

# **Climate Change Related Law & Policy Developments in India - The Groundwater Context**





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# Background

- 30 million+ GW users (largest in world)
- 'Water lifeline' – present & future
  - 40% of total available water resources
  - 55% of irrigation requirements
  - 85% of rural water supply
  - 50% of urban & industrial water supply
- GW hotspots – Punjab, Rajasthan, Maharashtra, Karnataka, Gujarat, AP & TN
- Need for regulation
  - 5842 assessment units – 802 (over-exploited), 169 (critical), 523 (semi-critical), 4277 (safe) and 71 (saline) (CGWB, 2009)
  - Reasons
    - Overdraft/mining/subsidence
    - Waterlogging
    - Seawater intrusion
    - GW pollution

# Observed Climate & Weather Changes

- Sources
  - India's National Communication to UNFCCC (2004 & 2012)
  - Indian Network for Climate Change Assessment (INCCA, 2010)
- Observed changes – variability
  - Surface air temperature - increase
  - Rainfall – regional variations
  - Extreme weather events – increase in frequency & magnitude
  - Sea level rise - increase
  - Impacts on Himalayan glaciers
-  SW demand;  SW supply
-  GW demand;  GW supply

# Impacts of Climate Change on GW

Climate Change Impact	Resulting Impact on GW Resources
Changes in precipitation & evapo-transpiration	GW recharge
Rise in sea level	Increased saline intrusion into coastal and island aquifers
Increase in frequency and severity of flood and drought events	GW quality in alluvial aquifers
Increase in rainfall intensity	Increased flood events; higher surface runoff & soil erosion and possibly reduced recharge

# GW in Climate Change Laws & Policies

- No comprehensive climate change law at Union or State level
- National Action Plan on Climate Change (2008)
  - Existing and proposed actions
  - Co-benefits approach: promote development goals + respond to climate change
    - Large uncertainties concerning spatial and temporal magnitude of climate change impacts
    - Rapid and sustained development can generate required financial, technological and human resources
  - Eight Missions including
    - National Water Mission (2011)
    - National Mission on Sustainable Agriculture (2010)
  - State Action Plans on Climate Change

# National Water Mission

- Focused attention to vulnerable areas including over-exploited areas
  - Promotion of traditional system of water conservation
    - Implement programme for repair, renovation and restoration of water bodies in vulnerable areas by
      - Increasing capacity of minor tanks
      - Rehabilitate water bodies
  - Physical sustainability of GW resources
    - Enact and enforce GW law
    - Implement programme for water conservation through GW recharge
      - RWH and GW recharge
    - Community participation in monitoring, regulation and management
    - Promote panchayat/district-level model for GW regulation
  - Intensive programme for GW recharge in over-exploited, critical and semi-critical areas
    - RWH and artificial recharge
    - GW recharge through dugwells

# National Water Mission (contd.)

- Comprehensive water database in public domain and assessment of impact of climate change on water resources
- Promotion of citizen and state actions for water conservation, augmentation and preservation
  - Empower and involve local institutions (PRIs, ULBs, WUAs) in water resources management
  - Sensitize elected representatives of over-exploited areas and orient investment under MNREGP towards water conservation
- Increase water use efficiency by 20%

# Climate Change in Water Laws

- No comprehensive water law at Union or State level
  - Draft National Water Framework Bill (2013)
    - Reference to climate change in sections on project planning and management & coordination and policy support mechanism
- Environmental pollution legislation
  - Water (Prevention & Control of Pollution) Act, 1974
  - Environment (Protection) Act, 1986
- State-level water-related laws have an environmental component or references to environmental protection
- GW laws
  - Model Bill to Regulate and Control the Development and Management of GW (2005)
  - State-level GW laws
  - Draft Model Bill for the Conservation, Protection and Regulation of GW (2011)
  - No explicit reference to climate change but references to environmental protection



# Climate Change in Water Policies

- National Environment Policy (2006)
  - Sections on GW and on climate change but linkages are not discussed
- National Water Policy (2002)
  - Regulate GW over-exploitation
    - recharge potential + social equity
  - Avoid over-exploitation of GW, especially near coast to prevent ingress of seawater into sweet water aquifers
  - Monitor GW quality
  - Develop GW potential of drought-prone areas
  - No explicit reference to climate change
- National Water Policy (2012)
  - Specific section on ‘Adaptation to Climate Change’

