Implementing the Spring Revival Protocol: A case from Dailekh, Nepal

RESEARCH PROGRAM ON Water, Land and Ecosystems

CGIAR

Australian Aid

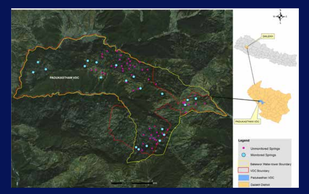
ICIMOD

Background and purpose

Springs are the main source of water for millions of people in the midhills of the Hindu Kush Himalaya. There is increasing anecdotal evidence from across the region that springs are drying up, leading to acute water stress.

The Spring Revival Protocol was implemented by International Centre for Integrated Mountain Development (ICIMOD) in collaboration with the Advanced Centre for Water Resource Development (ACWADAM) and Helvetas to understand spring systems and their management. The protocol involves the identification of drying springs and implementation of sustainable measures to recharge springs. The study was funded by the CGIAR Research Programme on Water, Land, and Ecosystems (WLE).

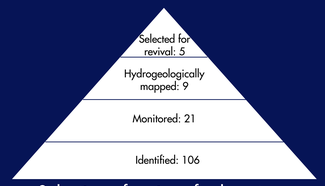
Step 1: Delineating the study area



- Area of the water tower: 22.1 km^2
- Number of springs: 106
- Population: 5,213

Northerly dipping rocks dominated mostly by phyllitic schist with lenses of gritty phyllite and quartz

Mainly three types of springs: depression, fracture, and a combination of fracture and depression



Selection of springs for long-term monitoring and intervention

Criteria for water tower selection

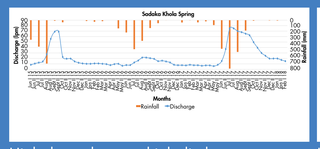
- High density of low discharge springs that are drying
- High per capita dependence on springs as a source
- High dependence of marginalized and low caste people
- Overall water stress
- High community interest in implementation of project activities
- Availability of land for revival related interventions

Step 2: Long-term monitoring of springs

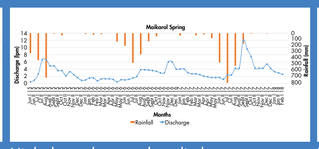
Criteria for spring selection

- Springs on which large numbers of households depend, especially people from the dalit community
- Springs with the lowest discharge in each ward

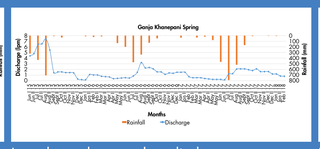
Dependency (vs discharge)			
Springs	Number of people dependent	Average discharge (litres/day)	Per capita availability (litres/day)
Sadaka Khola Mul	254	28,564	112
Maikarol Mul	335	4,521	13
Ganja Khanepani Mul	99	1,714	17
Dhara Khola Mul	141	3,957	28



High dependence vs high discharge



High dependence vs low discharge



Low dependence vs low discharge

Low dependence vs high discharge

Step 3: Social, institutional, and governance aspects

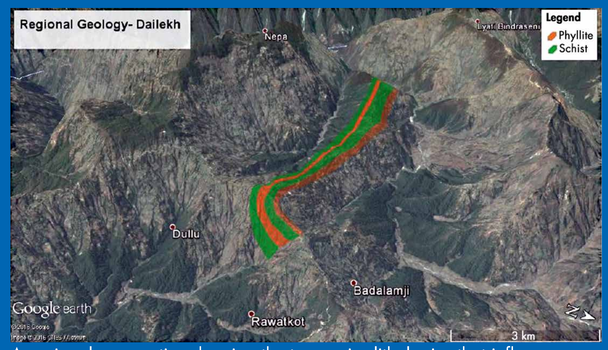
Eight out of 10 people who fetch water from springs are women

An average family of five members collects 100–150 litres of water each day depending on the season. Water is used for drinking, domestic, sanitation, irrigation, and religious purposes.

Most springs do not have formal management institutions. Typically, households dependent on the springs take care of upkeep and cleanliness. Usually everyone can collect water from a spring; however, in cases of water scarcity, rules on who can or cannot collect water, how much water can be collected, and times when water can be collected are introduced.

