

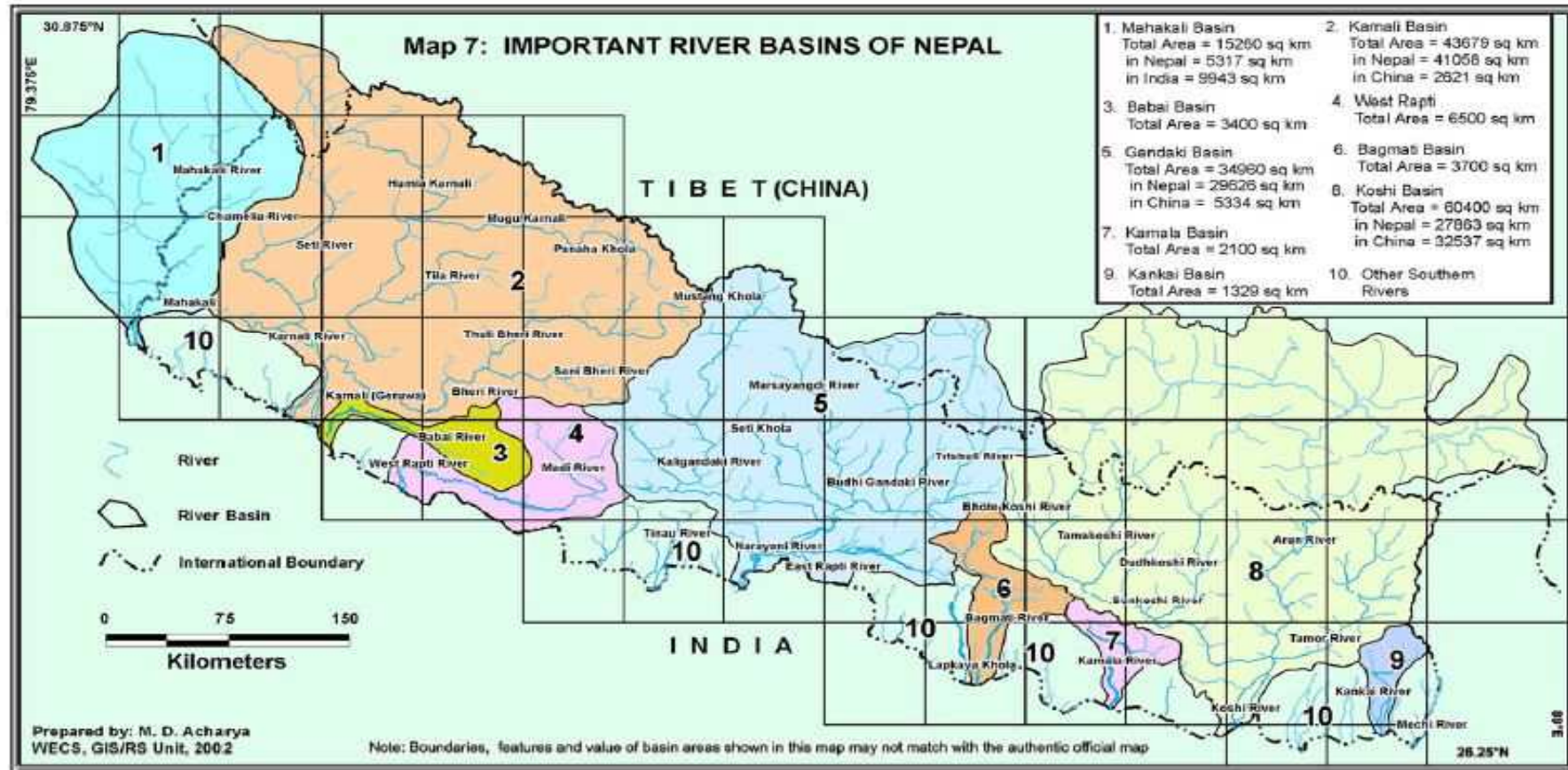
**HPCIDBC AND IWRM
IMPLEMENTATION IN NEPAL:
*CASE OF UPPER BAGMATI
RIVER BASIN***

**Rajesh Prasad Singh
Project Manager
HPCIDBC
NEPAL**

OUTLINE OF PRESENTATION

- **Nepal & its River Basins**
- **Bagmati River Basin**
- **Kathmandu Valley and Bagmati River Environment**
- **HPCIDBC**
- **HPCIDBC as a Upper Bagmati RBO**
- **HPCIDBC is doing**
- **HPCIDBC will do**
- **Expectation from NARBO**

