

Chapter 11

Capacity Building in the Field of Springshed Management

11.1 Background

Springs are the lifeline of mountain and hill ecosystems, as more than one-third of the population residing in these regions are directly dependent on springs for their water requirements, and many more are indirectly dependent on them. However, climate change, seismic and other anthropogenic activities have led to the depletion of these underground aquifers. There is a need for spring revival to meet the water requirements (related to drinking, washing, bathing, agriculture, etc.) of the local communities. Springs also play a crucial role in sustaining the local biodiversity.

It is envisaged that integrating concepts and approaches into actions based on the six steps methodology of SSM, especially in the mountain regions of India has become crucial for the water security of these regions. The successful implementation of flagship programs like PMKSY, JJM, MGNREGS, Amrut 2.0, Natural Farming (including Millets Mission), and VVP especially in the hill and mountain ecosystems, also depends on effective spring revival activities. The participatory-based spring revival practices will play a critical role in achieving Sustainable Development Goals (SDGs) 1, 3, 5, 6, 10, 12, 13 and 15.

Recognizing the significance of springs in the hill and mountainous ecosystem and their role in fulfilling regional water requirements, the Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD & GR) under the Ministry of Jal Shakti, Government of India, has acknowledged the necessity of

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establishing a concrete mechanism for SSM across the country through various state and centrally funded schemes. Consequently, the Department established a Steering Committee on "Springshed Mapping of the IHR, including mountainous regions of the country, and Springshed-based Watershed Management Plan" to develop a SOP for initiating spring and springshed mapping throughout the country.

The core committee members designated for the Capacity Building component have gone ahead and collected and collated the views of different stakeholders across the country involved in SSM. The information has been further analyzed by the committee to cover various aspects of capacity building including challenges encountered in SSM, gaps in skills of various stakeholders, mechanisms for effective capacity building, and required IEC materials for capacity building, which have been put together in this note.

Spring revival needs a multi-disciplinary team (consisting of geo-hydrologists, engineers, ecologists, social scientists, etc.) with required skills for the various stage of planning, implementation, and monitoring. Hence there is a need for capacity building across a wide spectrum of stakeholders – from community resource persons to policy-level decision makers in a strategic manner. There is a need to build and strengthen the capacities of various functionaries involved in SSM, under various programs, on three aspects:

- (i) **Concept:** The concept of 'springshed' is often misunderstood and confused with the sister terms such as watershed. Hence, it is important to understand the concept of 'springshed' in order to carry out activities in the desired area that can successfully revive springs.
- (ii) **Approach:** It is important for the team involved in the SSM activities to be thorough with the approach i.e., the six-step methodology for sustainable results.
- (iii) **Strategies:** Area specific strategies need to be adopted for spring revival considering the land use, land cover, land ownership, soil depth, soil type, needs & willingness of the users, and governance system.

Springs are local resources that have been used by the communities for generations. Hence, demystifying science, decentralizing decision-making, and participatory action around spring through capacity-building activities for concerned functionaries is increasingly important for spring revival and maintenance. Integration of traditional knowledge and modern technologies can help in the spring revival

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activities. Community-based monitoring can further enable decision making for the sustenance of the spring revival activities in the long run.

There is a need to identify experienced capacity-building institutions and bring them together for undertaking joint capacity-building activities. The training modules should be developed based on the 6-Step methodology for the different stakeholders considering their roles and responsibilities. Training materials in different languages need to be prepared covering various aspects of springshed management for the wide spectrum of stakeholders.

