

This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.

Asia Water Forum 2022
8–11 August 2022 • Online



Focus Area: Safer Applications of Treated Wastewater in Agriculture

Purple Pipes Painting the Way for Wastewater Reuse in Agriculture

10th August | 11-12.30 PM



WORLD BANK GROUP
Water



ADB



Contents

1. About 2030 Water Resources Group

2. The Problem statement

3. A Sustainable and Scalable Solution – Treated Wastewater

4. Era of the Purple Revolution

5. Carbon Neutrality through Treated Wastewater

6. Key Components of the Purple Pipes Project Aurangabad

7. Intended Outcomes and Opportunities for Scale-up

1. About 2030 WRG



Global Leader in Partnerships for Water Security



2030 WRG is a multi-donor trust fund **hosted by the World Bank Group**

We facilitate public-private-civil society **collaboration** for **transformative impact**

AB InBev THE Coca-Cola COMPANY CREDIT SUISSE Nestlé PEPSICO Unilever

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH GOVERNMENT OF HUNGARY State of Israel Ministry of Economy and Industry

AFRICAN DEVELOPMENT BANK IDB Inter-American Development Bank WORLD BANK GROUP Water

brac Global Green Growth Institute Global Water Partnership IUCN UNDP WORLD ECONOMIC FORUM

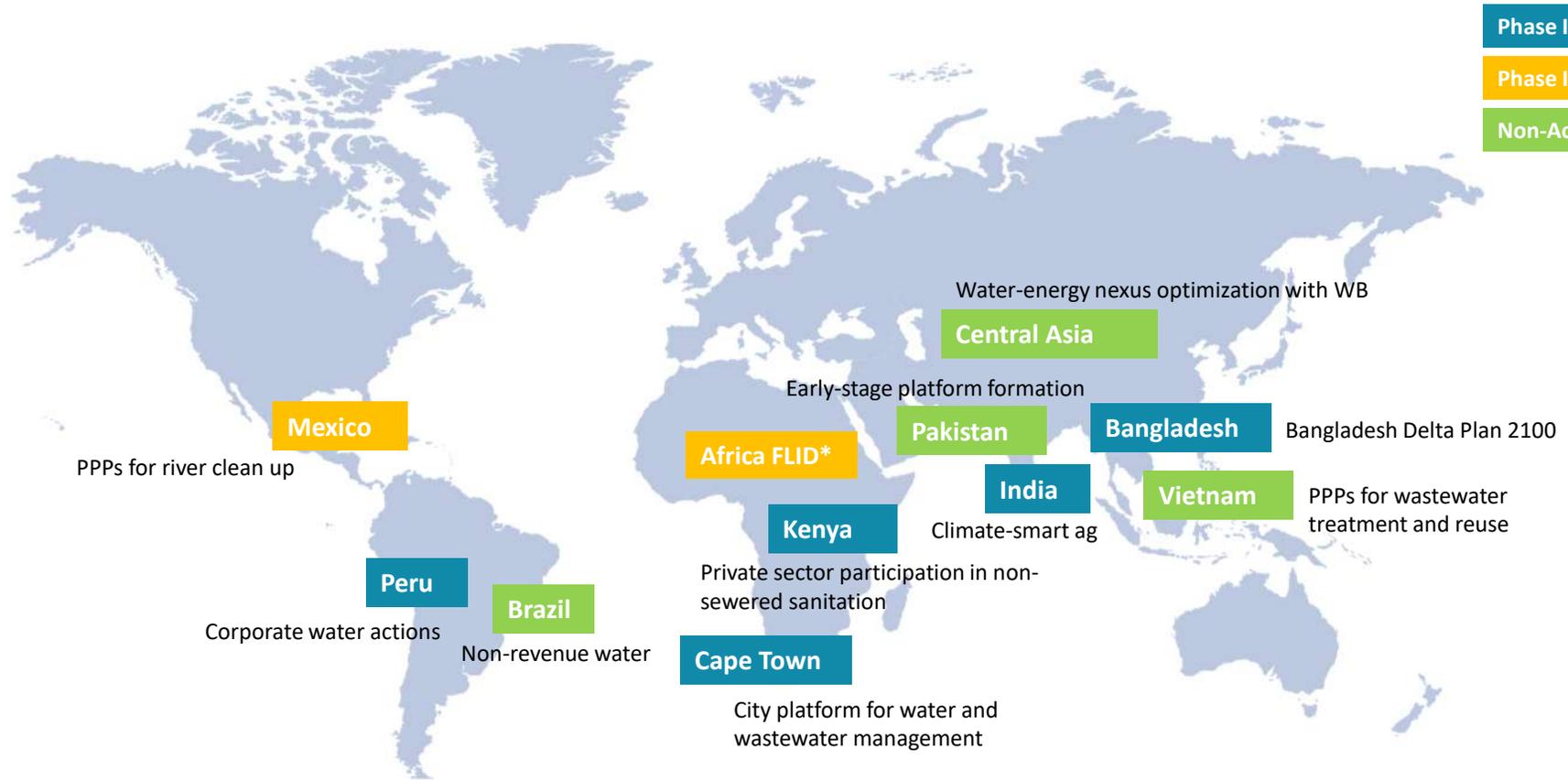
2030 Water Resources Group HOSTED BY WORLD BANK GROUP Water

