
This item was submitted to [Loughborough's Research Repository](#) by the author.
Items in Figshare are protected by copyright, with all rights reserved, unless otherwise indicated.

Building local capacity for hand pump maintenance

PLEASE CITE THE PUBLISHED VERSION

PUBLISHER

© WEDC, Loughborough University

VERSION

VoR (Version of Record)

PUBLISHER STATEMENT

This work is made available according to the conditions of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) licence. Full details of this licence are available at:
<https://creativecommons.org/licenses/by-nc-nd/4.0/>

LICENCE

CC BY-NC-ND 4.0

REPOSITORY RECORD

Devaraj, A.. 2019. "Building Local Capacity for Hand Pump Maintenance". figshare.
<https://hdl.handle.net/2134/29954>.



Building Local Capacity for Hand Pump Maintenance

A Devaraj, India



Danida Assisted Water Supply and Sanitation Project

In October 1996 Governments of India and Denmark signed agreement of bilateral cooperation regarding the implementation of demand driven rural drinking water supply and sanitation projects in the state of Tamil nadu. The Project covers Cuddalore and Villupuram districts with a total of 35 blocks and approximately 1800 village panchayats. The overall project strategy is to plan and carry out all components and activities at the most appropriate institutional level in an integrated manner using demand driven, cost sharing and participatory approaches. The Project lays emphasis on rehabilitation of existing water supply schemes, which range from simplistic hand pump based system to piped water supply.

Community Managed Water Supply Maintenance

Community has been constantly facing the problem related to maintenance of water supply system. Generally the Community managed systems have been functioning well for the sustainability of water supply. Recognising the importance of providing effective community managed maintenance system, the Danida assisted Water Supply and Sanitation project has taken a variety of measures including (a) active community involvement in planning and executing water supply works (b) establishment of local user groups responsible for the effective and efficient maintenance of water supply installations (c) building skills in preventive and break down maintenance through training and (d) distribution of tool kits for maintenance. This paper presents experiences relating to the training of village based hand pump mechanics.

Establishment of Community Institutions

As a part of providing sustainable water supply and sanitation, the project is involved in establishing four different community based groups (works with in the framework of village panchayati raj) with different tasks and responsibilities. They are

- village Water and Sanitation Committee
- Quality Assurance Group
- Environmental Protection Group
- Water User Group

Selection of Hand Pump Mechanics

The Project, through the Participatory Learning and Action process, facilitates meaningful interaction and discussion among the community members to plan a need based water supply scheme. During the process community members are sensitised about the importance of effective operation and maintenance of water supply installations and directed to select suitable candidates who could be involved for carrying out preventive and breakdown maintenance of hand pump and power pump based water supply system. The field team members give information about the common criteria to be followed for the selection (age, aptitude to carry out maintenance works, local youths who have already been involved in similar activities etc.).

The local mechanics are local craftsmen, generally cycle mechanics or blacksmiths or local persons who have been already involved in repairing of defunct hand pumps. Also selection of mechanics is based on considerations such as the candidates' community, their willingness to undertake hand pump maintenance and their physical fitness. Project gives equal preference for both men and women to be trained as mechanics. Initially there were reservation and reluctance to select female members as mechanics. But in the due course this attitude has totally changed and at present all panchayats select one male and one female mechanics. In some cases, husband and wife jointly participate in the training. Project also distributes a complete tool kits for each panchayat and the mechanics are expected to obtain the tool kit from the panchayat and carry out maintenance services within their panchayat or outside areas.

Training Needs Assessment

Project conducts a pre orientation meeting with the potential candidates and elucidate their aptitude and interest for maintenance tasks. The interaction is also used to identify the training need assessment. Also, during the training, a pre evaluation test is carried out to assess participants' attitude towards hand pump maintenance. Participants' expectations on hand pump maintenance mostly include (a) the ability to dismantle and reassemble a hand pump (b) learn the technical name of the special tools and its use in maintenance of hand pump (c) Identifying the damaged spare parts in the hand pump

and (d) techniques of motivating the Water User Group for effective maintenance of hand pump were indicated as other training needs.

Training Objectives

Create awareness on the importance of community involvement in the maintenance of hand pumps.

Facilitate the water users on proper use of hand pumps and their maintenance.

Assist the water users in regular preventive maintenance of hand pumps

Undertake necessary breakdown maintenance service of hand pumps

Maintain simple preventive and breakdown maintenance reports and records.

Resource Personne

Fitters attached to the Block Development Office are the prime resource persons. Project trained hand pump mechanics for field practical and experience sharing sessions. Apart, project staff conduct sessions relating to social aspects.

Training Content

During the five day skill oriented training the following contents are covered :

Water supply and poverty, Health and hygiene, gender issues in water supply and sanitation, Parts of India Mark II hand pumps and its functions, dismantling and assembling of hand pumps, preventive and break down maintenance, standard and special tools, Break downs of India mark II hand pumps (Signs, causes and remedies), roles and responsibilities of hand pump mechanics, records maintenance, working with community level institutions and VWSCs.

Training Methods and Materials

The training has been designed in a way to make participants feel comfortable in learning both theoretical as well practical sessions on preventive and breakdown maintenance of hand pump. The participants have been trained through short lecture, discussions, role-play, demonstration, fieldwork, practical exercises etc. participants had been also divided into smaller groups (consist of three to four members in each group) to facilitate intensive practical exposure during field works. Apart from this, to pay more attention to the learning process, every day revision, tests, quiz, role-play, social games, report writing was conducted. A detailed manual and guidebook related to preventive and breakdown maintenance developed in Tamil is given to the participants.

