

Role of Water Forum as a Social Learning Platform for Water Management in the face of Climate change and Urbanization: *Insights from Practice*

SUCHITA SHRESTHA
AND KAUSTUV RAJ NEUPANE

INSTITUTION: SOUTH ASIA INSTITUTE OF ADVANCED
STUDIES, NEPAL

SESSION: WATER DIPLOMACY: BUILDING BRIDGES FOR SUSTAINABLE
DEVELOPMENT

Water Security
and Climate Change
Conference



www.sias-southasia.org

Outline

- Context
- Research Aim
- Methodology
- Framework
 - Results
 - Lessons



Threats to local water security

- **Climate change**

- Nepal is ranked as 4th vulnerable country of climate risk (Global Climate Change Risk Index 2019)
- Extreme weather events - Floods and droughts;
- Glacier melt & GLOFs
- Drying springs



- **Urbanization**

- Rapid, unplanned urbanization
- High urban population growth rates (demand >> supply)
- Socio-economic development trends; lifestyle change



No. of municipalities	% of urban pop	year
58	17.1	2011(CBS)
217	40	2017 (NUDS)

Factors affecting Urban Water



- Multiple factors
- Multiple actors
- Multiple views
- Multiple priorities

Tough game to play

Why deliberative platform for better urban water management ?

- Urban water management is a **complex problem** that cannot be solved by individual stakeholders
- Conventional **top-down technocratic approach** with limited involvement of stakeholders fails.
- Growing importance of **horizontal learning** within the stakeholders
- For wider **acceptance** and better **implementation** of water policies and programs
- **Attaining sustainability** within water management
- But, **HOW** to set up the enabling environment for inclusive water governance?

Water Forum

- Locally popular as “*Paani Chautari*”

Formation

- Need of such **knowledge sharing and discussion** platform - by local stakeholders
- Then, the concept of Water Forum was envisioned
- About 25 representatives of water related institutions engaged

Objectives of Water Forum: *A deliberative discussion forum*

- to **promote learning** culture among diverse stakeholders of city water supply system to **co-create knowledge**
- To ideate water management **plans and strategies** on the basis of knowledge created
- Explore opportunities for **collaborations** among local stakeholder institutions

Structure of Forum

- an **informal and open deliberative** platform
- **No rigid** structure – all relevant stakeholders can be a part
- Facilitator, experts and relevant stakeholders



Water Forum

Modality of Meeting

- stimulated by facilitator, knowledge and practices shared by participants (experts, locals, bureaucrats, academicians, local rep.); 2 hours duration
- Stakeholders discuss on water related **problems** and explore **solutions**
- Deliberative discussion in the issue, inputs of **scientific as well as indigenous knowledge**
- **Coordinated** by Municipality

