

## Water CONSERVATION Management in National Capital Region

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**ABSTRACT**-National Capital Region (NCR) which covers an area of 33,578 sq. km comprising of nine districts of Haryana namely Panipat, Sonapat, Rohtak, Jhajjar, Faridabad, Gurgaon, Rewari, Mewat, Palwal; Alwar district of Rajasthan; districts of Uttar Pradesh Meerut, Baghpat, Ghaziabad, Gautam Buddh Nagar, Bulandshaher and NCT Delhi. Total area consists of Urban, Semi-urban & Rural population with present cultivated land of 22216 sq.km. Being proximity to the capital, industrial development is also rapid.

Conservation of water to reducing the usage and recycling of waste water for different purposes such as cleaning, manufacturing, and agricultural irrigation.

### I. BACKGROUND

National Capital Region (NCR) which covers an area of 33,578 sq. km comprising of nine districts of Haryana namely Panipat, Sonapat, Rohtak, Jhajjar, Faridabad, Gurgaon, Rewari, Mewat, Palwal; Alwar district of Rajasthan; districts of Uttar Pradesh Meerut, Baghpat, Ghaziabad, Gautam Buddh Nagar, Bulandshaher and NCT Delhi. Total area consists of Urban, Semi-urban & Rural population with present cultivated land of 22216 sq.km. Being proximity to the capital, industrial development is also rapid.

The objective of the study is to provide a solution to the water requirement for National Capital Region by adopting integrated water resources management (IWRM) approach, IWRM is a process which promotes the co-ordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-systems

### II. WATER DEMAND

Norms for Calculation of Water Demand:

#### Domestic

- NCT-Delhi @225 lpcd
- Towns having population  $\geq$  1 lakh @ 200 lpcd
- Towns having population < 1 lakh @ 135 lpcd

#### Industrial

Industrial demand assessment is calculated on the basis of norms prevalent in states:

- Rajasthan - 11.23 KL/day/ha of industrial area

- UP & Haryana - 45.00 KL/day/ha of industrial area developed

-NCT Delhi - Additional 45 KL/day/ha - 47 lpcd on domestic demand

#### Agricultural

Irrigated agricultural water demand has been estimated on the basis of average water usage of 4.8 to 7.2 MLD for 4.04 sq. km of agricultural land. Cropping intensity has been projected as 1.5 to 1.75 for different districts in the NCR for coming years.

NET WATER DEMAND FOR THE YEAR 2031

USES	Net Water Demand in MCM		
	2011	2021	2031
Domestic	3107	4137	5557
Industrial	1681	1996	2440
Agricultural	18221	18292	18699
<b>Total</b>	<b>23009</b>	<b>24425</b>	<b>26696</b>

### III. WATER CONSERVATION MANAGEMENT:

Considering various constraints and involvement of huge cost, following are the recommendations which can fulfill the water demand for 2031.

#### A. Construction of Infra-Structures

The proposed multipurpose projects under various stages of investigations, planning & design and are lacking behind due to crunch of funds and recommended their completion early.

#### B. Construction of Sewage Treatment Plants

Latest Technology is recommended to treat sewage so that treated water can be used for non domestic purpose such as agriculture, horticulture, Gardening, Construction,

Cooling Tower Make up, Washing - Cars, Buses, Train coaches, Toilet flushing, Irrigation, Chillers etc.

#### *C. Law for Encouraging Rain Water Harvesting Structures*

It should be made mandatory by amending building by laws in National Capital Region. It should cover all the existing and new buildings to provide rain water harvesting facilities. Also, a Bill to regulate and control the Development and Management of Ground Water and matters connected therewith or incidental thereto.

#### *D. Law for Private Sewage Disposal*

It should be made mandatory by amending building by laws in NCR region for institutions, shopping complexes, malls and hotels etc. that they should treat their sewage by constructing Sewage Treatment Plant so as to reduce the load on municipal sewer.

#### *E. Revival of Water Bodies*

Every village and town in various districts of NCR has at least one small pond. Over years, the ponds in urban areas have become eutrofied. Revival of these water bodies is proposed for effectively utilization of the available capacity of these surface ponds and storages. This will also help to increase ground water recharge.

#### *F. Dual Pipe System*

All new development areas should have two distribution lines, one for drinking water and other for non-drinking water/recycled treated waste water to increase the quantity of water.

#### *G. Metering and Sub-Metering*

Bulk meters should be provided at the source, treatment plant, transmission main, reservoirs, distribution system, etc. Water audit should be carried out from the source up to consumer by providing water meters. Regular monitoring and mitigation for leakage should be undertaken. All the connections should be metered and public stand posts should be discouraged as far as possible. Existing public stand posts should be phased out.

Sub-metering is used in units such as apartments and trailer homes to indicate water use by those individual units; the entire complex of units is metered by the main supplier.

#### *H. UFW Losses Control*

The existing GI/ HSC pipes in the water supply system should be replaced by High Density Polyethylene Pipes (HDPE) in phased manner in order to reduce the leakages. In all new connections, for distribution system, preference should be given for use of HDPE pipes and for transmission Mild Steel (MS) or Glass Fiber Reinforced Plastic (GRP).

