Stakeholders’ Workshop on “Developing an operational water security index, and demonstrating its application in diverse regions of Asia” (ARCP2014-16NMY-Babel)

Workshop Summary (Study Area: Banas River Basin, Rajasthan, India)

10th March 2015, Tuesday

Venue: Malaviya National Institute of Technology (MNIT-J) Jawaharlal Nehru Marg, Jaipur, Rajasthan
Background and Workshop Objectives

It is now well established that water is increasingly becoming a scarce natural resource in many parts of the world, and cannot be taken for granted. Multiple drivers like population growth, rural migration, urbanization, unregulated abstraction of water, indiscriminate pollution are already creating a stress on existing water resources. This is likely to be exacerbated by the imminent effects of climate change which will jeopardize water security in the future if appropriate remedial actions are not taken. Creating a water-secure society is therefore one of the top priorities for governments and policy makers across the globe.

This workshop, in Rajasthan (India), is among the series of workshops organized by the Asian Institute of Technology (AIT), in collaboration with the Thuyloi University (TLU) in Vietnam and Central University of Rajasthan (CURAJ), as part of an ongoing project entitled “Developing an operational water security index, and demonstrating its application in diverse regions of Asia”. The project is supported by the Asia Pacific Network for Global Change Research (APN). The workshop was co-hosted by the Malaviya National Institute of Technology, Jaipur (MNIT-J).

The main objective of this workshop was to provide a platform for stakeholders from various disciplines in the Banas River Basin (Rajasthan, India) to discuss, and deliberate upon, the various issues related to water security in the basin. It was expected that the inter-disciplinary discussions during the workshop will provide food for thought in deciding upon a more holistic, and robust, approach to evaluate the water security at different spatial scales.

Workshop Proceedings

Dr. Victor R. Shinde, from AIT, was the Master of Ceremony for the workshop. The detailed workshop agenda can be found in Annexure – I.

Prof Mukand S. Babel, Prof K.C Sharma and Prof. Rohit Goyal welcomed the participants on behalf of AIT, CURAJ and MNIT-J, respectively.

The participants were then invited to introduce themselves. Details of the participants, and their affiliations can be found in Annexure - II.
Prof. Babel (team leader of the project) gave a brief presentation on the project background, objectives and expected outcomes.

The keynote speech was delivered by Dr. J.R. Sharma, from the Indian Space Research Organization (ISRO), on the topic “Operational Water Security”. The key points of his presentation focused on:

1. Describing the general challenges of ensuring adequate water security.
2. Highlighting the main issues of water security in the basin.
   
   - Natural challenges: frequency of droughts, and gross variability in precipitation.
   - Development pressures: need for economic development.
   - Management and institutional challenges: laws and legislation.

3. Elucidating on issues related to water source variability, water footprints and water security in at different spatial scales—village, block, tehsil, district and state level.
4. Describing the role and use of science and technology in ensuring water security
5. Providing information on WRIS (Water Resource Information System), for data collection and information for different water related parameters.

Following the keynote speech, Dr. Devesh Sharma (CURAJ)) provided an overview on the water resources state of affairs in the Banas River Basin, focusing on the surface and groundwater situation, drought occurrence, land use patterns, water supply and sanitation issues, water quality challenges, and water demand and supply gaps. His presentation was followed by open discussion, facilitated by Prof. A.B. Singh (MNIT-J), where participants were invited to share their thoughts issues and challenges related to water security in the study area. The following key issues were brought up during the discussion:

- Health of rivers in the basin
- Ground water contamination

Dr. J.R. Sharma (ISRO, India)
• Dependence on a single source of supply: Bisalpur dam
Need to evaluate both surface and ground water security
• Need to consider social water security
• Role of gray water in developing water security indicators
• Footprint of agricultural and industrial water and their disposal
• Sustainable agricultural practices to enhance water security
• Rainwater harvesting

After the open discussion, Dr. Victor R. Shinde made a presentation the review of existing water security frameworks used worldwide. He also introduced the proposed water security assessment framework developed by the project.

Post lunch, all participants were divided in four groups for the two rounds of focused group discussions. Each group had a group leader, facilitator, and rapporteur. It was also agreed that each group would present the outcomes of their discussion in the plenary toward the end of the day.
Outcomes of Focused Group Discussion

1. How to define WS from your perspective?

Group- A

Any definition should include the following keywords:
- Liveable ecological equitable environment
- Maintaining biological diversity
- Respecting water
- Sustainability aspects
- Hydro-climatic zones
- Water security must be quantifiable
- Economic value concept

Group- B

- Availability of sustainable water quantity and quality for humans and livestock for domestic, agriculture, industry, environmental, energy, tourism and other purposes.

