

Stakeholder Engagement for Technological and Policy Support

"IWA- Wastewater, Water and Resource Recovery Conference"

10th April, 2022 (Online-Poznan)



Anshuman

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Unlock environmental and economic potential wastewater treatment / re-use & resource recovery (RRR)

Wastewater treatment & resource recovery










Water Governance

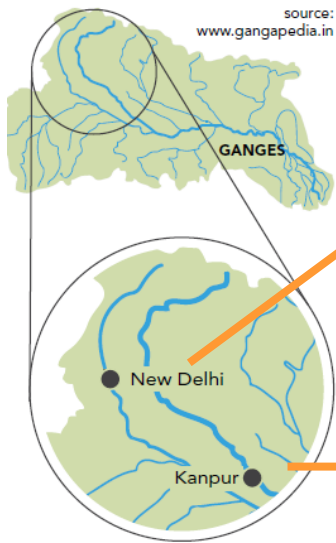


Smart Water Management

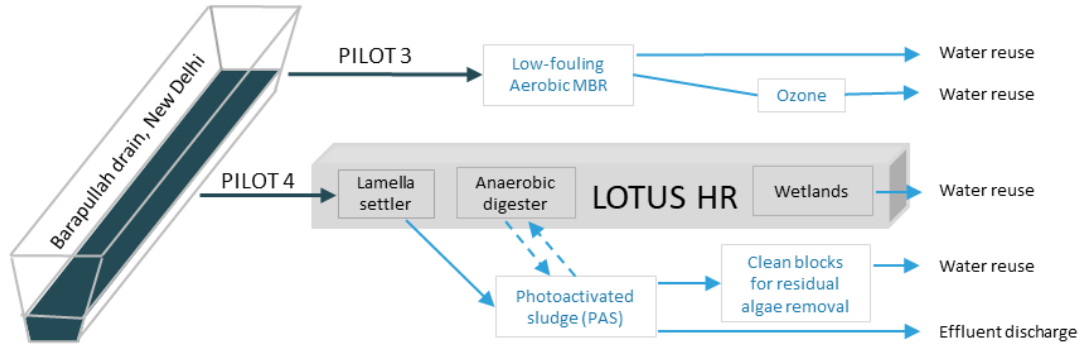


Capacity building, business development, dissemination

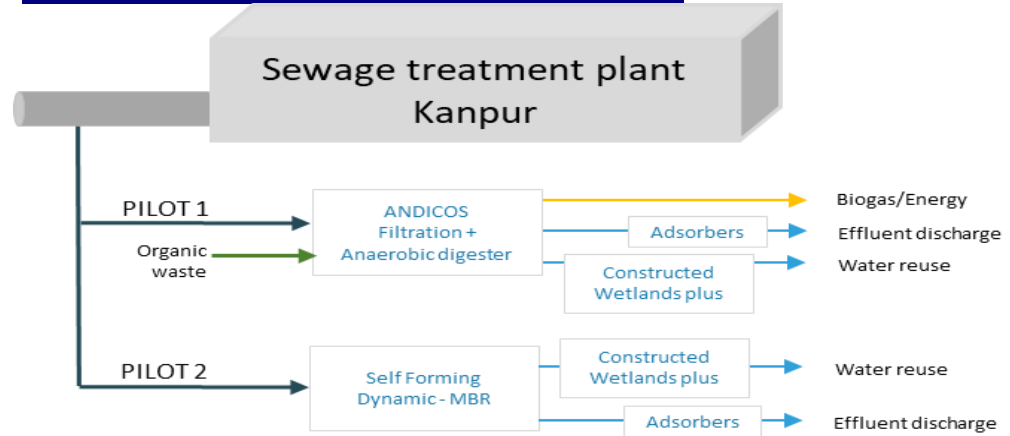
WP 2		Water governance, stakeholders engagement and policy support	Create policy and social support for innovative technologies through stakeholder engagement
WP 3		Treatment and recovery technologies	Evaluate & improve promising wastewater treatment, reuse and recovery technologies at lab scale
WP 4		Water monitoring, modelling and control	Deliver smart water quality monitoring & modelling solutions for two case areas
WP 5		On-site piloting and performance evaluation	Demonstrate and validate innovative technologies in real Indian wastewater settings at pilot scale
WP 6		PAVITRA GANGA Technology & learning network	Establish long lasting cooperation in capacity building and knowledge sharing
WP 7		EU-India Business Platform	Establish future market uptake and post-project exploitation of the demonstrated technologies
WP 8		Communication and dissemination	Communicate and disseminate the project activities and outcomes



