Waste Water Treatment, Recycle and Reuse

Water Security and Innovative Water Solutions for Sustainable Growth

VISHVARAJ ENVIRONMENT Pvt. Ltd.

Transforming Challenges into Opportunity

Challenge 1

Inadequate Sewage Treatment

- **Sewage in India (MLD)***

	Volume
Generation	62,000
Treatment	22,000
Untreated	40,000

- **Consequences**
  - Water borne diseases ~ 21%
  - Person days lost ~ 10 Crs
  - Pollution – Lakes / Rivers

Challenge 2

Water Scarcity

- **Water Availability (BCM) ****

	Supply	Demand
2008	1,123	634
2030	744	1,498

- **Reasons**
  - Rapid urbanisation / industrialisation
  - Extreme ground water extraction

Opportunity

Reuse of Treated Sewage for Non potable use (Missing link)

- Sewage is available within city limits to treat it to non potable use by industry
- Benefits
  - Drinking water for 12 cr citizens
  - Health benefits to citizens
  - Environment benefits
  - Secured source for industry

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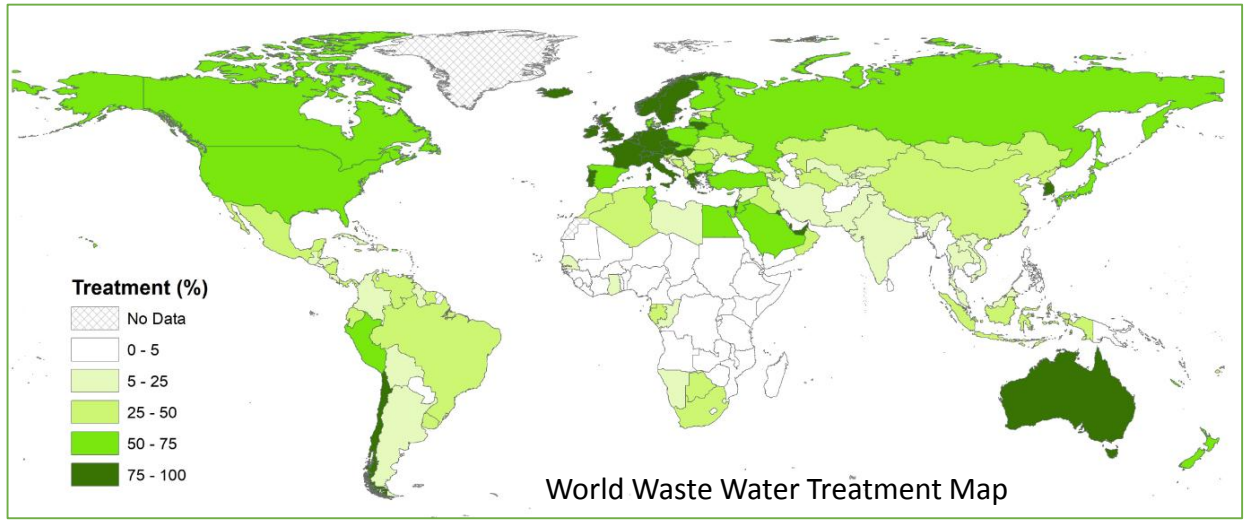
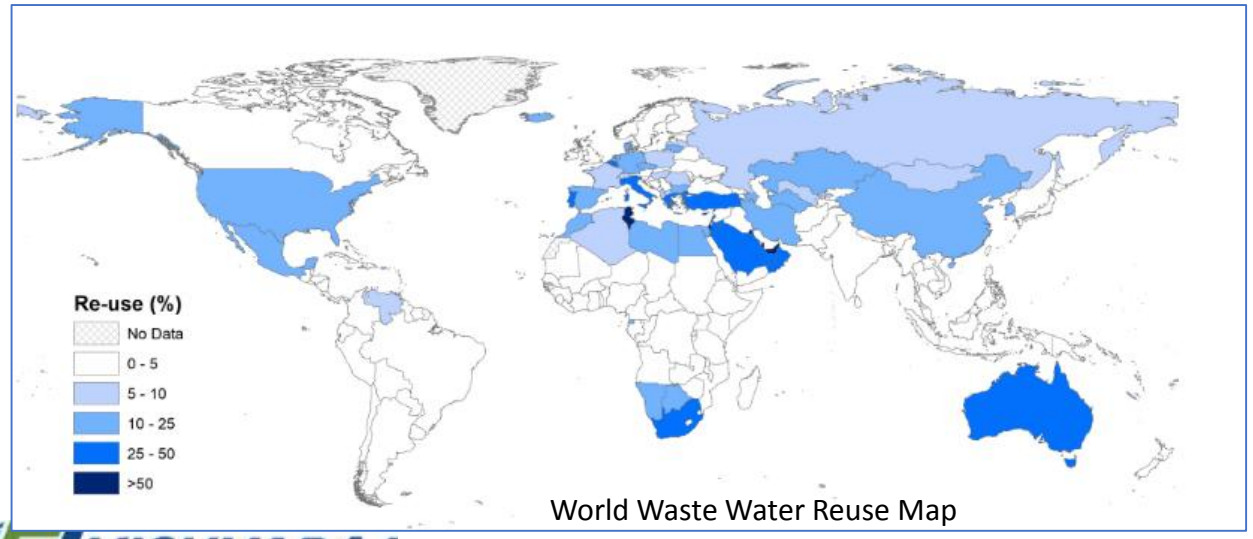
* Source – India Infrastructure Report