Nepal & its River Basins



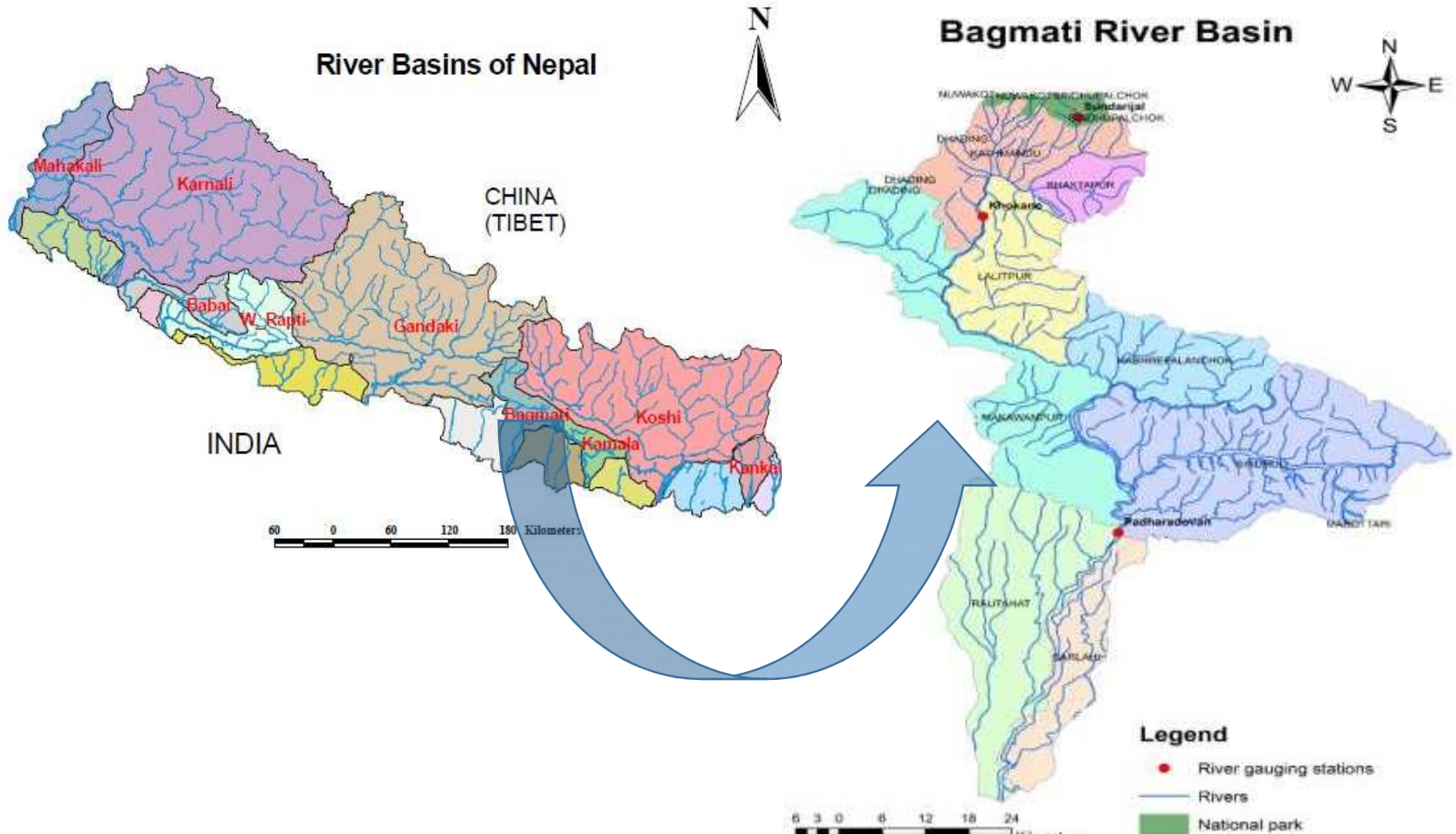
Nepal & its River Basins ...

- **6000 rivers and lakes within the territory of Nepal**
- **Total drainage area: 194,471 km²**
- **Nepal has 225 billion cubic meters of annually available water. Only 15 billion cubic meter is used for economic and social purpose (96% -agriculture, 1% -industry & 3% -municipal use)**
- **Water is regarded as the key strategic Natural resources having the potential to be the catalyst for all round development and economic growth of the country.**
- **Nepal Himalayas enjoy the possession of 7 mountain peaks higher than 8,000 meters 3,252 glaciers covering an area of 5,323 sq. km and ice-reserve of 481 cubic km 2,323 identified glacial lakes covering an area of 75.7 sq. km, 20 of them are highly vulnerable**
- **Nepal has a cultivated area of 2,642,000 ha (18% of its land area), of which two third (1,766,000 ha) is potentially irrigable.**

Nepal & its River Basins ...

