

# Field Visit on Springs and Springshed Management for Reviving Drying Springs



7–9 November 2017

Sikkim, India

# About ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD) is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalaya (HKH) – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – based in Kathmandu, Nepal. Globalization and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream and downstream issues. ICIMOD supports regional transboundary programmes through partnerships with regional partner institutions, facilitates the exchange of experiences, and serves as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop economically and environmentally-sound mountain ecosystems to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now and in the future.



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Field Report 2018

# Field Visit on Springs and Springshed Management for Reviving Drying Springs

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Sikkim, India

*Organized by*

**International Centre for Integrated Mountain Development (ICIMOD)  
Rural Management & Development Department (RMDD), Government of Sikkim**

*In collaboration with*

**Advanced Center for Water Resources Development and Management  
(ACWADAM)**

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# 1. Introduction

Mountain springs are the primary source of water for millions of people in the mid-hills of the Hindu Kush Himalaya (HKH). Both rural and urban communities depend on springs to meet their drinking, domestic, and agricultural water needs. Springs also contribute to the base flows of rivers in this region. There is increasing evidence of drying springs, decreasing spring discharge, and deteriorating spring water quality in many parts of the HKH. As a result, communities are facing unprecedented water stress. The exact extent of this problem is not well-known given that sufficient data on this problem has not been gathered.

The drying of springs is a regional phenomenon, and its consequences are felt across the HKH – from Afghanistan all the way to Myanmar. A few local and national organizations have started scientific studies and policy advocacy on springs, but more needs to be done, especially given the regional nature of the problem.

ICIMOD as an inter-governmental organization works in eight countries of the HKH (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan), and conducts country consultations with governmental and other partner organizations in each of the Regional Member Countries (RMCs). In these consultations conducted in mid 2010, drying of spring water sources, especially in the mid hill regions, emerged as a common theme across all RMCs of ICIMOD.

In Bhutan, one of the RMCs, drying of springs has been a major concern and the Watershed Management Division (WMD) of the Department of Forests and Park Services, Ministry of Agriculture and Forests, Royal Government of Bhutan, has been mandated to implement plans and programmes related to springs and springshed management. In the forthcoming 12th Five Year Plan, WMD plans to undertake springs and springshed management as a major activity and to address the issue of drying springs for better water security for mountain communities in Bhutan.

In this regard, a three-day field visit on Springs and Springshed Management for Reviving Drying Springs was organized in Sikkim from 7 to 9 November 2017. Fifteen officials from Bhutan working in various sectors related to water resource management, watershed management, public health, water supply, local body representatives and others participated in the field excursion.

## 2. Objective of the Field Excursion

The Dhara Vikas Initiative of Rural Management and Development Department (RMDD), Government of Sikkim has successfully implemented the springs revival programme including rejuvenation of lakes and adapting them as recharge ponds for reviving springs. The main objective of the field excursion was to provide firsthand practical knowledge about how spring revival works were successfully carried out by Dhara Vikas Initiative in south Sikkim. It is hoped that the learnings from the field exposure visit to springs revival sites will help the Bhutan delegates in planning their springs revival programme in a more efficient way in their working areas. It is also anticipated that the opportunity of knowledge sharing and learning will contribute in regional cooperation.



### 3. Synopsis of the Field Visit Workshop

The field visit programme was attended by 15 participants from Bhutan representing various institutions (Table 1). Institutions represented ranged from government departments/institutions and non-governmental organizations to local community organizations and Dzongkhag Administrations. The field excursion was facilitated by resource persons from RM&DD and ACWADAM.

