PARTICIPATORY SPRINGSHED DEVELOPMENT IN THANAKKASOGA GRAM PANCHAYAT, H.P.

- PSI's Experience -

Executive Summary

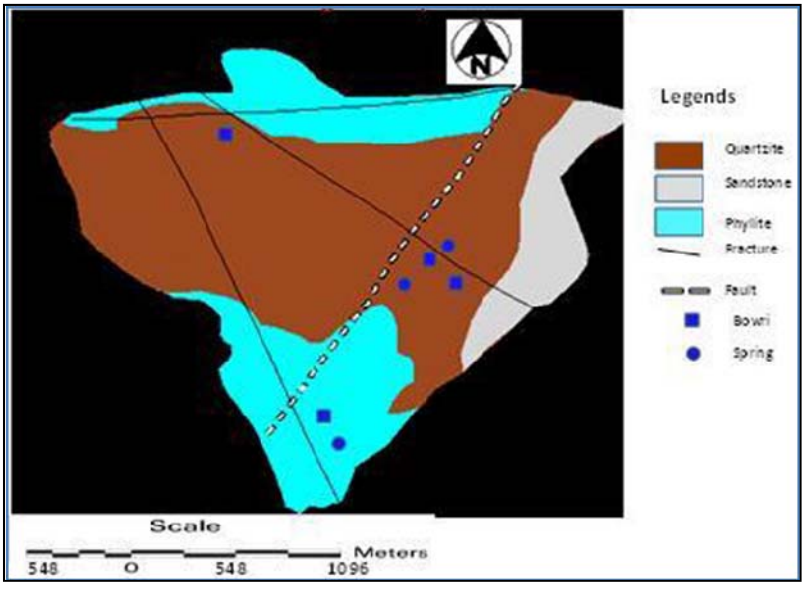
Lives and livelihoods of the people in the Indian Himalayan Region (IHR) are mostly dependent on groundwater in the form of springs and streams rather than on big rivers. However, most of these perennial springs and streams are becoming seasonal or have dried up leading to severe drinking water shortages. One such area is Thanakasoga Gram Panchayat, district Sirmour in Himachal Pradesh (HP) where the discharge of springs and *baoris* (spring fed shallow step-wells)was reducing owing to mostly anthropogenic factors. Moreover, spring water was found to be getting contaminated with infiltration of pathogens. PSI rejuvenated 5 critical springs located in three villages of Thanakasoga Panchayat in 2012 using the principles of Participatory Groundwater Management (PGWM) with technical inputs from ACWADAM and financial support from Arghyam. The interventions were based on local hydrogeological studies, groundwater quality monitoring and strong community mobilization which resulted in formulation of protocols for protecting the recharge area, maintenance of *baoris*, (springs) and equitable use of water. The initiatives not only resulted in enhanced spring discharge within a few months but also resulted in control of spring water contamination. Additional water was available for minor irrigation as well.

Background

Thanakasoga Gram Panchayat is located in Nahan block of Sirmour district of HP. The villages selected by PSI for spring rejuvenation under this panchayat were - Luhali, Dhyali and Thanakasoga having a total of 156 households. A sloping undulating topography and barren hills are the common characteristics of these villages. Average slopes are in the range of 40%-50%. The area lies on the leeward side of the mountain; so due to the rain shadow effect it receives less rainfall.

The area is located in the transitional zone between Siwalik and lesser Himalaya. The geology dominantly consists of quartzite, phyllite and sandstone. The springs of this area are either fracture-controlled or depression springs.

Springs are locally called 'baoris'. People are dependent on baoris for meeting their drinking water and other



Geological map of Thanakasoga Gram Panchayat

domestic needs. Before PSI's interventions, water in baoris used to decrease especially during summers leading to water shortages.

