

Drinking water for the last person

Training programme for Public Health Engineering Department

Madhya Pradesh



Centre for Science and Environment
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1. Background

In April 2009, the Department of Drinking Water and Sanitation (DDWS) released the new guidelines for rural water supply namely the National Rural Drinking Water Programme (NRDWP). These guidelines reflect a change in the philosophy and implementation strategy from the previous programme. The new guidelines gives major emphasis on ensuring sustainability of water availability in terms of potability, adequacy, convenience, affordability and equity while also adopting decentralised approach involving Panchayati Raj Institutions (PRIs) and community organisations. Adoption of appropriate technology, revival of traditional systems, conjunctive use of surface and ground water, conservation, rainwater harvesting, and recharging of drinking water sources, etc, have been stressed upon in the new approach.

1.1 Training needs assessment (TNA)

The DDWS in December 2009, organised a two-day National Workshop on Training Need Assessment for professional development of PHED Engineers with the twin objective of identifying the gaps in the existing set of knowledge, skills and capabilities of the existing Public Health Engineers across the country; and to identify issues and means to upgrade the existing set of knowledge and skills in order to upgrade their efficiencies.

Centre for Science and Environment (CSE) has been nominated as a key resource centre by the Department of Drinking Water and Sanitation (DDWS) to undertake activities of research, training and awareness creation. As part of this initiative, CSE will work with Madhya Pradesh Public Health Engineering Department (MPPHED) to undertake programmes for PHED engineers, panchayat officials, communities and schools in the state.

2. Drinking water for the last person: A programme for MP PHED

The main focus of the programme was to demystify some of the aspects of the new guidelines, which aim for universal coverage by March 2012. The guidelines cover great many issues in their broad sweep but the workshops were designed to focus on the key issues of community involvement and rainwater harvesting for source sustainability.

The speakers were selected to present diverse initiatives in field of rural drinking water supply like source sustainability, water quality monitoring and mitigation, recharge and community involvement for developing water security plans. The idea was to present insights into the main components of the new drinking water supply programme guidelines through case studies where people have carried out similar initiatives in the country with special focus on the state of MP. The programme also included a field visit to a village where communities are managing their piped water supply programme through efforts of recharge and water conservation.

The venues selected for the training programme were Bhopal, Indore and Sagar. The workshops were conducted at Bhopal (from August 26-28, covering 23 districts of Bhopal and Jabalpur division), at Indore (from September 15-17, covering 15 districts of Indore division) and Sagar (from October 6-8, covering 6 districts of Sagar division). The programme saw the participation of 130 engineers

(Superintendent Engineers (SEs); Executive Engineers (EEs); Junior Engineers (JEs); and, Sub Engineers (SEs)) from across the state.

2.1 Training agenda

The three day agenda was designed in a way to present various aspects of water management including the policy framework; explaining the provisions of the new guidelines; traditional methods of water harvesting and watershed management. The lectures therefore revolved around case studies of community involvement and rainwater harvesting which were supplemented by technical lectures on the science of hydrogeology and recharging. Key modules covered the following subjects:

- management of water supply schemes in villages through VWSCs;
- community contribution for operation and maintenance;
- mitigation of water quality through dilution and rainwater harvesting;
- sub-basin level planning for water security;
- rainwater harvesting for sustaining sources at household, village and watershed level; and
- watershed management.

The participants were familiarised with these concepts through lectures and discussions with the resource persons. In addition to these, there were detailed session on the science of hydrogeology. It was realised that the engineers would need to understand the concepts of hydrogeology for recharge, quite opposed to the current paradigm of using geology for exploitation purposes only.

Field visits: To demonstrate on-ground initiatives of some of the concepts outlined in the sessions, field visits were organised to villages in all the three programmes. The villages were identified to demonstrate successful initiatives through NGO efforts, PHED case study on community management of piped water supply schemes and convergence with other government programmes. It was meant to showcase community led initiatives becoming successful owing to the nurturing of social capital by mobilising people to come together for meeting their own needs. The point of this initiative was to wean the village off state dependence and inculcate a sense of ownership towards their common resources and systems.

In one of the training programme, the participants were taken to a problem village, which was facing severe water problems for the past few years and no scheme for water supply has proved to be successful here. The participants undertook a water budgeting exercise of the village with the help of a simple format and calculated the amount of water that would be available through rainwater harvesting. The group also explored the possibilities for solving the water crisis in the village. This was based on the learning gained through the lectures from the experts.

