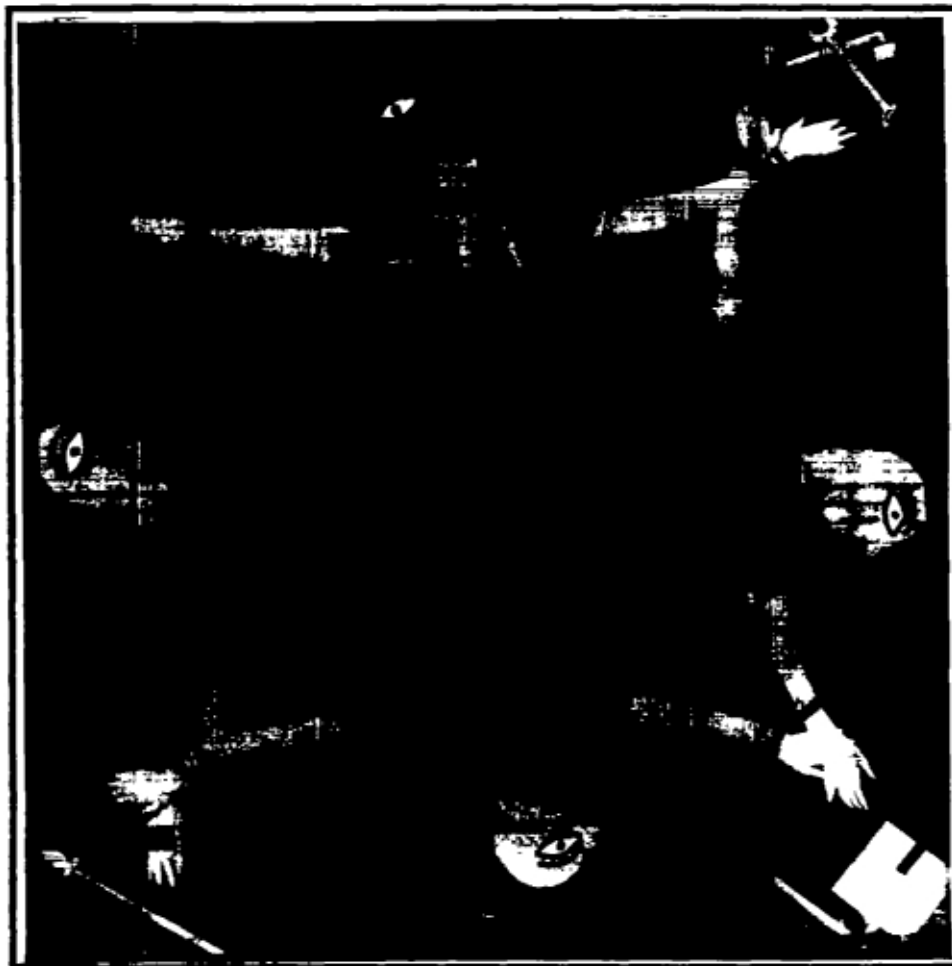


# TRAINER'S GUIDE



## **COMMUNITY BASED HANDPUMP MAINTENANCE INDIA MARK II & INDIA MARK III (VLOM)**

### **CARETAKER'S TRAINING**

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# VILLAGE HANDPUMP CARETAKER'S TRAINING

## TRAINER'S GUIDE

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## ***About this Manual***

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*The water supply programme, through installation of handpumps, has achieved significant progress in terms of accessibility and reach of the handpumps to the rural populations in the past few years. The focus now is gradually shifting from coverage to sustainability of the community water supply system. This changing scenario is leading to a transformation in the roles and perceptions of the users as well as the implementing agencies especially with regard to community involvement in repair and maintenance of installed handpumps.*

*In the light of the above, this manual has been developed to standardize the training of village handpump caretakers for the India Mark III (VLOM) handpumps or the India Mark II deepwell handpumps. The guide contains all the information necessary for organizing and conducting the India Mark III/II handpump caretaker's training and it highlights certain key factors that must be kept in mind. It can also be used by the trainers as a reference while using the accompanying visual aid to conduct the training.*