Group- C

- Water Security means regular access and equity to safe palatable water for drinking, sanitation and hygiene thereby leading to an acceptable, physical, mental and social wellbeing

Group- D

- Inclusive, accessible and equitable
- Accommodative and gender and marginalised sensitive
- Addressing various stakeholders (human and livestock)
- Right based approach
- Sustainable development as a thrust area
- Resource centric definition rather than demand driven

2. What are the factors affecting WS at city and basin scale?

Group- A

City scale

- Behavior of society
- Purchasing power parity
- Ineffective implementation of regulations
- Improper Water policies
• Digging of private tube wells
• Architecture/landscape of the city
• Increasing industrial demand

Basin scale

• Manmade land degradations
• Climate uncertainties
• Translating knowledge into planning
• Ecological niche agricultural practices
• Non point pollution
• Land use change
• Farmer awareness and technological advances
• Livestock practices
• No value for water
• Economics based agricultural practices

**Group- B**

City scale

• Population, climate, tourism (recreational activity), indiscriminate urbanization and inadequate land use planning
• Industrial pollution, conflicting demands
• Life style, culture and living standard, lack of awareness, poor governance (capacity building)
• Wastewater disposal
• Solid waste disposal and its impact on water resources

Basin scale

• Population, livestock, deforestation, topography
• Agriculture generated pollution
• Poor governance
• Encroachment

**Group- C**

City scale

• Population growth
• Migration from rural to urban in search of job, education etc
• Land-use change (shifting of forest and agriculture land for industry and urban construction)
• Over extraction of ground water
• Lack of testing labs for water quality
• Illegal mining of underground water in the form of bore wells by water mafias
• Poor utilization of institutional frame work
• Inequality of water supply in the same city
• Shifting of monsoon
• Poor Supply of water where there is scarcity of water or non availability during poor monsoon
• Lack of will in implementing rainwater harvesting policy by households, industries and public offices.
• Information, education and empowerment is lacking for conserving of water

Basin scale

• Challenge of cattle population
• Conservation of forests
• Usage of water as per the availability
• Recycling and treatment of wastewater
• Mining
• Agriculture

**Group- D**

City scale

• Settlement pattern, urban plan
• Source of water and their stability
• Aquifer & status
• Law to monitor and regulate
• Guidelines on use and disposal of wastewater
• Scale of technology – household or community
• Lack of coordination among departments
• Identification of water source – construction sector

Basin scale

• Landuse pattern
• Unorganized plan of water recharge and storage structure
• Aquifer mapping and management
• Lack of coordination among department
• How to manage water and energy consumption and management
• Inter basin transfer of water
• Water grid – government policy
• Climate change
3. What are the relevant dimensions of WS at city and basin scale?

**Group- A**

City scale:
- Health
- Socioeconomics
- Ecology and Environmental balances
- Industrialization

Basin scale:
- Agriculture and livestock
- Environmental and ecology
- Drinking water use
- Forest
- Health
- Socioeconomic value

**Group- B**

- Separate specifications for demand versus supply side
- Lack of awareness and poor governance (capacity building)
- Tourism (recreational activity)
- Indiscriminate urbanization and inadequate land use planning
- Hydro-geological
- Climate Change
- Water budgeting
- Dams should have a provision for GW recharge in GW- 10% of the availability of water in the catchment Protection of base flow
- Trans-boundary studies for basins

**Group- C**

At city and basin scale

- Livelihood
- Urban
- Safe and regular water supply
- Proper development and timely cleaning of drainage
- Treatment of waste water and recycle of waste water
- Agriculture water security industrial water security
- Disaster (Floods and Drought)
Group- D

City scale

- connected pipelines water supply system
- Share of private & public supply
- Rainwater harvesting structure
- Energy consumption
- Household water gadget
- Per capita water consumption
- Economic and recreational activities
- Area under water bodies and green belt

Basin scale

- Pressure irrigation
- Area under micro irrigation
- Subsidy on water saving programmes
- Climate change
- Cropping pattern
- Change in water bodies and wetlands
- Economic and recreational activities
- Groundwater tubewells/dugwells
- Area under flood/drought
- Safe drinking water and sanitation facilities

4. What are the future drivers of WS in the basin?

Group- A

- Climate regimes
- Economic development
- Conservation practices
- Crop price
- Demography
- Government policies
- Climate change

Group- B

City scale

- Waste treatment and reuse
- Population
- Climate
- Tourism (recreational activity)
• Urbanization and land use planning
• Governance (capacity building)
• lack of awareness
• Industrial pollution, conflicting demands
• Life style
• Wastewater disposal
• Solid waste disposal and its impact on water resources

Basin scale

• Restricted uses of chemicals for agricultural
• Climate change
• Population
• Water shed management
• Land use Change (Mix cropping)

