



Facing climate change – Development of a participatory water management in peri-urban slums in Jaipur, India

Project: Women's Action towards Climate Resilience for Urban Poor
in South Asia

Project Lead: Mahila Housing SEWA Trust (Indian NGO)



Theresa Frommen, Maike Gröschke, Michael Schneider, Dharmistha Chauhan

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Aim of the project

To develop a participatory water management for (peri-)urban slums

- Water supply
- Sanitation
- Solid waste management



Enabling communities to

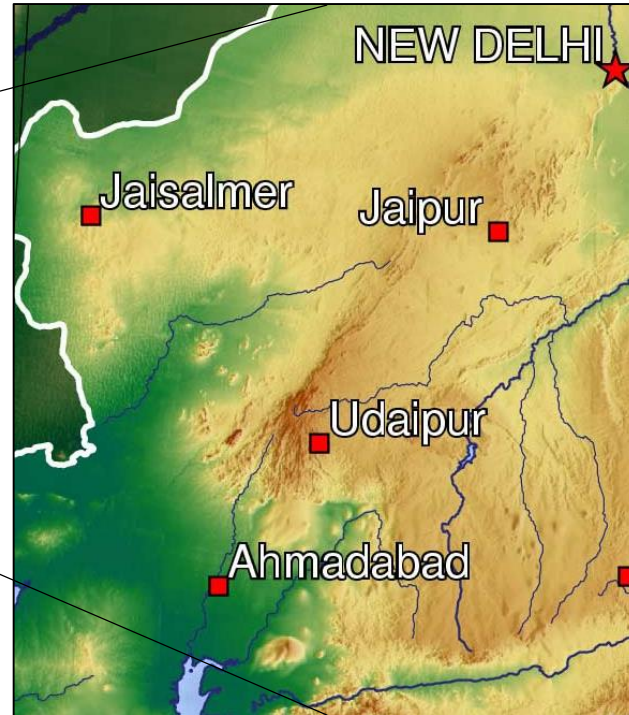
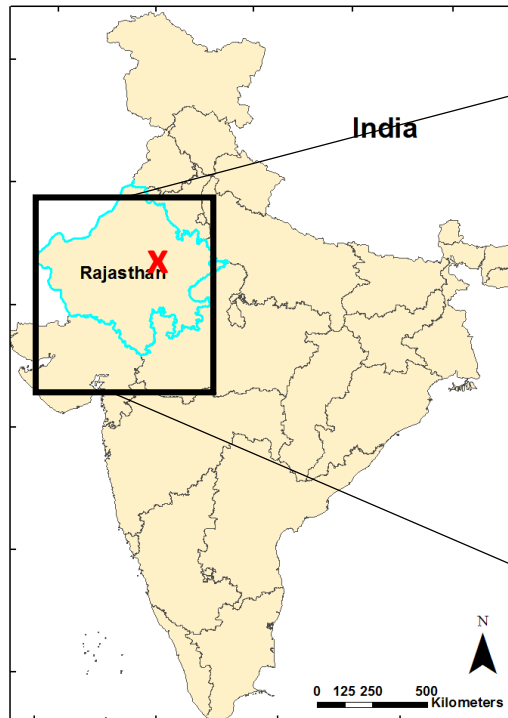
- Implement measures (e.g. recharge structures, groundwater protection zones)
- Demand concrete action from the municipality

How can this be achieved?

