

# Co-creation of Knowledge Base, Research and Development Ecosystem and People's Connect: Context of River Rejuvenation

*Sustainable Wastewater management in Developing Countries: An innovative Indian Approach in River Rejuvenation*

*Rajiv Ranjan Mishra, Former DG, National Mission for Clean Ganga*

*Chief Advisor, National Institute of Urban Affairs*

[rajiv\\_ranjanmishra@yahoo.com](mailto:rajiv_ranjanmishra@yahoo.com)

[rrmishra2309@gmail.com](mailto:rrmishra2309@gmail.com)

+919582225786

*Singapore International Water week 2022*

# Case for Co-Creation

- Why Co-creation of Knowledge Base for River Rejuvenation ----  
**Continuous exercise, Scaling up, Replicability**
- Self evolving, Complex, Unstructured, Wicked Problems need a **common learning process** between different social Actors
- Only **Specialist knowledge or Professional practices** may also impede solution oriented approach
- **Problem Driven Iterative Adaptation-PDIA\***
- **Science and Practice: Modes of Interaction-Separate, Cooperation , Co-Production or Co-Creation** ( Transdisciplinary, Experiential knowledge etc.)\*\*

\*(Matt Andrews et al, 'Building State Capability', Harvard Kennedy School)

\*\* ( Reger, B & Bunders, J –Knowledge Co-creation, Interaction between Science & Society)

# Co-Creation of Knowledge Base: Approach & Initiatives from Ganga Rejuvenation

- Basin Wide Approach & Basin Scale Activities
  - **Ganga River basin Management Plan (GRBMP)**
- **Interplay of Macro and Micro** (Sectoral application of Knowledge Base)
  - **Urban Areas**- Having largest and intense impact on Rivers
  - **Ecology and Flow** (*Aviral Ganga*)
  - **District** (Rural, Urban, Multi-sectoral)
- **Use-Learn-Research-Refine – Practice-Evaluate-Learn** : A cyclic Growth process

# cGanga: Centre for Ganga Basin Management and Studies

- Making GRBMP happen: **River Ganga (Rejuvenation, Protection & Management) Authorities Order 2016**
- **cGanga**- Set up at Indian Institute of Technology (IIT) , Kanpur as an Institutional Mechanism to be a comprehensive basin wide think tank, a link between Govt and academic institutions
- Work on different **research areas**, develop **eco-sensitive economic models** for water management
- **Dynamic development of GRBMP---**Basin Management & Planning Cycle-**GRBMP 2.0** in making
- Channel for **Environmental Technology Verification (ETV)** and **international knowledge** exchange, Research
- Permanence by declaring it as one of the centers of IIT, Kanpur

# Ecology and Flow....Going Beyond Cleaning

- **Environmental Flow:** Notification in 2018, A case of challenges of Know-how as well as Stakeholder acceptance/Willingness
- **Biodiversity Conservation** ( Collaboration with WII, WWF-India, CIFRI, State, Community....)
- **Scientific Afforestation-Lifeline of River**
- Conservation of wetlands and water bodies
- Demand side management

## River for Everyone : Project Dolphin

- Gangetic Dolphin- National Aquatic Animal

*WII-Wildlife Institute of India, CIFRI-Central Inland Fisheries Research Institute; WWF- World Wildlife Fund*



# River for Everyone: We too love Ganga!



# Managing Urban Rivers : River City Alliance

- Framework for Managing Urban River Stretches - **Urban River Management Plan (URMP)** with NIUA
- **River Centric Masterplans** (NIUA, TCPO)
- **Water Sensitive Urban Design** (CSE, NIUA)
- **River City Alliance** - an Institutional Mechanism, Self Correcting System hosted by NIUA
- Restoration of **Riverine Ecosystem**
- **Ecosystem services** and **Urban Biodiversity**
- A Real potential to contribute towards **Water Positive , Zero Carbon Vision**
- **Basin Connected Cities**