Training Evaluation

The management group elected/ formed by the participants presented everyday monitoring report of the preveious day in the morning session. If any issue arises in relation to the training process, discussions and review of the proceedings of each day had been done within the trainers and field Organisers to identify the strengths and limitations for further improvement. The participants were evaluated through a combined activities consisting of objective type questions, short tests, role-play, quiz programme, general knowledge, social and psychological games, demonstration etc to review the learning experience and training outcome.

Major Learning Experiences gained

- Functions of hand pump
- Special and standard tools and its usage
- Ability to dismantle and reassemble the hand pump
- Identify the problem occurred in the major assemblies of hand pump and the techniques to solve them.
- Ability to carryout preventive and breakdown maintenance
- Technique of grease application and rod cutting.
- Changing of hand pump chain and bolts and nuts.

Refresher and follow up training

As part of strengthening the effectiveness of the hand pump mechanics, the project conducts regular review cum refresher training programmes and ascertains if the hand pump mechanics are able to perform their tasks effectively. During this training, staff identify additional training needs of the mechanics to strengthen the capabilities.

District Level Conference of Hand Pump Mechanics

Project had also conducted a district level conference of all the project trained mechanics and identified strengths, limitations and practical measures for further refinement of the tasks¹.

Strengths of Local based hand pump Mechanics

Support from panchayat presidents

They extend their cooperation by issuing tools for carrying out hand pump maintenance and advise the users to cooperate with the mechanic during the hand pump maintenance. Supply spares to repair the defunct hand pumps and offer Rs. 100/- to Rs. 150/- as honorarium for repairing a hand pump.

Working conditions of female mechanics

Have acquired an enhanced social status and improved social esteem. Working together by male and

female mechanics has developed gender empowerment and awareness.

Working together by male and female mechanics

It develops gender balance in operation and maintenance of hand pump. It also broke stereotyped attitude that mechanism is a male oriented task.

Functioning of water user groups

Systematic approach for the operation and maintenance of hand pumps.

Receipt of honorarium

Community participation in acknowledging the task of community based water supply maintenance. It has also added income to the family. A few mechanics saved money and invested in getting new assets (cycle, house construction etc.)

Quality & quantity of maintenance services

Carried out preventive maintenance of hand pumps monthly once and this has increased the support of water user group and able to maintain the surroundings of hand pump by draining the wastewater properly.

Environmental Hygiene, Hand Pump and its surroundings

This helps community members to get safe drinking water and save the medical expenditure.

Limitations

- Defiant and relaxed attitude of a few presidents towards operation and maintenance of hand pumps.
- Less confidence among female mechanics in carrying out a few breakdown tasks and handling of special tools
- A few women mechanics do not get support from the male mechanics.
- Lack of clarity among Water User groups about their roles and responsibilities.
- Insufficient coordination with block Development Office.
- Less awareness on hygiene and environmental sanitation

| Hand Pump Mechanics Trained | | | |
|-----------------------------|------|--------|-------|
| District | Male | Female | Total |
| Villupuram | 124 | 78 | 202 |
| Cuddalore | 87 | 80 | 167 |
| Total | 211 | 158 | 369 |

Observations about the training Process and Field Experiences

Ms. Rajam, Hand Pump Mechanic, Semangalam

When I heard from the Panchayat President about the hand pump maintenance training, I was under the impression that they would give oral explanation on hand pump repair and its maintenance. I could learn theory and practical tasks in the practical training. The field practical made me to learn each and every part of the hand pump and its functions very effectively. So far, I was thinking that the task of maintaining a hand pump should be meant only for men. But the training made me to realise the fact that woman can also repair defunct hand pumps. Learning the skill of hand pump mechanism took only five days and the credit goes to the resource persons.

Mrs. Alamelu, Hand Pump Mechanic, V.P. Agaram

The President of our neighbouring panchayat informed about that three hand pumps were not working in his village. I along with male mechanic, vaiyapuri visited the village and dismantled all the defunct hand pumps and found that sealing ring, bucket washer and upper valve guide were damaged. We asked the president to purchase those spares and call us for servicing. Accordingly the president informed. Again Vaiyapuri and myself visited the village and repaired all the three hand pumps. The President gave us Rs. 300 and we both shared the amount equally. So far I have repaired six hand pumps. Nowadays villagers do not call me by name, but they address me 'Hello Fitter madam'. I feel so elated to hear this.

Mrs. Uma, Hand Pump Mechanic, Nagandur

The Panchayat President asked me to repair a defunct hand pump. I took the tool kit and started dismantling the hand pump. Children and ladies surrounded me. Few ladies murmured 'we did not really trust her word when she had told us about the skills she had acquired in repairing the hand pumps. Now we believe your word'. Few ladies also expressed their interest to learn the mechanism of repairing the hand pumps and volunteered to assist me in getting the tools from the box. I feel very proud to see appreciation and recognition I received from the ladies. A few ladies also asked me about the information related to next hand pump training. Children looked me something unusual, because they had not seen a lady doing mechanical works. They clapped their hands when they found water flowing from the hand pump, which had not been working for a long time. Finally, I explained about the procedures of using a hand pump systematically and the importance of cost sharing.

Conclusion

The prominent evidence indicates that the centrally managed hand pump maintenance system is difficult enough to implement and serve the community needs in the maintenance of water supply installations, since the community is scattered remote and economically poor. One union fitter had been assigned the job of carrying out all breakdown maintenance of hundreds of panchayat and villagers uniformly complain that defunct hand pumps were never repaired on time and they had to face lots of hardships in the past. Also, there

were no direct contact between the mechanics and users, since the block officials and president did the entire operations. But developing local skills has created a self-dependency for water with in the villages which people consider as sustainable and reliable.

Reference :

1. A. Devaraj, 2000. Report on District Level Conference of Danida trained hand pump Mechanics.

A. DEVARAJ, Danida Adviser, Villupuram.
