

# RAINWATER HARVESTING IN NTPC LARA

- **NTPC LARA SUPER THERMAL POWER STATION (2X800 MW)**
- **NET WATER POSITIVE TOWNSHIP**  
(Efficient, Sustainable, and Smart Solutions for Water Management)

Presented by: Dr. SUDHIR DAHIYA



# Project Summary



<b>Approved Capacity</b>	Stage-I : 2x800 MW ( Both Units commercial operation commenced)
<b>Proposed Capacity</b>	Unit#1: 01.10.2019 & Unit#2: 07.11.2020
	Stage-II : 2x800 MW (Both Units are under Construction phase)
<b>Location</b>	24 km from Raigarh, Chhattisgarh.
<b>Water Requirement</b>	Stage-I:45 MCM
<b>Water Source</b>	Mahanadi river from Saradih Barrage (36 kms from Plant).
<b>Coal Source</b>	Talaipalli captive mine(65 KM from plant). Coal blocks allotted to NTPC. [Approx 7.0 MTPA coal required for Stage-1 (at 90% PLF)]. Coal block allocated to NTPC by MoC on 25.01.2006.
<b>Beneficiary States</b>	Chhattisgarh state: Home state (As per MOU signed on 12.07.09, 50% Power demanded) - (approved by Gol vide letter dtd 17.01.11). Balance to other states. Tentative allocation: Gujarat-186 MW, MP-181 MW, Goa-15 MW, DD-21 MW, D&NH-75 MW, Maharashtra-290 MW, Unallocated-30 MW (Allocation by MoP)
<b>Power Evacuation</b>	Lara -Raigarh (Kotra) 400 kV D/C line Lara -Champa 400 kV D/C line
<b>Nearest rail Head</b>	Raigarh , 24 KM from plant.
<b>Nearest airport:</b>	Jharsugura 80Kms, Raipur 250 kms.



# NTPC WATER POLICY

“Committed to become one of the most water efficient power company globally by generating more power per drop”

## OBJECTIVES:

1. To be amongst the least water intensive power generator globally
2. To ensure right quality of water all the time along its operations
3. Endeavor to achieve positive water footprints in NTPC Townships



# NTPC RAINWATER HARVESTING POLICY

## Objective:

“To promote the installation and periodic upkeep of Rainwater Harvesting system in locations of and near to NTPC establishments.”

## PRINCIPLES:

1. Rainwater harvesting (RWH) system, though functional only for a brief duration in a year, is useful as a secondary source of water
2. Adoption of right combination of superior state-of-the-art technologies and global best practices shall increase the quantity and quality of harvested rainwater
3. Provision of accountability for all locations and mechanism to respond to any aberration from the policy objectives shall yield superior results
4. Promotion of RWH through inclusiveness, capacity building and regular knowledge sharing with concerned stakeholders shall result in capturing of increased quantity of rainfall that would have gone unused otherwise



# CEO Water Mandate (UN Global Compact)



## First Indian Power Company Signatory of CEO Water Mandate

Adani Energy Solutions Limited	Electricity	India	2024
Adani Ports and Special Economic Zone Limited	Industrial Transportation	India	2020
Banka BioLoo Pvt Ltd	Gas, Water & Multiutilities	India	2014
Classic Paints	Chemicals	India	2024
Eka Jal Private Limited	Gas, Water & Multiutilities	India	2022
HCLTech	Software and Computer Services	India	2023
Hindustan Zinc Limited	Industrial Metals & Mining	India	2020
Infosys Ltd	Software & Computer Services	India	2014
Maithri Aquatech	Gas, Water & Multiutilities	India	2022
Maithri Aquatech	Gas, Water & Multiutilities	India	2020
Norex Flavours Pvt. Ltd.	Food Producers	India	2024
NTPC Ltd	Electricity	India	2021
PGP Glass Private Limited	Packaging	India	2024
PrediQt Business Solutions Private Limited	Software & Computer Services	India	2024
Tata Steel	Industrial Metals & Mining	India	2010
Tech Mahindra	Software & Computer Services	India	2020
UPL Limited	Chemicals	India	2023



# CEO Water Mandate (UN Global Compact)



## The CEO Water Mandate's six core elements:

### **DIRECT OPERATIONS**

Mandate endorsers measure and reduce their water use and wastewater discharge and develop strategies for eliminating their impacts on communities and ecosystems.