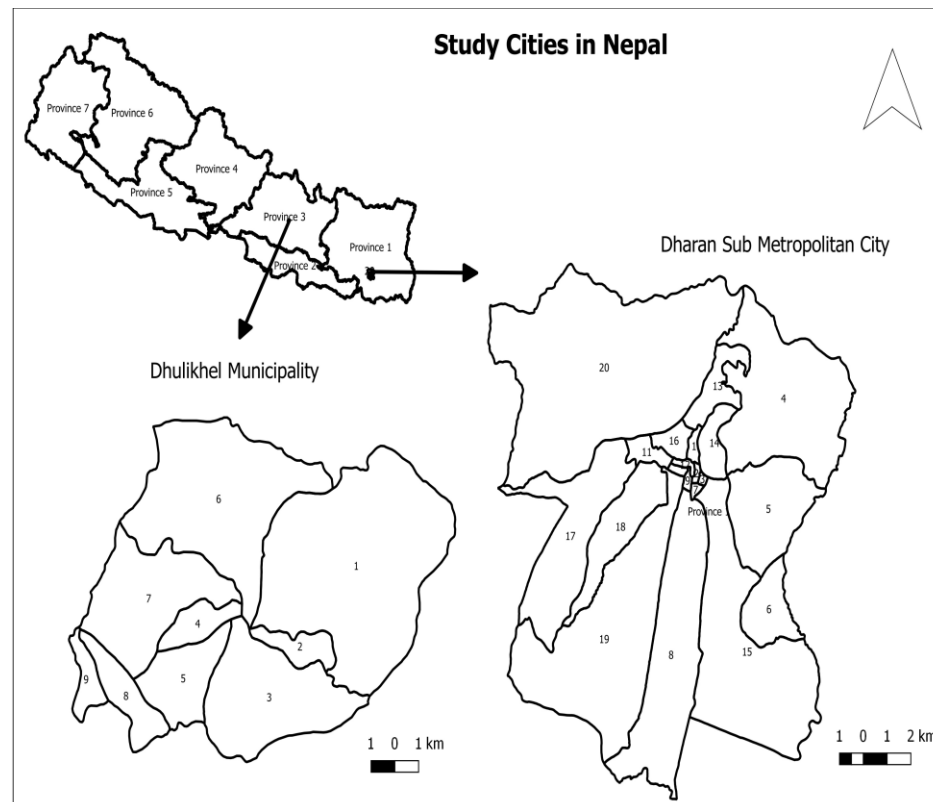


Research Aim and Methodology

Aim

Analyze the **role of water forum** as a platform of **social learning** in the two case studies municipalities - Dharan and Dhulikhel of Nepal

Study sites



Methodology

- Altogether, 9 water forums were conducted in two cities within 2 years of action research period
- involved as an facilitator and observer
- retrospective self-reflection and review the documents of water forums
- semi-structured interviews with stakeholders (local government, civil society, water committees' members, ward chairs, university representatives and private sectors)
- Secondary literature review

Theoretical context

- Social learning mechanism is required **to build new knowledge, relationships, and practices** in response to complex environmental challenges to attain climate change adaptation (Ensor and Harvey, 2015).
- Social Learning is the result of **social interactions between actors** within social networks that lead to a change in **understanding that goes beyond the individual** to become situated in groups of actors or communities of practice (Armitage et al., 2011).
- Pahl Wostl (2007, 2009) applied the concepts of social learning to the **challenge of water**.

The implementation of water management policies in a river basin must take into account its political, economic and social realities – this needs a transparent and open discourse between scientists, engineers and policy makers (Pahl-Wostl, 2007)

- The major assumption of the water forum is the belief that **nobody knows the “whole” information on the complex environmental issues** and the local stakeholders including policy makers, citizen, government officials, private sector have their own tacit knowledge that should be tapped to make an informed decision.