2030 WRG's Global Partners: A select group of leading, progressive, and reputed multinationals, bilateral agencies, and international NGOs/ IGOs

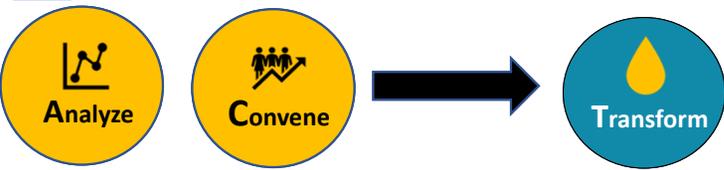


2030 WRG Country Engagements

Shift in Strategy Towards the “Transform” pillar of A-C-T



- Phase I Accelerator
- Phase II Accelerator
- Non-Accelerator Work



Focus on Transformation - Through Accelerator Programs

* FLID = Farmer-Led Irrigation Development

2030 WRG – India Programs



1

2

Program	Accelerator for Sustainable Climate Smart Agriculture	(Pipeline) Accelerator for Wastewater Reuse					
Elements	To transform agriculture impacting 5 million farmers across 5 million hectares in 5 years through : (i) increasing yields for specific crops, including rice and sugarcane, horticulture and agroforestry, (ii) lowering the water footprint through adoption of a sustainable package of practices, (iii) water-efficient technologies, mechanization at the farm level, (iii) increasing farmer incomes and (iv) lowering carbon emissions	WWR in Agri To support allocation, infrastructure development and safe reuse of treated water for irrigation – integrating renewable energy - Policy and Prototype	<table border="1"> <tr> <td>WWR in Industries</td> <td>WWR in Urban</td> </tr> <tr> <td>- To promote the reuse of wastewater and reduction of footprint in the textile industrial clusters and the large corporate textile units. - Baseline Assessment - Explore launch of Wastewater Reuse Certificates</td> <td>Carbon Neutral Water Utilities Standard Bidding Documents for Sewage Treatment Plants</td> </tr> </table>	WWR in Industries	WWR in Urban	- To promote the reuse of wastewater and reduction of footprint in the textile industrial clusters and the large corporate textile units. - Baseline Assessment - Explore launch of Wastewater Reuse Certificates	Carbon Neutral Water Utilities Standard Bidding Documents for Sewage Treatment Plants
WWR in Industries	WWR in Urban						
- To promote the reuse of wastewater and reduction of footprint in the textile industrial clusters and the large corporate textile units. - Baseline Assessment - Explore launch of Wastewater Reuse Certificates	Carbon Neutral Water Utilities Standard Bidding Documents for Sewage Treatment Plants						
Region	Uttar Pradesh	Maharashtra*	<table border="1"> <tr> <td>Maharashtra, Gujarat*, Tamil Nadu, MP</td> <td>Maharashtra</td> </tr> </table>	Maharashtra, Gujarat*, Tamil Nadu, MP	Maharashtra		
Maharashtra, Gujarat*, Tamil Nadu, MP	Maharashtra						
Outcomes	<ul style="list-style-type: none"> Transformed Value Chains Higher Productivity and Farmer Incomes Lower Carbon-Water Footprint 	<ul style="list-style-type: none"> Resource Circularity Carbon Neutrality 					

Cross Cutting : Alternative Financing, Disruptive Tech, Mainstreaming Gender

* Exploring Gujarat-Maharashtra corridor for WWR-based Irrigation investments.

