

**Shifting Grounds: Institutional transformation,
enhancing knowledge and capacity to manage
groundwater security in
Peri-urban Ganges delta systems**

INCEPTION MEETING

WORKSHOP PROCEEDINGS

16th October, 2014, Hotel Lindsay, Kolkata



SaciWATERS



Rapporteurs: Sharlene Gomes and Jyoti Nair

Project Description

Urbanizing deltas in South Asia have seen rapid growth and change. In some of the most groundwater abundant areas in the Ganges delta, urbanization increased pressures on available groundwater resources and has created patterns of poverty and exclusion. The stress is felt particularly in the peri-urban areas at the interface of urban centres and rural villages. These peri-urban areas were originally rural in nature, but are increasingly linked to nearby urban centres by flows of goods, services and resources. Existing policies and institutions fail to ensure an equitable sharing and sustainable use of groundwater resources in this changing environment. Government actors, urban and peri-urban communities are looking for new or modified institutional structures to improve the management of groundwater resources. Although crucial, little is documented of these rapidly evolving processes of concentrated groundwater use and institutional transformations in peri-urban delta areas of South Asia.

The proposed project aims to build knowledge and capacity among local actors to support a transformation process in peri-urban delta communities in Bangladesh and India for a pro-poor, sustainable and equitable management of groundwater resources across caste/class and gender. This will be based on an improved understanding of the dynamic interplay between local livelihoods, the groundwater resource base, formal and informal institutions and links with nearby urban centres in Khulna and Kolkata. These two cities provide a good basis for an institutional comparison, being part of the same Ganges delta system, yet located in different countries.

Official welcome and opening, Purpose of the Workshop. Professor Wil Thissen, TU Delft, Dr. Anamika Barua, SaciWATERS

Dr. Anamika Barua welcomed the participants to the inception workshop. She mentioned that it is important to reflect on the research conducted in the region to plan for future course of action. Thus, she emphasised that the feedback on the project of the local stakeholders is crucial.

Professor Wil Thissen made aware the participants of the objectives of the project. He informed that this project Shifting grounds is one of 7 projects funded by The Netherlands Organisation for Scientific Research (NWO). He told that the project aims to achieve high quality knowledge, deliver practical tools and perspectives for real world governance improvements for development, capacity development to improve delta management.. It focuses on institutional transformation on groundwater and peri urban region. This theme was chosen because heavy dependence on groundwater was observed in the area, along with increasing abstraction, salinity/ arsenic issues, water sewerage problems, increasing pressure leading to conflicts in peri-urban areas. Peri-urban institutions lacks clearly demarked rules and availability/ access is more determined by power dynamics than equity and sustainability. Under this project integrated approach using physical data collection, institutional/ governance analysis (comparing governance in the two regions in the same delta), livelihood and user participation through negotiated approach is proposed. The objective of the workshop is to inform and exchange information from the participants on the problems, explore existing initiatives in the field, synergize and cooperate with those working in the field, participant feedback.



Introduction to the UDW Shifting Grounds Project. Dr. Leon Hermans, TU Delft, Dr. Poulomi Banerjee, SaciWATERS, ParthaSarathi Banerjee, The Researcher, Prof. Mashfiqus Salehin, BUET and Prof. Vijay Paranjpye - Gomukh Environmental Trust for Sustainable Development, Pune

Dr. Poulomi Banerjee gave brief about the importance of the issue and project locations. SaciWATERS has been working in peri urban areas of south asia. Through this the team realized the need for exploring water management issues in peri urban areas and identified groundwater is the main source of conflict. The team had at first applied for pre-concept proposal and was selected after which they visited Bangladesh and took suggestions that fed into the final proposal.

Dr Leon Hermans gave the details of the project and way forward. He stated that the workshop discussions have released a need for improving understanding of groundwater systems and its importance to peri urban resident livelihoods. Institutions for peri urban areas are either absent or



overlapping and unable to effectively cope with rapid changes in these areas. Institutions are based on formal and informal rules and exchanges between groups of stakeholders. Project aims to improve understanding and contribute to capacity development and development of the peri urban areas. Three pillars are identified for the program: research on groundwater, social system, institutions (both existing and emerging), use recommendations from research and communication tools for sustainable development, capacity building. He

stressed on the importance of collaborations to have the desired impact on this complex issue.