** Source – NITI Aayog – Composite Water Management Index Aug 2019

Global Waste Water Treatment and Reuse Map



World Waste Water Treatment Map



World Waste Water Reuse Map

Country	Treatment %	Reuse %
Global	52	5 - 10
USA	50 - 75	10 - 25
Western Europe	75 - 100	10 - 25
China	25 - 50	10 - 25
Russia	50 - 75	5 - 10
Australia	75 - 100	25 - 50
India	5 – 25	0 - 5

Source - **United Nations University**
Institute for Water, Environment and Health

China – Big Push to Reuse – 2025 Reuse Goals

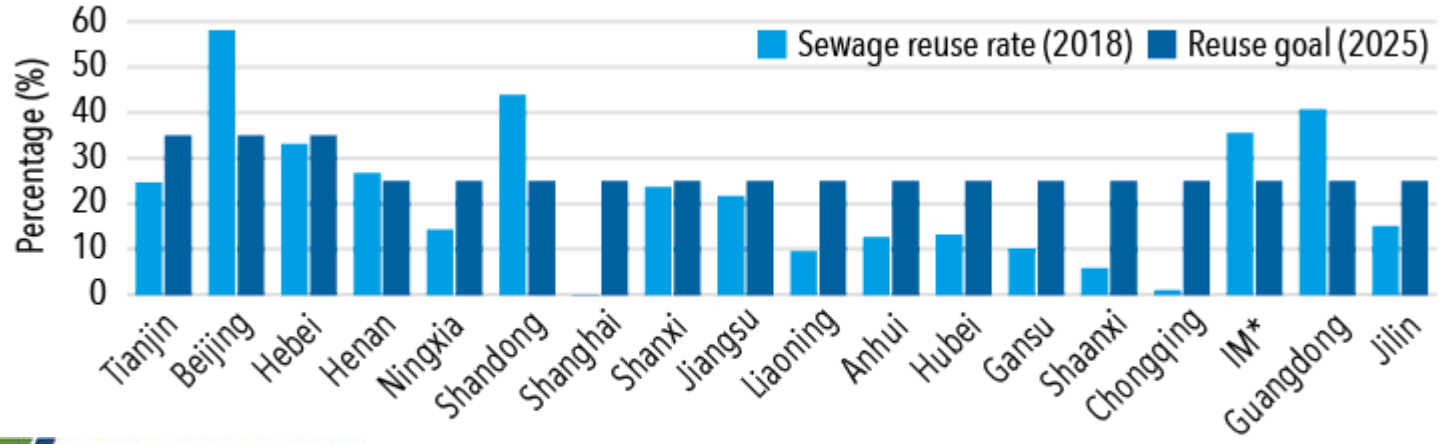
Water Scarce Provinces - 18

11th January 2021 - new guidelines promoting wastewater reuse, intensifying efforts to combat a looming water crisis

