

Government of India Acts

- The Inter-State River Water Disputes Act, 1956
 - Enacted under article 262 of Constitution
 - To provide for adjudication of disputes relating to water of Inter-State rivers and river valleys
 - 8 tribunals have been formed under the act out of which 3 award has been finalised.
- The River Board Acts 1956
 - Enacted by using powers available under article 246 of Constitution
 - To provide for establishment of river boards for regulation and development of Inter-State rivers and river valleys
 - No river board formed under the Act.
- The Betwa River Board Act, 1976.
- The Brahmaputra Board Act, 1980.
- Damodar Valley Corporation Act-1948

Constitutional Provisions

- Entry 56 of List I (Union List) of the 7th Schedule
 - Regulation and development of Inter-state rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest
- Entry 17 of List II (State List) of the 7th Schedule
 - Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to provisions of entry 56 of List I
- Article 262 – Provision for adjudication of disputes relating to waters of inter-State rivers or river valleys

State Acts

- Entry 17 of List II (State List) of the 7th Schedule
 - Water resources project is planned, investigated, implemented & managed by the State Governments as per their priority and resources available with them.
 - Management of Irrigation / canal
 - Flood
 - Dam Safety

Institutional

- Central Government Level – Overall planning
 - Ministry of Water Resources, River Development & Ganga Rejuvenation(NMCG,NWM): CWC, CGWB, GFCC, NWDA, BB, CWPRS, CSMRS, NIH, NCA, FBP, NPCC, WAPCOS, NERIWALM,etc.
 - Ministry of Environment, Forests and Climate Change
 - Ministry of Rural Development
- State Government Level – Planning / implementation of projects
 - WRD/ID, CADA, MI Dept.
 - GW dept.
 - PHED / PWD
- Stakeholders – Operation & maintenance
 - Water User Associations / Panchayati Raj Institutions
 - Non Government Organisations

Role of Central Government

- The Union Government renders assistance to States which is technical, advisory, catalytic and promotional in nature.
- Facilitates Co-ordination / consultation among Co-basin States of inter-state river basins.
- Sharing of Project Benefits, Cost, Water, Power Generation, Regulation
- Supplement financial resources of States

Role of Central Government

- Bhakhra Beas Management Board(BBMB)- MoP
- Damodar Valley Corporation (DVC)- MoP
- Narmada Control Authority(NCA)
- Sardar Sarovar Construction Advisory Committee(SSCAC)
- Bansagar Control Board
- Tungbhadra Board
- Uppar Yamuna River Board
- Polavarm(Indira Sagar) Project Authority-Godavari

Government of India initiatives/schemes

- 1. **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** to ensure access to some means of protective irrigation to all agricultural farms in the country to produce 'per drop more crop'. The main components of PMSKY:
 - **A. Accelerated Irrigation Benefit Programme (AIBP)**- completion of MMI projects
 - Benefit provided to about 290 major & medium irrigation projects
 - **B. PMKSY (Har Khet ko Pani)-Minor Irrigation** (both surface and ground water); Repair, Restoration and Renovation of water bodies; Command Area Development; Improvement in water management and distribution system; Ground water development; Creating and rejuvenating traditional water storage systems
 - To restore and augment storage capacities of water bodies, and also to recover and extend their lost irrigation potential.
 - **C. PMKSY (Per Drop More Crop)**-Preparation of State/District Irrigation Plan, Promoting efficient water conveyance and precision water application devices like drips, sprinklers, pivots, rain-guns in the farm.
 - **D. PMKSY (Watershed Development)**- **MoRD** management of runoff water and improved soil & moisture conservation activities on watershed, traditional water bodies.