Parthasarathi Banerjee mentioned that the region faces pressure due to migration for livelihood opportunities like post the Aila . This is responsible for peri urban expansion in Kolkata metropolitan areas. Management is unable to meet with challenges and this kind of collaborative research will help to formulate future policies with better evidences from the field.

Prof. Vijay Paranjpye explained that complexity of water use needs the combined expertise of different disciplines. Under the project limitations optimal solutions can be obtained using the Negotiated approach. First round like this inception workshop is where everyone shares their different views at the negotiation table. Key aspects of negotiated approach: consultation, integration, iteration and consensus. Negotiations occur until common ground is achieved towards a beneficial strategy. Important to approach the problem from a human perspective to those most affected by the issues studied.

Participant questions and comments

Dr. S P Sinha Roy (Former CGWB):

- Clarification on what is the context in which groundwater security is seen in the project (since security in peri- urban areas may have a negative impact on security in urban area)
- Commented that the geographic boundaries for the areas under study needs to properly defined in the study
- Define the type of groundwater studied brackish vs fresh groundwater
- Gave input on arsenic contamination status from his involvement in the arsenic task force

Responses:

- Sufficient groundwater to meet the needs and how groundwater relates to the larger water resource security in the region

- Area: Barrackpur II and Sonarpur in Kolkata metropolitan area and compare issues in north block vs south block
- Type of groundwater also includes brackish water since that is typical esp in Khulna
- Access conflict is particularly relevant to Khulna area as resources are highly vulnerable to issues of salinity, arsenic – holistic approach is needed

Prof Aftabuz Zaman

- Project should take into consideration the industrial and agricultural use of groundwater, especially in the Khulna site.

Mr. Jayanta Basu

- Boundary of urbanization in context of Kolkata metropolitan area needs to be clearly defined
- Although there is increasing water demand but Kolkata's population decreased in comparison as per last census so it may not be right to link demand with population

Session 1: Urbanization and Groundwater Management in Gangetic Delta city of Kolkata

Mr. Abhijit Ray, CGWS, pointed that the research outcomes need to be properly implemented/ disseminated. Thus the project team should develop an implementation strategy using the project results based on the duration of the project. And, emphasized on the need to set priorities for project activities.

Prof Pradip Sikdar, IISWBM, noted that while working with a Low topographic gradient, like that of the Gangetic delta its imp to account for hydro-geologic boundary as opposed to geographic boundaries. The project should attempt to study the past, present and future scenarios also for management to be successful.



Shri Niladri Naha, SWID, Govt. of West Bengal, pointed that 42 areas in the entire delta region are critical, but he thinks that both sonarpur and barrackpur areas are well chosen considering the situation of the region.

Dr. S.P Sinha Roy, Ex member CGWS, said that this project is unique and can help understand the delta environment of the adjoining countries. He pointed that the timeframe and geography boundaries are important. Present situation in the two locations: partly urbanized, industries are attracted to area due get tax rebates; urban growth will be at expense of rural, institutions are also expanding their scope. He was happy to note the choice of two locations as both locations are most likely to face significant challenges due to urban development. There needs to be some balance for rural growth and social growth in line with urban development. Results from this study can secure government support for implementation or scaling up of project. It is also important to utilize and share available and acquired data. Historically, groundwater recharge has taken a backseat need to give attention to it by negotiating with development or explore potential of utilizing available water

sources. He also stressed the importance of utilizing surface water resources and change focus from groundwater security only to 'water security'.