New Delhi - Barapullah Drain



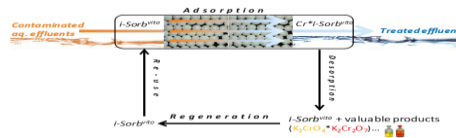
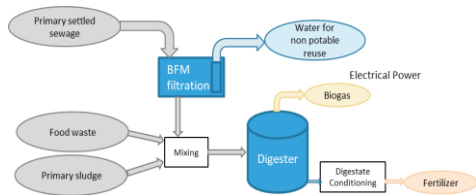
Kanpur - Jajmau STP



Wastewater treatment: Organics & Micropollutant Removal, Energy recovery

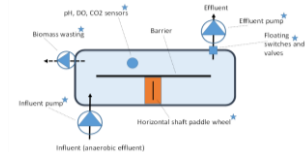
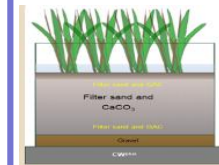
Bulk organics and nutrients removal. Low cost, low energy, effective & reliable:

- **(ANDICOS™)** combines concentrated **sewage + organic waste** to improve **AD efficiency** and water treatment
- **Self-Forming Dynamic (SFD) MBR** – “pseudo MBR” forms a **biological layer supported by a mesh** (inert material)



Polishing technologies (problem compounds)

- **Structured adsorbers** – manufactured **composites** with **high binding capacities + fast kinetics** (Cr removal 95%, P 95% removal)
- **Constructed wetlands plus – different adsorptive substrates (>80% heavy metal removal)**



Polishing technologies (problem compounds)

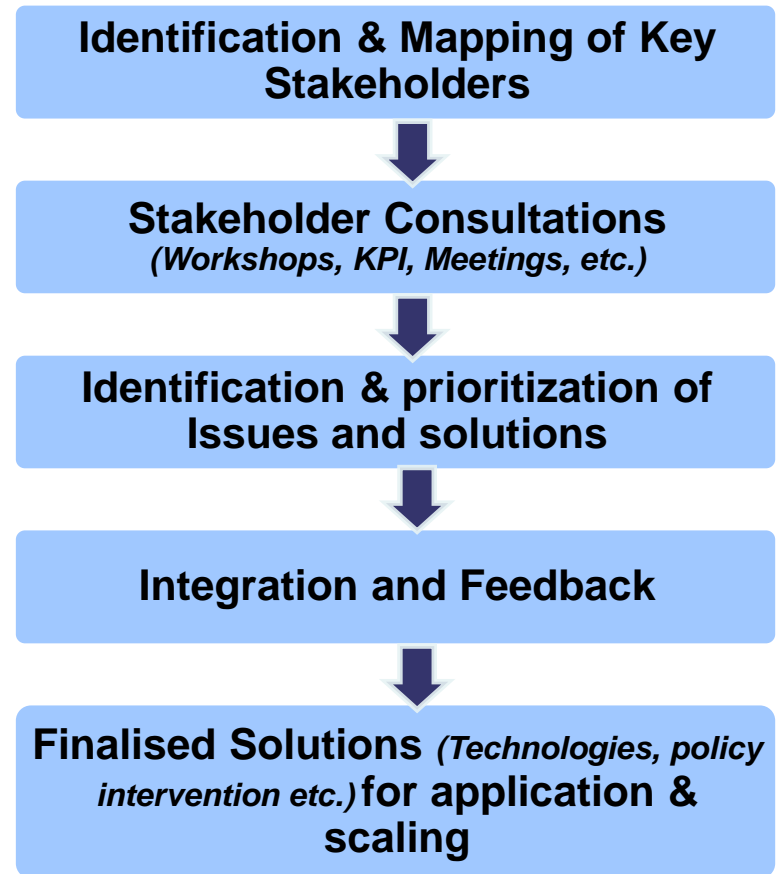
- **Ozonation** – removal **micro organisms & micropollutants**
- **Photo-activated sludge** – merger of high rate algae ponds + activated sludge systems (7 mg/l/hr ammonium removal)
- **Clean Blocks - Biofilm carrier for nutrient removal, filtration for suspended solids**

Objectives

To create **policy** and **social support** for innovative **technologies & concepts** through a **co-creation process** in which **stakeholders** are **engaged** in the framing of the **problem** and the **creation of promising solutions** leading to **targeted decision support** to **policy makers**.

