

**THE ROLE AND FUNCTIONS
OF
NATIONAL INSTITUTE OF HYDROLOGY**

OBJECTIVES

- **To undertake, aid, promote and coordinate systematic and scientific work on all aspects of hydrology**
- **To cooperate and collaborate with other national, foreign and international organizations in the field of hydrology**

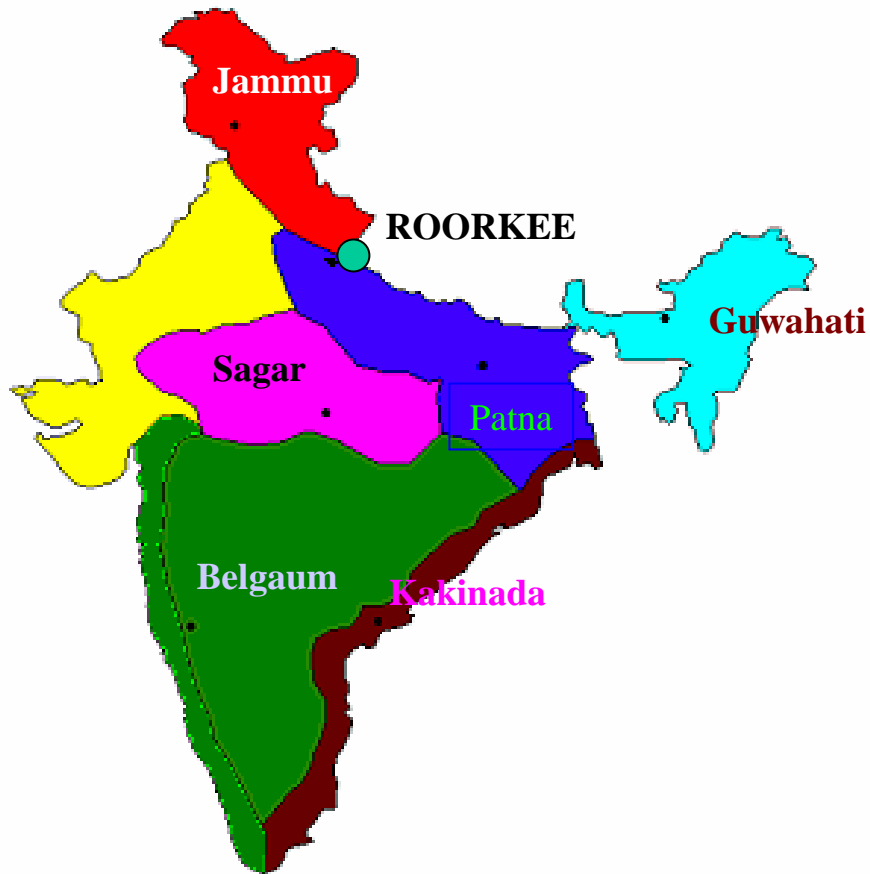
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OBJECTIVES

Contd...

- **To establish and maintain a research and reference library in pursuance of the objectives of the Society and equip the same with books, reviews, magazines and other relevant publications; and**
- **To do all other such things as the Society may consider necessary, incidental or conducive for the attainment of the objectives for which the Institute has been established**

NIH



REGIONAL CENTRES

BELGAUM
(Deccan Hard Rock)

KAKINADA
(Deltaic)

JAMMU
(Western Himalayan)