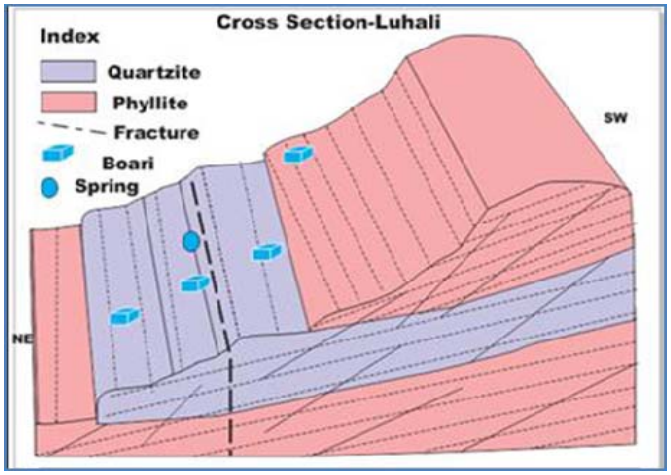
The Issues

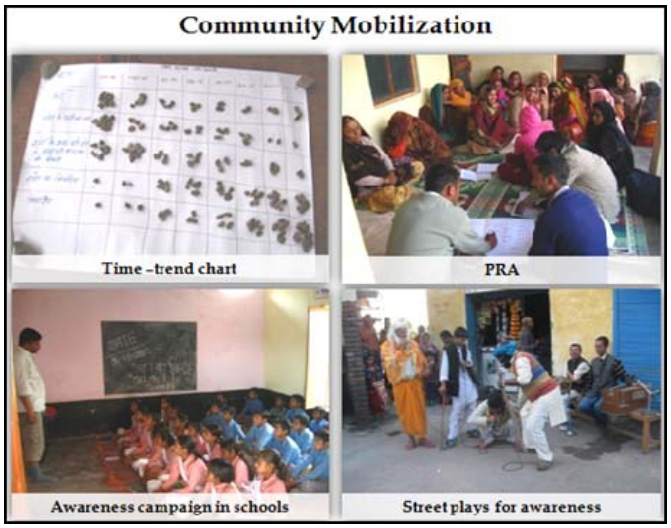
The major issues in these villages were inadequate drinking/domestic water availability and poorly maintained *baoris,* especially with low discharges during summers. The peak discharge in the *baoris* was found to be between 15-18 lpm during monsoon, which would fall to as low as 1 lpm during summer. Some of the baoris would even dry up in summers. There was prevalence of open defecation in the recharge area of baoris, hence contamination of water was a major problem.

Our Approach

PSI's approach was based on the principles of PGWM which includes recognizing groundwater as a common pool resource, studying the local hydrogeology, determining spring discharge & contamination trends and working towards sustainable and equitable use of the water sources through the local communities.

The approach involved scientific understanding of groundwater besides understanding the social structure of the villages. Use of hydrogeology helped us to identify the recharge area of the critical springs more accurately. Understanding the social structure helped to determine the water needs of the concerned communities and livestock population, ensuring involvement of all the categories of people in the programme and in formulating and implementing sanitary protocols for protecting the recharge areas.