Analytical Framework

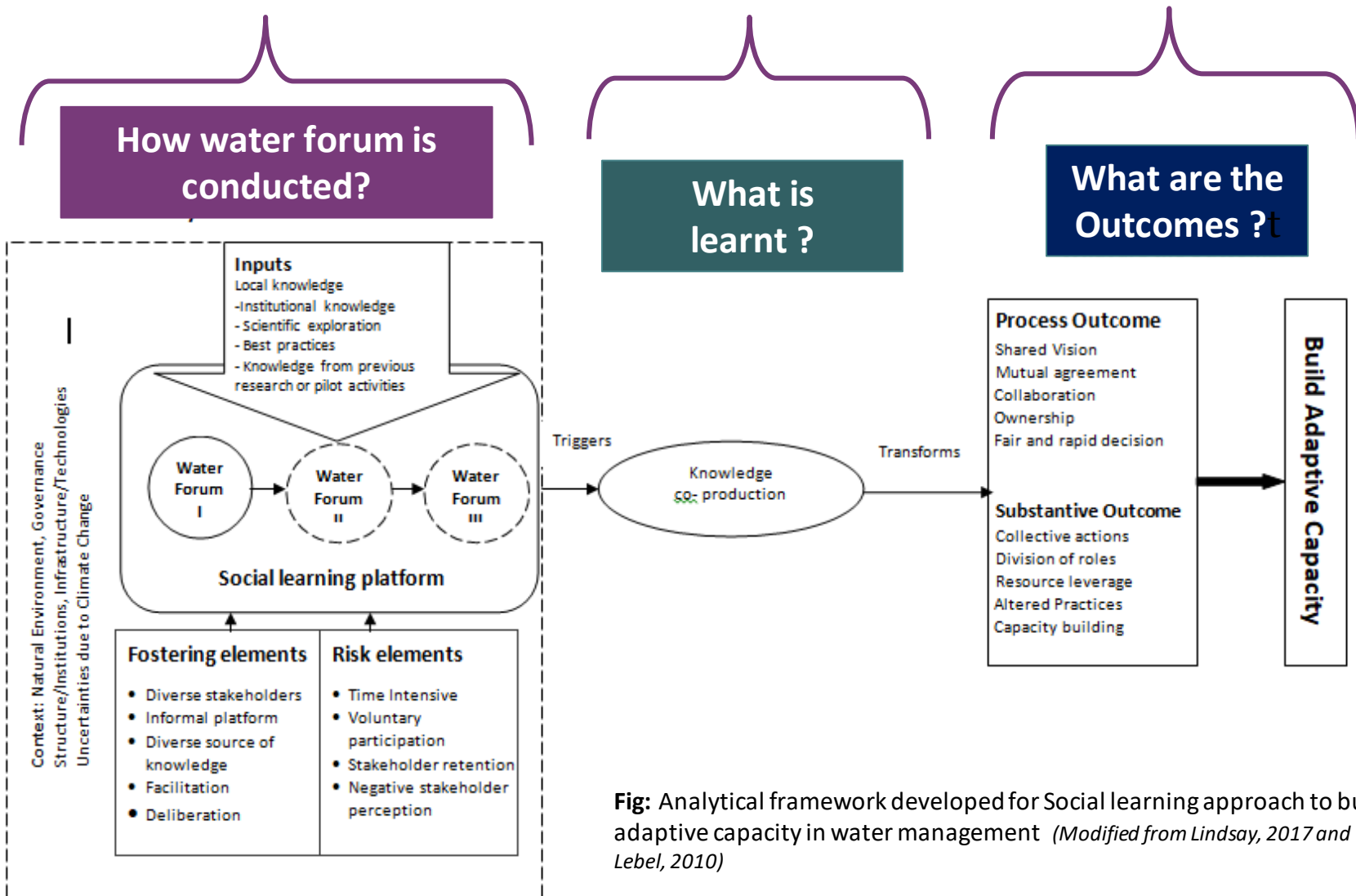


Fig: Analytical framework developed for Social learning approach to build adaptive capacity in water management (Modified from Lindsay, 2017 and Lebel, 2010)

Findings and insights

Dharan City Case



Dharan Water Forum Series

Water forum I: Identifying stakeholders and problems

Water forum II: Prioritize issue

Water forum III: Discussing appropriate solutions

Water Forum IV: Discussing on the design

Water forum V: Capacity Building

Training on Construction of Climate Adaptive Recharge (CARP)

“सहरीकरण र जलवायु परिवर्तनबाट पानीका श्रोत जोगाऔं,
दिगो पानी व्यवस्थापनका लागि सिर्जनशील बनाौं ।”

धरान पानी चौतारी

शृंखला

धरान, सुनसरी

आयोजक

समन्वयकर्ता



धरान उप-महानगरपालिका धरान सानेपानी व्यवस्थापन बोर्ड Southasia Institute of Advanced studies



Water Forum I: Prioritization by stakeholders

Mitigation Strategy	Study Cities	
	Dharan	Dhulikhel
Rain water harvesting	+	+++
Ground water recharge	+++	-
Source area protection	+++	+++
Watershed conservation	++	+++
Leakage control	-	+
Water utilities reform	+	+
Staff capacity enhancement	++	++
Water tariffs/pricing	++	++
Non-revenue water reduction	-	-
Public-private partnerships	+	+

Groundwater extraction is increasing:
 ADB funded new project;
 in dry season 66% of total
 water supply is covered

*“As we are being more dependent on ground water, we must need to think of how **ground water** can be **conserved**. The major challenge is **increasing land sealing** in urban areas”*
 (Chief Planning Chief of Dharan Sub Metropolitan, Dharan Water Forum II, 31st March 2017)

