Reviving Springs: An Eight-Step Methodology

ICIMOD

Springs: A lifeline for communities in the midhills

Springs, also called dhara, mool, kuwa, naula, and chasma, are, the most important source of water for millions of people in the midhills of the Hindu Kush Himalayas. Spring water is used for drinking, irrigation, domestic, and religious purposes. They also perform important ecological functions, like supporting local vegetation and wildlife and maintaing baseflow in rivers.

Uses of springs

Drinking and domestic uses | Irrigation | Ecological services

Springs are drying

There is increasing anecdotal evidence from across the HKH that springs are drying up, leading to acute water stress. This evidence is largely anecdotal as few systematic and scientific studies have been conducted on this topic.

Why are springs drying?

- Climate change, especially rainfall
- Land and land use changes
- Socioeconomic and demographic changes

Drying of springs leads to:

- Drinking and domestic water insecurity in rural and urban areas
- Irrigation water insecurity in hills
- Poor ecosystem services – e.g. low baseflow and human wildlife conflicts

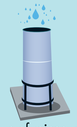
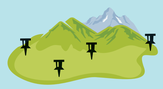
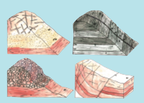
Genesis of the eight-step methodology

Given the importance of springs, and lack of scientific studies and growing evidence that springs are drying or their discharge is declining, researchers and practitioners from the region came together in December 2015 in Gangtok, Sikkim in an ICIMOD and ACWADAM organized workshop and collaboratively developed a common methodology for understanding the science, social science and implementation activities needed for revival of springs.

Integrating physical with social, and science with implementation

The uniqueness of this methodology lies in its power of integration. Given the complexity of the issue and urgency of dealing with it, our methodology integrates aspects of physical and social sciences, and is just as useful for researchers as it is for field practitioners. The step-wise approach is relatively easy to follow and each step generates scientific information while also allowing project implementers to invest in infrastructure that will help revive springs.

The eight-step method

STEPS	SUB-STEPS	LEADS TO	
I. Comprehensive mapping of springs and springsheds	1.1: Collect background information of identified area 1.2: Reconnaissance survey 1.3: Map springs and collect data 1.4: Delineate springshed area	 Delineation of water tower	 Comprehensive map of springs
II. Setting up a data monitoring system	2.1: Data collection (why, who, where, what, how) 2.2: Data storage and management 2.3: Data analysis (software development, app development) —Hydrograph/basic software 2.4: Share data with community	 Setting up of raingauge station	 Hydrometeorological data in Excel
III. Understanding social and governance aspects	3.1: Analyse existing institutions and systems of management using: questionnaire survey, focused group discussions, key informant interviews, and communication and dialogue with community and public policy makers	 Management of spring by the local community	 Questionnaire survey tool
IV. Hydrogeological mapping	4.1: Obtain geological map of the area 4.2: Observe geology during transect walk: latitude, longitude, elevation, spring location, geological observations and measurements 4.3: Create a base map using Google Earth/Toposheet	 Excel format of hydrogeological data	 Google-based base map
V. Creating a conceptual hydrogeological layout of springshed	5.1: Create a geological map based on the transect walk 5.2: Draft cross-sectional layout	 Geological map of spring and springshed	 Cross-sectional layout
VI. Classifying spring types, identify mountain aquifer and recharge areas	6.1: Identify spring and aquifer types 6.2: Delineate recharge area	 Example of spring types	 Outline of recharge area
VII. Developing springshed management protocols	7.1: Hydrogeological inventory for springsheds 7.2: Negotiable and non-negotiable land use and land cover change 7.3: Institutional mechanism 7.4: Conservation and intervention, measures of recharge and discharge area 7.5: Develop operational and maintenance guidelines	 Revival activities using voluntary labour	 Recharge structures
VIII. Measuring the impact of spring revival	8.1: Impact study 8.2: Continuous monitoring	 Before	 After

Curriculum development and training

A week-long training course has been designed for researchers, NGO partners, and government officials. Two trainings have been conducted and more are planned. In addition, special trainings have been conducted for village communities using pictorial training manuals.

The way forward

This methodology is now being deployed by ICIMOD and its partners in various locations in India and Nepal. Through the CGIAR Research Program on Water, Land and Ecosystems, work is being done in Dailekh and Sindhupalchowk districts of Nepal and in Nainital district of Uttarakhand, India. Similar work is also being undertaken under the HI-AWARE project (in Nuwakot district, Nepal, and Darjeeling district, West Bengal, India) and the Kailash Sacred Landscape Conservation and Development Initiative (Darchula district, Nepal, and Uttarakhand, India). Over the next five years, it is expected that this methodology will be applied in all countries of the HKH.

PARTNER ACWADAM

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