**Table 1: List of Participants of the Field Excursion on Springs Revival Programme in Sikkim**

S. No.	Name / Background	Email Address	Agency
1.	Mr. Nidup Tshering Rangeland/Livestock	nidupshering@yahoo.com	Watershed Management Division, Thimphu
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3.	Mr. Dawa Yoezer Forestry (Water)	dyoezer@uwice.gov.bt	Ugyen Wangchuk Institute for Conservation, Environment & Research, Bumthang
4.	Ms. Yangki Engineer	yangki@health.gov.bt	Ministry of Health, Thimphu
5.	Mr. Tashi Wangdi Forestry	t.wangdi89@yahoo.com	Mongar Forest Division, Mongar
6.	Mr. Sonam Drupchu Forestry	jazzdups@gmail.com	Mongar Forest Division, Mongar
7.	Mr. Pema Rinzin Forestry	rpema89@yahoo.com	Pemagatshel Forest Division
8.	Mr. Tendri Tshewang Forestry	tendritshewang@yahoo.com	Pemagatshel Forest Division
9.	Mr. Chimi Wangchuk Environment	ongchu02@gmail.com	Pemagatshel Dzongkhag Administration
10.	Mr. Sonam Rinchen Gup/Local Leader	decheeling@pemagatshel.gov.bt	Dechenling Geog Administration, Pemagatshel
11.	Mr. Phuntsho Wangdi Environment	phuntshowangdi@nec.gov.bt	National Environment Commission Secretariat
12.	Mr. Jambay Ugyen Environment		Zhemgang Dzongkhag Administration
13.	Mr. Tenzin Dorji Livestock	dorjit@mongar.gov.bt	Mongar Dzongkhag Administration
14.	Mr. Tshering Wangdi Legal Environment	twangdi@mongar.gov.bt	Mongar Dzongkhag Administration
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24.	Dr. Subash Dhakal	pkysub@gmail.com	RMDD



Figure 1: Workshop for sharing springs revival experiences in Gangtok, Sikkim

The first day of the programme was dedicated to a workshop aimed at providing background information on springs and the springshed management programme and sharing experiences in springshed management (Figure 1). The programme started with a welcome address by Ms. Sarika Pradhan, Additional Secretary, RM&DD. She talked about the water scarcity issue in Sikkim, the dependency of local communities on springs for their water needs, drying of springs, and how the springs revival programme was developed as part of the Dhara Vikas Initiative and linked with Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) of the Government of India. She explained how the application of knowledge of hydrogeology in cooperation with ACWADAM effectively contributed in reviving drying springs. She also emphasized that the Dhara Vikas has evolved from a learning-by-doing stage and briefly discussed some advanced scientific studies carried out in cooperation with national and international agencies, e.g., isotope study with Bhabha Atomic Research Centre and monitoring of springs with UNDP.

Dr. Subhash Dhakal from RM&DD shared the practical experiences of the springs revival programme and the shift in approach from reviving springs focusing on source to a broader landscape approach focusing on aquifers as a resource. He also explained the technical aspects of springs that they have considered while implementing revival programmes, particularly geological structures.

Mr. Imran Siddique, ACWADAM, shared the overall institutional journey in the area of springwater management covering its spring related activities in different parts of the Indian and Nepal Himalayas, Sikkim, Assam and peninsular India. He also highlighted that it had been possible to carry out spring water management activities owing to the collaboration and partnership with various institutions and organizations.

Rajendra Shrestha, ICIMOD, shared how springs and springshed management was implemented in several pilot areas of east and west Nepal using a step-wise approach. Sharing experiences in conducting spring related research, he also briefly discussed the preliminary results that have been derived so far.

Very fruitful discussion and interactions took place after the presentations. The Bhutanese delegates showed very strong interest in spring revival activities undertaken in Sikkim and enquired a lot about issues such as spring drying up and revival impact on communities, communities' participation, ownership of springs, linking of beneficiaries of springs in different areas of watershed, difference between springshed and watershed, etc.

Dr. Aditi Mukherji, Theme Leader, Water & Air, ICIMOD, extended sincere thanks to RM&DD for its strong support in organizing the Field Visit Workshop. She also thanked the National Environment Commission Secretariat and the Watershed Management Division of the Department of Forests and Park Services, Royal Government of Bhutan for their collaboration. She expressed appreciation for ACWADAM for handholding with technical support in organizing the field excursion. She thanked all the delegates from Bhutan for participating with strong interest and fruitful interaction.