2. The Problem Statement



Water Scarcity in India

- Per capita water availability in India to reduce from 1,544 cum to 1,341 cum by 2025 and **1,140 cum by 2050**
- **21 cities in India estimated to run out** of ground water by 2030
- Financing of **USD \$270 billion investment over 5-15 years** would be required to finance water infrastructure in India
- India has an installed capacity of 31,841 MLD of which only **64% has been utilized**. Total sewage generated in 2020 was 72,368 MLD of which **20,236 MLD (28%)** was treated.
- Total sewage generated in Maharashtra in 2020 was 9107 MLD and an installed capacity of 6890 MLD – only 62% of capacity utilized (42% of sewage generated)

Water Scarcity in Aurangabad, Maharashtra



Drought prone region



Contaminated water for irrigation

Climate vulnerable district, 84% agriculture dependent, ~80% smallholders



Feed and Fodder Shortages



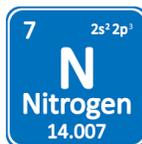
Impacts on Soil, Health and Communities

3. A Sustainable and Scalable Solution : Treated Wastewater

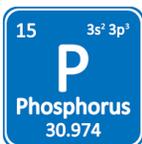


Provides additional plant nutrients

400 MT



136 MT



480 MT



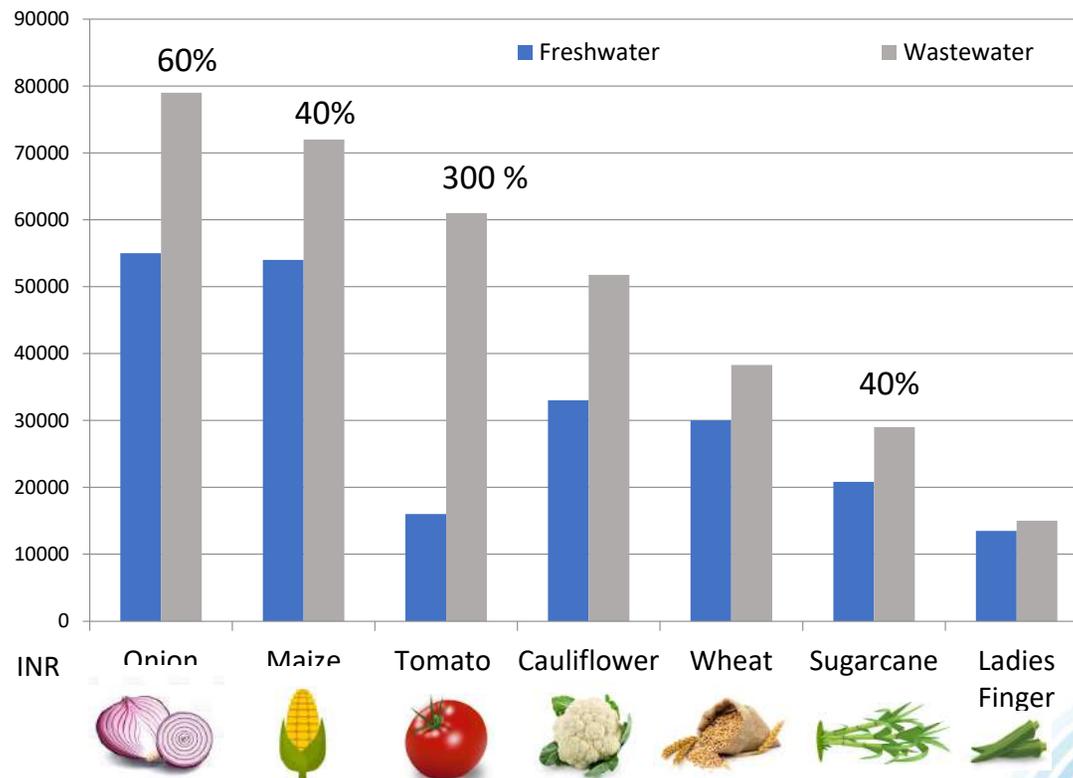
Improves Soil Fertility

Reduces Production Risks



Avg. Nutrient in sewage generated/day from 322 Class 1 cities & towns in India
 Source: IARI 2016

Generates value and increases profitability



Source: IWMI



4. Era of the 'Purple Revolution'

1854
Industrial Revolution (IR1)

1960
Green Revolution

1970
White Revolution

2022
Purple Revolution

Food & Agriculture

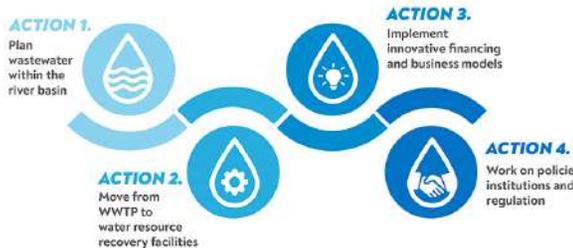
- Enhancing farm productivity
- Reducing the usage of chemical fertilizers
- High Potential for Carbon Sequestration
- Safer Food Value Chains