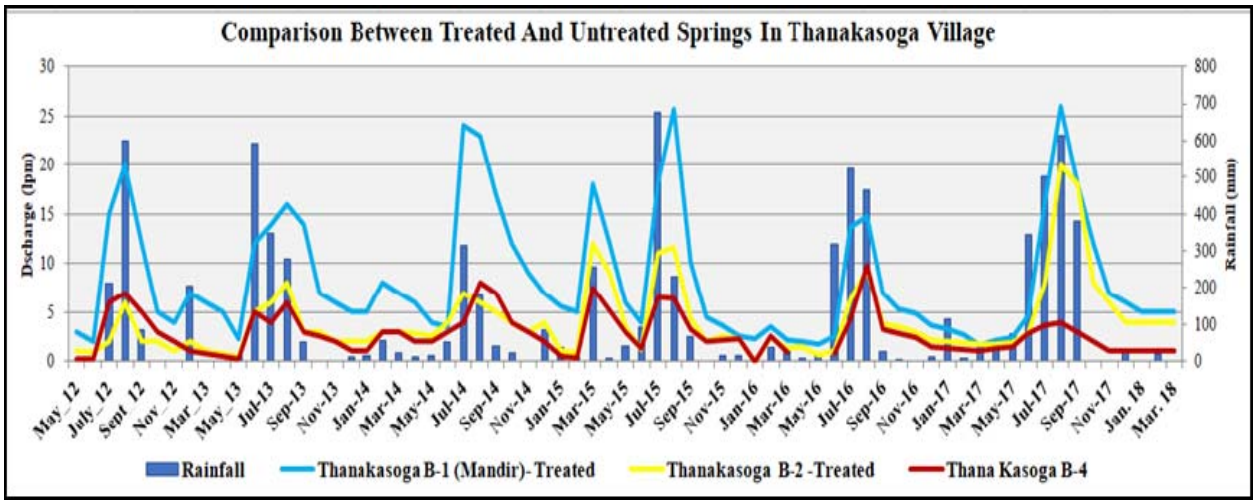


PRA exercises, time trend analysis and household surveys helped to determine the status of water demand and supply in these villages. Regular water quality monitoring and spring discharge measurements were carried out for all the selected sources of water on a monthly basis. Awareness about groundwater, spring rejuvenation and its maintenance was carried out. People were actively involved in all the stages of the programme.

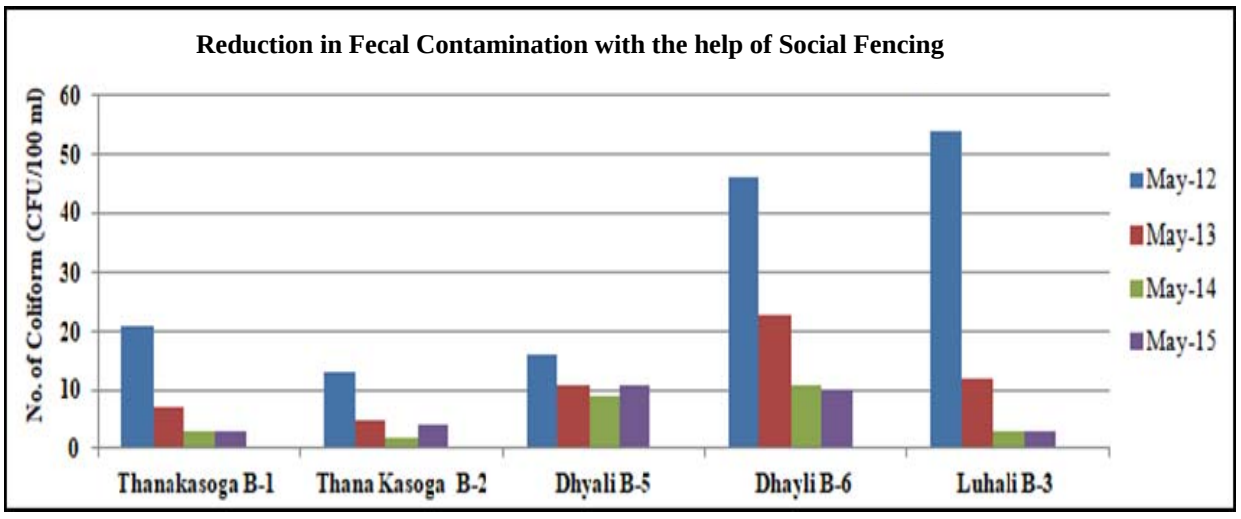
Outcomes/Achievements

A significant increase in the discharge was recorded in those *baoris* for which recharge interventions were carried out.