- **Nepal's water resources is confined within Four major river basins**
- **Koshi Catchment area -66,400 km²; 46 % or 27,863 km² within Nepal Avg. discharge -1,409 m³/s**
- **Gandaki Catchment area -34,960 km² 90% within Nepal, Avg. discharge -1,600 m³/s–Karnali Catchment area -43,679 km² 94% within Nepal Avg. discharge -1,397 m³/s**
- **Mahakali Catchment area-15,260 km², 34 % within Nepal Avg. discharge -573 m³/s**
- **Nepal contributes about 70 % of the Ganges flow in dry season**

BAGMATI RIVER BASIN



THREE REACHES OF BAGMATI RIVER BASIN

Sub-basin	Area	Tributaries	Districts
Upper Bagmati River Basin	611 km ² (Kathmandu Valley)	Bagmati Bishnumati Dhobikhola Manohara Balkhu Godavari Nakkhu	Kathmandu, Bhaktapur & Lalitpur
Middle Bagmati River Basin	2,298 km ² (Mahabharat and Siwalik range)	Kulekhani, Khani Khola, Kokhajor Marin Khola	Makawanpur, Kavrepalanchowk, & Sindhuli
Lower Bagmati River Basin	853 km ² (Terai)	Bagmati Chandi Jhanj Manusmara	Sarlahi & Rautahat

WATER USE IN BAGMATI RIVER BASIN

Sub-basin	Water Uses	Major Existing Projects
Upper Bagmati River Basin (Highly populated Valley)	WASH, Hydropower, Irrigation (8,000 ha)	Sundarijal WS Groundwater extraction for WS KVWSMP Sundarijal HEP
Middle Bagmati River Basin (Steep mountains)	Hydropower Irrigation (approx. 3000 ha) WASH	Kulekhani HEP Irrigation in Marin Valley Irrigation in Phapharbari area Rural WASH schemes
Lower Bagmati River Basin (High agriculture potential)	Irrigation (90,000 ha) WASH	Bagmati IP Manusmara-I & II Jhanj IP Flood Control Embankments STW for WASH

UPPER BAGMATI RIVER BASIN

- **Extraction/ use of water**
- **Declining groundwater levels**
- **Pollution from industry and urban sources**
- **Narrowing, deepening river channels**
- **Degrading catchments**
- **Eroding cultural values**
- **Rapid urbanization**



MIDDLE BAGMATI RIVER BASIN

- **Out-diversion for hydropower-Kulekhani**
- **Flooding and river bank erosion**
- **Watershed degradation**
- **Irrigation diversion**