# GW Recharge: Urban Areas

- Traditional water conservation practice: rainwater harvesting
  - NWP (2002 & 2012)
  - Model Bill on GW (2005)
  - Draft Model Bill on GW (2011)
  - Municipality Building Rules/Bye-laws
    - Mandatory for buildings in some states and cities
    - Based on age (new or old building), size of footprint area, plot area, number of storeys, and private, government, commercial or residential use
    - AP, Bihar, Delhi, Kerala, MP, Rajasthan, TN & WB
  - Some State water regulatory authority laws
- Comprehensive strategy for GW use regulation by large industrial and commercial establishments (NEP, 2006)
- Commercial sale of GW
  - Court order prohibiting construction industry from using GW in State of Haryana (2012)
  - Haryana State Groundwater Management and Regulation Act, 2013

# GW (Artificial) Recharge: Rural Areas

- National policies
  - Design techniques for road surfaces and infrastructure to enhance GW recharge (NEP, 2006)
  - Undertake artificial recharge projects (NWP, 2012)
- Artificial recharge schemes
  - Scheme on Artificial Recharge to GW through Dugwells in Hard Rock Areas (2007-2010)
    - AP, Gujarat, Karnataka, MP, Maharashtra, Rajasthan & TN
  - Master Plan for Artificial Recharge to GW in India (2013)
    - RWH, percolation tank, check dams, recharge shafts etc.
- Minor irrigation schemes
  - Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MGNREGA)
    - Minimum 100 days of guaranteed wage employment to every rural household for unskilled manual work
    - Works include water conservation and water harvesting, check dams, percolation tanks, renovation of traditional water bodies including desilting of tanks
  - Guidelines for the Continuation of Scheme on Repair, Renovation and Restoration (RRR) of Water Bodies in XIIth Plan (2013)
    - Increase tank storage capacity – by comprehensive improvement and restoration of water bodies

# Prevention of GW Over-extraction

- Command-and-control approach
  - Model Bill on GW (2005)
  - State-level GW laws
  - Some State-level water regulatory authority laws
    - Eg UP Water Management and Regulatory Commission Act, 2008
- Guidelines/Criteria for Evaluation of Proposals/  
Requests for GW Abstraction (CGWB, 2012)
  - Notified areas
    - Permit GW abstraction through any energized means only for drinking water purposes
  - Non-notified areas
    - Permit GW withdrawal by new or under expansion industries/  
infrastructure projects

# Practices to Increase Coping Capacity

- Cropping patterns
  - Promote efficient water use techniques (sprinkler/drip irrigation) & support feasible and remunerative alternative crops (NEP, 2006)
  - Adaptation to climate change through adoption of compatible cropping patterns (NWP, 2012)
  - Local-level regulatory mechanisms – orders of village panchayats
- Punjab/Haryana Preservation of Sub-Soil Water Act, 2009
  - GW preservation by prohibiting sowing/transplantation of paddy crop before prescribed time
  - Punitive provisions
    - Destruction of paddy sowed/transplanted before prescribed period
    - Pecuniary penalty per ha of land in violation of law

# Impacts of GW on Climate Change

- Overconsumption of diesel & coal-based electricity
  - GHG emissions
- Regulate use of electricity for GW extraction
  - Pricing
  - Separate electric feeders for pumping GW for agricultural use
- Reduce subsidies
  - Farmers do not pay for electricity
  - If they pay, on flat tariff basis
  - Exception – Gujarat & West Bengal
- Alternatives: drip irrigation, use of biofuels

# Other Issues

- Conjunctive use of GW and SW
  - Integrated and coordinated development and conjunctive use of SW and GW (NWP, 2002; NWP, 2012; RRR Guidelines, 2013)
  - Draft National Water Framework Bill (2013)
    - Conjunctive management
- Need for more and better information
  - National Water Mission
    - Assess impact of climate change on water resources – availability and quality of SW and GW
  - National Mission on Monsoon Prediction
    - Prediction of monsoon rainfall variability in all spatial and time scales

# Some Concluding Thoughts

- GW demand & supply concerns pre-date focused 'climate change' concerns
- Co-benefits approach
  - Flexibility and certainty?
- Need for improved regulation
  - Decentralization
- Order of priority for different GW uses
  - To prevent water conflicts
  - For food security
- High expectations from works in progress
- Incorporating generated information into laws & policies – hard choices
  - Importance of political will
- Need to overcome implementation challenges
- Translate words into action, eg conjunctive use