### **SUPPLY CHAIN AND WATERSHED MANAGEMENT**

Mandate endorsers seek avenues through which to encourage improved water management among their suppliers and public water managers alike.

### **COLLECTIVE ACTION**

Mandate endorsers look to participate in collective efforts with civil society, intergovernmental organizations, affected communities, and other businesses to advance water sustainability.

### **PUBLIC POLICY**

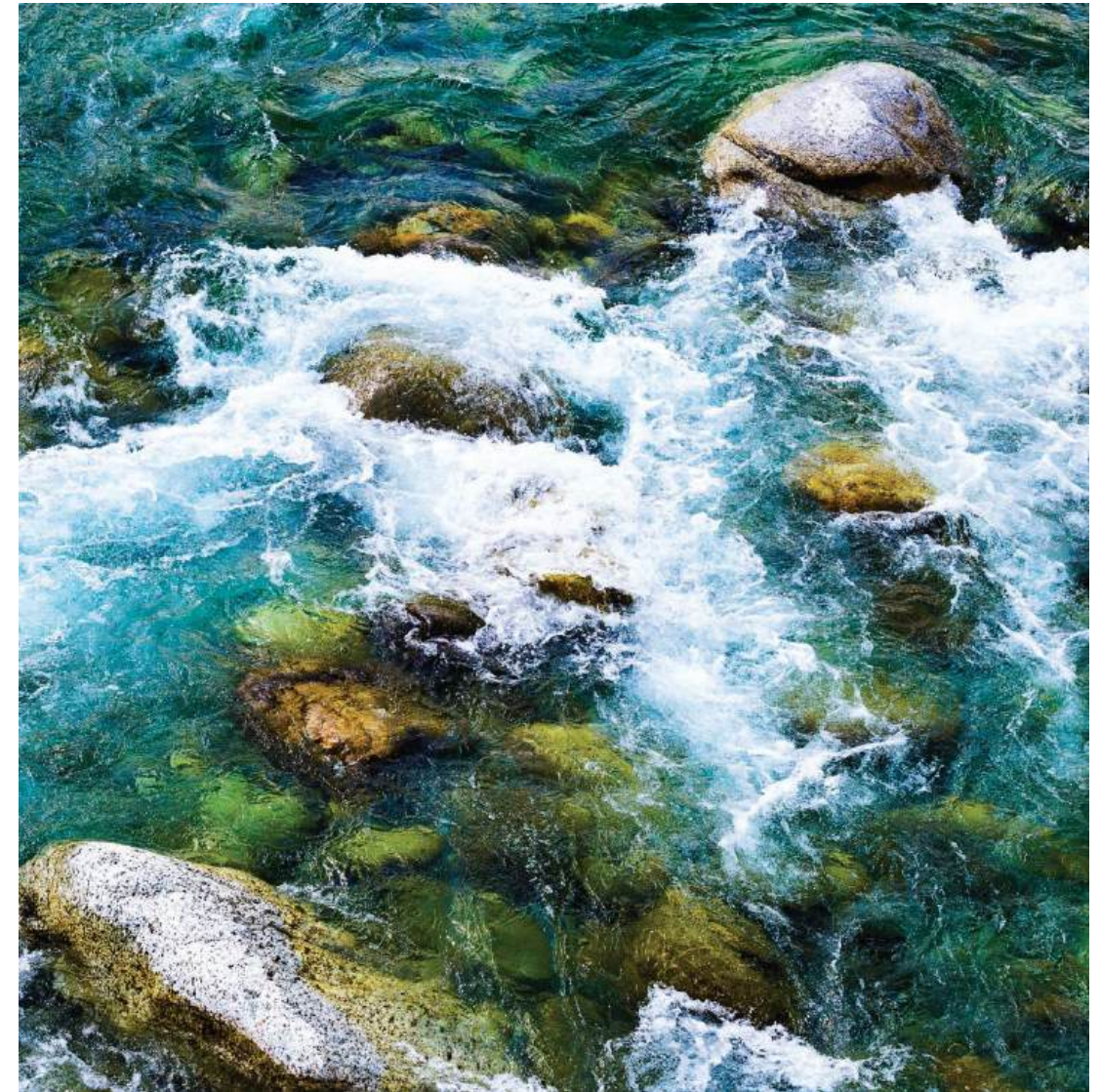
Mandate endorsers seek ways to facilitate the development and implementation of sustainable, equitable, and coherent water policy and regulatory frameworks.

