



# Integrated Water Resources Management

*Approach, Challenges and Issues*

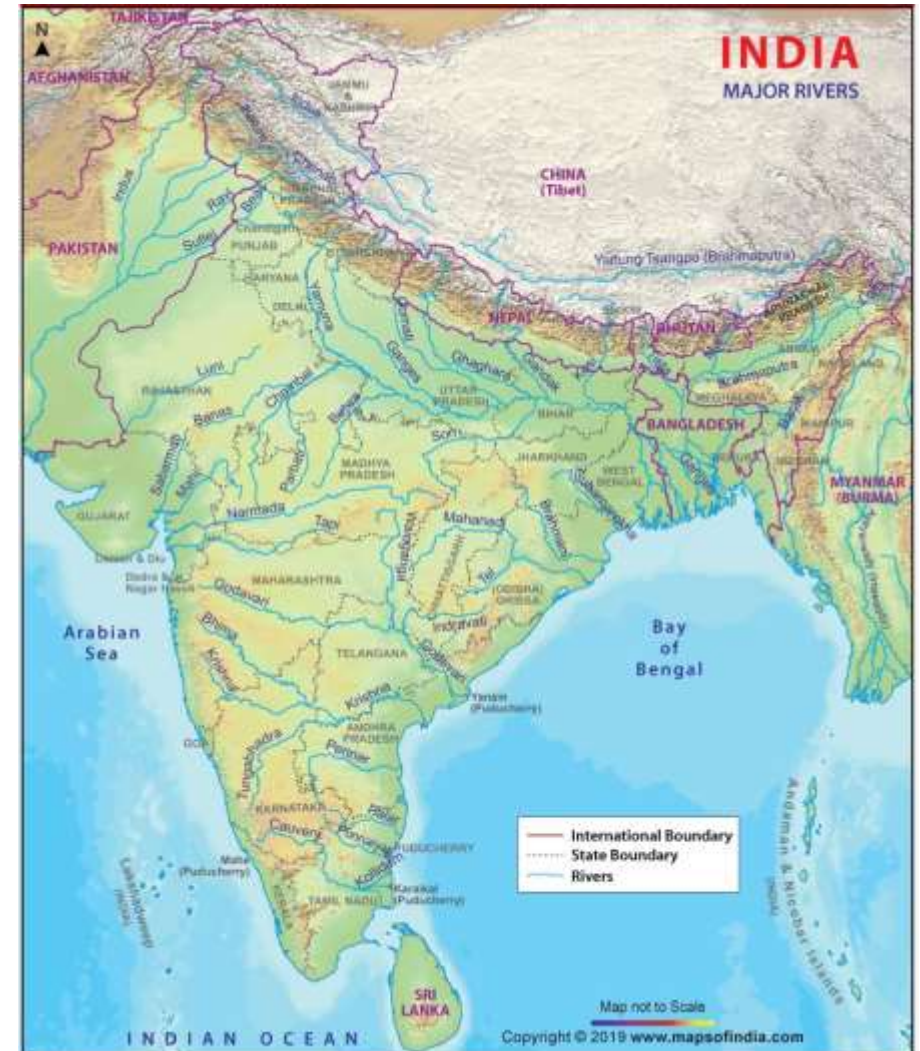
Dr. Pratap Singh  
Vice President, Sustainability, RMSI



# River Systems of India

## Integrated Water Resources Management (IWRM)

coordinated development and management of water, land, and related resources to maximize economic and social welfare equitably without compromising the sustainability of ecosystems.