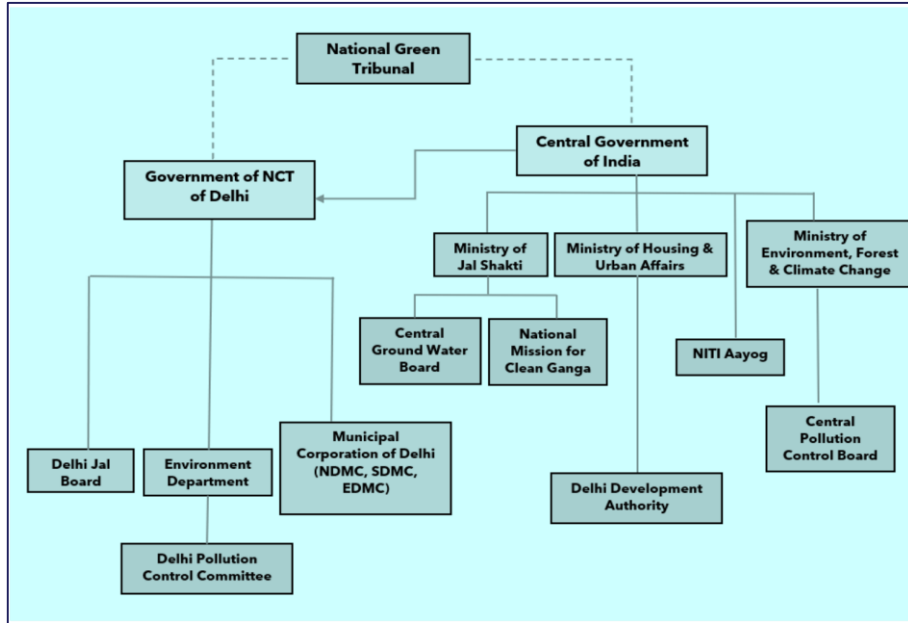
Specific objectives:

- **Analyse** (successful & unsuccessful) **water governance systems** across **India** and **internationally** for delivering improved (WW treatment, reuse & RR) solutions
- **Identify** critical **water quality issues** and related **socio-economic problems** for (WW treatment, reuse & RR) in **urban & peri-urban** areas
- **Develop** structured **decision support processes** and **multi-criteria decision analysis models** to **support regional water management** in the case study area
- **Develop** technology specific **sanitation safety plans** to assess, prioritise and mitigate **exposure risk associated to wastewater treatment and reuse**