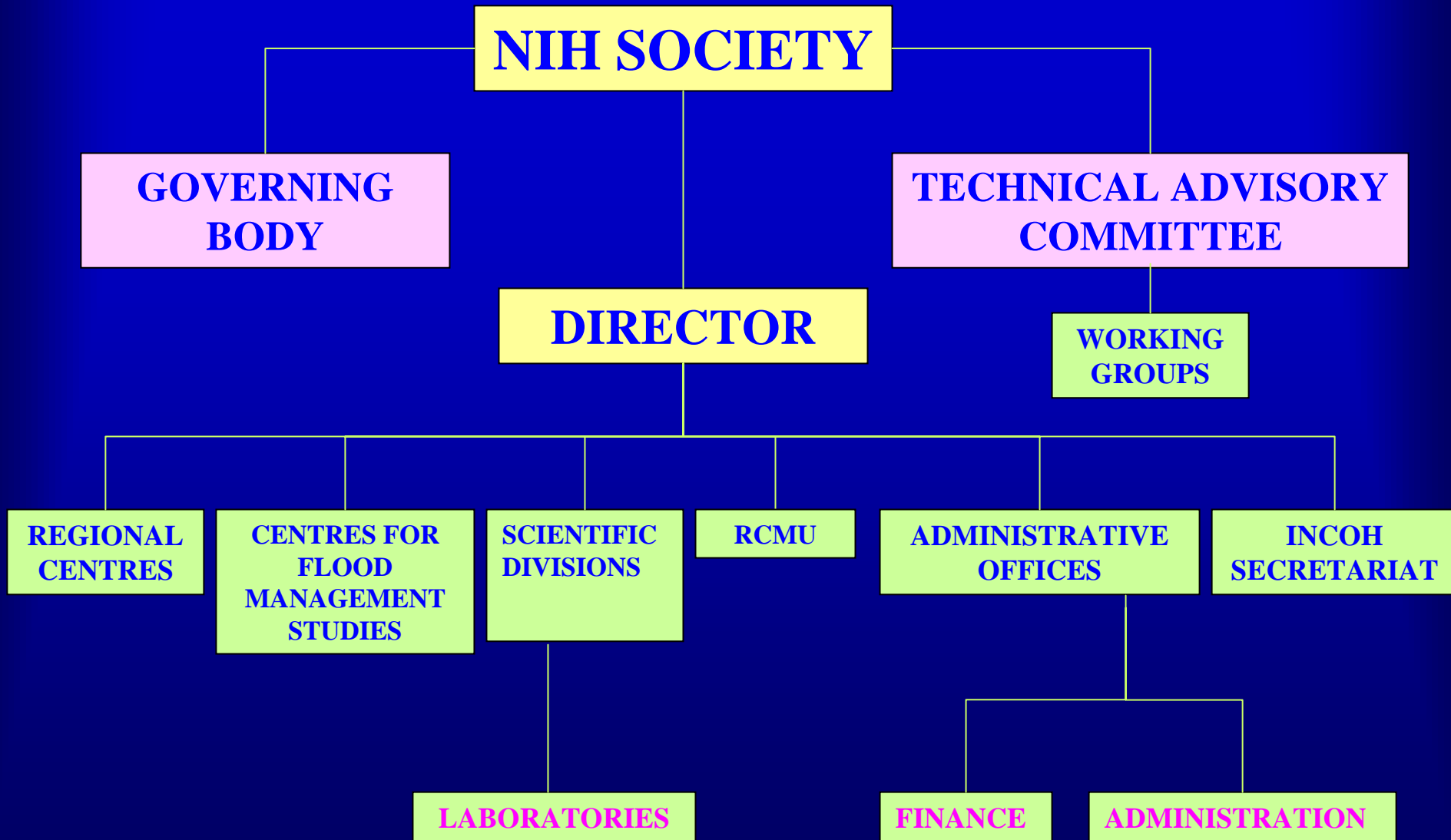
SAGAR
(Ganga Plains South)

CENTRES FOR FLOOD MANAGEMENT STUDIES

GUWAHATI
(Brahmaputra basin)

PATNA
(Ganga basin)

ORGANISATIONAL STRUCTURE



AREAS OF SPECIALIZATION

**ENVIRONMENTAL
HYDROLOGY**

**GROUND WATER
HYDROLOGY**

**SURFACE WATER
HYDROLOGY**

**WATER RESOURCES
SYSTEMS**

**HYDROLOGICAL
INVESTIGATIONS**

ACTIVITIES

- **BASIC, APPLIED AND STRATEGIC RESEARCH**
- **SOFTWARE DEVELOPMENT**
- **USER DEFINED, DEMAND DRIVEN RESEARCH PROJECTS**
- **CONSULTANCY**
- **TECHNOLOGY TRANSFER**
- **INCOH SECRETARIAT**