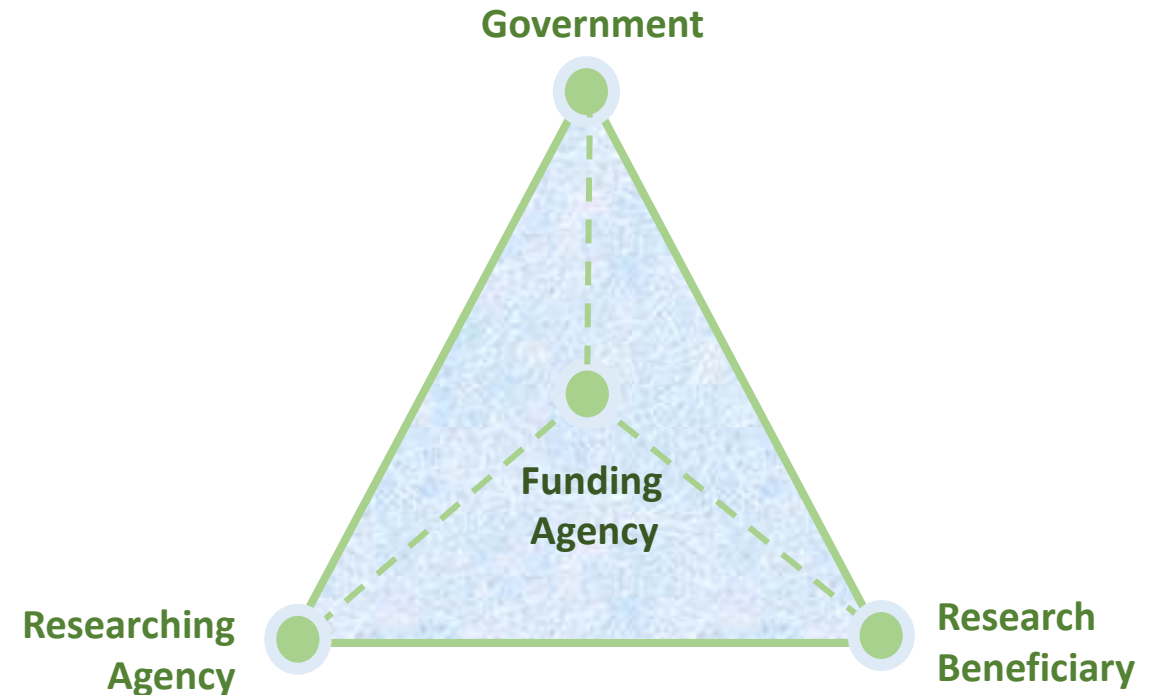
*NIUA- National Institute of Urban Affairs;*

*TCPO- Town & Country Planning Organisation; CSE-Centre for Science & Environment*



# Research & Development (R&D) Ecosystem

- Why do Research, What should be priority
- **Researching, Beneficiary, Funding Agencies and Government** - A sound interplay among these actors essential for a healthy enabling R&D Ecosystem
- **Science, Socio-Cultural, Governance, Economy**
- **Mission design of Ganga Rejuvenation** a good case of enabling R&D Ecosystem.
- **Centers for Excellence (COEs)** for reuse of treated waste water with TERI , Tanneries at Kanpur by Solidaridad, Netherlands, others with international collaborations





# NMCG TERI Centre of Excellence on Water Reuse

This first of its kind center of Excellence on water Reuse was launched on 24<sup>th</sup> December 2021 as a **Ganga Knowledge Centre** activity.

## Vision

- a. Design and foster **research and innovation**
- b. Identify knowledge gaps and support **targeted research**
- c. Support and nurture innovations-cost effective and **integrated treatment technologies** to bridge current treatment gap, augment capacities and provide ***safe treated water for reuse.***



## Stakeholders

- Policy makers, Regulatory authorities, Funding Institutions, Research Labs
- Academia, knowledge & consultancy partners, Technology developers, providers and
- End-users (ULBs, Industry & their representative bodies, associations etc.).

# R&D and Innovations : Ganga Rejuvenation

## **Scientific and Technical Aspects :**

- High resolution LIDAR Mapping of Ganga
- Integrated Management Plans for Flood Plain wetlands within 10 kms of Ganga, Springs conservation (IIT, Roorkee),
- Biodiversity Survey of Ganga & its Tributaries (WII, WWF)
- Integrated mapping and Conservation of Fisheries along Ganga(CIFRI)
- Scientific Afforestation Study and Action Plan (FRI)
- Microbial Mapping for Ganga Main Stem & Special property study (NEERI)
- Mapping of Paliochannels and Aquifer through Heli survey (NGRI)
- Scientific Study of Sand Mining hotspots (IIT, Kanpur)

*FRI-Forest Research Institute, NEERI-National Environmental Engineering Research Institute, NGRI- National Geophysical Research Institute*