### **COMMUNITY ENGAGEMENT**

Mandate endorsers seek ways to improve community water efficiency, protect watersheds, and increase access to water services as a way of promoting sustainable water management and reducing risks.

### **TRANSPARENCY**

Mandate endorsers are committed to transparency and disclosure in order to hold themselves accountable and meet the expectations of their stakeholders.



# Net Water Positive Township

NTPC Lara: A Case Study



As per NTPC Rainwater Harvesting Policy, where there is more than 1000 mm of rainfall, Water Collection shall be done by Surface Storage.

Surface storage and reuse is more useful. Ground water recharge is a slow process.



# Project Details: Storage Capacity & Infrastructure



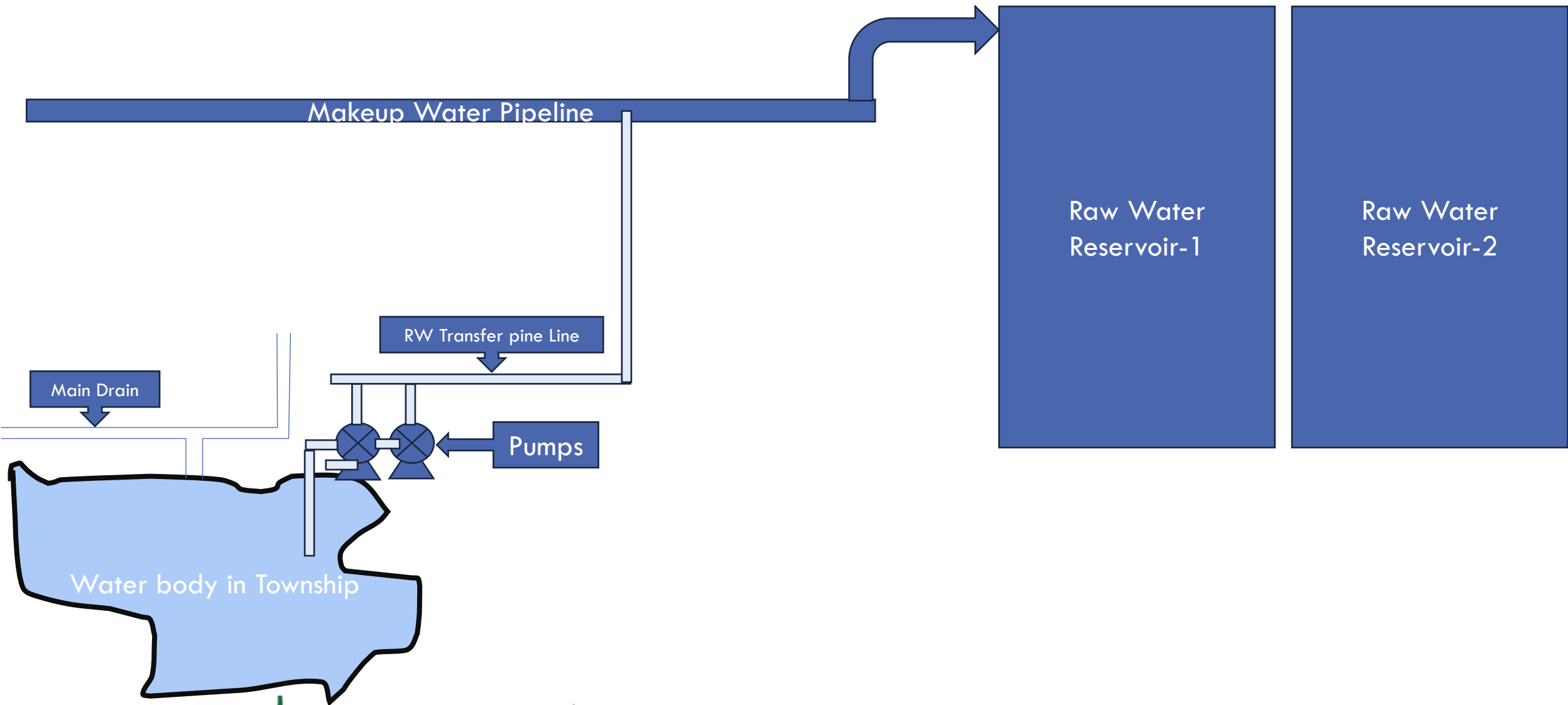
Financial Year	RWH Potential of NTPC Lara Township	Actual Storage of water
2024-25	3,00,112 cubic meter (As per study conducted by National Institute of Hydrology)	2,92,712 cubic meter