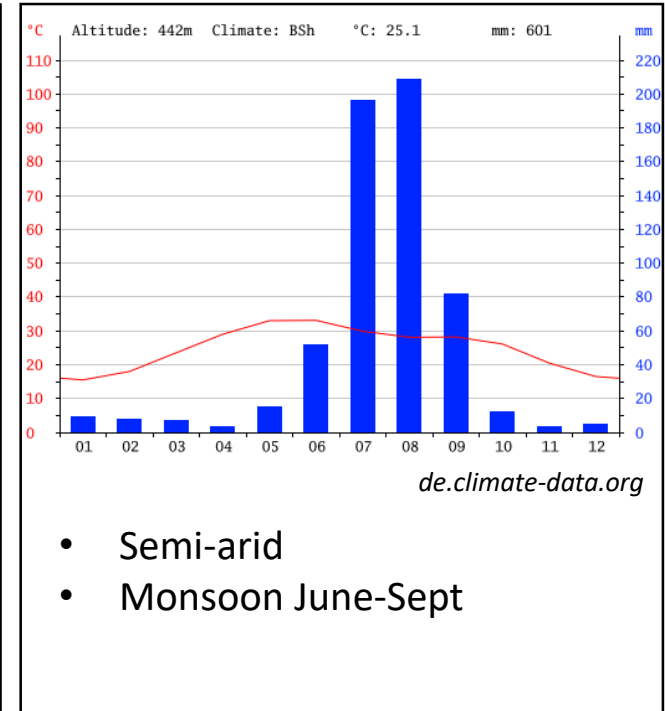
Pilot study at one location: Jaipur



Jaipur – Physical context



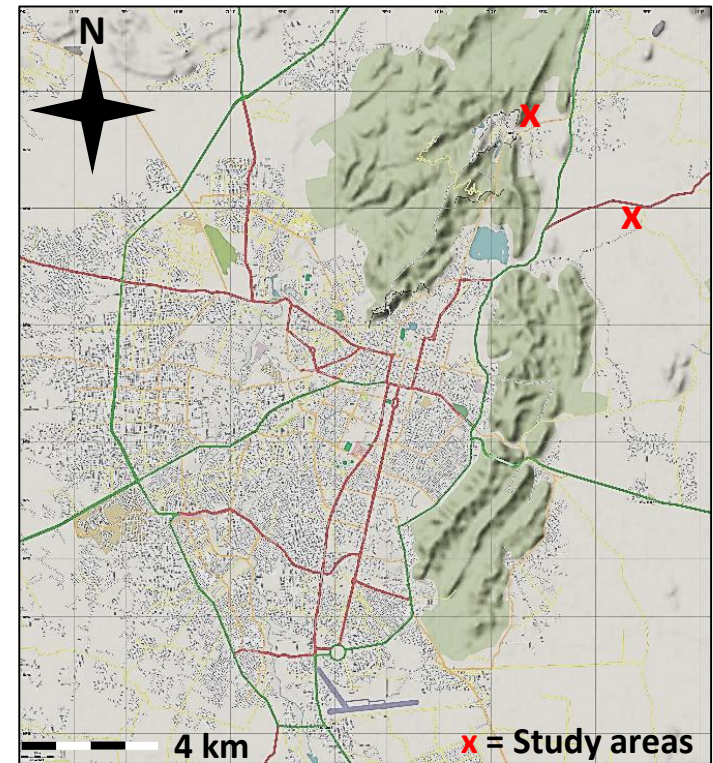
www.mapsof.net



Representative conditions for large parts of India

Jaipur – Social context

- Population: 3.1 Million (Census 2011)
- >20 % living in slum areas
- ~230 slums
- Hindu and Muslim slums
- Many peri-urban slums



www.4umaps.eu

Different social contexts found in one city

1. Preparatory work

- a) Local partner
- b) Desk study

✓ Identify study area

2. Preliminary investigation

- a) 2 field visits in 2015
- b) Interviews with local population
- c) Links between slum and city

✓ Identify the main problems and possible outputs

3. Main part – Field work

- a) Hydrogeological investigations
- b) Participatory action on community level
- c) Stakeholder analysis
- d) Policy analysis

➔ Develop solution strategies

4. Implementation

5. Monitoring and evaluation

Preliminary investigation – Tools to understand the community

- Interviews
 - Structured with women →
 - Semi structured with experts
- Camera user study
- Participant observation
- Daily schedule
- User experience map



1 THE USER

This is 65-year-old Zameer with her youngest daughter, Zameer. She is a nurse in Jaipur and has two children and four grandchildren. She wants to improve the life of her family and the community. Therefore, she volunteered by our project. She is a community leader in the movement, she is and because her young grandchild, she is a mother, she is frequently sick.