Table 2: Agenda for Field Visit on Springs and Springshed Management for Reviving Drying Springs, Sikkim

<b>7 November 2017</b>	Meeting/Workshop at Hotel Sikkim Retreat
11:00 AM	Registration and Introduction of Delegates
11:20 – 11:30 AM	<b>Welcome and introduction session</b> <ul style="list-style-type: none"> <li>• Brief on Springshed Development/Dhara Vikas by Additional Secretary</li> </ul>
11:30 AM – 12:15 PM	<ul style="list-style-type: none"> <li>• Presentation by Dr. Subash Dhakal, RMDD</li> </ul>
12:15 – 1:00 PM	<ul style="list-style-type: none"> <li>• Sharing of experience by Bhutan team, ACWADAM and ICIMOD</li> <li>• Open house discussion</li> <li>• Vote of thanks by Dr. Aditi Mukherji, ICIMOD</li> </ul>
1:00 – 2:00 PM	<ul style="list-style-type: none"> <li>• Lunch</li> </ul>
2:00 – 5:00 PM	<ul style="list-style-type: none"> <li>• City tour</li> </ul>
7:00 PM onwards	Reception dinner
<b>8 November 2017 – 7:30 AM</b>	Depart for Perbing, South Sikkim; Visit the field and check into Hotel Summit-Namchi.
<b>9 November 2017 – 7:30 AM</b>	Field visit to Chemchey and Dolling Lake, South Sikkim
<b>10 November 2017</b>	Departure

On the second day of the programme, participants were taken for field excursion to a site where spring revival measures were implemented. The site visited was in Perbing, south Sikkim. Mr. Pem Norbu Sherpa gave a detailed explanation of recharge structures like recharge ponds and their dimensions, locating them suitably in relation to topography, feeder channels and entrapping water in those structures for recharging (Figure 2a). In Perbing, the participants also learned about rock structures and their orientation in relation to slope such as dip slope, escarpment slope, and their importance in identifying areas for building recharge structures. Afterwards, a visit was made to a spring located in a springshed where they could learn about improvement in spring discharge and practice water quality measurements (Figure 2b).

Figure 2a: Mr Pem Norbu, field coordinator, explains the importance of hydrogeology in locating intervention sites, how recharge measures were conducted, and how it helped in springs revival in Perbing, south Sikkim.





Figure 2b: Participants hold a discussion near a spring (Kaila Baje Dhara spring) that has shown positive impacts after implementation of springs revival activities. Water quality measurements were also demonstrated at this spring site.

On the third and final day, the participants were taken to Omchu, where they saw and learned how various recharge structures are constructed (Figure 3a). In Chemchey field site, the delegates were able to learn firsthand how already dried Drolling lake was rejuvenated and how it helped in springs revival in that particular springshed (Figure 3b). Mr. Pem Norbu Sherpa reminded the visitors that working on the spring revival programme entails spending most of working hours in the field, studying rock structures, soil properties and the overall landscape. Recharge structures are built only after considering these factors or local hydrogeology.

Figure 3a: Demonstration on how various recharge structures are constructed





Figure 3b: Rejuvenated Dolling lake in Chemchey that helped in springs revival

## 4. Summary

The field excursion immensely benefited the participants and enabled them to understand the concept of springshed management for springs revival. Participants benefited a lot from practical firsthand demonstration of field techniques and recharge structures as interventions for springs revival. They expressed great satisfaction over being able to realize the importance of the springshed approach in reviving springs and their management. It also helped them understand the distinction between watershed and springshed approaches.

It is believed that this training will contribute in framing a common understanding of springshed management research and implementation among key stakeholders. It is also hoped that imparting such practical knowledge about hydrogeological aspects of springs through field excursions will enhance the capacity of the participants and in the process improve springshed management in their respective areas.

Events like this will surely and significantly contribute in enhancing knowledge generation and cooperation in relation to springs and springshed management in the region.







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