2.2 Programme highlights

2.2.1 Bhopal: August 26 – 28, 2010

The programme in Bhopal organised from August 26-28, 2010 was attended by 43 engineers covering 23 districts of Bhopal and Jabalpur division. The major expectation of the participants as outlined by them was to learn about the technologies for recharge, which would lead to sustainability of sources. A brief outline on the programme is given below.

Day 1

The lead lecture by Gita Kavarana, CSE provided an overview of India's water management strategies stressing on the challenges for water supply, giving importance to the need for water harvesting and

watershed management for sustained availability of water. This was followed by the MP Government's perspective on the drinking water supply programme, the difficulties and future opportunities by NS Kashyap, Superintendent Engineer, MP PHED.

The next module focused on sharing community initiatives on different aspect of rural water supply. Angita Raghuvanshi from Haritika, an organisation based in Chattarpur district of MP, presented a community managed water 24 x 7 water supply system in the Bundelkhand region. Speaking on integrated water resource management she mentioned that for any programme to succeed, people should have to play a central role from planning, implementation and monitoring. She also highlighted the measures for rainwater harvesting at the watershed level for maintaining the longevity of drinking water sources.

Rahul Banerjee, a development professional based in Indore shared his knowledge about community-based watershed initiatives in the Malwa region of the state. The focus of his lecture was on the science behind the design of the recharge structures in a difficult terrain. Working with tribal communities he has succeeded in meeting the water needs to the people through rainwater harvesting. Gayatri Parihar, working with Vasudha, a Dhar based organisation, shared her experiences on fluoride mitigation in Dhar district through dilution and rainwater harvesting.

VM Shah from the Water and Sanitation Management Organisation (WASMO) while sharing Gujarat's initiative spoke of the community involvement in monitoring water quality by forming teams in villages and using field testing kits to generate data on the status of water quality. Examples of watershed management and stakeholder participation in design, planning, implementation and maintenance of watershed programmes for water security were presented by Ashok Tanurkar of Prakruti Foundation, Ralegan Siddhi. Harshvardhan from Advanced Centre for Water Resources Development and Management (ACWADAM) gave a detailed lecture on hydrogeology and its use for designing recharge interventions.

Day 2

The second day involved field visits to village Didakhedi in Sehore district where Samarthan, a NGO had undertaken a mini-pipe water scheme in the village. This case study was selected to be showcase it is a prime example of community led initiatives becoming successful owing to the nurturing of social capital by mobilising people to come together for meeting their own needs. The point of this initiative was to wean the village off state dependence and inculcate a sense of ownership towards their common resources and systems.

There were interactions with the communities in the village where the villagers shared the process of getting their acts together for developing the water supply programme. There were some suggestions from the participating engineers on monitoring water quality using the field-testing kits provided to the panchayat and using finance commission funds for maintenance.

Day 3

There was an interactive session with Mr. Sujoy Majumdar, Director, DDWS on the new programme for rural water supply in Bhopal. He also sought feedback from the participants on the drinking water programme in Madhya Pradesh. This was followed by a group work where the participants were divided into two groups where one group had to enact the role-play of the community and one group as the PHED officials.

A problem village was presented and the PHED group was asked to develop a plan for sustained and safe water supply for the village, while the group enacting the role of community was asked to evaluate the programme suggested by the group and demand better services. The group shared their plan and there were discussions on what goes into making the water supply programme effective and sustainable.

2.2.2 Indore: September 15-17, 2010

The programme in Indore was held from September 15-17, 2010 and saw the participation of 45 engineers covering 15 districts of Indore division. As was in Bhopal, the participants here were interested in knowing about technologies for recharge while some wanted information on the new guidelines for water supply. A brief outline on the programme is given below

Day 1

GS Damor, Chief Engineer in his address spoke of the need to move from the old programme of rural water supply and look at the new guidelines as an opportunity to fulfil the right to water for the people of the state. He elaborated that the state has modified the norm for water availability from the 40 litres per capita per day (lpcd) norm to 55 lpcd. He also called for the engineers to work with the communities and design and implement schemes, which take into account their opinion, convenience and thus have a component of people's participation in the running of the schemes. He felt that the time is ripe for a revolution in the rural water supply sector and the new guidelines provide an opportunity to overcome the shortcomings of the past.

Thereafter there was a CSE lead lecture by Romit Sen giving an overview of India's water management strategies at the same time enumerating the challenges and looking at water harvesting and watershed management as the way forward.