5 DATA MANA

Name of community: _____
 Name of hand pump: HP2
 Date: 25.08.2015 Time: _____
 Well depth: _____ Depth to water: _____
 Air temp: _____ Water temp: _____
 Color: _____ Turbidity: _____
 pH: 2.3 mS/gal
 Nitrate: 300 mg/L

While taking the water sample, Zameer fills out the data sheet, which she provides to the data collector. She knows that this is important to observe the development of water quality parameters over time and to detect if there is a case of severe problems.

Now, Zameer can compare the results of the hand pump water sample with the guidelines. She can do this easily with the data sheet that she has during the video lessons. She is convinced that nitrate is much too high and she wants to diagnose for infants.

As a first step, Zameer takes action on a household level. She gives her grandchild drinking water from another source, like a well, or a tap. Then, she takes action on a community level. She explains to other community members that open defecation should not take place near to the handpumps and that cows and pig waste should be removed, too.



Five years later, a prevention zone was implemented around HP2. Nitrate concentrations slowly decrease, and regulations with authorities in reliable water supply are ongoing. The members of the community are now supported by handpumps and the necessary expertise.





Community	Name	Address	Phone	Gender	Age	Occupation	Education	Religion	Marital Status	Children	Grandchildren	Hand Pump	Water Quality	Water Use	Water Source	Water Cost	Water Quality	Water Use	Water Source	Water Cost

- Lack of knowledge and expertise
 - Wastage of water
 - Illegal pipeline connections
 - Open defecation/cattle breeding near drinking water wells
 - Thinking in limited ways (temporal and spatial)
- Target group not willing to pay for groundwater
- Need for communication between community and local water supplier
- Lack of capacity in terms of time, media access and confidence
 - Concise, entertaining and simple solution

Results – Social and infrastructural context

	Khara Kuan (“Salty Well”)	Nai Ki Thari
Religion	Hindu	Muslim
Population	200 Households	500 Households
Infrastructure	Paved roads, solid houses	Unpaved roads, solid houses
Solid waste management	None	None
Green areas	Some trees	Only few trees
Status	Well established	Newly emerged and growing fast
Picture		

Results – Hydrogeological context

	Khara Kuan ("Salty Well")	Nai Ki Thari
Main problems	<ul style="list-style-type: none"> • EC up to 3 mS/cm • 500 mg/L NO₃ • Dried-up dug well • Insufficient sanitation 	<ul style="list-style-type: none"> • Flooding • Water logging • Extremely high EC: >4 mS/cm • Insufficient sanitation
Water supply	<ul style="list-style-type: none"> • Hand pumps • Tanker • Water line (for lower area) 	<ul style="list-style-type: none"> • Bore well • Tanker
Geomorphological setting	<ul style="list-style-type: none"> • Steeply rising towards NW • Rocky underground 	<ul style="list-style-type: none"> • Flat plain
Sanitation	<ul style="list-style-type: none"> • Individual toilets (75%) • Open defecation 	<ul style="list-style-type: none"> • Individual toilets • Open defecation
Sewage system	<ul style="list-style-type: none"> • Small open channeled drains 	<ul style="list-style-type: none"> • Only few open drains • Most parts undrained
Picture		

Main part (ongoing)

- Hydrogeological field work and development of conceptual models
 - Mapping of study areas
 - Cooperation with local water supplier
 - Nai Ki-Thari: What is the cause of high salinity levels? Are there aquifers with lower salinities?
 - Khara Kuan: What is the reason for high nitrate levels? (N-isotope analyses?)
- First water workshop with slum women leader
- Preparation of stakeholder meeting in November



- Create awareness for the importance of hydrogeology among local NGOs
 - ➔ Because hydrogeology is very case-specific you ALWAYS need a hydrogeologist at least in the initial part of the water-project
- Find a common language/understanding with social scientists
- MHT already successful with other programs (e.g. housing)
 - ➔ We are confident that (ground)water programs can also make great progress

Thank you for your attention!