Inputs of Knowledge

City level inception workshop

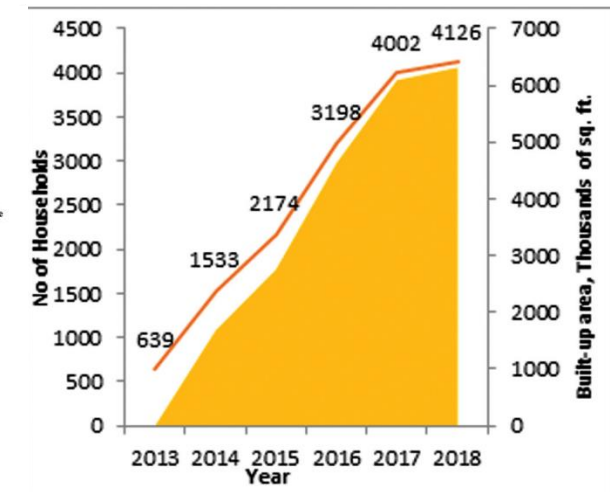
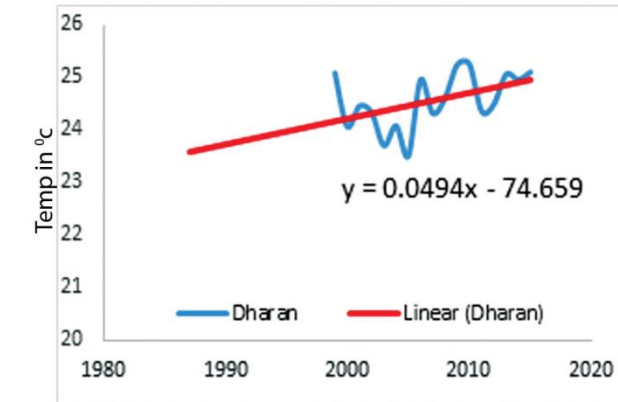
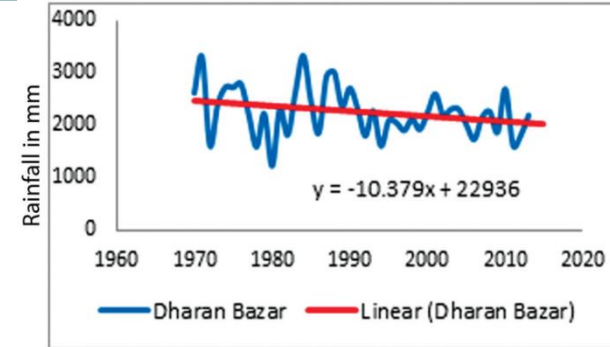
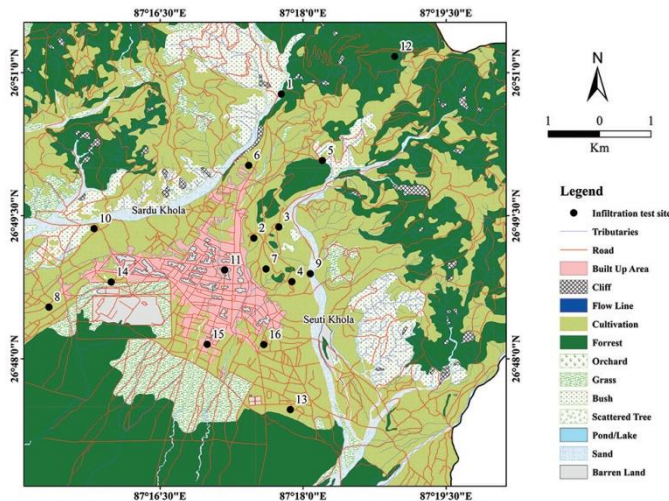
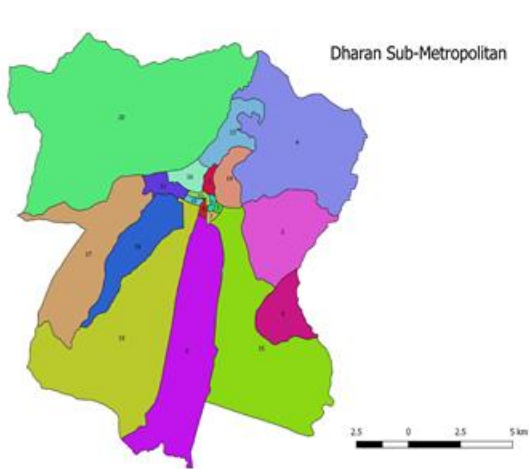
- vital to understand complexities, challenges and opportunities in water management practices of city
- 50 representatives from diverse stakeholders participated
- Local experts were keys to bring the existing information on the local water and urban issues.
- Local issues and interest were consulted and collected with sectoral group (i) government officials and academics, (ii) Community Users Group (iii) private sector and (iii) civil society committees on the basis of diagnostic questions
- Consensus was built and declaration was made

This year a religious fair, Kumbha Mela, was held in pilgrimage site of Dharan i.e. Barahchhetra where thousands of pilgrims attended the fair. But, unfortunately, due to the water shortage, Dharan could not accommodate those people and instead they stayed in neighboring cities Itahari and Biratnagar.