Government of India initiatives/schemes

- **Interlinking of rivers;** Identified 14 links under Himalayan Component and 16 links under Peninsular Rivers Component. Projects will enable additional irrigation to 35 million hectares area, generation of 40 million kilowatt of hydropower, flood control and other multipurpose benefits.
- Ken – Betwa Link Project (States of Madhya Pradesh & Uttar Pradesh), clearances for Ken – Betwa link project are in the advance stages and the Government will start implementing this National Project as model link project
- Damanganga – Pinjal Link Project and Par – Tapi – Narmada Link Project (Governments of Maharashtra and Gujarat)
- Mahanadi – Godavari Link Project

- **National Ganga River Basin Authority (NGRBA)** has initiated the Mission Clean Ganga in four sectors namely; wastewater management, solid waste management, industrial pollution and river front development.
- NGRBA has been established through gazette notification dated February 20, 2009 with the objectives of
 - (a) ensuring effective abatement of pollution and conservation of the river Ganga by adopting a river basin approach to promote inter-sectoral co-ordination for comprehensive planning and management;
 - (b) maintaining environmental flows in the river Ganga with the aim of ensuring water quality and environmentally sustainable development.

National Water Mission

The National Water Mission was set up as one of the 8 missions under the National Action Plan on Climate Change (NAPCC) 2008, with the **objective**

“Conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management.”

Role of The Union Government

- The Union Government provides assistance to States;
- technical, advisory, catalytic and promotional in nature.
- Facilitates Co-ordination / consultation among Co-basin States of inter-state river basins.
- Supplement financial resources of States
 - Accelerated Irrigation Benefits Program (AIBP)
 - Started in the year 1996-97
 - For expeditious completion of ongoing irrigation.
 - Benefit 290 major & medium irrigation projects
 - Repair Restoration & Renovation of Water Bodies (RRR)
 - To restore and augment storage capacities of water bodies, and also to recover and extend their lost irrigation potential.

National Water Mission - Goals

- Goal - I Comprehensive data base in public domain and assessment of impact of climate change on water resource,
- Goal - II Promotion of citizen and state actions for water conservation, augmentation and preservation,
- Goal - III Focussed attention on vulnerable areas including over-exploited areas,
- Goal - IV Increasing water use efficiency by 20%,
- Goal - V Promotion of basin level integrated water resources management.

Goal- I

Comprehensive water data base in public domain and assessment of the impact of climate change on water resource

India –WRIS:Central Water Commission (CWC) has launched web based Water Resources Information System (IndiaWRIS) in association with National Remote Sensing Centre (NRSC). The Version 4.1 has been initiated in July 2015, GIS based data is available in public domain at 1:2,50,000 scale. The data include Gauge, Discharge, Silt and Water Quality parameters as recorded by CWC Hydro Meteorological Stations since 1965.

The ground water level and water quality data of CGWB for the period 2005 to 2009 has been made available on IndiaWRIS.

The objective of establishment of National Water Informatics Centre (NWIC) under National Hydrology Project (NHP) is to develop centralized spatial data sets, including remotely sensed data.

National Hydrology Project approved on 06-04-2016 with a total outlay of Rs. 3679.7674 crore with World Bank's funding. In-Situ Hydro-met Monitoring Systems, National Water Information System, Water Resources Operation & Management Systems and Water Resources Institutions and Capacity Building are main components of the scheme.

Goal- I :Comprehensive water data base in public domain and assessment of the impact of climate change on water resource

Studies on Impact of Climate Change on major river basin: For study of initial projections of the impact of climate change on water resources, including the likely change in water availability across time and space, Ten proposals studies have been under consideration in R&D scheme.