The untreated baori B4 in Thanakasoga (Fig. below) had a lower average discharge of 1.69 Litres Per Minute (LPM) in summer 2017 as compared to the treated baoris B1 (2.6 LPM) and B2 (2 LPM). On the whole, the discharge of B4 baori (control) declined in 2017 as compared to 2012 (pre-implementation period) while the treated baoris B1 and B2 recorded an increase in discharge.

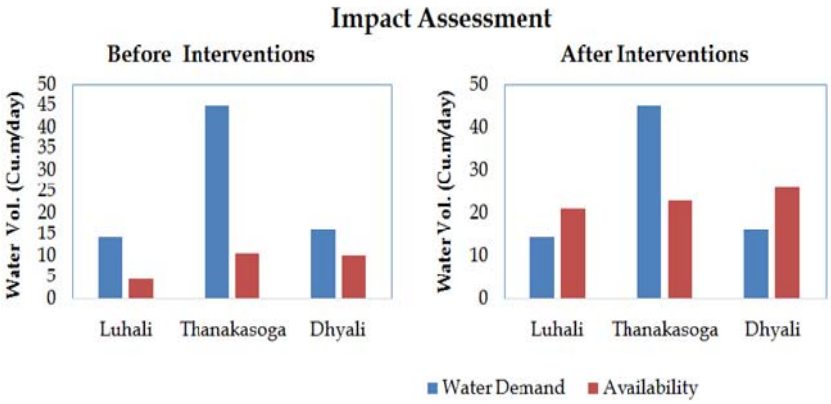


Social fencing in the recharge areas helped in reducing the bacteriological contamination in baori water. The graph below shows fecal contamination values for the month of May from the year 2012 to 2015. Each year there was a reduction in the number of fecal coliform counts which indicates that proper implementation of sanitary protocols can protect the recharge area and help in improving the drinking water quality.

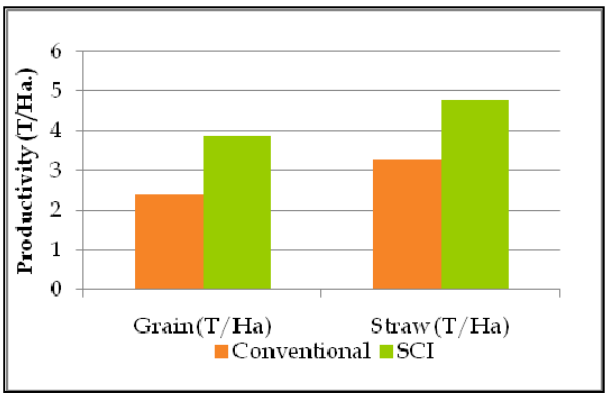


Impact

- There was an increase in availability of water.
- Enhanced spring discharge led to a more equitable water sharing amongst the communities and also enabled increased water availability for minor irrigation. Villagers were motivated to try out SCI (System of Crop Intensification) technique of farming in crops like maize and wheat. The technique yielded more grain with less water. With SCI technique, the average productivity of irrigated wheat went up from 2.42 ton/ha to 3.9 tons/ha for grains while the straw yield increased from 3.3 ton/ha to 4.8 ton/ha. Introducing SCI for grains, vegetables and spices helped farmers (58 out of 152 households in 3 villages) earn additional income.



Availability of water before and after interventions



Average productivity of wheat

- The results obtained through this work influenced policy level decisions. A clear methodology has been developed which can be replicated in other areas.
- Several agencies approached PSI to initiate training programmes on participatory springshed development in their areas. It helped PSI to establish new collaborations in the North-Eastern states, particularly with the state government departments.

Conclusion

Participatory springshed development based on hydrogeological and water quality studies can help in effectively rejuvenating springs in the Indian Himalayan region, which is the need of the hour considering the growing water demands and increasing scarcity. PGWM principles help to make the communities become more resilient to climate changes and also encourage them to maintain their local water bodies. Secondly, hydrogeology proves to be a better tool for springshed development as it helps in identifying the exact recharge area and the type of interventions required in the hilly region.