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The Core Group members consulted various agencies involved in different aspects of SSM at the state and/or national level. These included NGOs, Government Departments, and Academic Institutions (Annexures 1.1 and 1.2). The consultations have been in the form of meetings, workshops and personal interviews. It included the following points:

- (i) Role of the organization/institution in SSM
- (ii) Geographical coverage
- (iii) Personnel involved in SSM and their specific roles
- (iv) Challenges encountered by the personnel
- (v) Current sources of capacity building
- (vi) Capacity building needs

Most of the organizations were found to be involved in the implementation of SSM which are either sponsored by various government flagship programs (like JJM, PMKSY, watershed development, MGNREGS, etc.) or supported by CSR. The main capacity-building Institutions include ACWADAM, PSI, CHIRAG, and PRASARI. Some state ATIs are also undertaking training and capacity building programs. IIT-R, GBP-NIHE, CGWB, and NIH is mainly involved in research work, especially related to spring inventory, hydrological modeling and recharge area identification. Arghyam has contributed to the development of various digital IEC materials with the help of ACWADAM and PSI.

The role of the different functionaries involved in various SSM programs along with challenges faced by them helped in identifying the various capacity building needs. Based on the consultations and views expressed by different stakeholders involved in SSM and capacity building institutions, capacity building in SSM may

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be dwell upon following four sections:

- Identified challenges: Issues for capacity building
- Stakeholder wise identified gaps for capacity building
- Mechanisms for effective capacity building
- Capacity building materials

11.2.1 Identified challenges: Issues for capacity building

The following challenges have been identified in springshed based watershed management which needs to be addressed through capacity building of concerned stakeholders.

(i) **Lack of awareness & capacities:**

There is a lack of awareness about springshed concept and required skills (related to planning, implementation, and monitoring) among people involved in SSM at all levels i.e., Gram Panchayat, Govt. and Non-Govt. functionaries, and at decision-making levels. Such lack of awareness leads to inappropriate designing of programs, and faulty approaches and strategies in SSM.

(ii) **Undermined role of springs in pipeline water supply:**

In the past few decades when the centralized piped water supply has reached the households in the mountainous and hilly areas, the relevance of the spring water has been declining. There is a lack of awareness among the people, about the role of springs in contributing to the pipeline water supply. There is a need to make all stakeholders aware of the contribution of springs to base flows of streams, usually tapped for piped water supply.

(iii) **Need for simplification of spring science:**

Most functionaries expressed difficulties in understanding the hydrogeology of springs for the demarcation of recharge areas. The other areas of difficulty include creating a spring inventory, measuring water quality, designing treatment measures, etc. There is a need to demystify spring science so that scaling of SSM can be undertaken. Representatives of communities need to be trained as para hydrogeologists so that they are able to undertake monitoring of spring discharge and water quality. Similarly, extension functionaries need to understand the hydrogeology of springs and context specific treatment measures.

(iv) **Absence of water budgeting and demand management:**

Most of the focus of current efforts is on enhancing the spring discharge without

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taking into consideration the water demand (domestic and agricultural) of the concerned community and accounting for other water resources. The practice of water budgeting should be carried out through participatory water resource assessment. It is also necessary to integrate demand management measures along with SSM for sustainable results. Hence, the concerned personnel need to be trained on water budgeting as well as demand management measures.

(v) **Limited application of hydrogeology:**

Many functionaries tend to apply watershed approaches while identifying recharge areas and treating springs, since they lack a proper understanding of the hydrogeology. SSM is a technical process requiring the involvement of trained hydrogeologists for proper mapping, monitoring, and characterization of the concerned aquifers.

(vi) **Gaps in connecting recharge interventions with livelihood activities:**

Springs recharge activities are often conducted in isolation and not clubbed with livelihood activities such as plantation and orchard development. Clubbing spring revival activities with livelihood development activities can motivate the community to participate in SSM activities to take multiple benefits like fuelwood, fodder, fruits, medicinal plants, etc.

(vii) **Lack of context-specific protocols for spring revival:**

The protocols for the revival of the springs are needed to be tailor-made as there is no one size fit for protocols when it comes to conducting SSM activities in any area. Hence, trained personnel are needed to understand the local situation and dynamics to develop context-specific protocols for spring revival.

