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

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