# Research and Innovations : Ganga Rejuvenation

## **Social, Cultural and Economic Aspects :**

- **Cultural Mapping** of Ganga for Architectural, Natural and Intangible Heritage (INTACH); Study of Riverside Communities for linkage between River and their livelihood (TISS) and Jalaj initiative empowering Ganga Praharis to promote conservation
- **Arth Ganga** (Linking livelihood and Conservation through Multiple Sectors- Sustainable agriculture, Tourism, Ecology, Waterways ) –IIM, Lucknow, cGanga, IIT, Roorkee, WII
- **Economic Valuation of Ecosystem Services** (Work-in –progress)

## **Governance:**

- **All in one Plan**, Making GRBMP happen-Institutional empowerment & development , National to District level committees
- **Doing it Fast** (Authority, delegation and empowerment) and **Doing it Better** (HAM, One City-One Operator in wastewater sector)
- **River Centric Planning**
- **Circular Economy projects**; Paying for its own upkeep

*INTACH-Indian National Trust for Art and Cultural Heritage; TISS-Tata Institute of social Sciences*

# People's Connect: Reconnecting to River

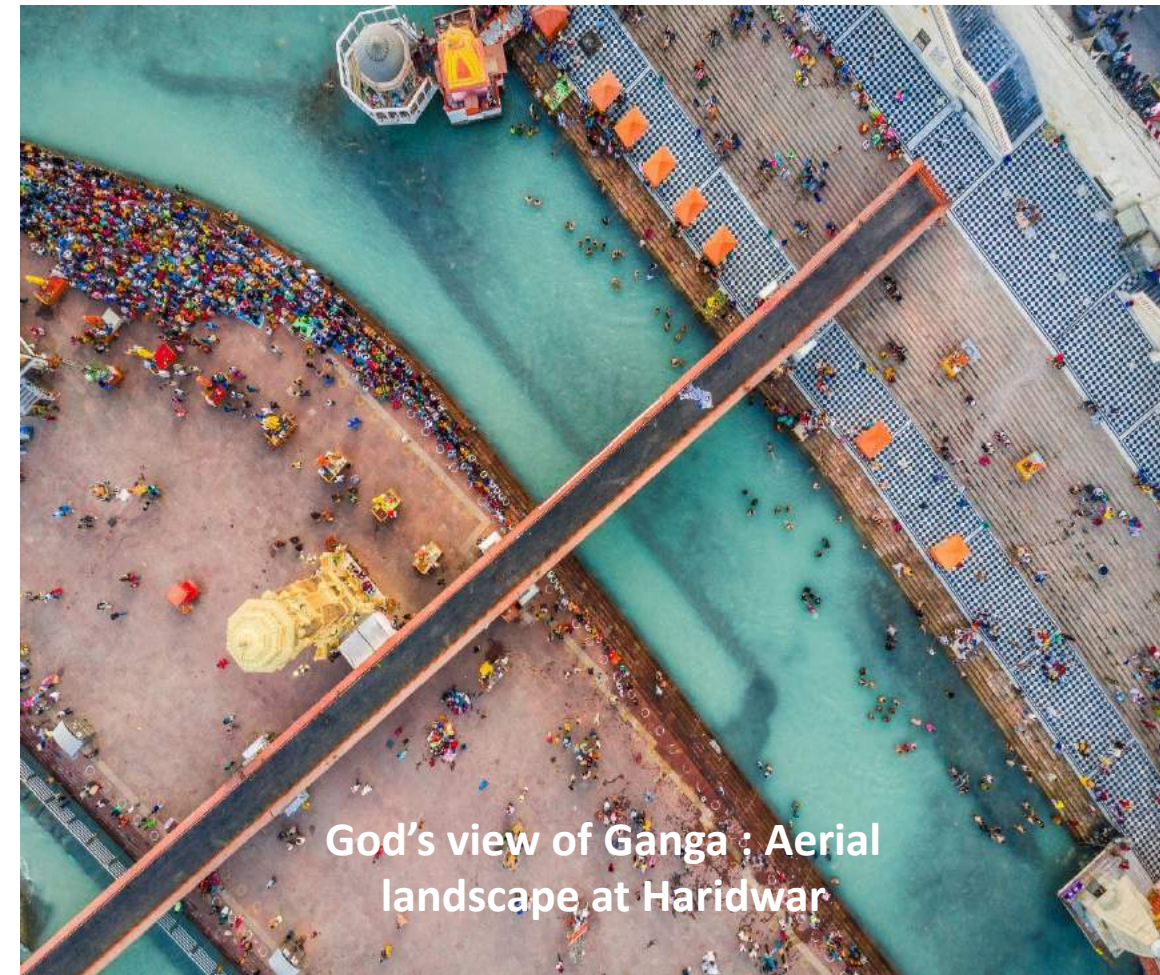
- **Who owns Ganga?** .....How to make them realise and who will do it?
- 'To make rain possible, you need to start with dust. To start a mission , you need an anchor' \*
- You need to create as many dust particles
- Infinite number of activities can be thought of....Roadmap?
- Stages for Strategic Intervention-Awareness, Activities, Advocacy \*\*
- **River People Continuum**
- **Army of River Champions**....Structures and catalysing Activities