## Components of Rainwater Storage:

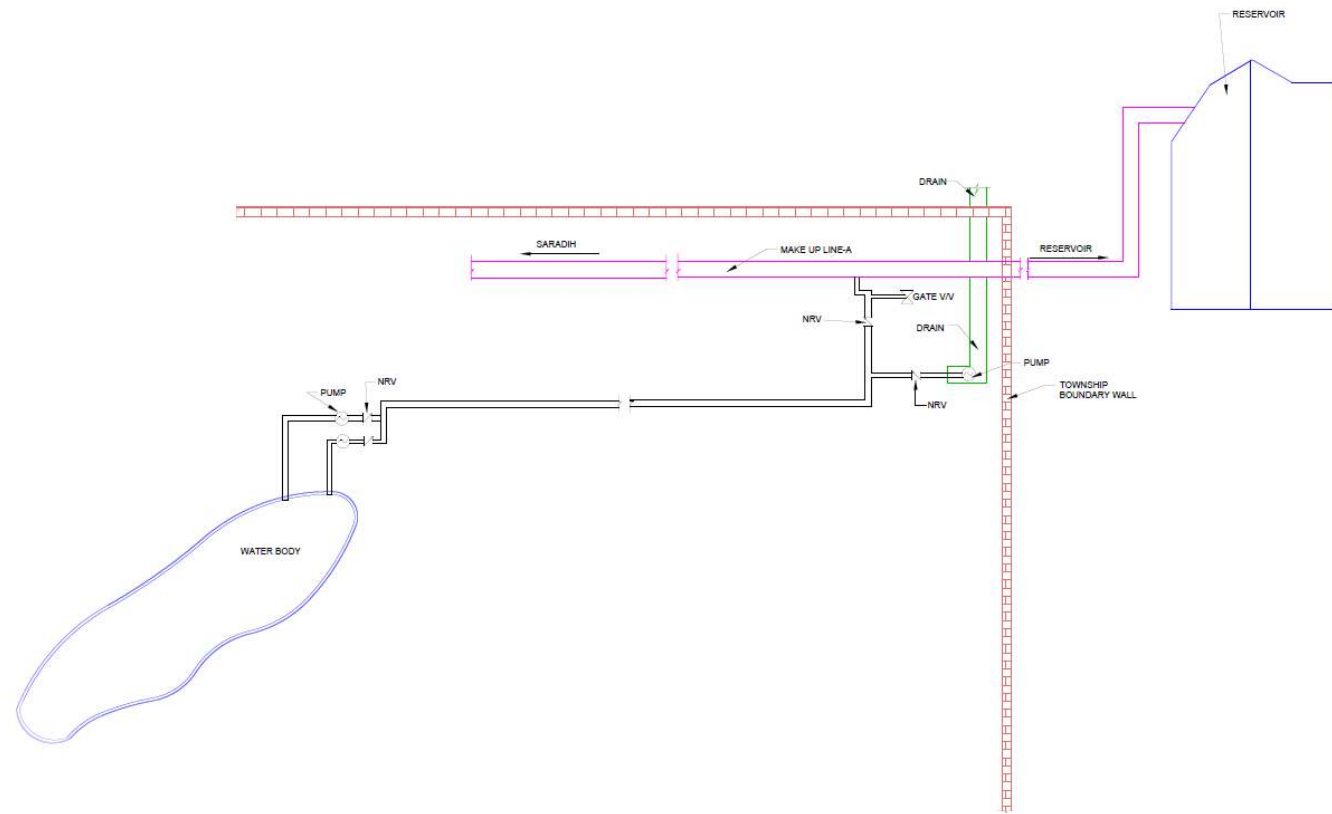
Sr. No.	Type of Storage	Amount of water stored
1	<b>Township master drain connected to water body for collecting rainwater, then this water is pumped to reservoir.</b>	1.66 LCM (Lakh Cubic Meter)
2	<b>Simultaneously rainwater is also lifted from the master drain and taken to reservoir.</b>	1.047 LCM (Lakh Cubic Meter)
3	<b>Rainwater harvesting through RWH pit</b>	0.22 LCM (Lakh Cubic Meter)
	<b>Cumulative Total Rainwater Harvesting</b>	2.927 LCM (Lakh Cubic Meter)