Participant comments/questions

Prof. Paranjpye:

- Project limitations are there but on route corrections will take place
- Institutional transformation is more static than dynamic to project will be a challenge. Important to determine where to intervene for changes to be accepted

Prof Wil Thissen:

- Project team has thought about implementation strategies
- It is a good approach of viewing this project as a pilot study to understand the issues
- Will try to come up with a variety of solutions and let the stakeholder negotiate which is best suited for them

Prof. Salehin:

- Appreciates the concept of viewing it from a hydro-geologic boundary
- Research will be inter-disciplinary in nature

Mr. Jayanta Basu:

- Limited approach and macro level view can be an opportunity to develop insights into groundwater mgmt.
- Important to be flexible to value the inputs from the workshops/ consultations
- How is success of the project defined? E.g. Evidence of implementation. other projects (e.g. IUCN) has fed into West Bengal policy now- idea is to link this work to other existing

Dr Leon Hermans :

- Few project activities are fixed: location, groundwater, funding distributed primarily for PhDs and workshops

Session 2: Periurbanization and Water Resource management in Gangetic Kolkata: A policy - research interface

Mr. Jayanta Basu, Environment correspondent, Telegraph, said that Water is considered “free” in this part of the world. There is a critical need to change mindsets. Some areas have some of the highest population density in the world but this differs among the entire Kolkata municipal area so blanket observations should not be made since it is a heterogeneous situation. He encouraged linking the current project with other similar efforts like the transboundary sundarbans project with world bank. He indicated that there is disparity in the use of water in peri-urban vs urban. 1/3 of population is slum, so blanketing the whole population in the study is incorrect since usage/ access is varied between different peri- urban residents



Dr. Priya Sangameswaram, Faculty, Center for Social Studies, One must think about link between water and housing as the kind of housing determines the kind of water they have access to. Sonarpur has different types of settlements: formal real estate development and migration from sundarbans, so there is a division of class that can be studied through housing. Usage at a micro level in Kolkata is higher than other parts of the country- need to capture perceptions of use and waste at micro level. Also, the kinds of

technology used in groundwater abstraction and management over time links to governance mechanisms since micro level management in specific wards is also important. Perceptions about what kind of water is desirable and who provides these services (formal vs informal) can be studied. Relationship between urban and peri urban depends on how development is viewed (it can be linked to real estate development).

Dr. Nabinananda Sen, Faculty, University of Calcutta, Peri urbanization is a chaotic developmental process leading to urban sprawl and must be seen in a dynamic context. Long term policies need to account for this process. Gender, occupational ramifications of urbanization also needs to be featured. Water resource management must be considered together with other aspects such as spatial planning (peri urban areas are particularly vulnerable to poor spatial / land-use planning). Pepsico plant in Ghariya is a major contributor to groundwater depletion in the area so considering water intensive establishments is important from a planning perspective, they also pay very little for the resource. Cultural importance of resources in Kolkata also presents another challenge (eg. use of Ganga by temples and for bathing etc). How do we balance cultural dependence and management? Population also changes daily since there is a daily migration to and from the city that impacts the demand for water resources. Awareness on water management is needed to change perception of water as a “free good”. From macro study, we need to prioritize micro level issues also

Participant Comments/Questions

Ms. Chinmoyee Mallick:

- Women is an important aspect to be considered in peri urban areas as they are particularly marginalized there

Prof Pradip Sikdar

- Project should look into adequacy, redundance and inadequacy of existing water legislation/ rules

Prof Vijay Paranjpye:

- National policy is way ahead of state and vice versa in some states
- Entitlement depends on access to JNNURM funds
- Interface between entitled and non entitled is an important point to be noted
- Legal obstacles impose on urban and non urban expenditures determines the urban vs peri-urban discrepancies

Dr. S.P. Sinha Roy

- In WB entire drinking water system is controlled by 2 Departments and determines consumption amounts for urban and rural area (per capita)
- Estimates are as per block in sonarpur and barrackpur but urban sectors within the block are not included (i.e. separate for urban and rural part in each location)
- Urban supply is as per estimate but not the case for rural as pipeline distribution is not uniform for every village and supply is intermittent (so tax should be based on supply)
- 30% of water distributed in Kolkata municipality goes as waste
- Kolkata has a confined aquifer