*"We need to come together and unify to save the greatest gift of nature to India and to entire humanity for posterity. In fact, We have no choice but to do so."\**

*\*Ganga: Reimagining, Rejuvenating, Reconnecting; \*\* TREE Craze Foundation*

# People's Connect: River Front Management

- ❖ **Makeover at the River's Edge : Interface of people and River-Patna River Front Development (RFD) Project**
- ❖ **Improving Amenities & Sanitation**
- ❖ **Much needed Public Place for Cities**

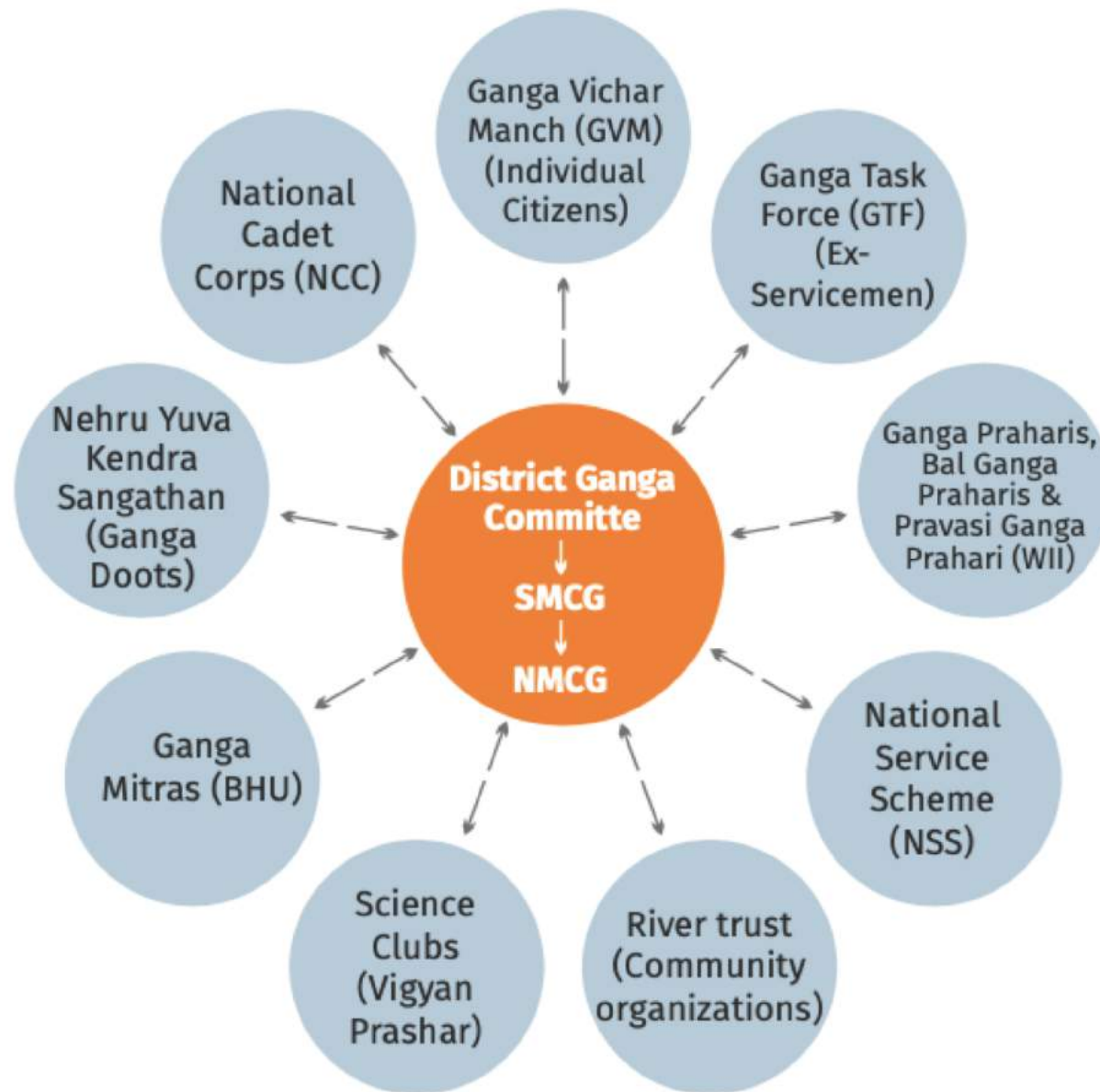


# People-River Connect

Continuous Learning & Activity Portal

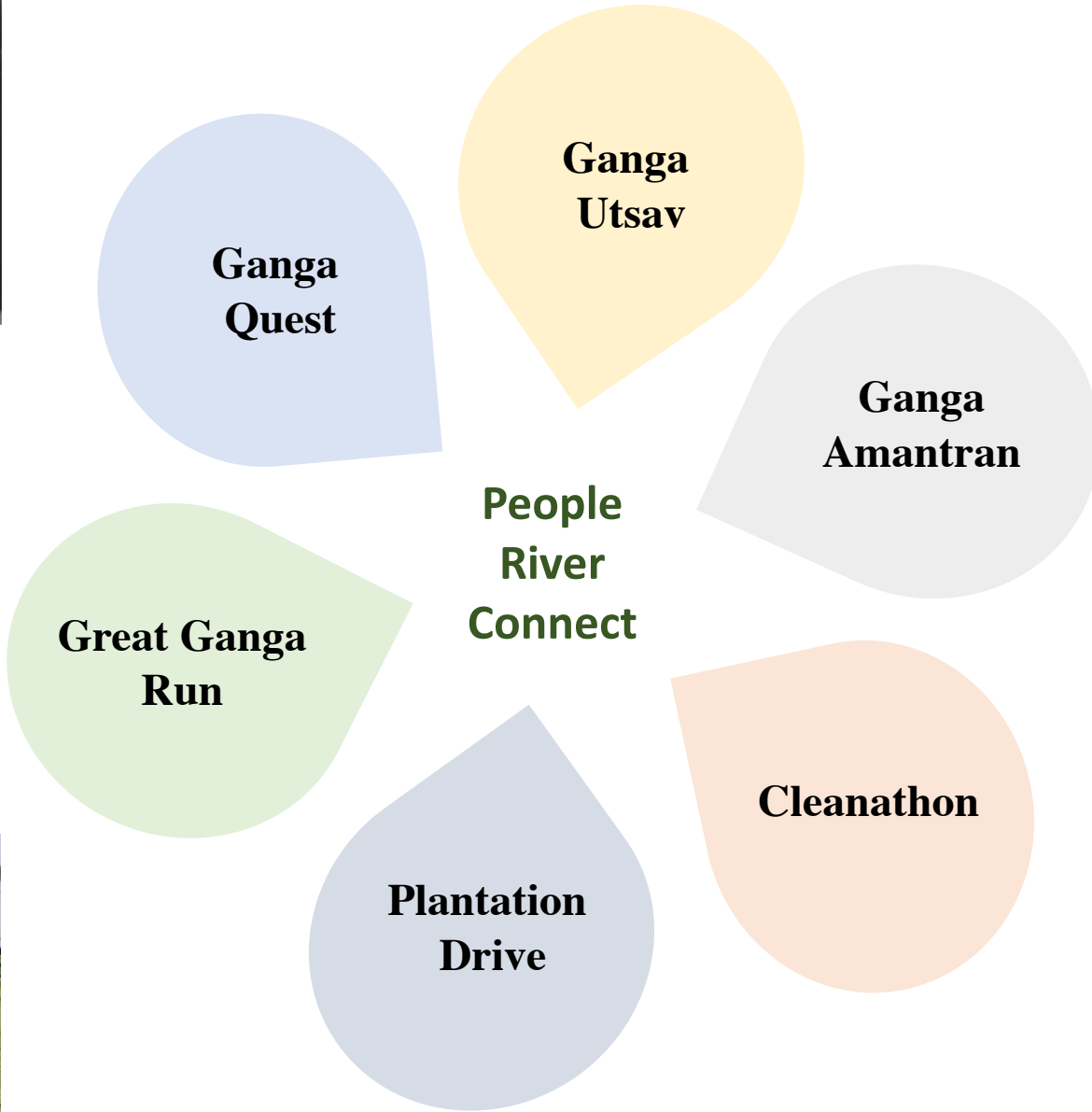
[www.clap4ganga.com](http://www.clap4ganga.com)