❖ **Setting up of new CWC Hydrological Observation Stations-.**


❖ **Establishing new Ground Water Monitoring Wells by CGWB-**

❖ **Re-assessment of river basin-wise water situation : CWC in collaboration with NRSC has started the work on the reassessment of 19 river basins. Approval has been issued. Training programmes for CWC officials have been conducted by NRSC and more training programmes are planned for regional offices. Procurement of hardware / software, data collection and initiation of study in CWC field offices has been initiated.**

Goal-V; Promotion of basin level integrated water resources management

- The National Water Policy, 2012 was adopted by the National Water Resources Council (NWRC) at its 6th meeting held on 28.12.2012. NWP-2012 document has been placed in public domain.
- Department / Organizations of Central / State Government to be restructured to adopt IWRM approach
- Permanent Water Disputes Tribunal for resolution of disputes
- Setup for each river basin for collection and collation of data
- Rainfall, river flows, area irrigated by crops and by source, utilizations for various uses by both surface and ground water
- Reforms and progressive measures to be promoted
- Setting up of State Water Regulatory Authority
- A Committee was constituted under the Chairmanship of Dr. S.R. Hashim to suggest a road map for implementation of NWP 2012.
- Review of State Water Policy under progress-14 States done

State Water Missions

- State Water Mission under the Chief Secretary for coordination in the State within different Deptt. like Department of Water Resources, Irrigation, Department of Agriculture, Urban development, Rural Development, Industries etc.
 - CWC prepared Guidelines for different use of Water i.e irrigation, drinking, industrial uses.
 - A Workshop on Integrated Water Resources Development and Management was organized in Feb.2015 and CWC has finalised guidelines for Integrated Water Resources Development and Management (2015).
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Preparation of State-Specific Action Plans(SSAP) for Water Sector

- Twelve States namely, Andhra Pradesh, Telangana, West Bengal, Uttarakhand, Gujarat, Assam, Chhattisgarh, Karnataka, Madhya Pradesh, Maharashtra, Odisha and Tamil Nadu have been requested to prepare their State Specific Action Plans, in the 1st phase.
- **North-Eastern Research Institute of Water and Land Management (NERIWALM), Tezpur, Assam will function as the nodal agency**
- NWM proposes to offer technical guidance to the State level as well as financial assistance to the tune of Rs. 50 Lakh to Large states and Rs. 30 lakh to Small States/UT's.

Increasing Water use efficiency

- Agricultural sector uses more than 80% of water. Industrial water usages are about 13%, domestic sector 7% of total water supply. For enhancing water supply, the viable option is to give priority to Water Management and its conservation, improving water use efficiency in agriculture, industry or domestic sectors.
- Efficient water management system would help in reduction of the gap (about 15 percent) between irrigation potential created and utilised.
- A **scoping study** on the Water Use Efficiency for the Major-Medium Irrigation Projects has been completed in association with Asian Development Bank (ADB). The report has been circulated to all the State Governments and uploaded on the website of MoWR, RD & GR for implementation.
- Sub-Basin wise Ground and Surface Water modeling centers.
- NWM has initiated baseline studies in the area of Irrigation in association with the WALAMTARI, Hyderabad(A.P. Telangana), WALMI, Aurangabad (Mah.) and NERIWALM, Tejpur(N.E region) for 21 irrigation projects .