WATER AVAILABILITY

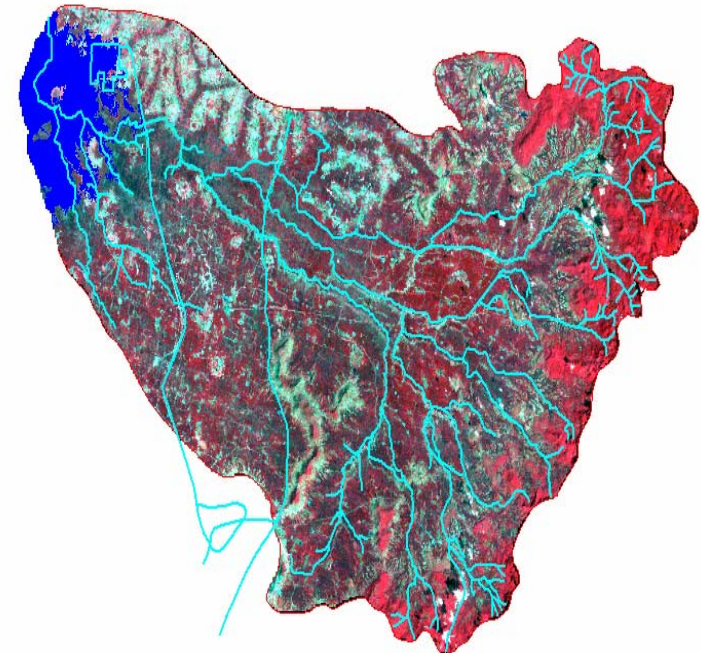
- **Hydrological modeling for estimating the temporal and spatial variability in the availability of surface and groundwater resources**
- **Development of flow duration curves for estimating the dependable flows**
- **Impact of land use changes and developmental activities on the water availability**
- **Estimation of surplus and deficit water availability considering water demand and available water supply**