The next module focused on sharing community initiatives on different aspect of rural water supply across Madhya Pradesh. Angita Raghuvanshi from Haritika, presented the integrated water resource management involving rainwater harvesting at the watershed level through participatory planning. Rahul Banerjee, a development professional based in Indore shared examples of water harvesting in the Malwa region of the state. Working with tribal communities he has succeeded in meeting the water needs to the people through rainwater harvesting. Gayatri Parihar, working with Vasudha, presented the fluoride mitigation programme in Dhar through alternate supply using shallow wells and dilution with rainwater.

Siddharth Patil from ACWADAM gave a lecture on the science of hydro-geology and how it can be used for effectively designing recharge structures. He also presented case studies from Madhya Pradesh where how hydro-geological studies at the watershed level have been useful in augmenting water resources in Dewas district

Day 2

The participants were taken to village Mahukheda in Dewas district to look at a PHED initiative of community managed piped-water supply scheme. Mahukheda is a large village with a population of over 3000 people, which faced severe water scarcity until few years back when the PHED along with the Panchayat jointly implemented a pipe water scheme and have been running it successfully through the pani samiti. Mahukheda presented a classic example where water scarcity brought the people together and how the PHED and the Panchayat through the pani samiti have jointly worked for ensuring continuous availability of water through convergence of various programmes of water conservation. There were a lot of queries from the participating engineers on the methodology adopted for community involvement and how the pani samiti has been able to generate funds from the communities to keep the system running. The members of the pani samiti, the watershed committee shared their efforts for convergence of watershed programmes and of the measures for social regulation in the village for preventing misuse of water. The group also got to interact with the water quality monitoring team in the village, which displayed the results of the seasonal monitoring in the village and the ameliorative measures taken for mitigation.

Day 3

The third day was mainly devoted to reflecting on the field visit and draw learnings for further replication in other areas. The participants were unanimous in their opinion that the main reason for the success in

Mahukheda has been the close coordination and convergence between the PHED and the Panchayat. The model of source sustainability through successful implementation of watershed programmes was something the participants saw as a possibility of future work with the watershed mission in the state. However, they were concerns about the exact replication in other areas because of the fact that the community interactions and togetherness may not be the same as was seen in Mahukheda.

Murlidhar and Narendra Patel from Samaj Pragati Sahyog made a presentation on the watershed conservation work of their organisation in Bagli block of Dewas district. They also informed of the piped water supply scheme in their area, which has been successful running because of the water conservation measures undertaken in the region.

Thereafter, there was an exercise to discuss on the village waters security plan format of the DDWS and possible additions in the format. The group felt added that in the social profile section it is important to keep a distance map of the village form the district and block head quarter and include the estimation of water for livestock needs while doing the water budgeting. Details on the availability of power as an important input should be included in the format.

Finally, a group exercise was undertaken on the format for village water security plan. A SWOT (Strength, Weaknesses, Opportunities, and Threats) analysis was also conducted with the background that if the PHED has to implement the new guidelines, what are the areas that they would need and with their experience of providing rural water supply what are the strengths that they can bring into the programme. The participants were divided into groups and were asked to reflect on each of the four aspects (SWOT) and share it in the plenary. There was a discussion on the observations made within the group.

Box: The SWOT exercise in Indore

In Indore, the engineers undertook a SWOT analysis after their field visit to look at actualisation of community involvement in village-level water management that included addressing sustainability concerns through recharging.

Most engineers felt that their strength lay in their technical expertise in designing and execution of rural water supply schemes. They also felt that their long experience has honed their financial and operational management skills. While this is true, and the PHED can play a very supportive role in providing technical and management expertise to the community, the PHED will also have to learn anew knowledge and practical skills in the area of building up sustainability of water sources through groundwater recharging.

Their weakness was perceived to be a lack of taking into account the concerns of communities and an unwillingness to work along with communities. They also realised that this characteristic way of functioning that excludes people from their activities has been responsible for the state of disrepair of the water supply systems. Given the fact that the new guidelines makes it mandatory for community involvement, this weakness is a key factor that needs to be addressed.

The interactions and exposure to community-based case studies led to a realisation that government schemes are unnecessarily costly and it is possible to achieve the same results at a much lower expense. They also admitted that there is a need for corrective action in terms of making more realistic estimates of structures based on availability of power and other infrastructure. The engineers also expressed concerns about working conditions in areas as shortage of manpower, timely sanction of schemes and budgets.

