

**Creating Climate-Resilient Communities
in Mid-Hills of Uttarakhand:
Interventions Towards Forest & Water**



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Acknowledgement

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About the project

In the Indian Himalayan Region (IHR), springs are the major source of water. More than 70% of the population in the region depends upon these critical water sources across the Himalayan belt. Recent evidences suggest that a vast majority of springs are showing a reduction in discharge or becoming seasonal if not completely drying. Scientists attribute this phenomenon to a combination of factors i.e. climate change, forest degradation, and unsuitable developmental practices. As a result, many urban and rural areas are facing acute water scarcity, leading to reduced agricultural productivity, increased women drudgery, and in some cases migration from the villages.

With this backdrop, Centre for Ecology Development and Research (CEDAR) in collaboration with Central Himalayan Rural Action Group (CHIRAG) undertook a project to understand and address the issue through nature and need-based choices to build climate resilience of rural communities in the Ramgarh cluster of Nainital District in Uttarakhand. The main focus of the study was to strengthen the forest-water-community interlinkages by involving interaction amongst biophysical, social, and economic components. The project activities focused on understanding the ground realities through participatory socio-hydrogeological research and exploring solutions in consultation with community leaders and other stakeholders. Training of para hydro-geologists and women empowerment were key to the project.

Objectives

Major achievements

Inventorization and status assessments of springs in the selected area.

- 8 springs and villages geotagged.
- Feasibility assessment of the three selected springs for springshed treatment completed.
- Household surveys were conducted to assess the dependency on each spring.

Assessment of environmental and anthropogenic impacts on springs discharge

- 53 household surveys were conducted 156 men, 133 women and 148 children were surveyed. Out of the total 355 beneficiaries, 32 beneficiaries were SC.
- Water user committees were made, and village level training workshop provided to address pressure on springs. 1,112 hours of training imparted to 144 personnel.

Demarcation of critical water zones and rejuvenation through forestry, soil and water conservation methods

- Hydro-geological mapping was done to determine critical water recharge zones.
- Vegetation cover was promoted in 4 ha of land through 2,500 plantations, Direct Seed Sowing.
- Eradication of Eupatorium has been completed in the selected villages.

Developing climate adaptive water management solutions based on socioeconomic and biophysical factors

- Recommendations shared with all the stakeholders.

Developing climate adaptive water management solutions based on socioeconomic and biophysical factors

- Para hydrogeologists have been trained for implementation purpose and long-term data monitoring.
- 6 Youth leaders were trained.
- 1 centralized capacity-building training was conducted for the identified para-hydrogeologists on Spring Discharge Monitoring, Geo-Hydrology and Water Quality Testing.
- 2 Trainings cum Exposure visits were organized for the identified para-hydrogeologists, youth leaders and water user committee members to understand the on-ground spring recharge work and its impact.



1. Feasibility Survey



2. Baseline Survey



7. Implementation



6. Treatment Plan



8. Advocacy and Awareness



3. Formation of Village Level Water User Committees (WUC)



4. Community Capacity Building



5. Hydro-geological Survey



9. Monitoring and Impact Assessment

9 Step Methodology

Site of Intervention

Indian Himalayan Region (IHR): Uttarakhand
Location: Ramgarh, Nainital

Spring I

Mandir Naula (Nathuwakhan)

- Rooftop Rainwater Recharge Pits – 4 Nos.
- Deep Recharge Pits – 50
- Contour Trenches – 50
- Percolation Pits – 110
- Assist to Natural Regeneration (ANR) – 0.50 Ha
- Plantation – 210 Nos.
- Beneficiary Households – 18
- No. of Para-Hydrogeologists trained - 2

Spring II

Uchyura Naula (Gajar I)

- Rooftop Rainwater Recharge Pits – 1 Nos.
- Deep Recharge Pits – 18
- Percolation Pits – 57
- Sub-Surface Check Dam – 1 Nos.
- Assist to Natural Regeneration (ANR) – 2 Ha
- Deep Seed Sowing – 1000 Nos.
- Beneficiary Households – 22
- No. of Para-Hydrogeologists trained -2

Spring III

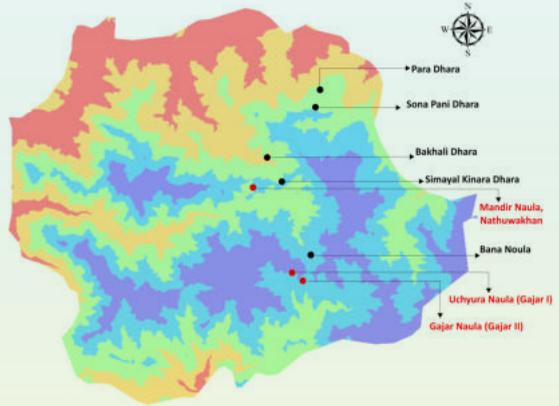
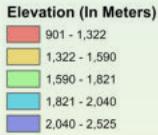
Gajar Naula II