REGIONAL HYDROLOGY

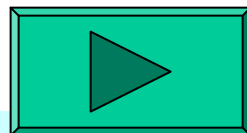
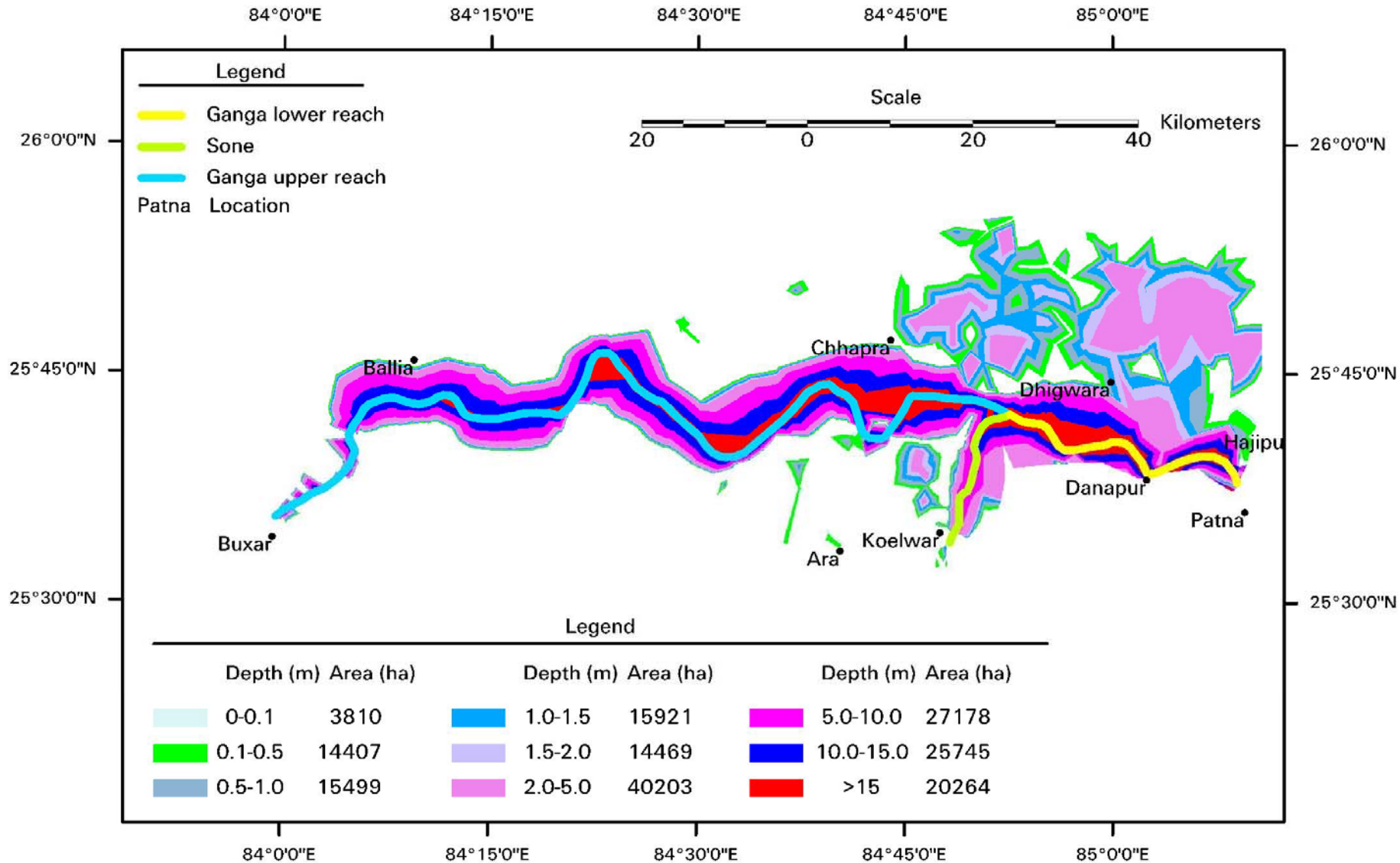
- **Regional relationships for unit hydrograph derivation**
- **Regional flow duration curves**
- **Regional rainfall–runoff relationships at different temporal scales**
- **Application of regional flood formulae for design of hydraulic structures**
- **Computation of dependable flow and hydropower potential using flow duration curves**

FLOOD MANAGEMENT

- Design flood estimation
- Real-time flood forecasting
- Flood plain zoning and flood plain mapping
- Dam break flood simulations
- Shifting characteristics of the alluvial rivers
- Flooding due to drainage congestion

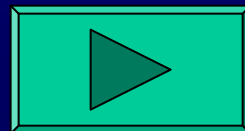


FLOOD PLAIN ZONING



SNOW AND GLACIER HYDROLOGY

- **Snow cover and glacier mapping**
- **Hydrological Studies of glaciers to investigate melting, storage and drainage characteristics**
- **Snow and glacier melt contribution to annual river flow**
- **Snow melt runoff and sediment modeling**
- **Forecasting stream flow during the melt season**