# Storage Capacity & Infrastructure at NTPC Lara Township



# Storage Capacity & Infrastructure at NTPC Lara Township



<b>NTPC</b>	<b>NTPC LIMITED</b> (A GOVERNMENT OF INDIA ENTERPRISE)
PROJECT-	LARA SUPER THERMAL POWER PLANT
TITLE-	FACILITY FOR TRANSFERRING SURPLUS WATER FROM TOWNSHIP WATER BODY TO RESERVOIR



Before Renovating the waterbody



After Renovation of waterbody

Township Waterbody Storage Capacity – 88500 m<sup>3</sup>



## WATER BODY IN TOWNSHIP

# RAINWATER HARVESTING PITS

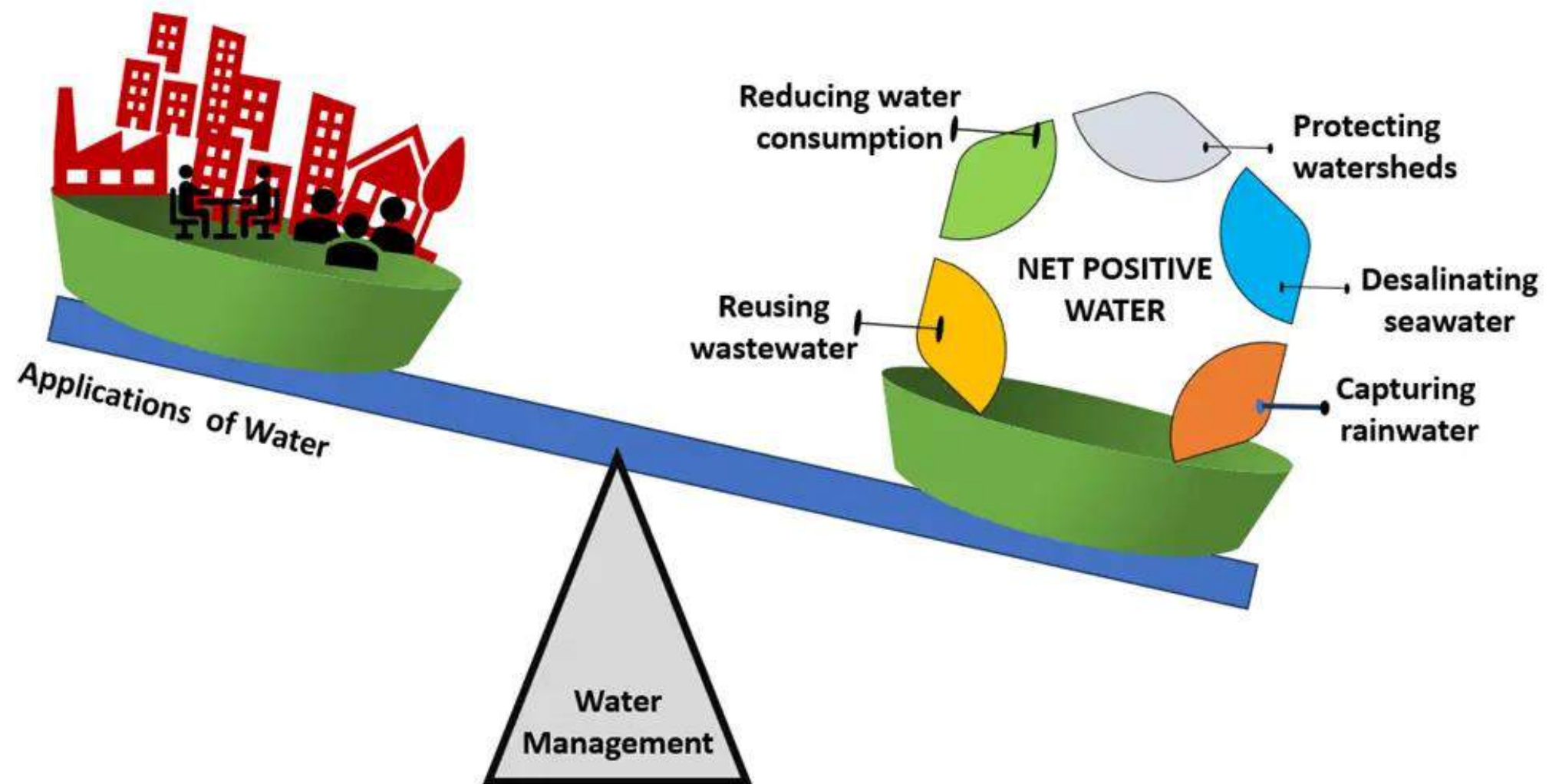


# Rainwater Utilization Efficiency

Financial Year	RW Harvesting Potential (M <sup>3</sup> )	Actual Usage of water
2024-25	3,00,112 cubic meter (As per study conducted by National Institute of Hydrology)	2,92,712 cubic meter
Efficiency of Storage		<b>97.53 %</b>
Utilization Efficiency of harvested RW (Storage water is sent to Reservoir)		<b>100 %</b>



# Net Water Positive Township



# Criteria for certification for "Net Zero Water Rating"

Rating level	Compliance Requirement