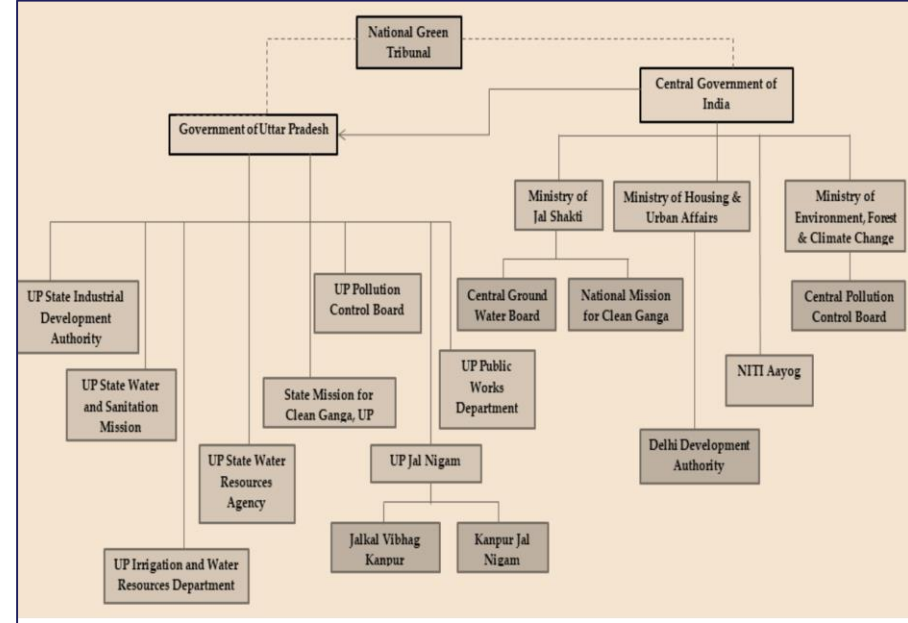
❖ Stakeholder Mapping

New Delhi



New Delhi (Agencies): NGT, MoJS, MoH&UA, MoEF&CC, NMCG, CPCB, MCD, DJB, CGWB etc.

Kanpur



Kanpur (Agencies): UPPCB, UP Jal Nigam, Kanpur Jal Nigam, UP-Irrigation & WR Dept., SMCG, PWD, etc.

Water Governance Stakeholder Consultation Workshops

- Project Pavitra Ganga Launch on 2nd March '20 by Shri U. P. Singh, Secretary, **Ministry of Jal Shakti** in presence of **NMCG** & other dignitaries
- Stakeholder Consultation Workshops**



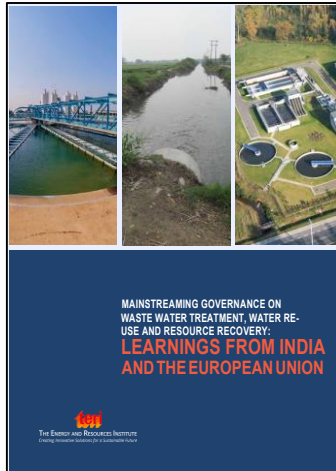
New Delhi (27th Feb'20)

Kanpur (6th March'20)



Policy Brief:

Mainstreaming Governance on Wastewater treatment, water reuse and Resource Recovery: Learnings from India and the EU

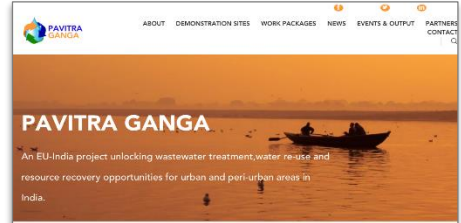
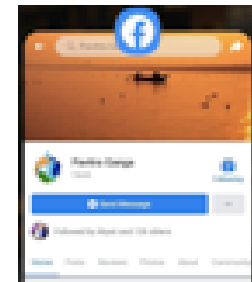


Key Messages

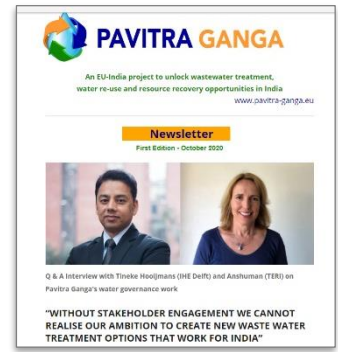
- Need for target-based regulations, defined national reuse standards for treated wastewater and sewage sludge and effective enforcement strategy.**
- Policy and guiding frameworks need to establish detailed guidance on wastewater and sewage sludge treatment and reuse technologies (fit-for-purpose treatment)**
- Need of effective financing mechanisms** (funds, taxes, tariffs) that permit **sufficient cost-recovery** for long-term **O&M** of wastewater and sewage sludge treatment infrastructure.
- Strengthening of institutional and monitoring capacity**

Website: <https://pavitra-ganga.eu/en>

- Maximizing visibility of project
- Dissemination of project activities & outcomes to stakeholders in India and EU
- Facilitate the outreach and engagement of key actors
- Creating support among local actors
- Ensure replication of the demonstrated technologies
- Information Sharing



Pavitra Ganga Launch Event (2/3/20)