(viii) **Limited understanding of water and sanitation linkages:**

SSM activities in the concerned recharge area generally tend to overlook sanitation practices resulting in poor water quality. Efforts should be made to include proper sanitation practices in SSM practices such as the prohibition of open defecation and grazing by stray livestock. This will help in keeping the recharge area clean maintaining the water quality of the aquifer.

(ix) **Lack of incentives for para hydro-geologists:**

People trained as para-hydrogeologists do not receive adequate incentives, especially in post project phase, thereby affecting the regular monitoring of spring discharge and water quality. Incentives can encourage para-hydrogeologists to take on SSM activities and ensure sustainability in the efforts.

(x) **Absence of Decision Support System:**

The policy makers highlighted the absence of a decision support system which

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would otherwise be helpful for the concerned functionaries to take appropriate actions at different stages of SSM.

(xi) **Lack of training materials in local languages:**

The training material developed for SSM is presently available mostly in English. However, India, being a land of many languages and dialects, efforts should be made to develop training manuals in various languages in order to make the content understandable and interesting for the local communities.

(xii) **Limited sharing of monitored parameters for decision-making:**

Presently most of the data collected (pertaining to rainfall, spring discharge, and water quality) is accessible to the concerned researchers. It is felt necessary to analyze the data collected and shared with the local communities in a simplified manner to facilitate community-based decision making.

(xiii) **Shortage of dedicated human resources and capacity-building institutions:**

Most of the institutions shared that there is shortage of skilled personnel who could be committed to SSM activities. At the same time, only few institutions exist who could impart training to the concerned personnel for SSM.

11.2.2 Stakeholder wise identified gaps for capacity building

The personnel involved in SSM programs can be broadly categorized into the following four groups, namely.

- (i) Community level institutions including gram panchayats, village water and sanitation committees, Women's Groups (Mahila Mangal Dals, and Mahila Madals), and Water User Groups, are mainly responsible for the operation and maintenance of springs.
- (ii) Para workers (also known as Jal Praharis/Sevaks) including representatives of communities who are mainly responsible for community mobilization, micro-planning, monitoring of spring discharge and water quality, and extending support in treatment measures.
- (iii) Extension agencies include personnel from both government and non-government organizations who are involved in spring inventory preparation, identification of critical springs, setting up governance systems, establishing monitoring mechanisms, and impact assessment.

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- (iv) Policy/Decision makers include the higher-level authorities in different government departments who are responsible for planning SSM programs, personnel hiring and capacity building arrangements, and monitoring and evaluation.

Further, there is need for capacity building of researchers including field researchers which need training in advance tools and methods for improving the methodology for springshed mapping and quantification, scenario building and modeling under changing climate and social conditions. The six-step methodology of SSM include:

- (i) Comprehensive Mapping of Springs and Springsheds
- (ii) Setting up a Data Monitoring System
- (iii) Understanding Social and Governance Systems of Springs
- (iv) Hydrogeological Mapping, development of conceptual layout and identification of recharge area
- (v) Developing SSM and governance protocols
- (vi) Measuring the impacts of spring revival activities

The functions of the identified stakeholders' groups in each step of the six-step methodology of SSM was further detailed to understand their challenges and capacity-building needs. These are summarized in Annexure 11.1. These issues need to be addressed while developing training modules and materials for the stakeholders. Annexures 11.2(A) to 11.2(D) are examples of training modules designed for the four groups of stakeholders which can be further fine-tuned according to the requirements. Pedagogy should include classroom lectures, group discussions, practical exercises & field exposure.

11.2.3 Mechanisms for effective capacity building

Capacity-building strategies need to take into account following:

- (i) **Identification a consortium of training institutions and experts:**
A national/state-level portal for SSM is required which having a database of not only springs but also capacity-building institutions. Since SSM is a multidisciplinary exercise, there is a need to identify institutions and individuals having the required expertise in different fields. These individuals and institutions need to come together to impart training to a range of stakeholders.