*The trainers guide should be used along with other materials available for training caretakers ie.*

*Visual aid for the training of the Caretakers and reference booklet for the caretakers.*

*Slide set on Caretaker's training.*



# Introduction

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## 1.1 Rural Water Supply Programme

India implements possibly the largest rural drinking water supply programme in the world. Provision of drinking water supply is in the core of its development plan. However, the magnitude of the task of providing safe potable water to the 6.5 million rural people and the enormous cost involved exclude the possibility of any piped water supply or centralized maintenance systems such as those that exist in urban areas. Alternatively, during the early 1960's piston type hand pumps were introduced to pump water from deep bore/tubewells in the rural areas. However, these pumps failed too frequently and were considered unreliable to use as a source of providing drinking water to the rural populations. In the 1970's, the Government of India (GOI) initiated action in cooperation with the State Governments, World Health Organization (WHO), United Nations Children's Fund (UNICEF), Mechanical Engineering Research & Development organization (MERADO) and Richardson & Cruddas (1972) Ltd., (a GOI Undertaking), for the development of a dependable deepwell handpump. A very reliable and sturdy deepwell hand pump was developed in the late 1970s and is now known all over the world as India Mark II deepwell handpump. By the early 1980's, the India Mark II hand pump had become a household name in the villages in India, and this proved a reliable source of water supply to millions of people in rural and semi-

urban areas. By 1993, over 2.2 million India Mark II/III hand pumps were in operation in India alone.

The development of India Mark II was a major breakthrough in reliability and ease of operation. There was a dramatic increase in the number of pumps operating at any point of time from a dismal 25% to an impressive 85%.

Although, sturdy and reliable in design, the pump requires preventive and curative maintenance. The repair needs envisage special skills, manpower and tools to make replacements. These may not always be available/feasible at the village level.

Studies conducted so far indicate that the present maintenance systems have high overhead cost. Further the community is not adequately involved during planning, execution and maintenance of the handpump based water supply system.

In order to improve the IM-II handpumps, to enhance maintainability at village level and increase meantime before failure (MTBF) further efforts during the period 1983-87 led to the development of a village level operation and maintenance (VLOM) version of India Mark II known as India Mark III handpump. This VLOM concept promotes maintenance of a handpump by the users themselves with minimal outside support.





## **1.2 Handpump Maintenance Systems**

*Handpumps are the most widely accepted technological option for community water supply. While the India Mark II/III handpumps are reliable, robust and efficient pumps, like any other machine, they require a certain level of maintenance to function without breakdown. The different handpump maintenance systems prevailing in India are :-*

### **1.2.1. Three Tier Maintenance System**

*This maintenance system is organized with 3 levels or tiers of functionaries. It was the first institutionalized attempt at involving the users in the maintenance of hand pumps. Essentially, the system proposes the following three tiers :*

*1. A village level voluntary caretaker identified by the implementing agency from among the nearby users of the pump. This caretaker is trained for conducting preventive maintenance, keeping the handpump surroundings clean and motivating the users to handle the pump properly. She also reports any event of breakdown to the higher level of the system through a pre-printed post card.*

*2. At the second tier is the Block Mechanic who looks after all the pumps in the block. His duty is to visit all pumps regularly and to undertake minor repairs of the above ground components. In case a major repair of the below-ground assembly becomes necessary, he too reports such repair needs to the next higher level.*

*3. At the district level, the Mobile Maintenance Team constitutes the third tier and is expected to look after all the handpumps in the district. Being equipped with a vehicle and 5 workers, the mobile maintenance team undertakes all major repairs as and when necessary.*

*The operation of this system hinged on a crucial functionary, the village level handpump caretaker. The assumption that the voluntary Caretakers could be easily recruited and motivated to carry out simple preventive maintenance and communicate the need for repairs to the next higher level turned out to be wrong in most cases.*

*It was felt that the Three Tier system was a top-heavy and centralized system in which the Caretaker depended on the Block Mechanic, who in turn depended upon the Mobile Team. A failure in any one of the links would result in a collapse of the system as a whole.*