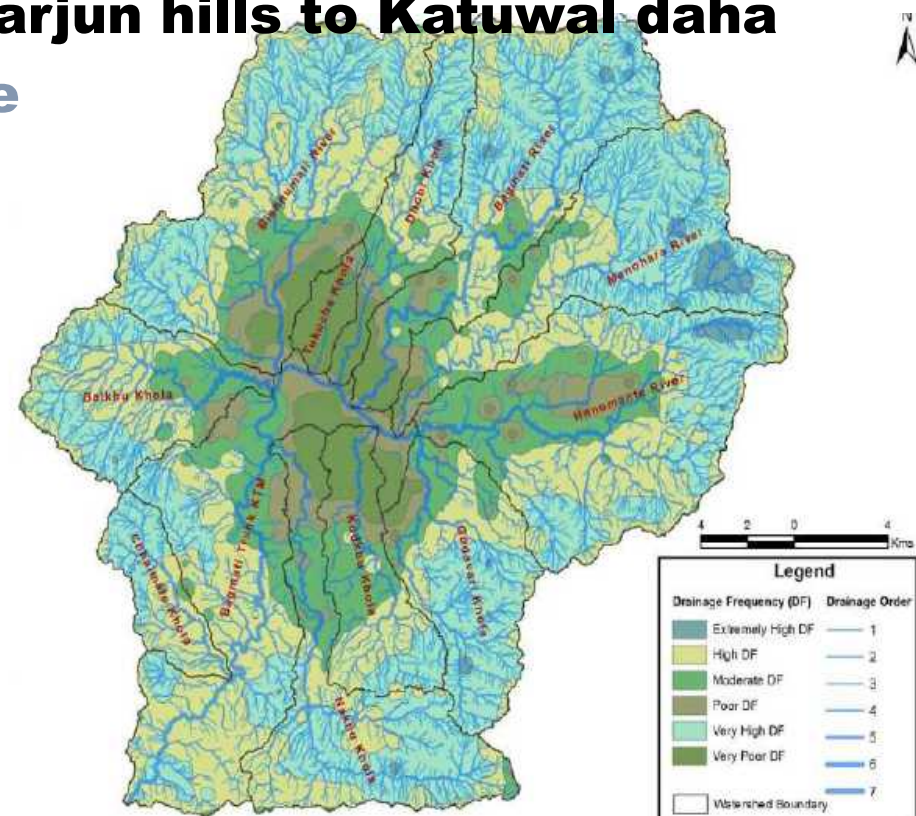
LOWER BAGMATI RIVER BASIN

- **Flooding and River bank erosion**
- **River channel stability**
- **Use of groundwater**
- **Deforestation**



KATHMANDU VALLEY AND BAGMATI RIVER ENVIRONMENT

- **Kathmandu Valley covers three district-Kathmandu, Lalitpur and Bhaktapur with an area of 611 Km²**
- **Old cities with rich civilization and culture**
- **Stretches from Shivapuri-Nagarjun hills to Katuwal daha**
- **Main rivers with the Valley are**
 - **Bagmati**
 - **Bishnumati**
 - **Dhobi Khola**
 - **Manohara**
 - **Balkhu**
 - **Godavari**
 - **Nakkhu**



HIGH POWER COMMITTEE FOR INTEGRATED DEVELOPMENT OF BAGMATI CIVILIZATION

- **HPCIDBC- established in 1995 with the aim of implementing and monitoring of environmental improvement of Pashupati area**
- **The scope of work of the Committee was extended in 1995, 2006 and 2008 with inclusion of integrated development approach**
- **GON has approved Bagmati Action Plan (2009-14) and HPCIDBC as main implementer of BAP**
- **Bagmati Area Physical Infrastructure Development Project (BAPIDP) was initiated in 1996**
- **Bagmati River Basin Improvement Project-BRBIP/ADB was stated in 2012**
- **Bagmati river cleaning campaign reach in 195 weeks**
- **HPCIDBC-amendment of formation order to act as RBO of upper Bagmati river**

HPCIDBC AS UPPER BAGMATI RBO

- **To prepare integrated river management plan of Bagmati river and its tributaries,**
- **Include alternative plans to address the water availability and uncertainty due to climate change while preparing integrated river management plans,**
- **To recommend to issue license for the use of river water,**
- **To monitor and evaluate the water allocation and water quality as per issued license,**
- **To prepare and update surface water as well as groundwater data and information,**
- **To recommend for technical clearance of project related to river water use,**
- **To prepare holistic periodic plan of water resources within the scope of the committee,**

HPCIDBC AS UPPER BAGMATI RBO

- **To prepare plans in coordination with surface water and groundwater resources,**
- **To maintain water quantity and quality for environmental flow,**
- **To manage and maintain cultural and other uses of water,**
- **To prepare, operationalize and manage activities related to community participation,**
- **To organize integrated water resources management related capacity building activities of the concerned stakeholders,**
- **To coordinate with all concerned agencies related to the uses of river water and resolve or recommend to resolve conflicts if any,**

HPCIDBC AS UPPER BAGMATI RBO...

HPCIDBC Vision

Clean, green and healthy river system in Kathmandu valley; that is full of life and valued by all.

What is HPCIDBC doing

Clean River system

- Managing the river
 - River engineering
 - Defining the river water ways
 - Construction of guide bunds
 - Laying of sewers and ancillaries
 - Design and construction of Waste water Treatment Plant and its operation(how long)
 - Coordination with other developing Agencies



What is HPCIDBC doing...

Green river system

- Solid waste mgmt
 - Regular weekly cleaning campaign
- River bank land management
 - Depth study of old and new land maps demarcation of River Land
 - Demolition of encroached land
 - Squatter clearance (inventory preparation)



What is HPCIDBC doing...