Industries

- Alignment with Global Sustainability Goals and Standards
- Compliance to discharge norms and ZLD
- Enhanced water security leading to higher industrial output & productivity

Urban & Commercial

- Opportunity to bridge the demand and supply gap for growing urban areas.
- Renewable, a perennial source of water for urban secondary application.
- Reduced treatment and energy cost, achieving higher water use efficiency.
- City's Carbon Emission Reduction



5. Climate Neutrality through Treated Wastewater



Climate Smart Approach

- Overcome challenges of drought and flash floods.
- Long term planning for resilient and high yielding crops through climate smart agricultural practices
- Nutrients in wastewater reduce use of chemical fertilizers

Baseline Emission Assessment

- Water supply, wastewater treatment and sludge management for AMC water Utilities assessed using *ECAM 2.0 software
- Emissions due to CO₂, CH₄ and N₂O at various stages of water sourcing and wastewater processing has been estimated

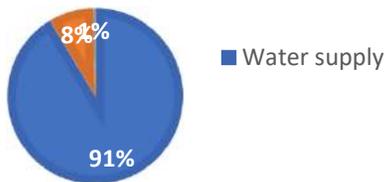
Carbon Neutral Water Utilities

- AMC has been selected to participate in the Energy efficiency program of Central Government (Bureau of Energy efficiency).
- Investment grade Audit of five water utility pumps carried out in May 2022 by nodal agency.
- Carbon reduction and energy efficiency through retrofitting.



Water supply - 91% Energy Consumption

ENERGY CONSUMPTION
(93,347,138 KWH)



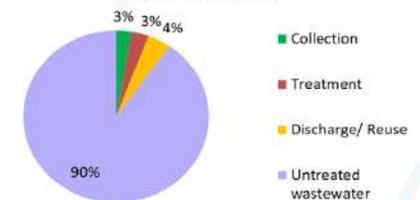
Water Abstraction – 54% GHG Emissions

GHG emissions by stage (102,120,213 kg CO₂eq)



GHG Emissions – 90% due to untreated wastewater

GHG Emissions-Water Treatment
(kgCO₂ Equivalent)



ECAM - Energy Performance and Carbon Emissions Assessment and Monitoring Tool



6. Key Components of the Purple Pipes Project in Aurangabad



1. Community and Multi-Stakeholder Approach

- Formation of the First of its kind Wastewater Reuse Association (WUA) Sukhana Jalkranti (Jan 2020)

2. ULB and Regulatory Support

- MoU between AMC and Zalta GP – in local language (Jan 2022)
- Allocation of **2 MLD** water by the AMC (Feb 2022)
- **Tariff structure** guidelines by GoM, MWRRA, Draft **GO** on water allocation

3. Finance- Farmers Contribution

- Infrastructure:~ 40% Contribution by the farmers
- Water: INR 1000/annum/farmer – paid by farmers (Mar 2022)

4. Special Infrastructure

Dedicated Wastewater Conveyance system from STP to farmlands

5. Leveraging Technology

- Integration of Solar Energy
- Sensors to detect contaminants in the soil and crops.
- Flow meters to monitor water use