It is suggested to adopt SCADA in public water supplies to reduce UFW Losses (Physical and Non physical). After implementation of SCADA efforts should be made to shift the supply of water from intermittent to continuous (24x7).

Separate leak detection cell must be created by the State Governments and their implementing agencies for monitoring UFW losses as well as losses due to theft / commercial losses. An appropriate system in this regard

should be developed to facilitate public for reporting such complaints.

#### *I. Adoption of Water less Urinal*

It should be adopted at Institutions, Shopping Complexes, Public Places, Theaters, Hotels and similar buildings etc. which will help to conserve water.

Or Adoption of Low Flush Toilets or Toilet Displacement Devices (Plastic cold drink bottles can be filled with water or pebbles and placed in a toilet tank to reduce the amount of water used per flush).

#### *J. Tariff*

Tariff should be rationalized on progressive consumption basis, with higher tariff for higher consumption and accordingly, reforms in this regard should be carried out.

Similarly, provision should also be made for upkeep of sewage treatment plants/sanitation in the cities. Revenue earned from commercial and industrial users could be utilized for augmentation and replacement.

#### *K. Residential Water Audit Programs*

Residential water audit programs involve sending trained water auditors to participating family homes, free of charge, to encourage water conservation efforts.

#### *L. Industry*

Regulation should be made to use four wheeler when minimum two persons are travelling in the four wheeler. And during day time (peak hours) three persons should be made mandatory in four wheeler, resulting in lesser production, cleaning and washing. This will improve environment as well as save good quality of water.

#### *M. Zero Discharge Industry*

All the water requirements for non-drinking purposes in big hotels, industrial units, air-conditioning of large buildings/institutions, large installations, irrigation of parks/green areas and other non-potable demands should be met through treated waste water with permissible limits as per norms. Necessary enabling provisions in the respective acts of the local bodies may be made.

#### *N. Old pumps and motors*

Change old (after expiry of practical life) deteriorated pumps and motors for lesser losses.

#### *O. Agricultural - Drip & Sprinkler Irrigation Techniques*

Encouragement to farmers to adopt Drip Irrigation Methods and Sprinkler Irrigation Methods should be made. For implementation of these methods in phased manner necessary support (technical & financial) need to be provided.

#### *P. Industry Farmer Partnership*

This may be taken up on pilot basis in each region of NCR. Allot one district area to one industry & industry management should finance all the equipment & motors to the farmers. Educate them for advanced methods to get higher yields of high quality by consuming less water. For

this, Govt. should wave off some of the taxes of industries. The profit in terms of yield will be shared between farmer and industry on mutually agreed terms and conditions.

#### *Q. Horticulture*

Plantation of eucalyptus and popular tree etc. should be banned in over exploited area of NCR.

#### *R. Ban on Discharging Waste Water to Water Bodies*

Discharge of un-treated waste water into rivers should be avoided / banned. Fresh water should not be used for irrigation purpose if treated waste water is available. Treated waste water could be supplied for agricultural farms and equal quantity of raw water being provided to agricultural usage be diverted to the river for fresh water flow in the river. This will improve environment as well as provide good quality of water to downstream towns of the river.

#### *S. Ground Water Recharge*

Ground water should not be extracted from over-exploited areas. As far as possible, water supply should be made from surface water resources and ground water from flood plain aquifers. Recharging of aquifer should be taken up immediately by constructing suitable rain water harvesting structures such as recharge pits, recharge trench, recharging dug wells, recharge shaft, shaft with recharge well, trench with recharge well, check dam and percolation tanks. All Opportunities should be utilized to recharge ground water as proposed by Govt. under various schemes.

#### *T. Prevention of Storm Water Drains from Pollution*

Measures should be taken to prevent the use of storm water drains for conveying sewage and dumping of solid wastes and sludge in open drains. Unauthorized development/encroachment/slum dwellings in the drainage system should be prohibited.

#### *U. Law for Population Control*

Growth of population gives adverse impact on all development activities as well as on natural resources like land, water & environment. Therefore it is suggested to adopt family planning measures rigorously by telecasting and broadcasting on T.V. and Radios.

One house scheme (i.e. Law for only one house to each nuclear family) should be adopted to save precious agricultural land.

There should be a universal law to have one child in spite of all caste, creed religion etc. Due to increase of population the usage of valuable agricultural land is decreasing though this is the only great source for food security.

#### *V. Private Partnership of NRI's*

Involvement or participation of NRI's to improve the Water Supply and Sanitation conditions in their native places / villages / towns etc. can be attracted by Govt. by giving them special rewards / tourism facility / mass publicity etc.

#### *W. Mass Awareness*

- It should be made mandatory that all T.V./Radio channels should telecast/ broadcast daily program for adoption of water saving methods to bring the attitudinal & behavioral changes in the common man, to build the character of people to adopt the conservation ways & means to reduce the use of water.
- Introduction of new syllabus at school level.
- Capacity building of people by organizing programmes competitions arranged by local municipal bodies to conserve water.

#### REFERENCES:

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