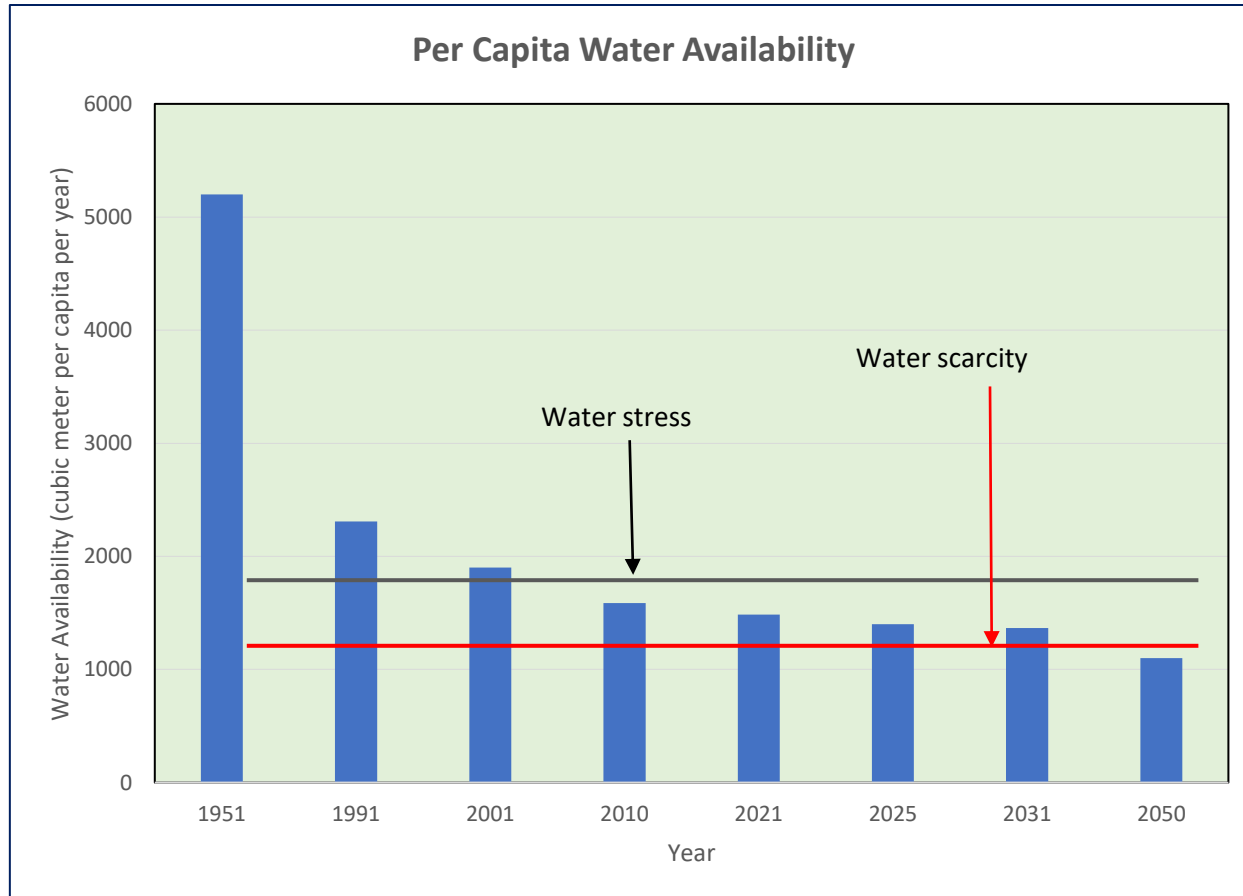
# Utilizable Water and Demand on Country Scale

Total Precipitation and Water Availability (BCM)	
Total Precipitation	4000
Total Water Availability	1869
Total Utilizable Water	1123

Total Utilizable Water (BCM)		Percentage
Surface Water	690	61.4%
Ground Water	433	38.6%
<b>Total</b>	<b>1123</b>	<b>100.0%</b>

Water Demand (BCM)		
Year	Total anticipated demand	With improved management
1997	629	
2010	813	710
2025	1093	843
2050	1447	1180