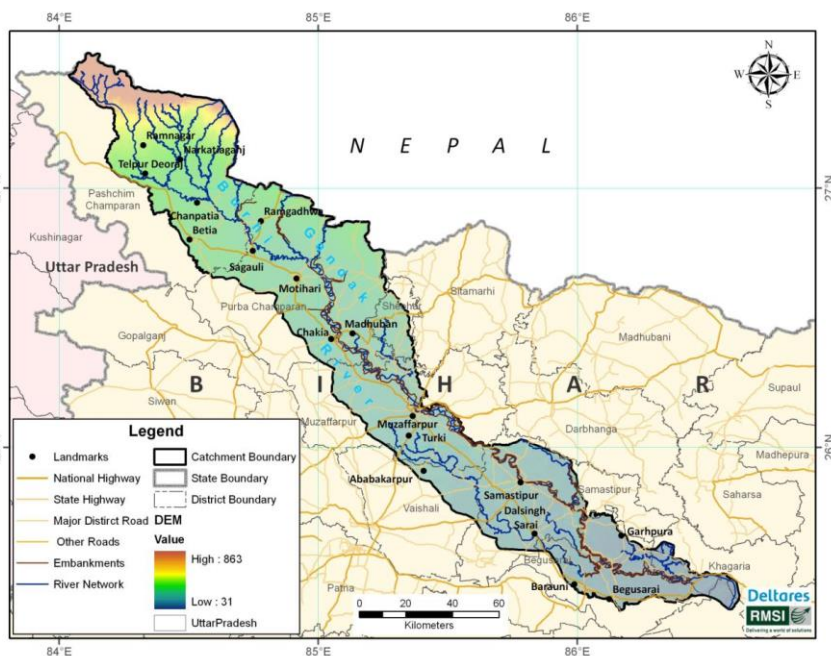
IWRM at a sub-basin level

- The river basin approach to focus on implementing IWRM principles on the basis of better coordination amongst operating and water management entities within a river basin, with a focus for allocating and delivering reliable water-dependent services in an equitable manner.

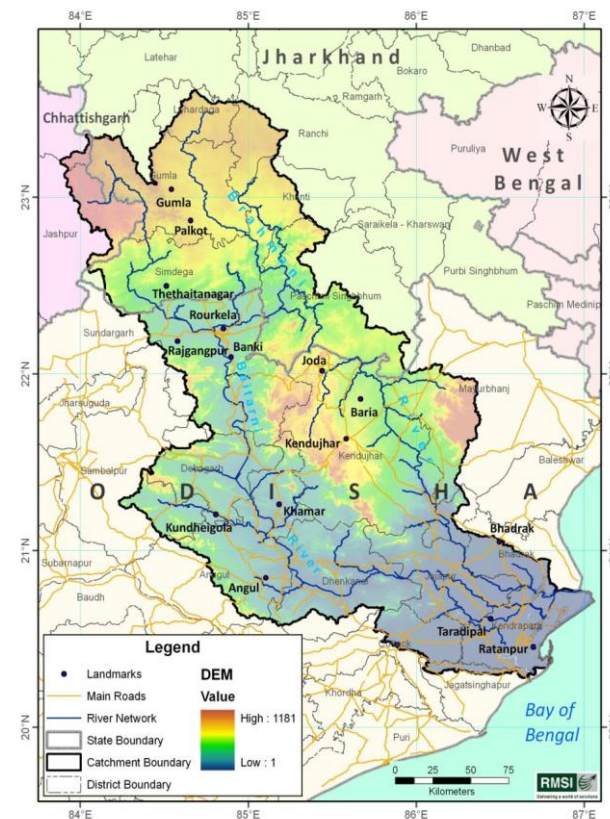


“Operational Research to Support Mainstreaming of Integrated Flood management (IFM) under Climate Change”:

- **structural and non-structural** measures for flood risk mitigation in India
- **Phase 1: scoping study and provide ToR**
- **Selection of 2 sub-basins**
- **Phase 2: Buri Gandak sub-basin in Bihar and Brahmani basin in Odisha**



Burhi-Gandak (Bihar)



Brahmani-Baitarani (Odisha)

ADB Recommendations

Flood Risk Analysis:

Basin level flood risk analysis for effective basin management. High quality data on exposure/vulnerability required. Research on failure mode of embankment and effective reservoir operation rules are required

Flood risk evaluation:

Sector specific evaluation based on different return period emphasizing safety level and CBA.

Selection of flood mitigation measures:

Urgent measure first: all kinds of repair and emergency measures

Short term measures: implementing measures which can reduce flood impacts without large investments and quick benefit (early warning, comm. preparedness etc.)

Medium to long term: upgrading embankments, new dams and diversion projects, watershed improvement, land use zoning, etc

Institutional arrangement:

River basin approach for flood mitigation measures using flood modelling

Setting of RBOs, redefining the roles and responsibilities of existing RBOs

Thanks