Group- C

Sustainable water management through;

• Creation of recharge zones by rainwater harvesting
• Recycling and reuse of wastewater for irrigation
• Financial and technical support for maintenance of pipelines and supply of safe drinking water
• Disaster management (water borne; Floods and drought)
• Information, education and communication at the supply as well as demand side (Water education)
• Effective monitoring and cost-benefit evaluation (structures and plants)
• Incentives for RRR (Recycling, Reuse and Reduce)
• Mobilization of resources for cleaning of major rivers
• Knowledge sharing and networking with agencies across the world working on the subject

Group- D

• Climate Change
• Change in irrigated area
• Change in water intensive crop
• SEZs, water recreational industries
• Implementation of laws and policies
• Overexploitation of ground water (dark zone)
• Social, economical and health vulnerability
5. **How can WS be mainstreamed?**

**Group- A**

- Through policies
- Nexus approach between water-energy-agriculture
- Behavioural change communication
- Social activity

**Group- B**

- Incorporation in academic curriculum
- Public awareness
- Capacity building of PRI/ Municipal corporation or Jila Parishad
- Stringent provision of legal provisions
- Technology intervention
- Change of mind set

**Group- C**

- Effective implementation of national and state level water policies
- IEC
- Involvement of major stake holders

**Group- D**

- IWRM Approach: Planning, Coordination, Implementation, Monitoring
- Inducing at School Curriculum
- Interface/Exchange with Techno-sound Countries
- Strict implementation of legal provision
- Capacity building Programme for various stake holders
- Use of Science and Technology in Public Domain
- Use of available information for policy analysis
Key outcomes and recommendations of the workshop

1. Water security can be defined as “availability of adequate quantity and quality of water; at an acceptable level of risk; for the physical, mental and social wellbeing of all stakeholders; leading to a livable, and ecological equitable environment”.

2. Water security is site-specific, and the contextual conditions must be taken into account in assessing the security as a whole. For example, in Rajasthan the adequate availability of water for livestock maintenance is a crucial component of the overall water security in the state/basin.

3. At basin scale assessment, there may be a case for estimating urban and rural water security separately, given that both have very different driving forces.

4. At city level, it may be worthwhile to consider evaluating the water security based on the categories of the cities, i.e. class A, B, or C.

5. The role of “grey water” will gain increased significance in ensuring water security in the years to come.

6. Unlike the traditional line of thought, data availability in the basin may not be a constraint in developing a robust framework for water security assessment. There is a plethora of data and technology available.

7. Any form of interventions to improve water security would be impossible without the engagement of citizens, and will require a major paradigm shift in behavior and attitude of these stakeholders towards safeguarding water.
# Annexure- I

## Workshop Program

Master of Ceremony: Victor R. Shinde

<table>
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<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>0900-0930 h</td>
<td>Registration</td>
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| 0930-1030 h | Welcome address by project leader (5 min).................................M.S. Babel  
            | Welcome address by CURAJ (5 min)...........................K.C. Sharma  
            | Welcome address by MNITJ (5 min)...................................R. Goyal  
            | Introduction of participants (15 min)                                  
            | Workshop objective and agenda (5 min)................................M.S. Babel  
            | Keynote speech (20 minutes)........................................J.R. Sharma  
            | Vote of thanks (5 minutes).............................................D. Sharma  |
| 1030-1045 h | Presentation 1: Water security (WS) related issues in the study area......D. Sharma  |
| 1045-1115 h | Open discussion on WS related issues in the study area........................A.B. Gupta  |
| 1115-1135 h | Group photograph and networking break                                      |
| 1135-1155 h | Presentation 2: Existing and proposed WS evaluation framework/s............V.R. Shinde  |
| 1155-1200 h | Formation of groups for group discussions, and briefing on the modality of the discussions..........................M.S. Babel  |
| 1200-1330 h | Focused group discussion 1:  
            | • How to define WS from your perspective?  
            | • What are the factors affecting WS at city and basin scale?  
            | • What are the relevant dimensions of WS at city and basin scale?  |
| 1330-1430 h | Lunch and networking                                                       |
| 1430-1530 h | Focused group discussion 2:  
            | • What are the future drivers of WS in the basin?  
            | • How can WS be mainstreamed?  |
| 1530-1545 h | Coffee break                                                              |
### Reports from working groups

- 1545-1615

### Recommendations from the workshop

- 1615-1630

**Annexure-II**

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</table>
Workshop Interaction

Group- A

Group- C

Group- D

Group –A
Dr. H. Solanki

Group –B
Dr. Yasmin Khan

Group –C
Dr. P.C. Ranka

Group –D
Dr. Jagdish Jadav

Group Presentation