Dr Priya Sangameswaram:

- Understanding the politics of distribution is important
- Think about different orders of misuse (e.g. pipeline issues vs pepsi company misuse)

Dr. Sen:

- Irrigation study with World Bank in West Bengal and found that most stakeholder highlighted that leaching of soil nutrients and pesticides was a major factor of groundwater pollution. And flooding and drainage problems lead to vector disease issues.
- Arsenic and pesticide is also critical factors in food chain contamination
- Examining water user habits and propensity for water to understand peri urban disparities in water use

Session 3: Urbanization, Water security and Delta process: understanding the regional dynamics

Prof. Aftabuz Zaman, Bidhan Chandra Krishi Viswabidyalay

- Agriculture is main stakeholder in water sector since 80% of water use in India is for agriculture



- Need to identify how to manage water without affecting crop yield
- To achieve objective, we need a concrete and well defined technical program
- Capacity dev is needed for participatory process in program implementation

Sri A.K. Chatterji, Ex Senior Hydrologist CGWB

- Project requires a better idea of data gathering techniques
- There are some crops with can tolerate brackish water so, it is useable to some extent
- Stakeholder participation in project are is essential to control misuse

Shri Surajit Das, SWID

- In delta region, there are nearly 40 municipal areas and they are mostly undergoing high population growth
- Previously (since groundwater regulation act of 2005 in WB) there was no effort to take stock of groundwater resources. Now it is done at the district level
- How do we manage urban requirement of water: some developers want to be independent of government providers by creating their own resource
- Need to understand the entire technical aspect of groundwater system
- Will contribute data on urban allocation of water resources

Participant comments/questions

Dr. Priya Sangameswaram:

- Kinds of permission involved in developments creating their own water supplies
 - Provide details of daily water requirement for entire development in application and task force decides whether they are able to provide for the demand from available surface water. If not, they are given permission to construct their own tube well

Parathasarathi Banerjee:

- Present government is promoting use of electricity in agricultural groundwater extraction because of high cost of diesel.

Session 4: A Khulna Perspective, Prof. Mashfiqus Salehin, IWFM, BUET

- Groundwater security is examined but not in isolation from other resources
- Problems in south west coastal zone
 - Khulna district in moribund delta of ganges basin
 - Hydrogeology problems in terms of water availability, conflicts in water use
 - Very high poverty incidence
 - Faced with multiple hazards: floods,, water logging, storm surge, low dry season
 - water availability, saline water intrusion, arsenic contamination



- Groundwater use is very restricted compared to other areas of country (very limited)
- Above Khulna there is extensive irrigation and groundwater use. More irrigation is from shallow tube well (west) and (east) from surface water.
- Growth in shallow tube wells in sadhkira is much higher than Khulna
- Aquifer systems are very complex and salinity is not uniform throughout. Difficult to examine locally since it varies so much. Aquifer is fragmented, localized and complicated
- While shallow aquifers is brackish, the deeper aquifers varies in salinity from place to place
- Good database in Bangladesh for most aspects of groundwater except for salinity (sufficient data points not available)
- Different uses of groundwater: extensive use of groundwater for drinking and household activities, irrigation and freshwater fisheries
- Safe water availability very limited and some places completely absent
- Importance of considering gender: in peri urban Khulna water level drops in dry season (Exacerbated by pumping for municipal and irrigation) and it's the women and young girls to fetch water from community wells
- Surface water use is constrained because of quality issues
- Land use: brackish water growth is uneven and causes degradation of soil quality
- Conflict: urban & peri urban, agriculture vs fisheries, drinking vs irrigation and fisheries, brackish water fisheries and agriculture use, urban and peri urban/ rural drinking water
- Conflict of interests among water management institutions