Near Net Zero Water	WPR $\geq$ 0.75 (Or) WPR $\geq$ 0.5 and WBS $\geq$ 0.75
Net Zero Water	WPR $\geq$ 0.5 & WBS $\geq$ 1.0
Net Water Positive	WPR $\geq$ 0.75 & WBS $\geq$ 1.25

WPR – Water Performance Ratio; WBS – Water Back to Source

\*<https://igbc.in/igbc-net-zero-water-rating>



# Rainwater Potential Utilization Efficiency



Sr. No.	Storage/Usage of Rainwater Harvested	Amount of Water Harvested/ Utilized
1	Total Water Stored	2,92,712 Cubic meter
2	Actual Usage of Water	2,26,731 Cubic meter
<b>Net excess of Water (Net Water Positive)</b>		<b>65,981 Cubic meter</b>

## NET WATER POSITIVE TOWNSHIP



Rainwater harvested Quantity/Usage of Rainwater Harvested

■ RW Harveted Quantity (Cubic meter)

■ Annual Water Utilization in T'ship (Cubic meter)



# Sewage Treatment Plant



- Capacity of STP- 1700 kLD (kilo Litre per day) MBBR based STP operation in Lara Township
- Treated water from STP is used for Afforestation/ horticulture activities
- During peak summers make up water from main source is being used for Afforestation/ horticulture activities



