Case studies presented during the INR 1.3 AP session on

Building Resilience to Water-Related Disasters in the Asia-Pacific Region

7th World Water Forum 2015
12–17 April 2015, Daegu and Gyeongbuk Republic of Korea

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Improving the Practice and Policy of Springshed Management in India

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Asia-Pacific Water Forum

Introduction

Springs have been providing water for mountainous communities for centuries – not only in the Himalayan region, but across all mountainous regions in India. Most Himalayan rivers originate from springs. There are no official figures as to the number of springs in India, but there could be an estimated 2 million springs in the country. Around 60–80% of the population in the states of Uttarakhand and Himachal Pradesh and in the North Eastern states are dependent on springs as a source of water for drinking, domestic purposes, sanitation, and livelihoods. The culture of these regions is replete with references to traditional spring sources and local communities have maintained close ties with this natural source of water.

Springs offer a lifeline to mountainous communities in India. They provide ecosystem services and have a strong cultural connection. They also cater for domestic and livelihood needs. The inherent nature of the resource, land-use changes, lack of scientific understanding, and climate variability all make springs vulnerable to extinction. Current practices seem inadequate to deal with springshed management needs.

Arghyam, an India-based charitable trust, has been supporting several non-government organization (NGO) partners in springshed management. On-the-ground evidence gathered by Arghyam and its partners suggests that better demand and supply-side management, greater institutional convergence, improved capacities, and an empowered community are key elements of a new paradigm in springshed management in India.

Recently, Arghyam has catalysed a collaborative group of government and non-government organizations, donors, and academic institutions to take part in a 'Springs Initiative'. This initiative boasts an open platform, which has grown organically in recent times. Considering that there are some elements of commonality among springs, it is possible to envisage an overarching management template for springs and to make joint pitches for improved public policy and demarcated investments for springshed management in India.

India's springs are vulnerable to extinction and current practices are inadequate to deal with springshed management. Better demand and supply-side management, greater institutional convergence, improved capacities, and an empowered community are key elements of a new paradigm in springshed management in India. Arghyam's 'Springs Initiative' is an open platform where practitioners, academics, government departments, and donors can come together and craft an agenda for the revival of springs and an overarching template for springshed management in India.

Multiple vulnerabilities

Land-use changes

Rapid land use changes due to anthropological activities such as construction, mining, road building, tunnelling, dams, deforestation in upper catchments, and rising population growth have had an obvious impact on the behaviour of springs, which has not yet been formally

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acknowledged. Springs seem to be collateral to the larger development agenda, which so far has muffled conservation efforts related to springs. The tide seems to be turning in the face of the looming drinking water crisis in India and other regions.

Lack of scientific understanding

Many springs owe their genesis to structural features such as fractures, faults, and other weak planes, while others are simply a function of the water table of the unconfined aquifer being exposed along the slope in depressions. Lithological contacts also give rise to springs, whereby an abrupt change in the vertical permeability of rocks brings groundwater to the surface. These fractures and faults serve as channels through which groundwater flows and finally emerges from a suitable orifice in the form of a spring. The extent of the aquifers, their geometry, and their hydrogeological properties (storativity and transmissivity) show great variation in the Himalayan sub region. A high degree of deformation in some of the rock systems implies the presence of folding and faulting and the development of fracture zones, contributing to the loss of aquifer continuity in the mountains and plateaus.

There is also a rich diversity of spring types governed by the geology and hydrogeology of these regions, typified by contact springs, depression springs, fracture springs and karst springs, etc. The understanding and application of this body of knowledge to springshed development is new. The failure to understand springs as sources of groundwater has meant that the public policy and investments for preserving and developing springs as perennial sources of water have eluded the region.

The common property resource dimension

Springs as a source of groundwater are a common property resources and share similar characteristics of non-exclusion and subtractability. A spring source is akin to a well, which may be located on private land, but the health of the spring is governed by the aquifer, whose boundaries are neither configured around private ownership nor an administrative unit. In most of the Himalayan region, springs are treated as a community asset. Even though spring discharge cannot be controlled, efforts to extract more water, either by artificially creating a source in the discharge area or by the diversion of water, may result in less water being available to downstream communities.