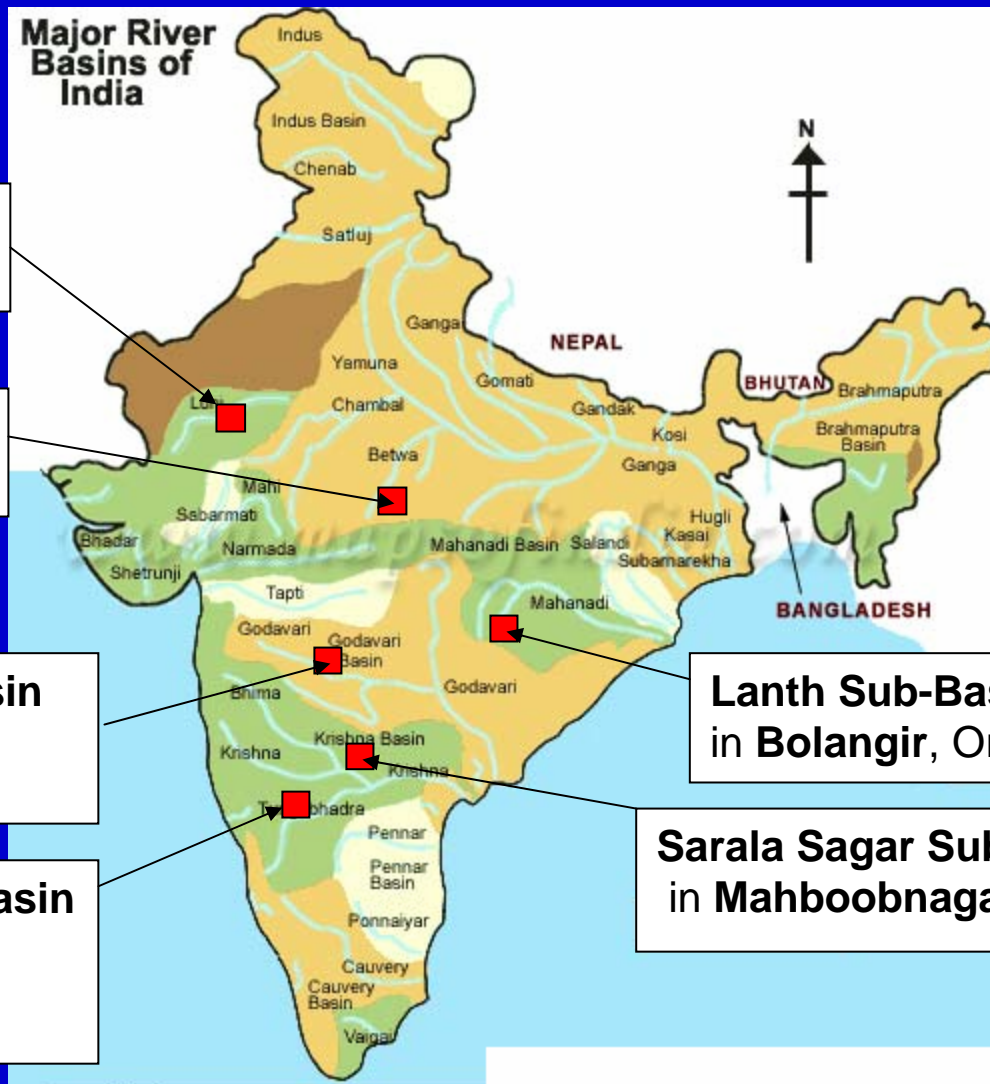


DROUGHT ANALYSIS

- **Development of appropriate drought indices**
- **Low flow analysis**
- **Supply and demand management of water during drought**
- **Real-time monitoring and prediction of drought**