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Training workshops at national and regional levels can be beneficial for the planning, executing, and monitoring agencies.

(ii) **Development of training modules and IEC materials in local languages:**

It is important to develop training modules for various stakeholders based on the six-step methodology for SSM, considering their roles and responsibilities. A cadre of master trainers through the Training of Trainers module needs to be further prepared for imparting training at the community level. Training materials should be developed in the local languages in the form of posters, manuals, handbooks, and monographs in order to make them interesting and easily understandable.

(iii) **Recognition and capacity building of local institutions:**

Community-based institutions like VWSC, WATSAN, VP, WUG, etc. should be recognized and made responsible for the implementation of SSM projects for the sustenance of efforts. Water User Groups need to be formed for the governance of springs at the local level and funds for springshed development be released directly to these groups. These groups should be made responsible for the implementation of the SSM projects. Proper training should be imparted to the Gram Panchayats (including sub-committees) in order to build the capacity of the local communities, giving a special focus on women's involvement.

(iv) **Develop a trained cadre for para hydrogeologists:**

There is a need to develop a dedicated human resource for SSM at the community level. This can be done through the identification of village youth who could function as para-hydrogeologists after proper training. An incentive-based mechanism (IBM) should be put in place to encourage the above process. The trained para workers can help in demystifying the science of SSM. Capacity building (including guided mentoring) of para hydrogeologists can be integrated with Skill India Initiative.

(v) **SSM as part of the education curriculum:**

There is a need to build awareness about SSM from the school level itself. SSM can be considered an area of specialization in higher education.

(vi) **Convergence of institutions and cross learnings:**

Convergence of communities, gram panchayats, NGOs, and government departments are required to work together for SSM activities. Regional-level consortiums or platforms (like the one in Uttarakhand) can encourage cross learnings and help in convergence among various stakeholders of SSM. There is a need to develop multi-stakeholder platforms at the state/district level.

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(vii) **Integrate best management practices in capacity building:**

There is a need to integrate SSM with sewage management, water budgeting, demand management, livelihood activities, etc. A baseline survey of various aspects needs to be done for making proper impact assessment post interventions. Proper monitoring systems also need to be established for regular measurements of rainfall, discharge, and water quality. Sewage management can be done through convergence under Swatch Bharat Mission.

(viii) **Specialized and refresher courses:**

Specialized courses can be designed based on the specific needs of certain institutions. For example, urban springs are often neglected hence the gaps in the urban SSM can be filled by imparting specialized training to the concerned authorities. Feedback should be obtained regularly from the trained personnel once they apply the knowledge and skills acquired. This will help in identifying specific requirements based on which refresher courses, guided mentoring, and hand holding can be provided.

11.2.4 Capacity building materials

A note of caution regarding capacity building and capacity building materials needs to be highlighted at the onset. The diverse set of institutions required to undertake the restoration and revival of springs necessitates a demystified yet rich content and delivery of training and capacity building. If the content and delivery is of a kind that addresses researchers then the effort at creating knowledge, understanding and the skills to develop a robust programme on SSM might get defeated. Hence, a skill-based, demystified and continued capacity building programme needs to be thought through and designed. This programme also requires a sufficient degree of customisation based on the location-specific situation and conditions prevailing at the time of planning a SSM intervention.

A range of capacity-building materials is required which can be used as reference material by the various stakeholders involved in SSM. A lot of capacity-building materials already exist which need to be made available at one point, e.g. through the suggested national portal on SSM.

Development of training materials in local languages can help in bringing uniformity to the approach of SSM. It will also help in the effective and efficient dissemination of knowledge relating to SSM among various stakeholders. Short video films could be effective capacity-building tool. They can be made available in the local languages in order to make them understandable for the stakeholders at the

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local community and paraworker level. It is also important to keep these films short and interesting.