# Per Capita Water Availability

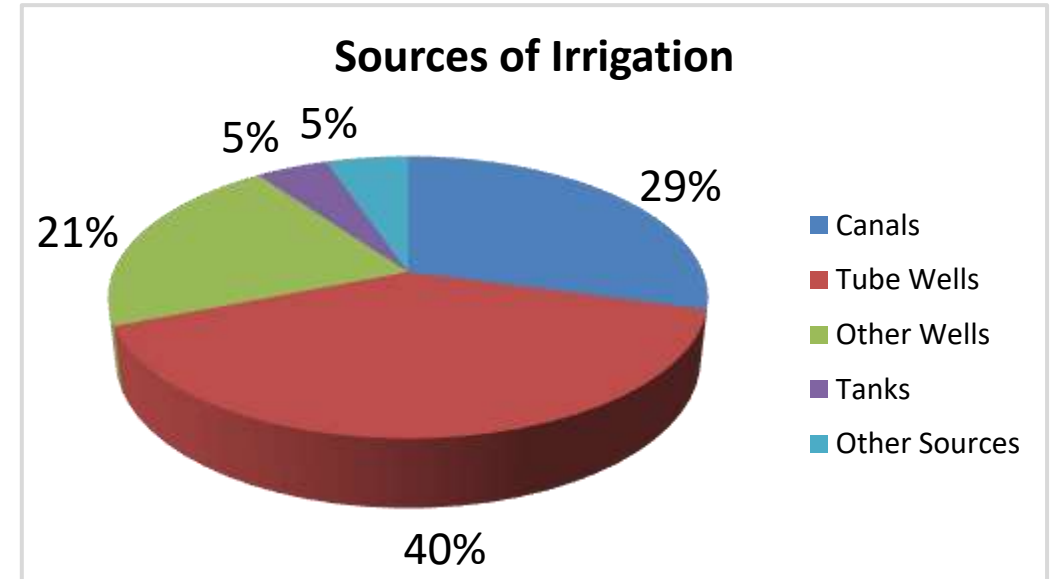
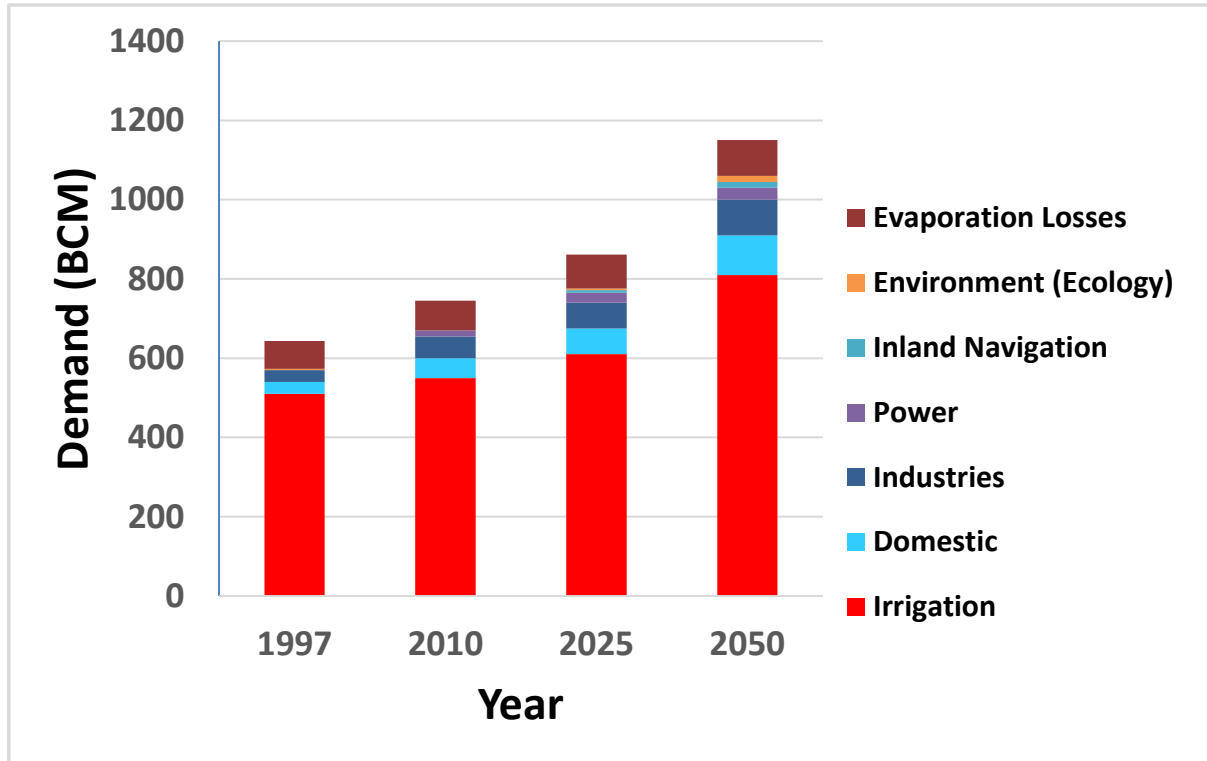


# Why IWRM is Complex in India ?

---

- A large variation in water availability exists across regions, with high seasonal and inter-annual fluctuations.
- Unpredictable water availability (periods of high and low water) poses challenges for water managers and societies.
- Demand is increasing in many regions due to population growth, urbanization, and changes in consumption and production patterns, leading to perpetual or seasonal supply shortages.
- Climate change impacts water availability in India (quantity and quality) with varying precipitation and extreme weather events.

# Demand for Various Sectors



# Irrigation Water Use Efficiencies

---

- Currently over 80 percent of the available water is used by the irrigation sector.
- No realistic national-level assessment of overall irrigation efficiencies. A rough estimation of overall efficiencies:
  - 30-40% in surface water
  - 65-70% in groundwater
- Water Use Efficiency (WUE) studies carried out by the CWC on 30 Major and Medium Irrigation (MMI) schemes indicated:
  - WUE on nine schemes was found to be less than 30%
  - WUE average was 38%.
- This interest in improving the performance of completed Major and Medium Irrigation (MMI) schemes has focused the attention of the NWM and the 12th FYP (2012-2017) on the issues of improving water use efficiency, setting a target of increasing the water use efficiency by 20%.

# Way Forward for Improving IWRM

---

- Investigation and research for an accurate estimate of available resources and demands on the sub-basin scale:
  - Surface Water
  - Ground Water
  - Water Demand (Domestic, Agriculture, Livestock, Industrial etc.)
- Future climate change scenarios are to be considered
- Water should be used efficiently and recognized as a scarce resource.
- A robust plan to improve irrigation efficiency by minimizing water losses and optimizing water usage
- Crucial to develop water resources at a pace that matches the rising demand for water