(Participant from Dharan Water forum I, 2016)

Inputs of Knowledge

- Water insecure city: among the cities along Himalayan foothills facing **water insecurity** and **city flooding** at the same time
- In the 10 years period from 2001 to 2011, Dharan's population increased by 41% (Central Bureau of Statistics, 2011).
- Water source: stream water and groundwater
- Water demand: 30 MLD, Supply : 10-13 MLD



Recent events of Flash Flood



Bridge at Dhankute road in Dharan collapses Sep 25, 2015
(Kantipur News)



Seouti River Image Date 11 August 2017, 12 PM



Floodwaters rage along the bank of Surdu River near Sundar Basti in Dharan Rohit Rai /Republica) Date: Aug 19, 2007



Seoti River, Image Date 11 August 2017, 3:30 PM

Geology of Dharan

- situated at sloppy terrain which mainly comprises **of alluvial fan deposit**.
- The sediment in the area is unconsolidated, highly permeable, ill-sorted, coarse sediments
- base of the hill slope represented by **alluvial debris** and further away by alluvial fan deposit of Sardu and Seouti River

(Source: Department of Mines and Geology)

- *Flooding on alluvial fans, where highly permeable fan deposits surround a basin, can be an important source of groundwater recharge in arid environments [Bull, 1977; Hendrickx et al., 1991; Houston, 2002]*

Blue Roof Town: around one-fifth (19.27%) of the households harvest rainwater in Dharan



Further investigation

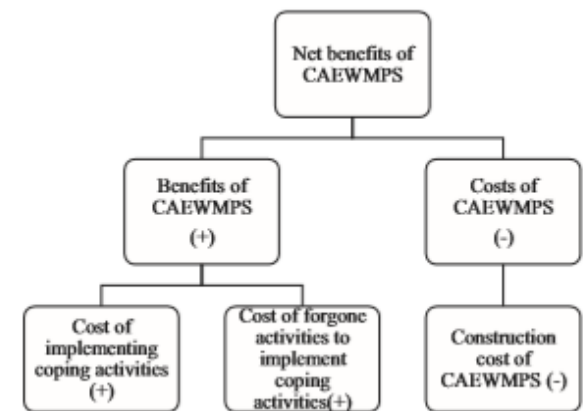
Infiltration rate

- Collaborated with Local research institution: Geology department of Central Campus of Technology of Dharan
- 16 sampling sites
- scored “very high” ~ 124mm/hr
- 124L per cubic meter could be recharged into the groundwater per hour



Cost benefit analysis of the recharge pit action

- HH level coping strategies including minimizing consumption, purchasing from market, harvesti and harvesting technology installing, equipmen and pumping



Analytical framework for the analysis

Outcomes

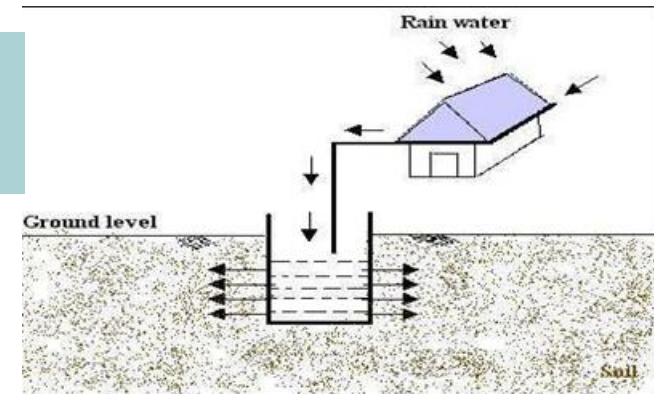
Social learning is both an outcome in itself and a process that leads to other outcomes (Lindsay,2017)