Session 5: Synthesis and way forward

Prof. Wil Thissen

- Considering boundaries from different perspectives is relevant
- Different suggestions will be considered
 - Broader focus not just on groundwater: Solution ideas: spatial planning, socio-economic solutions and causes may lie outside local groundwater. Complexity of aquifers, socio-economic system
 - Need to look deeper into multiple factors affecting groundwater use/ needs (eg gender)
 - Have to encourage stakeholder involvement
 - Need to study the current acts and difference between countries
 - Need to form a strategy: are we aiming for implementation or using this more as a pilot study

Mr Jayanta Basu

- Groundwater should not be a standalone consideration (context of overall water resource regime) since relationship between them is intricate
 - Demographic consideration of inter and intra peri urban disparities, for this population density is a key demographic indicator
 - Link the project at least conceptually to other transboundary work
 - Very important to note that communication is not just a component but is key in this particular project because unlike air pollution, groundwater is a non-point issue. Need to have a good communication strategy to interact with community level
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Prof. Salehin

- Potential for using brackish water
- Acts and rules very important (India: groundwater act while in Bangladesh: only water act)

Dr. SP Sinha Roy

- Consider problem in 2 diff ways: 1. Area specific problem (block wise study) 2. Southwestern conditions can be discussed after addressing block level
- Need to know resource condition, availability, constraints in utilizing resource etc



- Map of block showing current, future peri urban areas (potential for future development) and rural. Research should be done based on this classification

- Agricultural productivity needs to be increased while controlling water intensive cropping: this will lead to rural development

- Rural community needs 3 things: drinking water, education, employment. Non seasonal employment through agriculture can be arranged

- Women are primarily responsible for water allocation: self help groups managed by ladies are available. So knowledge should be used to train them

for community to prosper

- Necessary to amend the existing groundwater act and improve legal instruments for groundwater dev. Act was based on shallow tube well (now grown in number and capacity significantly)

Prof Paranjpye:

- Workshop has led to transparent data sharing between the 2 regions of the same delta- previously lack of communication
- Useful to have common maps of the region
- Other parts of India there have been informal mechanisms for resolving conflicts without needing government intervention (NA is useful in this sense)
- Need to share experiences between 2 regions- project provides this opportunity
- Distress migration is a reality and think of it as a way of risk aversion during the project

Participant comments/ questions

Prof Pradip Sikdhar

- Who, how, when is the need to build capacity; are the questions that the project needs to be addressed
- Not sure how government participation will take place
- Can work at three levels: NGOs, Researchers and Government
- Resource estimation (both qualitative and quantitative) and resource appropriation required

Dr Anamika Barua

How do we bring govt on board and make outcomes attractive for implementation?

- Need to reach the policy makers but he/ she changes with changes in political regime
- Important to convince them of the recommendations are possible at grassroots level and will help impact community dev in a big way- ultimately they are interested in that
- Think of timing for connecting with ministers and keep them apprised of developments
- Political engagement without baggage (don't make government changes a liability)

Wrap-up and closing. Prof. Wil Thissen and Dr. Anamika Barua.

ANNEXURE 1:

PROGRAMME AGENDA - INCEPTION WORKSHOP

TIME	ACTIVITY
THURSDAY, OCTOBER 16th, 2014 - INCEPTION WORKSHOP	
9:00 - 9:30	Registration and Tea
9:30 - 9:45	Official welcome and opening, Purpose of the Workshop. Professor Wil Thissen, TU Delft, Dr. Anamika Barua, SaciWATERs
9:45 - 10:30	Introduction to the UDW Shifting Grounds Project. Leon Hermans, TU Delft, Poulomi Banerjee, SaciWATERs and Prof. Vijay Paranjpye – Gomukh Environmental Trust for Sustainable Development, Pune
10:30 - 11:00	Plenary questions and discussion
11:00 - 12:00	Session 1: Urbanization and Groundwater Management in Gangetic Delta city of Kolkata <ul style="list-style-type: none">➤ Chair: Shri Niladri Naha – Director, State Water Investigation, Directorate, Department of Water Resources Investigation Development➤ Dr. S.P Sinha Roy, Ex Director, CGWB, Ministry of Water Resources, Govt. of India➤ Sri Abhijit Ray - Ex Regional Director CGWB and Vice President of CGWS
12:15 - 12:30	Discussions