The climate variability angle

Several of the mountainous regions in the Hindu Kush Himalayas are characterized by high rainfall. Cherapunjee in Meghalaya reportedly receives around 12,000 mm a year, the highest in the world – although this is declining. However, due to extremely high runoffs because of the topography in these regions, recharge is also very poor. Furthermore, the distribution of rainfall is becoming erratic for climatic reasons. Climate variability adds another, largely unknown, layer of vulnerability to springs.

Current practice

Conventional water conservation approaches, such as watershed development, have attempted to ensure higher recharge (and ameliorate soil erosion) by following a ridge to valley treatment approach. However, an action research study of the hydrogeology in the Himalayan sub region demonstrated that recharge does not necessarily follow a ridge-to-valley approach, but a valley-to-valley pattern. This suggests that investments in recharge without understanding the recharge-discharge areas could be misguided and are unlikely to deliver a full return on investment. Another deeper study of an aquifer found that only a part of the catchment area was contributing to recharge, thereby obviating the need to cordon off the entire catchment area for recharge. Accordingly, any programme attempting to develop springs as a natural resource must involve the assessment of the geologic controls on springs, the recharge potential of springs through springshed development measures (at the micro level), the maintenance and protection of springs, and the effective monitoring of spring discharge and water quality.

How can practice be improved

Improving the practice of managing springs in India is a challenging task – but it can be done. Some of the following suggestions on improving practice have emerged from the work done by Arghyam's[2] partners across the country.

Managing supply and demand

For the sustainable development and management of springs, it is essential to understand the hydrogeology and the surface water features in the area. Before the management of springs can be undertaken we must:

[2] Arghyam is a charitable trust, founded by Rohini Nilekani, which works out of Bangalore in India. Arghyam has supported around 90 projects in 20 states of India. Its vision is safe, sustainable water for all.

- understand the hydrogeologic and hydrologic characterization of the spring type, drainage (discharge) and recharge area, and recharge and discharge parameters, such as water quality and quantity; and
- conduct a reliable analysis of spring discharge and water quality, by collecting discharge and quality data for springs.

While it is important to restore the aquifer storage that feeds the spring through a systematic approach to spring-water recharge, it is equally important to ensure demand-side management. Demand-side management refers to initiatives that ensure the satisfaction of current water requirements in times of limited resource availability, by augmenting supply and ensuring water use efficiency.

Community participation

Communities have been protecting spring sources for ages without necessarily extending their understanding to include the recharge/catchment area as an integral component of springshed management. The results of the action research carried out through the Arghyam-supported Participatory Ground Water Management Programme (PGWM) showed that building resource understanding through demystification of the science and imbibing traditional knowledge can help rural communities to develop protocols for the better management of this resource. In addition, empowered communities can effectively regulate demand, especially during the lean season. Demystification of the science follows an experiential learning process, which essentially enables communities to understand and appreciate the behaviour of water through rocks and its implications for overall water availability.

Internalization of this knowledge usually nudges communities to connect with the resource and informs the development of management protocols that emanate from their shared understanding. The trigger in most cases is existing or imminent water scarcity. Perhaps the realization that the cost of inaction far outweighs the cost of collective action will expedite the process.

Improving institutional convergence

The governance of springs is as complex as managing groundwater anywhere else in the country. Springshed management involves the institutions presiding over the functions of catchment management or creating water distribution systems. The broader resource management, which entails catchment protection, recharge interventions, soil and water conservation, and plantation, is usually split between the government departments for forest and for rural development. On the demand side, drinking water, agriculture, and minor irrigation departments also come into play. Given the backdrop of institutional silos and lack of convergence between these departments, a concerted effort for springshed management with the express objective of ensuring drinking water security is challenging, yet vital.