Reuse Target

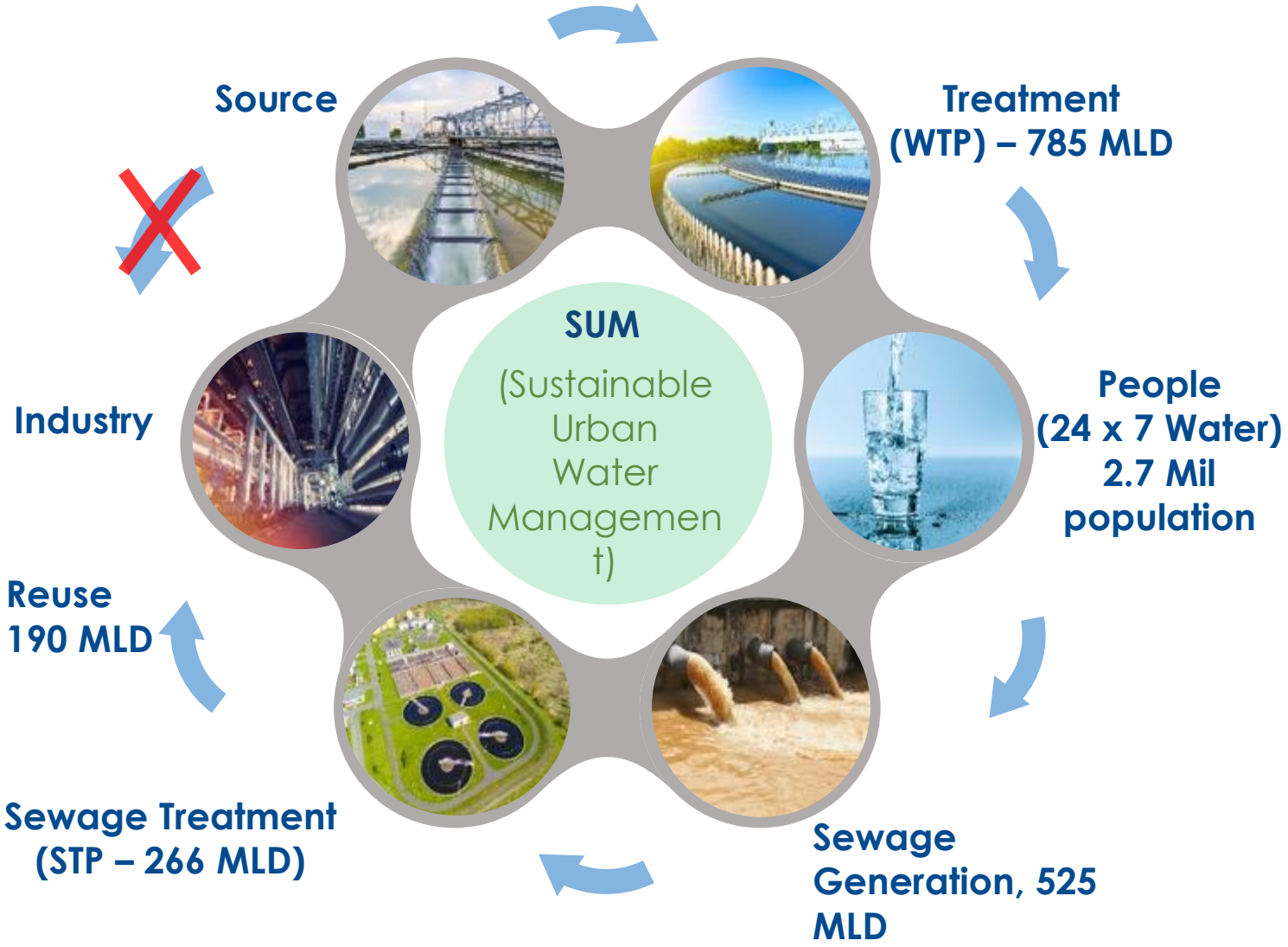
2020 – 20%
2025 – 25%
2025 – 35 % (Most Water Scarce Region of Beijing-Tianjin-Hebei)