12:15- 13:15	<p>Session 2: Periurbanization and Water Resource management in Gangetic Kolkata: A policy - research interface</p> <ul style="list-style-type: none"> ➤ Mr. Jayanta Basu – Environmental Correspondent “Telegraph”, Faculty of Dept. of Environmental Sciences, Kolkata University ➤ Dr. Priya Sangameswaram – Assistant Professor Center for Studies in Social Sciences, Kolkata ➤ Dr. Nabin ananda Sen, Associate Prof. of Environment Management, University of Calcutta, Dept. of Business Management
13:15 - 13:30	Discussions
13:30 - 14:30	Lunch
14:30 - 15:00	<p>Session 3: Urbanization, Water security and Delta process: understanding the regional dynamics</p> <ul style="list-style-type: none"> ➤ Chair: Prof Aftabuz Zaman, Bidhan Chandra Krishi Viswabidyalay ➤ Sri Ashish Chatterjee, Ex Senior Hydrologist CGWB ➤ Mr. Subhas Acharya, Ex-Chief of Sundarban Unnayan Parshad
15:00 - 15:15	Discussions
15:15 - 15:30	Tea Break
15:30 - 16:00	<p>Session 4: A Khulna Perspective. Professor Mashfiqus Salehin, IWFM, BUET.</p>
16:00 - 17:00	<p>Session 5: Synthesis and way forward</p> <p>Chair: Prof. Wil Thissen, TU Delft</p> <ul style="list-style-type: none"> ➤ Mr. Jayanta Basu – Environmental Correspondent “Telegraph”, Faculty of Dept. of Environmental Sciences, Kolkata University ➤ Prof. Mashfiqus Salehin, IWFM, BUET ➤ Dr. S.P Sinha Roy, Ex Director, CGWB, Ministry of Water Resources, Govt. of India ➤ Prof. Vijay Paranjpye – Gomukh Environmental Trust for Sustainable Development, Pune
17:00 - 17:30	Wrap-up and closing. Prof. Wil Thissen and Dr. Anamika Barua.

List of Participants

	Name	Institutions Name
1	Prof. Wil Thissen	TU Delft, Netherlands
2	Prof. Leon Hermans	TU Delft, Netherlands
3	Sharlene Gomes	PhD Scholar - Shifting Grounds
4	Prof. Mashfiqus Salehin	BUET, Dhaka, Bangladesh
5	Dr. Nabin ananda Sen	Associate Professor, University of Calcutta
6	Shri Niladri Naha	Director, State Water Investigation
7	Dr. PK Sikdhar	IIWSB
8	Surajit Das	SWID
9	Prof Vijay Paranjpye	Chairman, Gomukh Environmental Trust for Sustainable Development
10	Suparna Katayani	PhD Scholar, IIT Guwahati
11	Partha Sarathi Banerjee	The Researcher, Kolkata
12	Binoy Majumdar	The Researcher, Kolkata
13	Soha Majumdar	The Researcher, Kolkata
14	Jayanta Basu	Environmental Correspondent "Telegraph"
15	Dr.Kalyan Rudra	Chairman, West-Bengal Wasteland Development Corporation
16	Dr. Priya Sangameswaram	Assistant Professor, Center for Studies in Social Sciences, Kolkata
17	Prof Aftabuz Zaman	Bidhan Chandra Krishi Viswabidyalay
18	Ms.Chinmoyee Mallik	Post Doctoral Scholar, IIM Kolkata
19	Shri Abhijit Ray	Ex Regional Director CGWB and Vice President of CGWS
20	Dr. S.P.Sinha Roy	Ex Director, CGWB, Ministry of Water Resources
21	Shri Ashish Chatterjee	Ex Senior Hydrologist CGWB
22	Dr. Anamika Barua	SaciWATERS
23	Dr. Poulomi Banerjee	SaciWATERS
24	Sreenivas	SaciWATERS
25	Jyoti Nair	SaciWATERS