Newsletter



Project Flyer

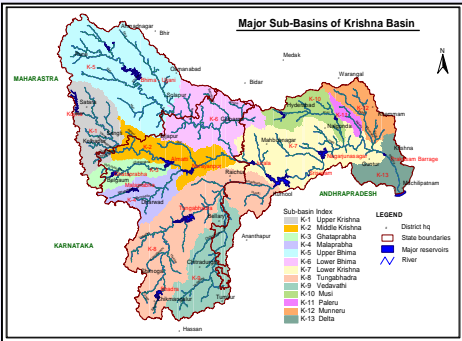
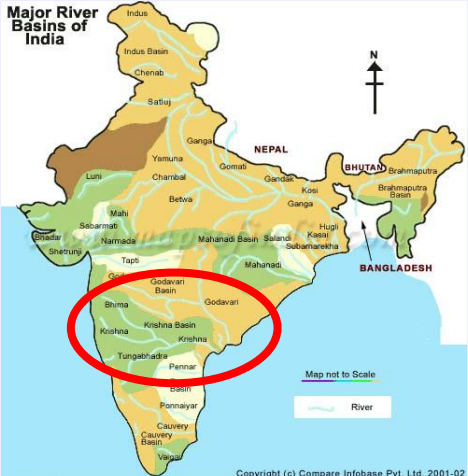
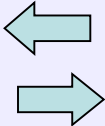


Expected Impacts

- **Efficient and cost effective technical solutions** for waste water treatment, reuse and resource recovery
- **Smart solutions for monitoring and modelling** that provide relevant information for local stakeholders
- **Improved local water governance and engagement** with stakeholders

Addressing Climate Change and Agricultural Water Security: A case of the Krishna Basin in India

"Impacts of Climate Change and Watershed Development on Agricultural Water Security in the Krishna and Murray-Darling Basins"



Krishna Basin: U/S & D/S interstate Issues

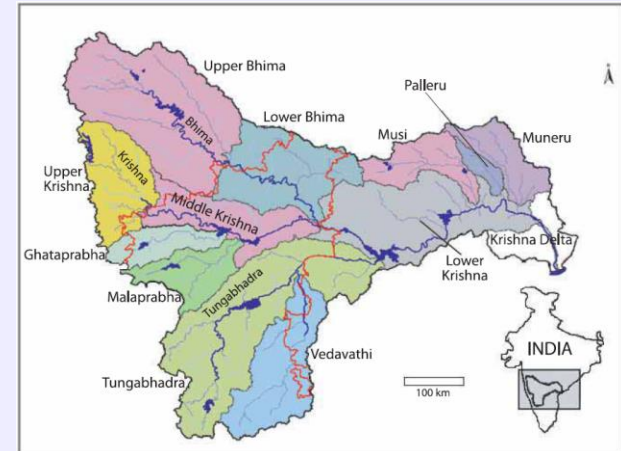
- **Increasing** shallow **tube wells**. Groundwater irrigated area exceeds surface water irrigated area in the basin
- **Closing of Basin**: Cumulative impact of large irrigation expansion (since 1960s) & extensive WSD programs
- **Mean annual runoff** to ocean **decreased** despite **no significant decrease** in rainfall
- The **basin is nearly closed** and stream flow to the ocean (1995-2005) was only 20% of pre-irrigation discharge (1900-1960).
- Urban and industrial **effluents** from **U/S cities** (e.g. Hyderabad) are **drained into** the **Musi River**. The urban **wastewater**, mostly **untreated**, is then **reused** in agriculture further **downstream**.

Krishna Basin:

Total area- 2,65,812 km². River length:1485 km

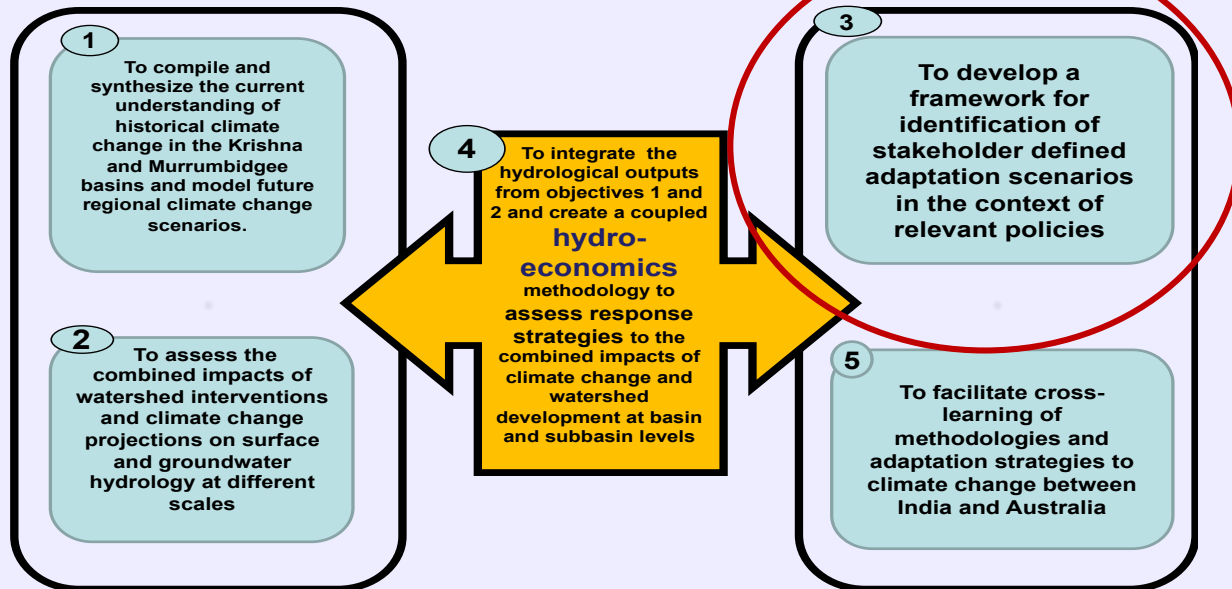
The Basin falls in the states of

- Maharashtra : 70,348 km²
- Karnataka : 1,11,381 km²
- Andhra Pradesh : 84,083 km²