Process outcome

- **Shared vision, ownership & rapid decision**

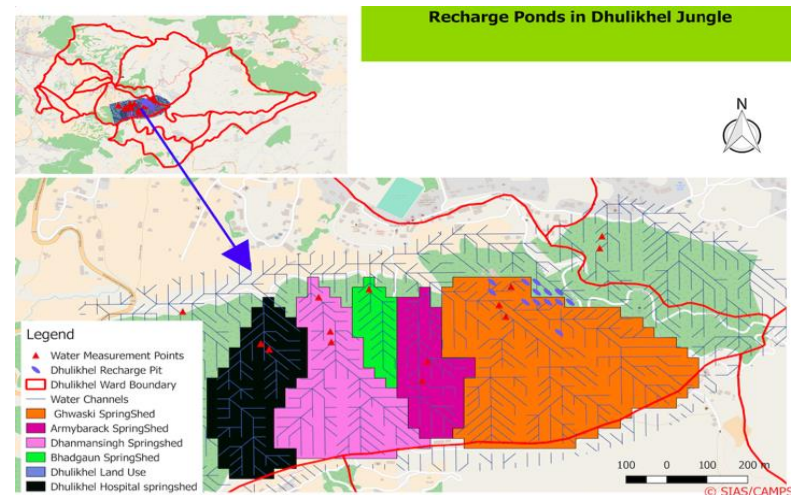
We are committed to adapt ground water recharge in the Municipal policy (Mayor, Dharan Sub Metropolitan City, Dharan Water Forum III, 15th September, 2017)

- **Collaboration:** Central Union of Painters, Plumbers, Electro Construction Workers (CUPPEC), sub metropolitan office, Dharan Chamber of Commerce and Industry, Geology Department
- Advantages of collecting and storing rainwater in urban areas
 - the reduction of demand on water supply systems
 - reducing the amount of storm-water run-off and consequent flooding.



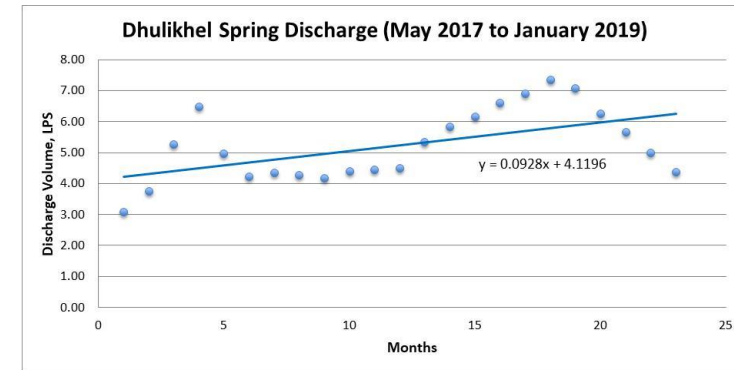
Case of Dhulikhel Municipality

- **Water Forum I:**
 - discussion on issues and prioritization
 - need of water secure plan common understanding of the stakeholders.
- **Water forum II:**
 - Discussion on the most critical water issue
 - Best possible adaptive actions to address the issue
 - Local spring - Water volume are declining
 - Recharge ponds – solution
- **Water Forum III:**
 - how artificial recharge ponds can increase the rate of natural infiltration to augment ground water aquifers
- **Water Forum IV**
Recharge ponds construction at 1600 m and the 1550 m



Case of Dhulikhel Municipality

- 24 recharge ponds and trenches were constructed
- Collaborated with the local government and Water users committee
- Gathered data for the volume of water in springs
- Stream flow rate (liters per second) steadily increasing trend from April 2017 to January 2019



Impact

Programs and budget were allocated for the construction of recharge pits in other areas implemented by municipality

Lessons

- Long engagements with major stakeholders is needed
- Proper input of knowledge both scientific and local
- Building on what is already known and what are the major issues
- “scattered parts of knowledge” leading to “whole form of knowledge” to take decision on complex situation
- Researcher should not be just researcher; need to be a good facilitator
- Institutionalization of the stakeholder engagement process for sustainability
- Social learning process can predict what works, what does not work and what could work better in terms of water governance.
- finding synergies and complementarities across institutions represented in the network

6 CLEAN WATER
AND SANITATION



SDG implications

Ensure availability and sustainable management of water and sanitation for all”

Water scarcity affects more than 40 percent of people, an alarming figure that is projected to rise as temperatures do. (UNDP, 2019)

Target 6.b

Stakeholder participation : “Support and strengthen the participation of local communities in improving water and sanitation management”

6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water a

Thank you Gracias!

suchita@sias-southasia.org
such.shrestha@gmail.com

Effective conservation planning of resources is a social process informed by science, not a scientific process which engages society (Knight et al. , 2011)

Acknowledgement: This research findings is the part of action research project “Climate Adaptive Water Management Practices and Strategies in cities of South Asia (CAMPS)” funded by IDRC Canada



International Development Research Centre
Centre de recherches pour le développement international