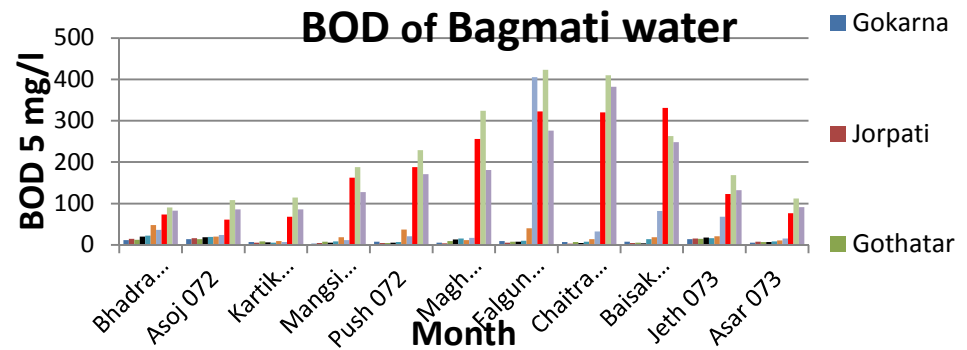
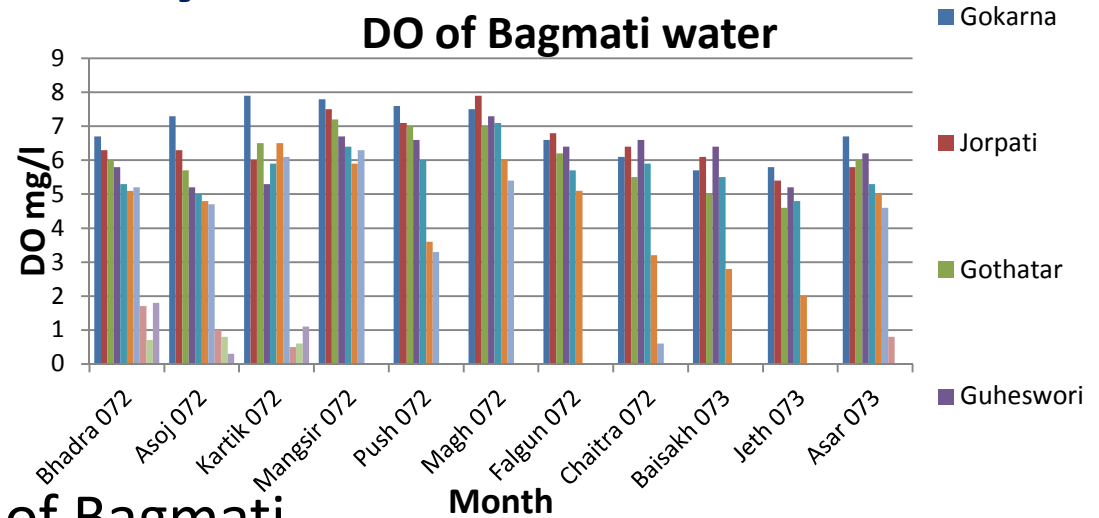
Green river system

- Park and Open space Creation
 - various stretches called for park construction by people/institution ,etc
 - sustainability aspect handing over to local clubs and organization
 - (47 interested, 25 agreement,19 started)
- Organizing local events in Bagmati

What is HPCIDBC doing...

healthy river system

- Liquid waste mgmt
 - Interceptor construction along
 - Bagmati(28.8)
 - Rudramati(20km)
 - Bishnumati(21km)
- Water quality monitoring
 - Along various stretches of Bagmati
 - Regular monitoring of leakage and new intruders



What is HPCIDBC doing...

healthy river system

- Water quantity improvement
 - Construction of 24 mts high CFRD: **Dhap dam**(40lps discharge)
 - Study (Feasibility & Detailed Engineering Design) of 90 mts high CFRD: **Nagmati Dam** (360lps discharge)
 - 2800 hh will be participating in the rain water harvesting & groundwater recharge



Aerial View of Dhap Dam



View of Main Dam and Spillway

What *will* HPCIDBC *do*

Clean River system

- Form alliance with local clubs/institutions etc for sustainable progress of parks and river solid waste management
- Advocate /persuade other related organizations to take up their duties in this aspect with more responsibility
- Increase more vigilance and monitoring of the river corridor
- Increase activities of awareness at various level using new techniques and methods
- Search for new partners to support our action plan activities

What *will* HPCIDBC *do...*

Clean Green and Healthy River system

- Construction of Infrastructures; Nagmati Dam, Treatment plants, Parks, New parks with public facilities etc...
- Integrated Bagmati River Basin Development Master Plan to be formulated soon
- New Water laws and regulation to be worked out(RBO/ACT)
- Pilot project for solid waste management activities
- Bagmati Museum- *a center for* water science & Bagmati civilization
- Flood forecasting & Early Warning System

Expectation from NARBO

- advise on the roadmap towards establishing an RBO
- advice on capacity building and benchmarking of the RBO
- advise on how to make co-ordination among various stakeholders in Urban Rivers
- suggestions for twinning with other basin organizations in fast growing urban centers



Thank You