Gangaquest 2022



## Yearly Activities

- *Ganga Quest*
- *Ganga Utsav*
- *Ganga Amantran (Rafting Expedition)*
- *Great Ganga Run*
- *Cleanathon*
- *Tree Plantation*



**Ganga  
Quest**

**Ganga  
Utsav**

**Ganga  
Amantran**

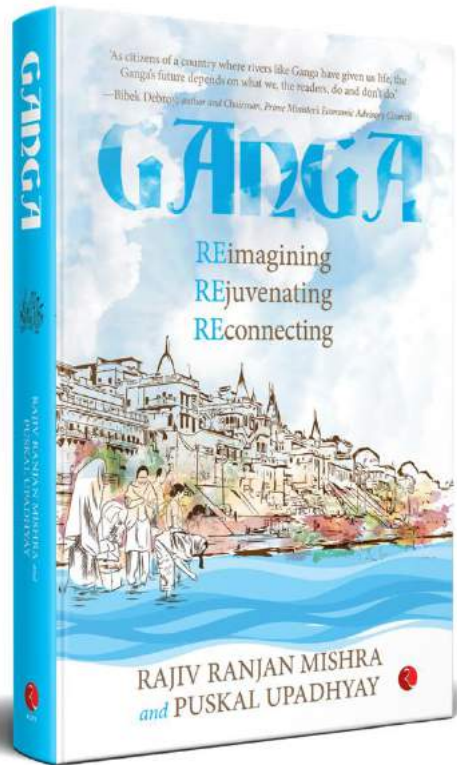
**People  
River  
Connect**

**Great Ganga  
Run**

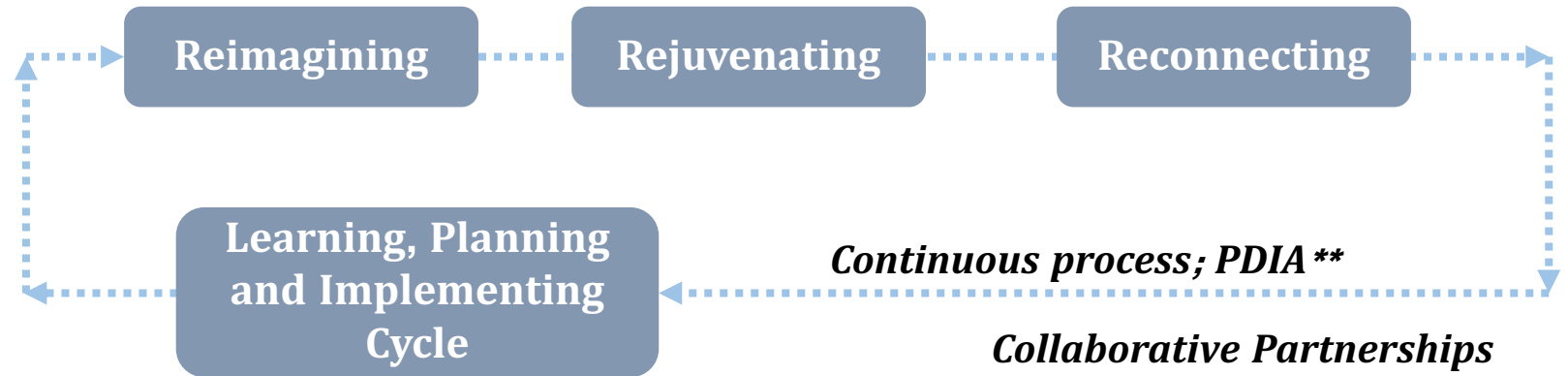
**Cleanathon**

**Plantation  
Drive**

# #3R Model of River Rejuvenation



*Co-creating knowledge, enabling Research ecosystems*



*Can be effectively led by*

*Learning organization \**

*Organizations that can truly learn and continuously enhance capacity to meet higher aspirations \**

**Reference - Ganga: Reimagining, Rejuvenating, Reconnecting**

**\*Fifth Discipline by Peter M Senge; \*\*Building State Capability by Matt Andrews et al, HKS**



**Birth of Ma Ganga on the snow capped  
Gaumukh Mountains**



**Circle of life: meeting point of Ganga and the Ocean at  
Gangasagar**

**Thank You**