DROUGHT STUDY - Sub-basins in different states



**Luni Sub-Basin
in Rajasthan**

**Sonar Sub-Basin
in Damoh/Sagar M.P.**

**Manar Sub-Basin
in Nanded,
Maharashtra**

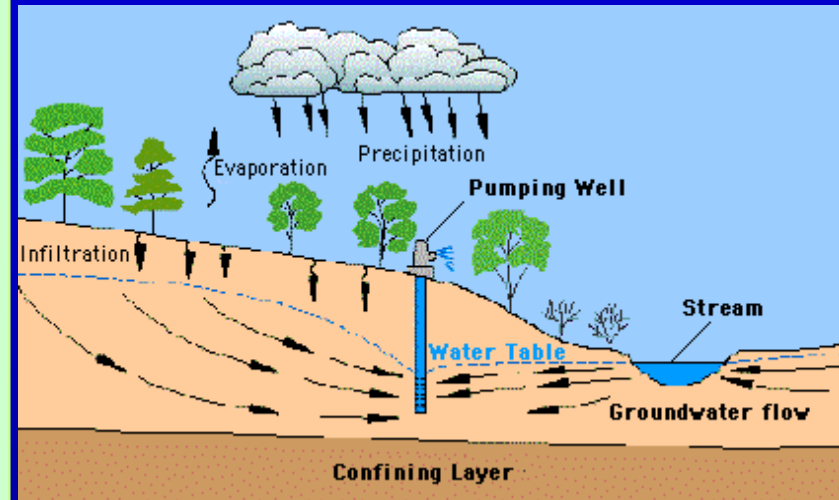
**Don Sub-Basin
in Bijapur,
Karnataka**

**Lanth Sub-Basin
in Bolangir, Orissa**

**Sarala Sagar Sub-Basin
in Mahboobnagar, A.P.**

GROUNDWATER HYDROLOGY

- Assessment of irrigation return flow
- Seawater intrusion into the coastal aquifers
- Conjunctive use of surface and groundwater
- Water logging and salinity studies
- Identification of groundwater recharge zones
- Design of sub-surface drainage in canal command