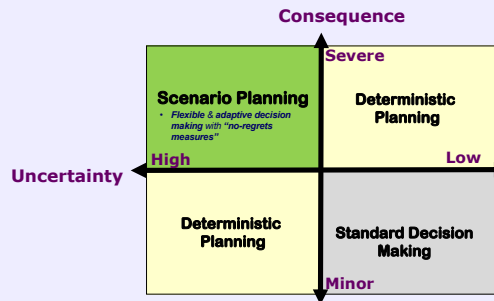


Source: IWMI

The Project Objectives...



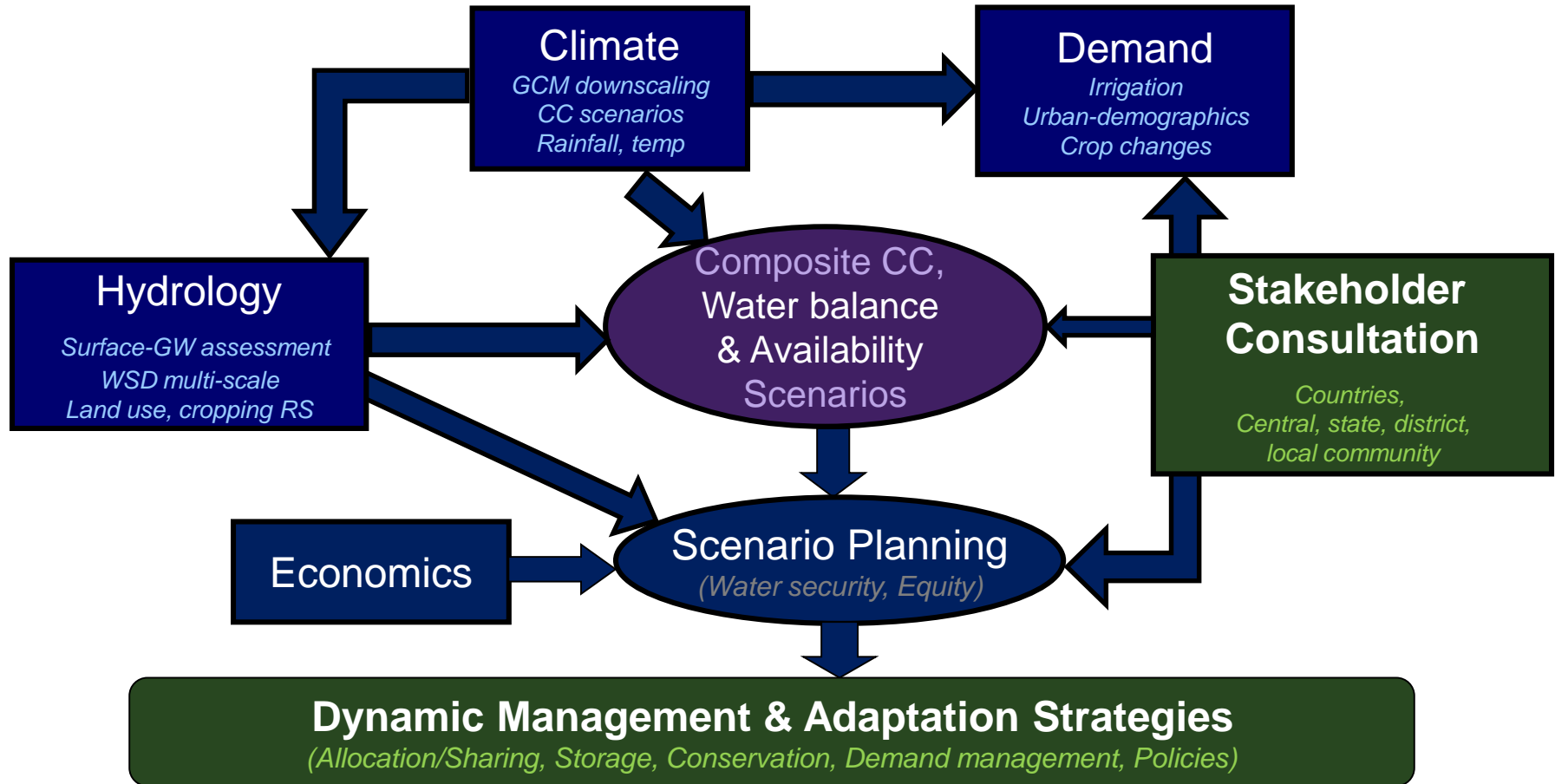
An Integrated Scenario Planning Approach
to Climate Change Adaptation in Water
Management



