

# Water security in periurban South Asia: adapting to climate change and urbanization

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# Overview and structure of presentation

- Research Objectives and Conceptual Framing of the problem
- Project partners and research locations
- Methodology: the value of a mixed methods approach
- Findings in a comparative perspective
- Approaches to intervention
- Some implications for health

# Research Objectives

- Examine the implications of urbanization and climate change for periurban water security
- Identify the vulnerable groups
- Examine the adaptive responses as shaped by a mix of technologies and institutions
- Assess the cost-effectiveness of different adaptive measures

# The project team

- SaciWATERs
  - Hyderabad
  - Gurgaon
- IWFM, Bangladesh
  - Khulna
- Nepal Engineering College
  - Kathmandu
  - Project is supported by IDRC, Canada

# What is periurban ?

- A confusing term with no consensus regarding its meaning
- Place based definitions problematic in a comparative perspective
  - Definitions of urban and rural vary from country to country
  - Villages and towns get reclassified periodically
- Use to denote
  - A place
  - A process
  - A concept

# Counterparts of periurban in other languages

- Dutch
  - *halfstedig* (semi-urban)
- East Asia
  - '*desakota*' (city village)
- German
  - *urban landlichen zonen* (urban rural zones)
- Afrikaans
  - *buitestedelik* (outer city or beyond the city)

# Characterizing periurban

- Look for certain features:
  - Changing land use
  - Multiple claimants
  - Social heterogeneity
  - Livelihoods across both urban and rural spaces
  - Changing locus of control over natural resources

# Conceptual framing

- Debated and defined periurban in terms of features, rather than location
- Focus on water insecurity rather than water scarcity
  - Caused both by urbanization and climate variability
- View vulnerability as a chronic phenomenon, rather than in relation to occasional, extreme events
  - Water insecurity is a day to day phenomenon
- Moved from seeing climate change as a context to a stressor/factor shaping water security
  - Conceptual foundations laid in Narain (2011)



# The framing of the problem

- Climate variability and urbanization interact to create patterns of periurban water insecurity
  - Urbanization creates new claimants on water and increases competition for water
  - Climate variability/ change aggravate the impacts of the above:
    - E.g Gurgaon
      - Floods in 1977, decline in rainfall after that, heavy rains in 2010 damaged crops
      - Shorter winters; shorter period of rains after 1977

# Combining qualitative with quantitative approaches

- Complementing each other
  - Climate variability assessed through analysis of meteorological data, as also through trend lines and seasonality analyses in PRA exercises and people's narrative of a changing climate
  - Supplement qualitative narratives of vulnerability with a quantitative index of vulnerability
  - Qualitative insights from semi-structured interviews fed into survey design

# Khulna: the major issues

- Identified as one of the 15 most vulnerable cities under climate change impact
- Sea level rise, reduced upstream flows and prolonged dry spells expected to drive up salinity levels
- Urban wastewater getting into periurban areas and surrounding rivers
- Increasing claimants over water; conflicts around sluice gates
- River floods increase salinity in fresh water sources
- Surface water salinity near Khulna in 2007 was the highest recorded in 32 years

# Hyderabad

- Hyderabad
  - many water bodies have been filled up and encroached upon for urban expansion
  - studies have reported a particular decline in the area under tanks
  - Have implications for local communities who depend on them e.g. dhobis
  - Decline in rainfall and frequency of rainfall exacerbates a deficit on the supply side

# Gurgaon

- Decline in rainfall after floods of 1977
- Reduced duration and intensity of winters after 1980s
- 2010 year of high rainfall; damaged paddy harvest and disrupted the rabi sowing season
- Increased pressure on water from farm-houses, real estate, urban expansion, and rural-urban water flows (tankers)
- Lands acquired for urban expansion and building water treatment plants led to loss of water sources

# Kathmandu

- major land use change in the peripheral areas from agriculture to housing
  - Major rural-urban water transfers from the periurban areas to the city through water tankers compromising local water security
  - Sand mining from the river bed has severe implications for local hydrology

# So what's new about this ?

- Most studies of vulnerability focus on purely rural or urban contexts
  - Studies of vulnerability of pastoralists, agriculturists (SAVI)
  - Studies on improving urban/city resilience (ACCRN)
- Periurban locations are subject both to rural and urban stressors
  - Implications both for inequity and vulnerability
  - Differential vulnerability across elite and less fortunate

# Findings in a comparative perspective

- Towards a typology of periurban water security issues in the region
- Issues related to ecological foot-print of urbanization
  - Land acquisition for building WTPs and canals for carrying water to the city
  - Encroachment of commons for urban expansion
    - Gurgaon, Hyderabad, Khulna
- The flows of water between rural and urban areas
  - The use of wastewater for agriculture
    - Gurgaon
  - water flowing from villages to cities
    - Hyderabad, Kathmandu



# Towards a typology...

- Issues related to the land tenure status and links with water rights and access
  - Loss of access to water sources on account of land acquisition
  - use of rural water for farm-houses
    - Gurgaon, Hyderabad, Khulna
- Issues related to governance and the rural-urban dichotomy
  - rural-urban water conflicts
  - unregulated transfers of water from rural to urban areas
  - pollution of water sources
    - common across research locations

# Approaches to intervening in periurban contexts

- Policy Advocacy
  - Khulna and Hyderabad
  - E.g. work with SOUL, Save the Moyur River campaign
- Institutional
  - Formation of water management committees
    - Kathmandu, Hyderabad
  - Improving state-water user interface and breaking the anarchy syndrome in water management : participatory video
    - Gurgaon
- Technological
  - Capacity-building for technical support and interventions
    - Hyderabad, Kathmandu
- Livelihood diversification
  - Promoting livelihood skills so all eggs are not in one basket

# So what about health ?

- Health impacts of periurban water use
  - Impacts on quality of life from growing stress on groundwater from increasing claimants and pressures
  - land acquisition and loss of water sources: increased distance to water sources and time spent collecting water

# Periurban water use and health impacts

- Health effects associated with the use of urban wastewater
- Waterborne diseases and ailments from consuming contaminated water when periurban areas are outside formal water service delivery
  - Often they lack tenurial status

# Further links

- Read more about the project, publications and outputs at
- <http://www.saciwaters/periurban.org>
- [vishalnarain@mdi.ac.in](mailto:vishalnarain@mdi.ac.in)