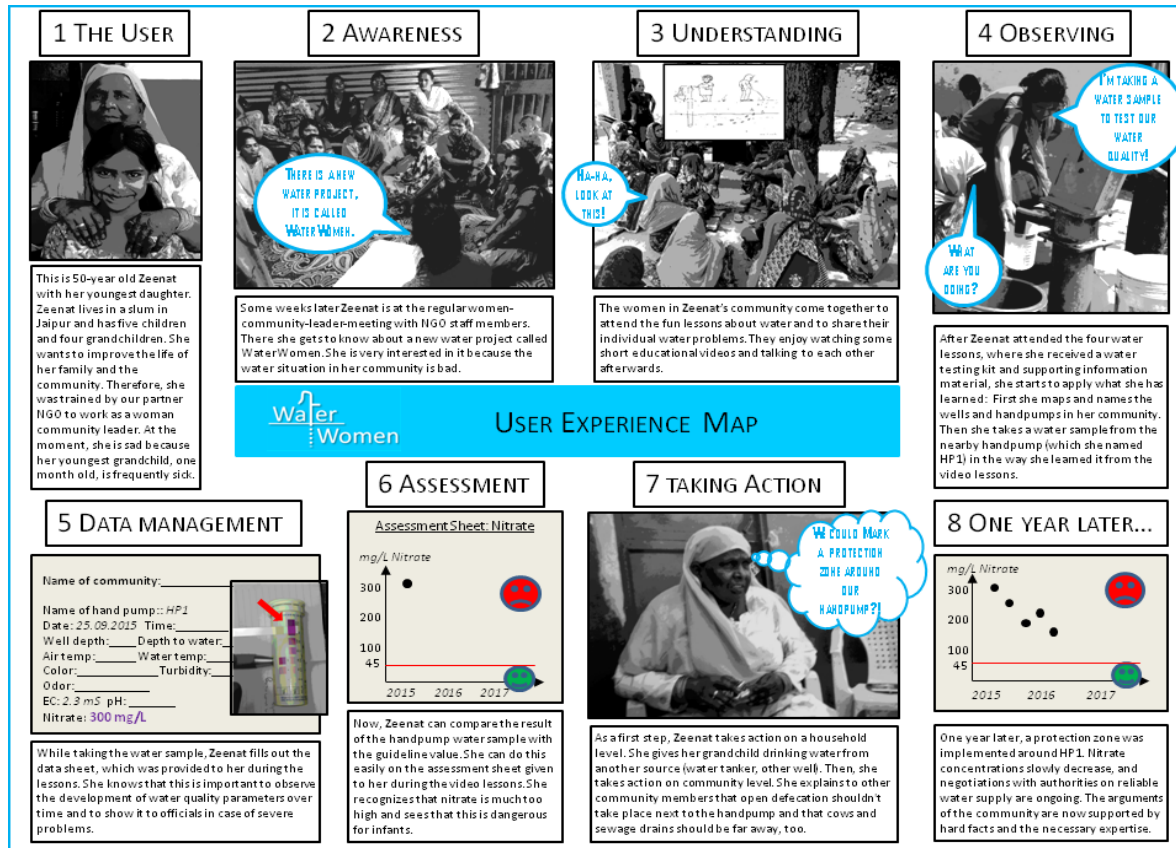
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User Experience Map



- Sustainability (MHT will continue our work)
- Transferability (Comparison with Ranchi)
- Hydrogeological research → costs
- Effects more in middle to long term, not in short term
- show organizations who are planning water projects that it makes sense to involve hydrogeologists in their projects
- Slum is embedded in city → impacts from outside which slum population cannot influence (stakeholder analysis to bring together all the potential influencers)