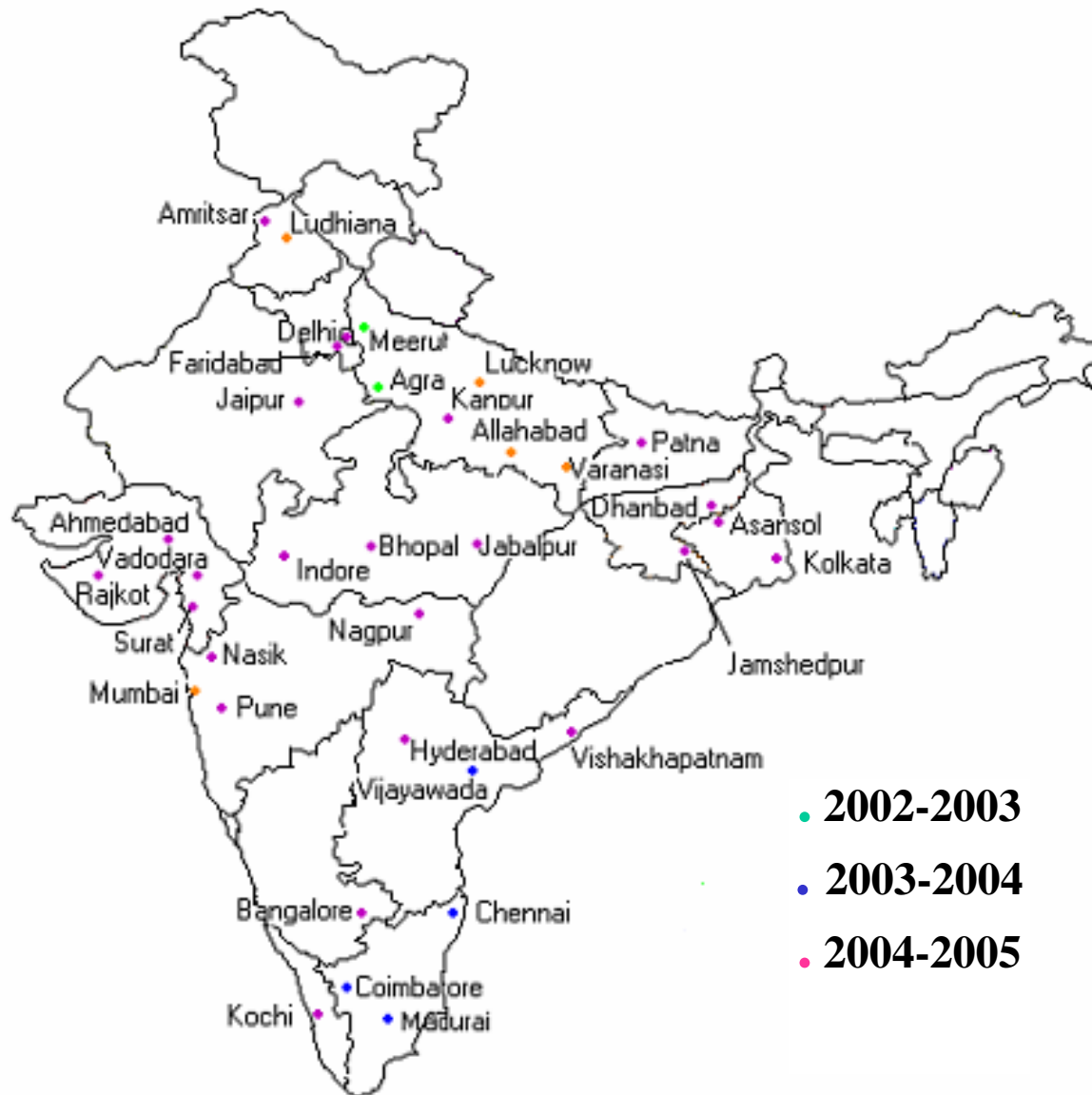


WATER QUALITY

- Groundwater quality in 30 metropolitan cities
- Identification of sources of pollutants
- Water quality in rivers and lakes
- Stream-aquifer interaction



Ground Water Quality in Metropolitan Cities



HYDROLOGY OF LAKES

- **Water balance**
- **Monitoring and modeling the lake water quality**
- **Sedimentation and life of lakes**
- **Evaporation and seepage losses from lakes**



HYDROLOGY PROJECT – I (1996-2003)

- Imparted training to the State and Central Govt. officers on hydrological data processing and specialized topics in hydrology and water resources
- Completed 4 Research Projects



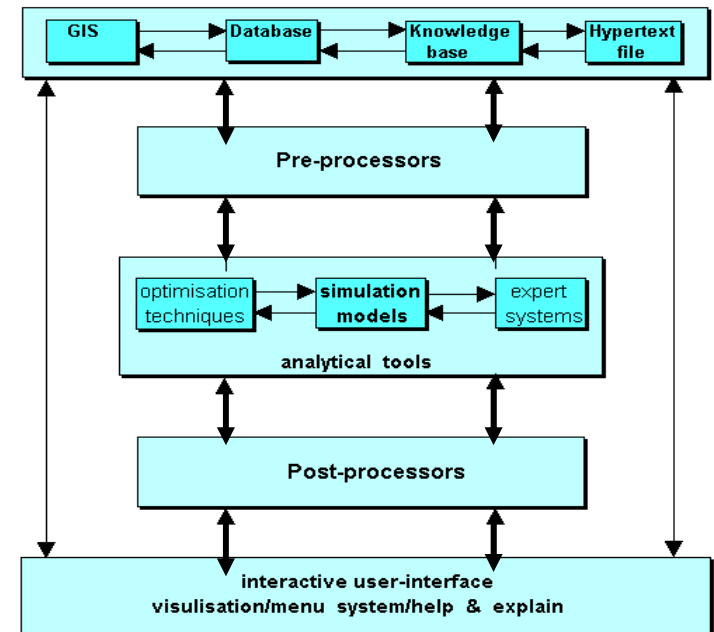
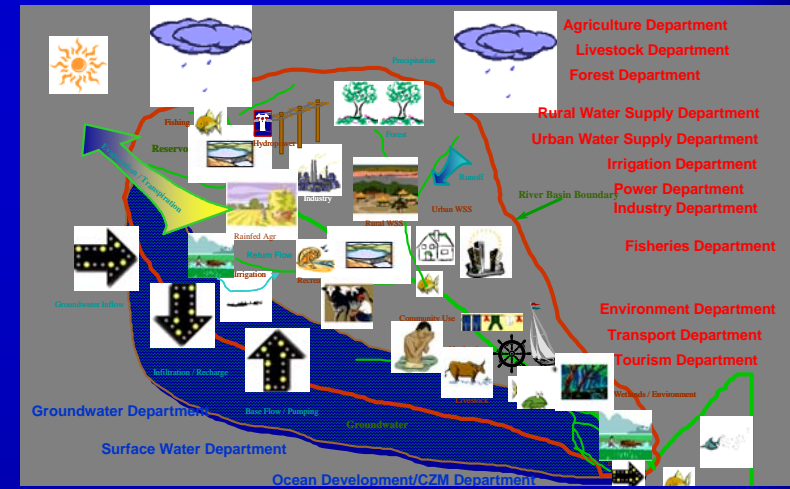
HYDROLOGY PROJECT – II (2006-12)