The exercise ended with a hopeful note that new programmes would provide them the financial resources and the flexibility to try out different kinds of technologies and methods for groundwater recharge for sustainability. While there was also good cheer on the current actions for convergence between different government programmes, there was also scepticism on how cooperation and convergence would happen at the district and village levels.

2.2.3 Sagar: October 6-8, 2010

The programme in Sagar was held from October 6-8, 2010 and saw the participation of 42 engineers covering 6 districts of Sagar division.

Day 1

HS Gond, Superintendent Engineer Sagar, in his address spoke of the relevance of the programme which was just in time when the districts will prepare the water security plans. He called upon the participants to reflect upon the current deficiencies in implementation of rural water supply programme and improve upon them while the new guidelines are implemented.

There was a presentation on the guidelines of the National Rural Drinking Water Programme by CSE. It highlighted the main points of the guidelines and stressed on the changing role of the PHED from an implementer to facilitator.

In the discussion that followed the participants echoed that while the provisions in the new programme are good, operationalising them would be difficult. A.K. Jain, Executive Engineer while initiating the discussions reflected upon the difficulties in implementation covering issues of staffing, competing uses, poor governance and resistance from communities. In the context of the Bundelkhand region the discussions revealed the following challenges in implementation of the new programme :

- The region has seen deficit rainfall in the past several years and there have been consecutive droughts resulting in severe depletion of groundwater sources and drying up of schemes. Methods for recharge will also take time to yield results and till the time where effects are seen, one would have to look at alternate method of water supply.
- Due to the poor economic condition of the people living in the region which is compounded by the successive droughts, the ability to pay for a water supply scheme is low and it will be difficult for people to even contribute for the operation and maintenance (O&M)
- The number of private sources being dug in the region is on a rise and is impacting the availability of water for domestic purposes. Until there is some regulation on the private sources, the region will never be able to meet the aim of water security.

Vijay Singh from Parhit Samaj Sevi Sansthan, Datia informed of the household rainwater harvesting initiative in Hamirpur village of Datia district and its impact in increasing the water levels of the region. He also shared the village water security plan format developed by the organisation with the communities.

Himanshu Kulkarni from ACWADAM informed the participants on geo-hydrological techniques for water harvesting. He explained in length on the concepts of geology and its importance in water harvesting. There were small exercises in the session which gave the participants hands on on the science of hydro-geology.

Day 2

The day began with a session on Participatory Resource Mapping (PRM) by Suchita Jain from SOPPECOM. She elaborated on the objectives, methodology and interpretation of data obtained in a PRM exercise. While explaining the concepts, she stressed that the objective of a PRM exercise is to give quantitative information for better planning of interventions in a water conservation programme. She also highlighted the use of Geographical Information System (GIS) to interpret and use data generated in a PRM exercise giving an example of the work done in Haritika in Chhatarpur district of MP. The use of GIS can help in data interpretation and modelling for better use of field data.

Subsequently, Gita Kavarana, CSE gave an overview of the water management explaining India's water management strategies, policy, legal and institutional frameworks, financial investments and the way forward, looking at traditional water harvesting systems across the country. The PHED - Sagar invited RS Bhardwaj from MP Council of Science and Technology to inform of groundwater perspective maps developed for the districts of Bundelkhand under the Rajiv Gandhi National Drinking Water Mission. He explained the preparation of the maps and detailed out its interpretation for better planning.

Day 3

The exercise for this workshop was to develop a water security plan for a problem village. Participants visited the village, interacted with the village community, understood the problem, and undertook a water budgeting exercise and together with the villagers identified potential water sources for development.

Box: Designing a water security plan for Mardanpur village, Sagar district

The village named Mardanpur is situated on granite rock and past efforts in developing a water supply system have not yielded results in the area. The village with a population of 1200 was facing severe water problems for the past few years.

Participants were briefed about the methodology of developing a water security plan the previous day in a series of lectures. They were exposed to (1) household data collection on water demand and current availability; (2) data collection on water related data – water sources, hydrogeology, physiography, rainfall, soil, catchment area etc (3) calculating the deficit in water availability and then planning for plugging the gap and for future water security through water resource development.

Physical data about the village environment was gathered from groundwater prospect map developed by the NRSA and other water related institutions such as CGWB etc. Participants collected village level data on population, demand and availability based on a format developed for this purpose. The data was collected through interaction with the village community members.