Sewage Ruse Rate vs Goal



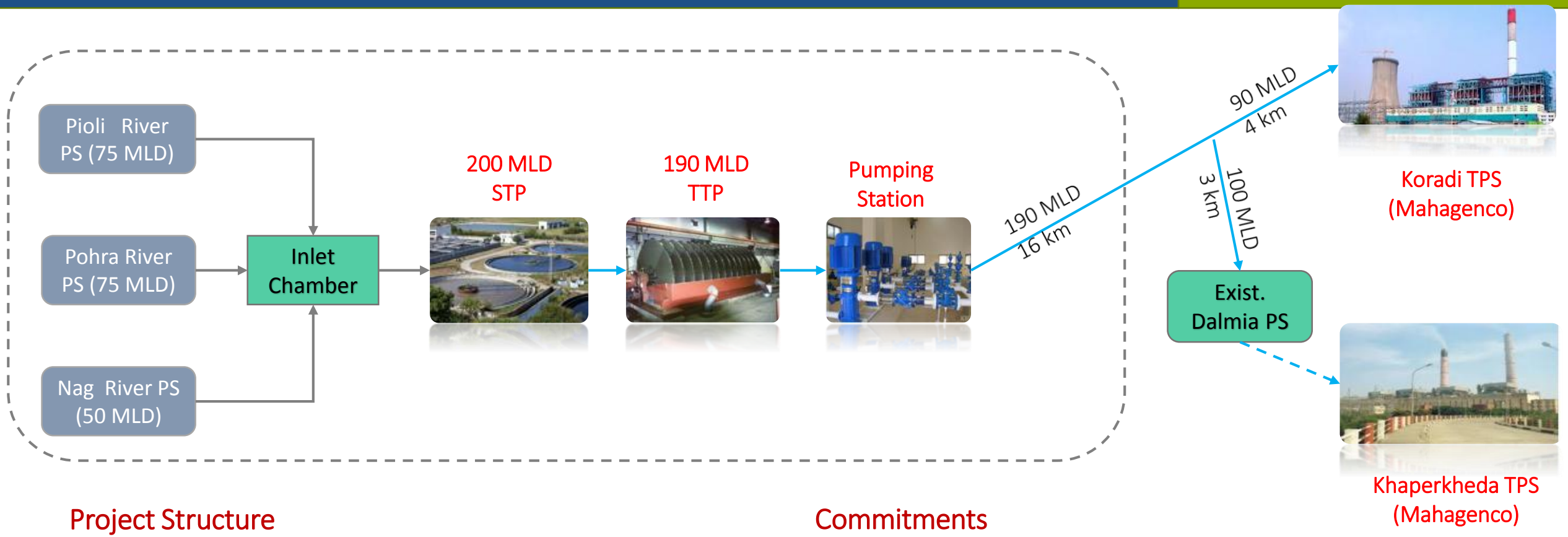
Source – Global Water Intelligence Report

India Approach - Integrated Water Management Approach



Vishvaraj Environment Pvt. Ltd. implemented integrated water management in the **city of Nagpur, India**

Reuse Case-Study – Nagpur 190 MLD Reuse



Project Structure

- Investment Model – PPP (100% investment by private operator)
- Revenue – Sale of treated water – Self finance model
- Project duration
  - Construction Period – 2years
  - O&M period – 25 years

Commitments

- Private Operator – Quality and Quantity Commitment
- Buyer – "Take or Pay" commitment through Escrow arrangement

Reuse Possibilities

Power Plants

- Potential ~ 5,600 MLD
- Policy in place for mandatory use – within 50 Km, pass-through tariff

Other Industries (Refineries / Industrial Clusters / Ports / Railways)

- Potential ~ 10,000 MLD
- Policy in place for mandatory use – within 50 Km, pass-through tariff

Agriculture

- Secondary treated water from STPs can be reused for nearby agricultural land
- One time capex for Solar based pumps / Pipelines can funded by government and then it becomes self sustainable
- Maharastra irrigation potential STP reuse water – 1,70,000 Ha ~ 1 % of total irrigation
- Similar potential exist in other states as well

Sewage Treatment with Reuse – Win-Win Model

- A quantum leap towards achieving Hon'ble Prime Minister's commitment to achieve SDG goals
- Creating fresh drinking water for over ~ 12 crore citizens as a first step.
- Addressing Health hazard for millions of citizens, and saving billions of rupees in health budget and workdays losses
- Boosting Swachh Bharat - Saving our rivers / lakes / wells, Improving Environment dramatically
- Ensuring a sustainable water resource for Thermal power plants
    - Enables Private Investment of over Rs ~30,000 crores in this core sector as first step
    - Employment generation for over 2 lac people directly and over 10 lac indirectly
- With Tariff incentive Many more Industries will opt for this green option - - releasing millions of litres of fresh water, helping get drinking water security for millions more

Scaling Up “Reuse” in India

- A “Reuse Mission” similar to AMRUT 2.0 or Smart City by Government
  - Government funding as a VGF to bring treated water tariff close to fresh water tariff
- Thrust on PPPs
  - Private investment instead of Government funds
  - Skin in the game by private operator ensures speed of execution and quality assurance during O&M
- Incentivize industries for use of treated water by giving water credit (similar to carbon credit)
- Special funding / scheme for agricultural reuse from existing operational STP

ABOUT VISHVARAJ ENVIRONMENT PRIVATE LTD

Drinking water treatment plants in operation

30 plants of **2,138 MLD**

Population served with drinking water

42 Mn+ People

Waste water treatment plants in operation

33 plants of **1020 MLD**

Treated waste water

240 MLD Reuse

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Thank You

Arun Lakhani
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Vishvaraj Environment Pvt. Ltd.