• INSTITUTIONAL STRENGTHENING

- Consolidation of HP-I
- Awareness, Dissemination and Knowledge Sharing
- Technical Consultancy

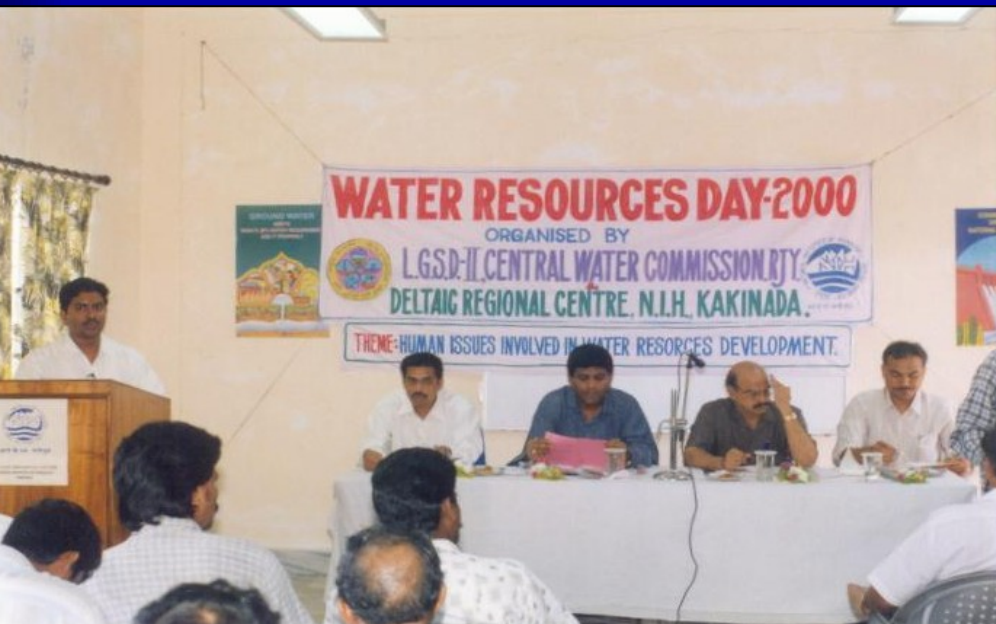
• VERTICAL EXTENSION

- Decision Support System for Water Resources Planning
- Purpose Driven Studies



CAPACITY BUILDING

- Conducting Basic and Advanced Trainings and Workshops for the Field Engineers
- Awareness Campaign for Women
- Interaction with NGO
- Organizing National and International Conferences



INFRASTRUCTURE



Remote Sensing Lab



Hydrological Investigation Lab



Soil & Water Lab



Water Quality Lab



Snow and Glacier Lab



Nuclear Hydrology Lab

VISION FOR THE XI PLAN (2007-12)

- **Environmental Hydrology**
- **Groundwater Modeling and Management**
- **Hydrology of Extremes**
- **Impact of Land Use Changes on Water Resources**
- **Surface Water Modeling and Regional Hydrology**
- **Sustainable Water Systems Management**

Thank You