping of Raw water conveyance main from Muradnagar to Delhi
3. Non conventional Power generation: Bio, Solar & Hydro Power
4. Revamping of all WTPs with power efficient equipment on PPP model
5. Exploring raw water along Najafgarh drain
6. Treatment of Brackish water in Najafgarh area
7. Setting up Central Monitoring system to integrate all WTPs and BPS
8. Strengthening of GIS.
9. Introducing ERP



Challenges in Water Sector

Remote possibility of adequate raw water from neighboring states. Any idea of new water resource becomes interstate issue

Unplanned growth continues. There is hardly space for laying of services and creating new infrastructures. Hydraulic disturbed



Intermittent & non uniform water supply causing pressure on distribution system and contamination of water.

Old water infrastructure causing inefficiency of service delivery and high O& M cost

High NRW: Leakages &

Unwillingness to pay water bills in illegal colonies/ Faulty meters/ free water



Challenges in Water Sector

Poor enforcement of law: Illegal water connections, online boosters, tampering of DJB water lines

Reluctance to accept efficient meters installations at the consumer end makes water accounting difficult and commercial losses continue.

Water accounting difficult and commercial losses continue till 100% water audit.

Climate change – rainfall patterns more unpredictable, surface water availability less certain, subject to inter-state agreements

Employees are retiring at the fast rates and remaining are more than of average age of 50



Suggestions ?

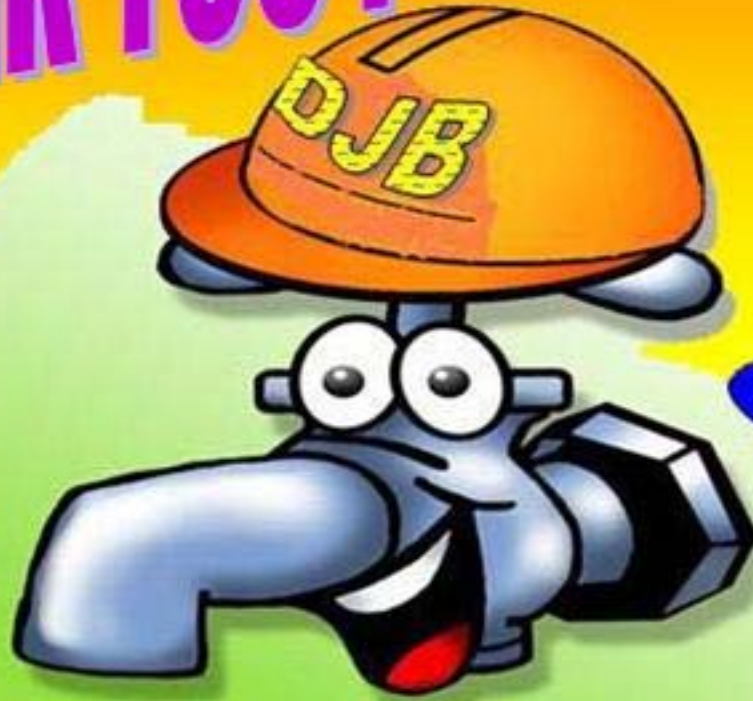


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**ALL EXPERTS
CONSULTANTS &
AGENCIES**



THANK YOU!



Save Water

because every drop matters

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