The participants undertook a water budgeting exercise of the village with the help of a simple format. They also calculated the amount of water, which would be available through rainwater harvesting. The possibility of rainwater harvesting was intense in the village as it had concrete buildings in form of school, health centre, anganwadi kendra and households with pucca roof.

They also identified pucca household structures in the village that could be used for rooftop rainwater harvesting. During the interaction with the community, there were vigorous discussions on the scarcity, the cause and what the communities was prepared to do in order to ensure water security. Villagers suggested measures that could be undertaken by the PHED in order to get adequate water for supply. They suggested checkdams in two potential areas that could ensure year-round supply.

After this, the entire group together with the villagers visited these areas suggested by the villagers. In one area, which was a valley between two hillocks, the potential was great, but the area was not within the jurisdiction of the PHED. It was under the Forest department. They then visited the second site where the villagers had note that several private open wells had water throughout the year. It was found out that the hard rock covering the village dipped down at this point and therefore the area was more suitable to recharge. A site was identified to construct a small check dam. It was agreed by the PHED that if the villagers got together to form a Village Water & sanitation Committee and agreed on their share of contribution for operation and maintenance, the PHED would undertake the capital work for water supply.

3. Concerns in NRDWP implementation

There were substantial discussions in all the three programmes on the operational difficulties in actualising the new programme for rural water supply. While the participants were in agreement on the principle and the rationale behind the new programme, they were sceptical on how these could be implemented on ground. Some of the key concerns were:

- Source sustainability: As the focus has always been on exploiting groundwater, the engineers expressed a need on structured capacity building on recharging techniques and the principles of hydro-geology.
- Community mobilisation: This is a totally new perspective in their work. Most engineers show a reluctance to work with communities. There is a need to have sessions on change management. The provisions of the new guidelines will require PHED engineers to interact with the communities and people at large for which they would need skills on engaging and working with the people.
- Human resources: The shortage of manpower and the current work load is a major constraint in achieving what is desired in the new programme.
- Community contribution: The general feeling amongst the participants was that it would be difficult to get communities to make financial contributions. As the Swajaldhara programme was not very successful in the state, they were not very hopeful on how the contribution from the people will be obtained in the current programme.
- Convergence: The point on how various departments would converge at the state and district level for successful execution of water supply programmes was a major concern. On informing of the role of SWSM and DWSM in bringing about convergence, the participants were little cautious at its actual implementation at the ground level.

4. Feedback

The participating engineers wanted more technical information on recharging at district level. There was not a great enthusiasm about community involvement but since this is one of the key points of new guidelines, ways and methods on how to stimulate thinking and action on these aspects needs to be worked upon.

The overall feedback received in the programme was that the workshops should be done at the district level as the reach would have been more. The sessions on hydro-geology were well received in all the places and the participants felt that the lack of awareness of hydro-geology impacts the performance of the schemes. The participants said that “the science of groundwater movement is something we as PHED engineers should consider for sustainability of our schemes”.

On the case studies of the NGO's, though there was appreciation on the work done by them in their areas but the engineers felt that replicating these examples by them would be difficult as the skills of social engineering are lacking amongst the staff. There are also problems of shortage of staff and as these activities are time consuming, the group felt that it would require the support of NGOs in the state. They also wanted technical details of the schemes shown in the case studies for better understanding and video documentation of such examples in the state. It was also felt that instead of doing workshops separately for panchayats and engineers, perhaps it will be useful to do both together as they two groups have to work closely in the implementation of rural drinking water programme.

In the end while everyone realized that community participation is the key for a programme to succeed, there were also concerns on how we all can forge better means of working together for realizing the common goal of provision of same water. To sum it up in the words of a participant, “Training is completed but what will be important is that how do we translate what we have learnt here when we go back into our districts.”

Quote – unquote

“We will need to play a role of the social engineer and learn social engineering skills”.

“The science of groundwater movement is something we as PHED engineers should consider for sustainability of our schemes”.

“Panchayat officials and PHED Engineers should be jointly involved in the training programmes as both these institutions have to play a key role in the implementation of the rural water supply programme”.

“The programme was useful as it helped us understand the provisions of the new guidelines”.

“The training programme can be made more useful by including technical details on recharging methods”.

“It is a useful course but it needs to include details on how the results were achieved while working with communities”.

“Training is completed but what will be important is that how do we translate what we have learnt here when we go back into our districts.”