The understanding of springs as groundwater is only now gaining currency and it may take a while before it provides a policy underpinning for broader springshed management. There are currently no rules or laws regulating demand or incentives for the protection of spring catchments. It is also important that communities develop norms for managing this resource, and perhaps there is a greater possibility of embedding these norms within local institutions, such as 'gram panchayats' (a village-level unit of governance) or the 'van samitis' (forest committees). The mainstreaming of such protocols at an institutional level would provide hope for inter-generational efforts at managing the resource. Furthermore, distilling efforts at the level of the panchayat would allow financial resources to be directed to these village-level institutions for springshed management.

Building capacities

Action research pilots under the Participatory Ground Water Management Programme have separately established the knowledge as well as the delivery mechanisms required for springshed management across the mountainous regions of the Himalayas. These studies have also demonstrated how para-workers[3] from local communities can be empowered to transfer this knowledge to a wider audience. For expanding the reach and sustenance of these efforts, it is imperative to locate these para-workers within an institutional framework. This will not only compensate them for their efforts, but also hold them to account.

[3] A 'para-worker' is community resource person who provides services to the larger community for effective groundwater management based on the knowledge and understanding of hydrogeology.

The Springs Initiative

Fifteen civil society organizations and two state governments in India have come together in a common platform to form the Springs Initiative. The idea is to use this platform to share experiences and push a common agenda forward for the protection and revival of springs. The initiative grew organically from a diverse set of projects on springs. It is important to understand the genesis of this initiative, which has the potential to amplify local voices for better knowledge sharing and advocacy.

Due to the relative obscurity of the communities that are dependent on springs and their low political capital, their plight has not caught the attention of the media or the policy makers. Also, much of the work around springs has happened in relative isolation without the primary actors being aware of each other's efforts. Fortuitously, Arghyam has six partners working on springs in the Himalayan region as well as the Eastern and Western ghats. Convening a meeting of these partners unlocked a lot of latent energy, which was needed to spur the springs work. The fact that so many other people were already working on similar issues and facing similar challenges helped break down the walls of isolation and galvanized the group to craft a collective agenda. The next meeting was used to take the narrative to other actors, especially state government bodies, such as the Central Ground Water Board (CGWB), in India. All of the partners agreed to position the Springs Initiative as an open platform where practitioners, academics, government departments, and donors can come together and craft an agenda for the revival of springs in India.

Way forward

Springs across diverse contexts in India may seem disparate on the surface, but a common narrative exists. Springs are a primary source of water security for India's mountainous regions – from the Himalayas, which extend from the North in Jammu and Kashmir all the way to Arunachal Pradesh, the Western Ghats, the Eastern Ghats, and the Aravallis or the Vindhyas. They are also the source of rivers and are vital to ecosystems.

The other common thread connecting springs is the relative obscurity of the communities that are dependent on springs and that work around springs. These communities exist in isolation without the primary actors being aware of each other's efforts. The idea is to learn from best practices across civil society organizations and governments and help co-create a new management paradigm for springs.

Once the knowledge is shared and practices are discussed, there is the possibility of developing a management template for springshed management in India. Some elements of this template will be context specific; others will be near universal/context neutral.

During this process, or close to its conclusion, one would expect a lot of buzz in policy circles. The initiative needs to capitalize on this momentum and make succinct policy pitches. This would involve developing a better legislative environment, improving the governance architecture, building capacities, demarcating public investment, and empowering local institutions to make informed choices in relation to springs. The goal may seem distant, but the Springs Initiative has made an important and promising beginning.

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Preparations for the Asia-Pacific Regional Process of the 7th World Water Forum were partially funded by the National Committee for the Forum through Korea Water Resources Corporation (K-water) and the Asia-Pacific Water Forum.

ICIMOD gratefully acknowledges the support of its core donors: the Governments of Afghanistan, Australia, Austria, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Norway, Pakistan, Switzerland, and the United Kingdom.