- Rooftop Rainwater Recharge Pits – 1 Nos.
- Deep Recharge Pits – 70
- Contour Trenches – 290
- Percolation Pits – 27
- Assist to Natural Regeneration (ANR) – 1 Ha
- Deep Seed Sowing – 750 Nos.
- Beneficiary Households – 13
- No. of Para-Hydrogeologists trained - 2



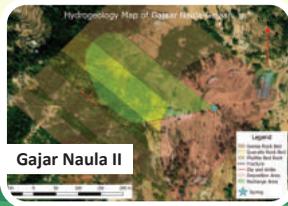
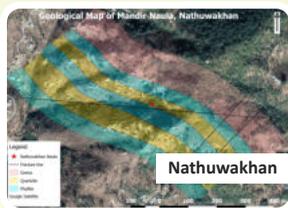
Interventions

1. Inventory of springs



Map of eight springs

2. Demarcation of critical water zones



3. Installation of Automatic Weather Station (AWS)



Outputs an Outcomes

- Treatment and implementation work at 3 springs. Revived 10 ha of forest area in the spring catchment.
- 3 water users committee was made, one at each site. Village-level training provided to address pressure on springs. 53 household surveys were conducted including 156 men, 133 women, and 148 children. The total beneficiaries of the project implementation were 355 individuals.
- Training modules developed for springshed management and discharge monitoring.
- Livelihood options generated for community members during the implementation phase of the project.
- One demonstration model was developed for replication of the implementation activity.
- Institutional collaboration developed with the Forest Department Uttarakhand.
- Developed 6 para-hydrogeologist and 5 youth leaders.
- 200 plantations under Assisted Natural Regeneration were done with the help of villagers along with the eradication of Eupatorium in the selected villages.

Envisaged Impacts

- Improved supply of drinking water and also reduced time and energy spent on collection of the same especially aiding in reducing the drudgery of women folk.
- Springshed development and management-oriented activities can be used in the future to train community members by following the prepared modules for a series of interactive trainings on spring water discharge monitoring, hydrogeology, and water quality.
- Strengthened local governance of springs through knowledge transfer on the science of groundwater.
- Long term climate observations will allow better research and decision-making.

Highlights

Water User Committee

The Water User Committee (WUC) locally referred to as Jal Upbhokta Samiti is a democratic body of the members of families using the spring water. The WUC acts as the point of contact or nodal agency for spring recharge activities in the village. The body has a President, Vice-President, Treasurer, and Secretary with specific roles for each of them.



Para-Hydrogeologists

The WUC members with the help of experts conduct a series of interactive trainings to develop para-hydrogeologists. They are trained on organization structure and roles, spring water discharge monitoring, hydrogeology, and water quality testing.



Women Empowerment

The WUC formation creates a space for better gender representation and gives priority to women. Since they are the ones involved in fetching water, their involvement in decision-making roles provides them with more control over their natural resources.



Climate Adaptive Water Management Solutions

- It is greatly realized across the world that community participation is essential in dealing with complex and multi-layered environmental problems. The community must be involved right from the planning phase of the project. This is a key step for leading a bottom-up change.
- Sustainability of the project must be kept in mind at every step of implementation. The focus should be on empowering the local communities to ensure post-project operation and maintenance.
- In order to convey the importance of springs, it should be added to the school curriculum. Regular training programs for communities and executors of developmental projects is required.
- Since a large proportion of the geographical area of Uttarakhand is under forests, the recharge areas of springs are also under the jurisdiction of the Forest Department. Mechanisms to allow better collaboration between communities and the Forest Department needs to be looked at.
- Post-project impact assessments and evaluation mechanisms must be put in place in order to continuously reevaluate and redesign the project based on the data and community feedback.
- Providing locals with the resources to implement rooftop rainwater harvesting for their houses will not only help women but will also act as a backup water source during dry spells.
- In addition to springshed management, nature-based solutions such as Rainwater Harvesting should be encouraged in tandem for better preparedness and increased resilience against water crises.
- Rainwater Harvesting will be useful as communities will be encouraged to adopt a more sustainable and cost-effective mechanism for water security.
- Incentive mechanisms between upstream and downstream communities in form of PES (Payment for Ecosystem Services) could be initiated.



Collaborating Organisations

Centre for Ecology Development and Research (CEDAR)
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For more details, please visit
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Disclaimer: The map shown in the figure is not up to scale and does not showcase accurate political boundaries. The representation here is only to broadly demark the regions.