STP Water Beneficiary Land Map



Multistakeholder and Community Driven Approach



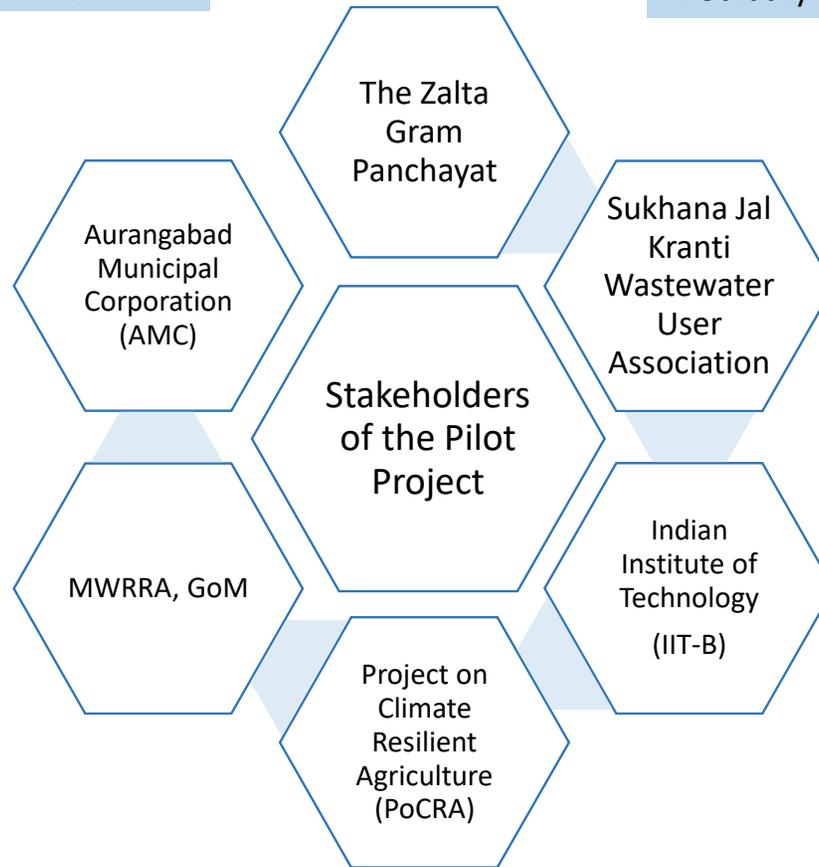
January 2020

Resolution of the Zalta GP to form a WUA



MoU Between WUA and AMC

January 2022



February 2022



Allocation of 2 MLD water by AMC and setting the Tariff Plan



March 2022

Formal Inauguration of the Project

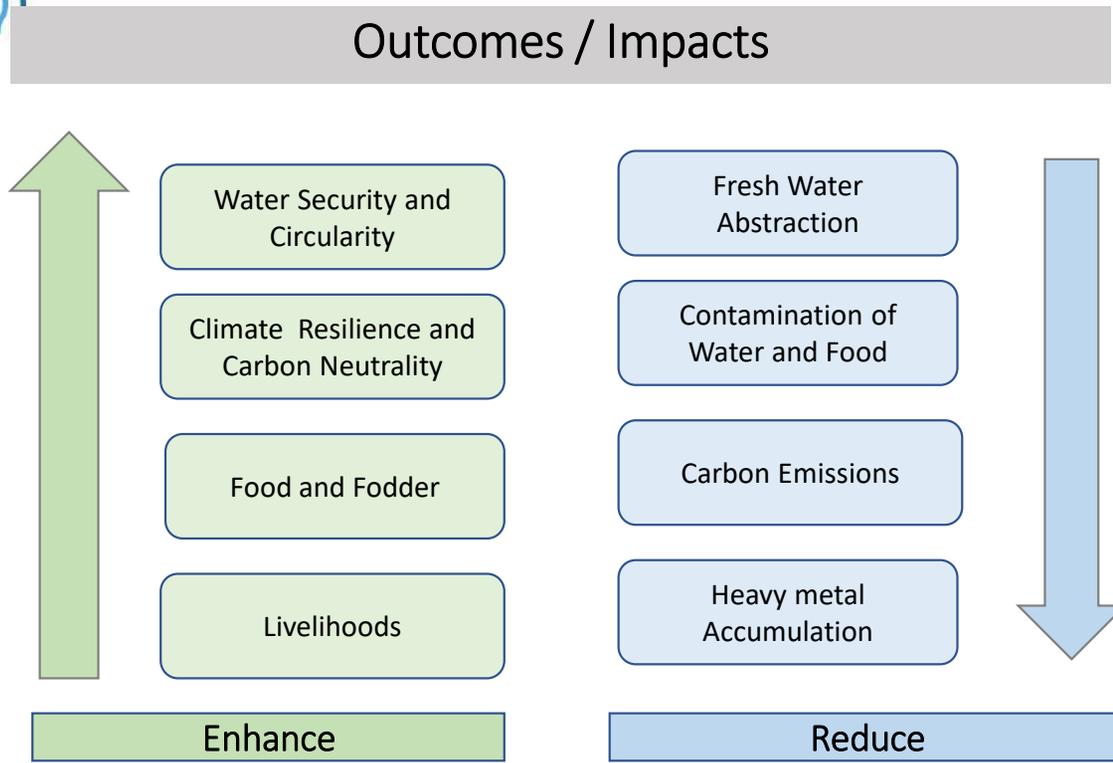


Launch of the Treated Wastewater Supply System in Aurangabad



Shri Subhash Desai, Hon'ble Guardian Minister, Aurangabad, Shri Astik K. Pandey, IAS, Commissioner, Aurangabad Municipal Corporation, Shree Sunil Chavan, IAS, District Collector, Aurangabad, Officials of AMC, 2030 WRG, Yuvamitra and the farmers of WUA – March 2022

7. Intended Outcomes of the Project and Scale up





Thank You