Integrated Planning & Management



Creating Innovative Solutions
for a Sustainable Future



Multi-stakeholder involvement

➤ Stakeholder consultations: Four tier/level:

Tier 1: Central

Tier 2: State

Tier 3: District

Tier 4: Village

- **Central:** MoWR (CWC, CGWB), MoEF, MoRD/MoUD, MoST (DST)
- **State:** WRD, I&CADD, Watershed Development & Management, PWDs, SGWB, Krishna Water Disputes Tribunal & RBOs eg. MKVDC, MWRRA
- **District:** Local authorities eg. DCs, PHED, Jal Boards, MCs, Planners, Chief Engineers
- **Village/Civil Society:** PRIs, Community associations/local community, NGOs, KVKs

State

District

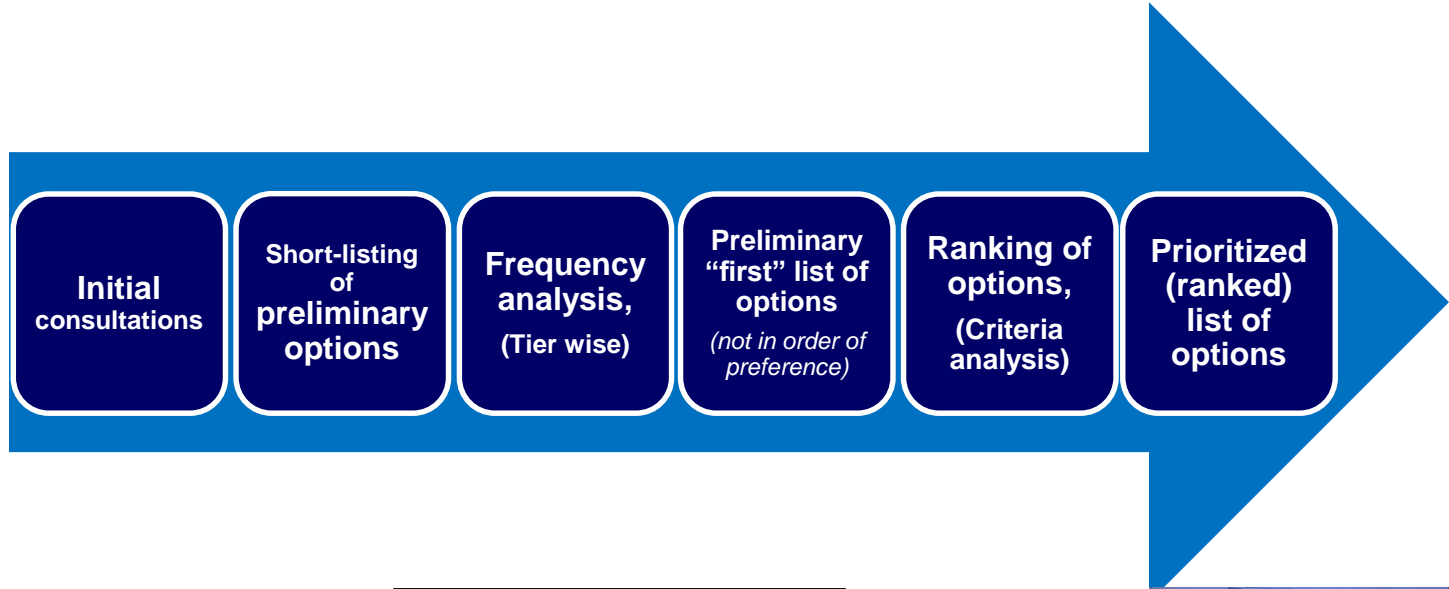
Community



Consultative Prioritization Process



Creating Innovative Solutions
for a Sustainable Future



ఆ పనులు	OPTION	వెంచు RANK
బెరు పు		2
కాలువ		1
బొరు బావి		6
చెక్క డామ్		5
బొంకు సుడి తోపు		3
నీటి నిర్వహణ పథ్యము		4

Finalized Adaptation options prioritized by stakeholders at different levels

Stakeholder Prioritized Adaptation Options

State Level <i>Tier-2</i>
1. Diversification of livelihoods
2. Change in cropping pattern
3. Repair/renovate existing structures
4. Regulatory body to check water withdrawal limits
5. Convergence of institutions
6. Temporal water apportionment
7. Creating more water storage structures
8. GW Regulation <i>(Restriction on bore well)</i>

District Level <i>Tier-3</i>
1. Increased participation from farmers in government schemes
2. Strict water allocations within the basin
3. Change in cropping patterns
4. Improve efficiency of water management within the basin
5. Dissemination of new technologies to farmers
6. Improved accuracy in weather forecasting
7. Dissemination of information through IT to farmers

Community/Farmer <i>Tier-4</i>
1. Farm ponds and tanks to be constructed
2. Need more canal irrigation systems
3. Need water sources that they can control
4. Need ground water recharge structures like check dams and bunds
5. Need simpler process to obtain financial assistance (loan/subsidy/crop insurance)
6. Create awareness on water conservation and management practices

Selected Adaptation Options

- Changing cropping patterns
- Increasing watershed development
- Improving irrigation efficiency

Conclusion & Recommendations



Creating Innovative Solutions
for a Sustainable Future

- **Implementing a Crop Diversification policy** would appear to have the greatest returns.
- **WSD and Efficiency improvements result in values of water being much lower than currently experienced.** There is significant **variability in the regions.**
- **Potential policy intervention** should be **evaluated** for **both its water security** and its **economic outcomes at a catchment scale.** **What is optimal and ideal from a physical perspective** in water security **does not necessarily provide the best economic outcome**
- In **response to climate change**, it is ideal to **focus** on **'no-regret' flexible adaptive approaches** (like changing cropping patterns) **over the less flexible WSD** and the **highly inflexible** improvements to **irrigation efficiency**

Stakeholder Engagement: Recommendations



Creating Innovative Solutions
for a Sustainable Future

- **Project strategies** needs to be **designed keeping in view the individual catchments and whole-of-basin perspectives**, and must be **aligned with the political structure and stakeholder interests through a multi-tier consultation and negotiation process.**
- **Transparency and data sharing through common authority or commission.** Dissemination of information through various **media & channels** is equally important
- **Stakeholder consultative process** is important for sustainability of various interventions developed in a project
- **More flexible and adaptive approach** should be undertaken based on **plausible future scenarios** combined with **associated adaptive responses.**
- A **wide-based stakeholder consultative approach** should be used to **elicit basic scenarios, plausible responses and design water management strategies.**



Thank You for Your Attention

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