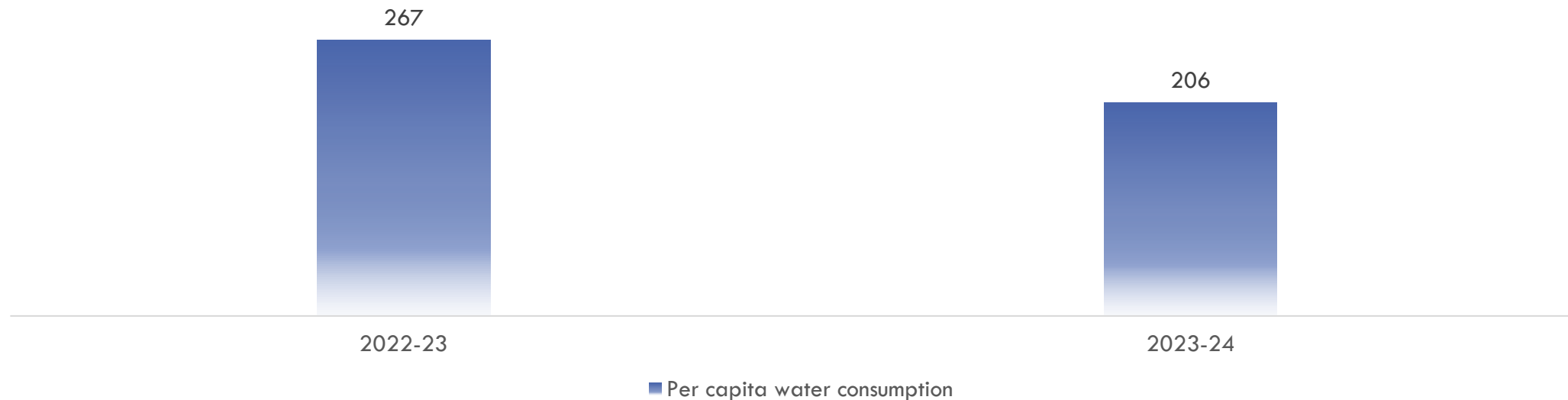
# Efficient Use of STP treated water in Afforestation/ Horticulture



# Per capita water consumption

Sr. No.	Financial Year	Per capita water consumption
1	Per capita Water Consumption in 2022-23	267
2	Per capita Water Consumption in 2023-24	206

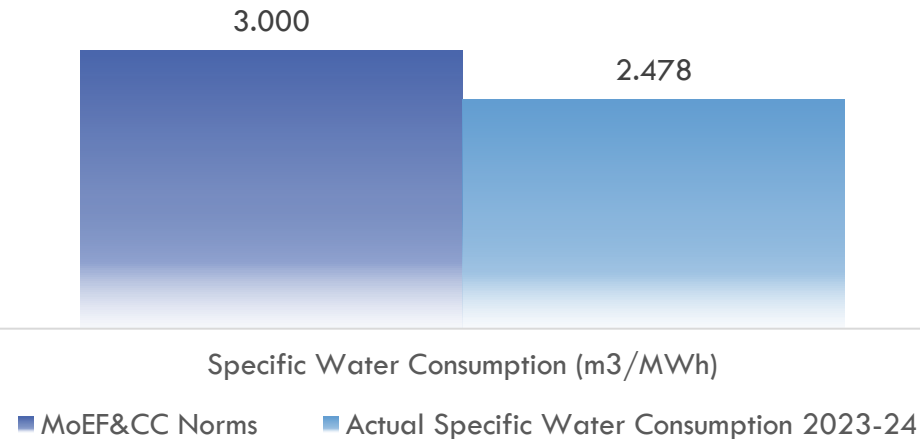
## PER CAPITA WATER CONSUMPTION



This also includes the water used for horticulture and afforestation during peak summers



## SPECIFIC WATER CONSUMPTION



- MoEF&CC norms stipulate a limit of 3.00 m<sup>3</sup>/MWh for specific water consumption
- In 2023-24 financial year, Specific water consumption of NTPC Lara is 2.478 m<sup>3</sup>/MWh. Which is well below the statutory limit stipulated by MoEF&CC.



# What's NEXT for NTPC Lara ?

## A Step towards saving water specifically in NTPC Lara Plant in phase manner in next two years!

- 1) Annual RWH Potential of NTPC Lara Plant Area: 11,94,691 m<sup>3</sup>  
Township RWH Potential – : 3,00,112 m<sup>3</sup>  
Total RWH Potential – : 14,94,803 m<sup>3</sup>
  
- 2) To bring down the current Per capita Water Consumption further down by installation of more efficient fixtures & switching the afforestation and horticulture requirement on alternate water during peak summers
  
- 3) Certification of Maitri Nagar Township for station's efforts for
  - i. Water Management (Net Water Positive Township)
  - ii. Waste Management (Zero Waste to land fill)
  - iii. Energy Conservation (Net Zero township)

- After successful completion of RWH of 2,92,712 m<sup>3</sup> at NTPC Township. RWH work is in progress at the Plant area.
- After Completion, 16 days of NTPC Lara plant water consumption shall be saved & utilized annually!





**THANK YOU**