Step 4: Hydrological mapping, layout development, and identification of recharge area

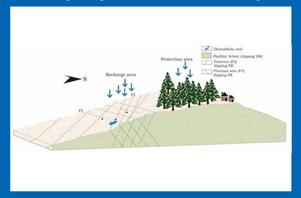
Step 4a: Hydrogeological mapping



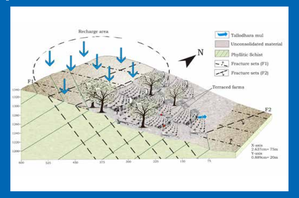
A regional perspective showing the two major lithologies that influence spring systems in the project location. Saffron indicates phyllite dominant areas, while green indicates areas dominated by schists

Step 4b: Conceptual hydrogeological layout development

Nine springs selected for conceptual layouts



Dhara Khola, fracture spring

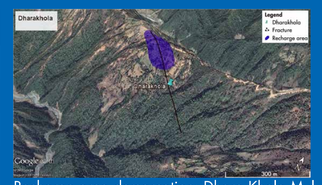


Tallo Dhara, fracture and depression spring

Step 4c: Spring types, mountain aquifer, and recharge area identification

Springs	Type
Bukakhali	Contact
Baspani	Fracture
Maikarol	Fracture
Batokuwa	Depression
Kathanaula	Fracture
Ganjakhanepani	Depression
Dhara Khola	Fracture
Badarukh	Fracture
Tallo Dhara	Fracture and depression

Out of the nine, two are from deeper aquifers and seven are from shallow ones.



Recharge area demarcation: Dhara Khola Mul

Recharge area demarcation: Tallo Dhara Mul

Step 5: Springshed management and governance protocols

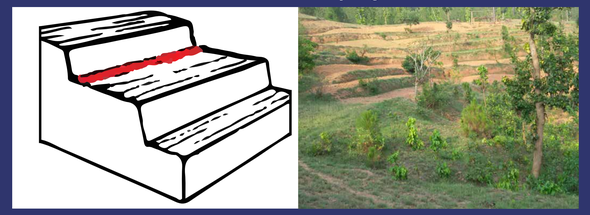
Field observations

Five springs out of nine were selected for revival activities. Most recharge areas lie in privately-owned land. There are mostly cultivated lands with characteristically outward-sloping terraces.

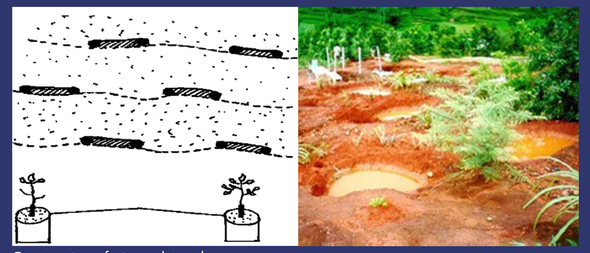
Recharge zones

- Falls in private and rain-fed cultivated land
- Outward sloping terrace

Measures recommended for spring revival

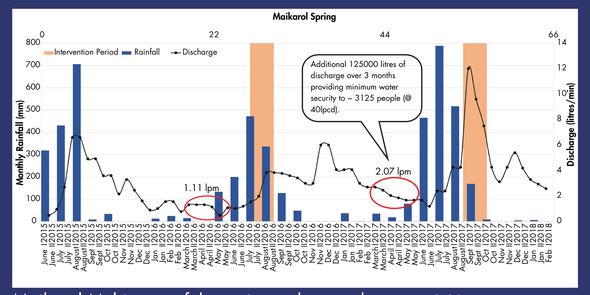


Leveling of land and converting outward sloping terraces to inward sloping ones



Construction of pits and trenches

Step 6: Impact of spring revival activities



Maikarol Mul is one of the springs where recharge activities were imlemented during July–August 2016. Following the interventions, average dry season (Mar–May) discharge increased from 1.11 litres per min (lpm) in 2016 to 2.07 lpm in 2017. This means that average lean season discharge almost doubled. This translates to an additional 125,000 litres of discharge over three months. Assuming a minimum water requirement of 40 litres per capita per day, additional water in the dry months can meet the water needs of roughly 625 families (assuming a family size of five).

Partners

ACWADAM

HELVETAS Together for a better world

International Centre for Integrated Mountain Development, GPO Box 3226, Kathmandu, Nepal, **T** +977 1 5275222, **E** info@icimod.org

www.icimod.org