*Independent evaluations of the functioning of the 3-tier system have invariably identified absence and shortage of Caretakers as one of the main reasons why the Three Tier System has not functioned effectively. High workload on Block Mechanics and the Mobile Team and improper work programming have often resulted in unusually high down-time, once a pump had broken down.*



### **2.2.2. Two Tier Maintenance System**

*In many States, this maintenance system went under the name of the Two Tier System and took different forms in different places. Most Two Tier Systems attempted to eliminate the need for Caretaker by increasing the numbers of Mechanics and Mobile Maintenance teams and decentralizing them. These actions eliminated the need for the facing the difficult, unfamiliar (and more importantly, non-technical and non-engineering) task of recruiting and motivating Caretakers. Many a time, these modified versions of the Three Tier system completely did away with any semblance of community involvement sometimes.*

### **2.2.3 One tier Maintenance system**

*The search for an alternative system was based upon the visible drawbacks of the three tier system and a growing belief that rural people could be empowered and enabled to maintain their own handpumps. The first such attempt was made by the Social Work and Research Centre (SWRC), a voluntary organization based at Tilonia, Rajasthan. It was based upon a conviction that people who were users of handpumps, were capable of maintaining them.*

*If illiterate villagers could repair electric and diesel pumps, tractors and other agricultural implements which were much more sophisticated machinery than a hand pump, the actual repair task could be demystified and no skills needed to be imported from the district level to keep the pumps going. A village based Handpump Mistry - HPM could replace*

*all the 3 tiers. The idea of a Handpump Mistry was based on the premise that unemployed rural youth from economically poor families could be identified based on their mechanical aptitude and their skills upgraded by training so that they would undertake most common repairs necessary for a handpump.*

*This system had many advantages in terms of the ready availability of the handpump mistry to the community and use of local skills in maintenance & repair. However, in the process of large scale implementation, it had its own problems including the identification of the right person as the handpump mistry; and bottlenecks in the provision of spare & tools to the handpump mistry.*

*The village based artisans such as blacksmiths, carpenters and cycle mechanics etc., after receiving training, necessary tools and spare parts, could take care of essential preventive maintenance and regular repair needs of about 20 to 25 pumps. They would need to be backed up and monitored by a second tier consisting of a Junior Engineer and his maintenance crew at the block level.*



## **Community Based Handpump Maintenance System**

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### **3.1 Need**

*As the number of installed handpumps increase in a district, the efficiency of a maintenance system through a centralized mechanism deteriorates. Besides, studies conducted so far indicate that maintenance through centralized mechanisms have high overhead costs. Thus high priority needs to be given to the development of sustainable village based and community managed maintenance systems which adapt to the local needs and requirements.*

*Moreover, the involvement of community is essential during planning, execution and maintenance of the handpumps installed in the community. Complete community involvement would result in a sense of ownership of the handpump installed. A water supply system like the handpump can be preserved only if the community understands and appreciates its role in management of the system. The community should be able and willing to take responsibility for its management & maintenance.*

### **3.2 Definition**

*The Community Based Handpump Maintenance System, is a strategy for ensuring sustenance of the water supply through the handpump at the village level. Under this system of maintenance, the user groups select representatives to form a WATSAN committee. The WATSAN committee undertakes the responsibility of*

*management, preventive maintenance as well as repair of the handpumps installed. It collects contributions from the users and uses the money to buy spares required for repair & maintenance.*

*Two user representatives are selected by the WATSAN committee to undertake preventive maintenance of the handpumps. Women handpump mechanics are selected & trained within the village to undertake repair of the handpump. The caretakers and mechanics work under the overall responsibility of the WATSAN committee. The skills necessary for maintenance & repair are transferred to the community representatives (caretakers & mechanics) through training.*

*The accountability for operation and maintenance lies with the WATSAN committee. Self-sustainability in terms of procurement of spares and servicing cost is ensured through contributions from user groups.*



# COMMUNITY BASED HANDPUMP MAINTENANCE

## ORGANISATION PROCESS







# STRUCTURE

## PANCHAYAT

*Handpump caretaker  
(one/handpump)*

*Handpump mechanic*

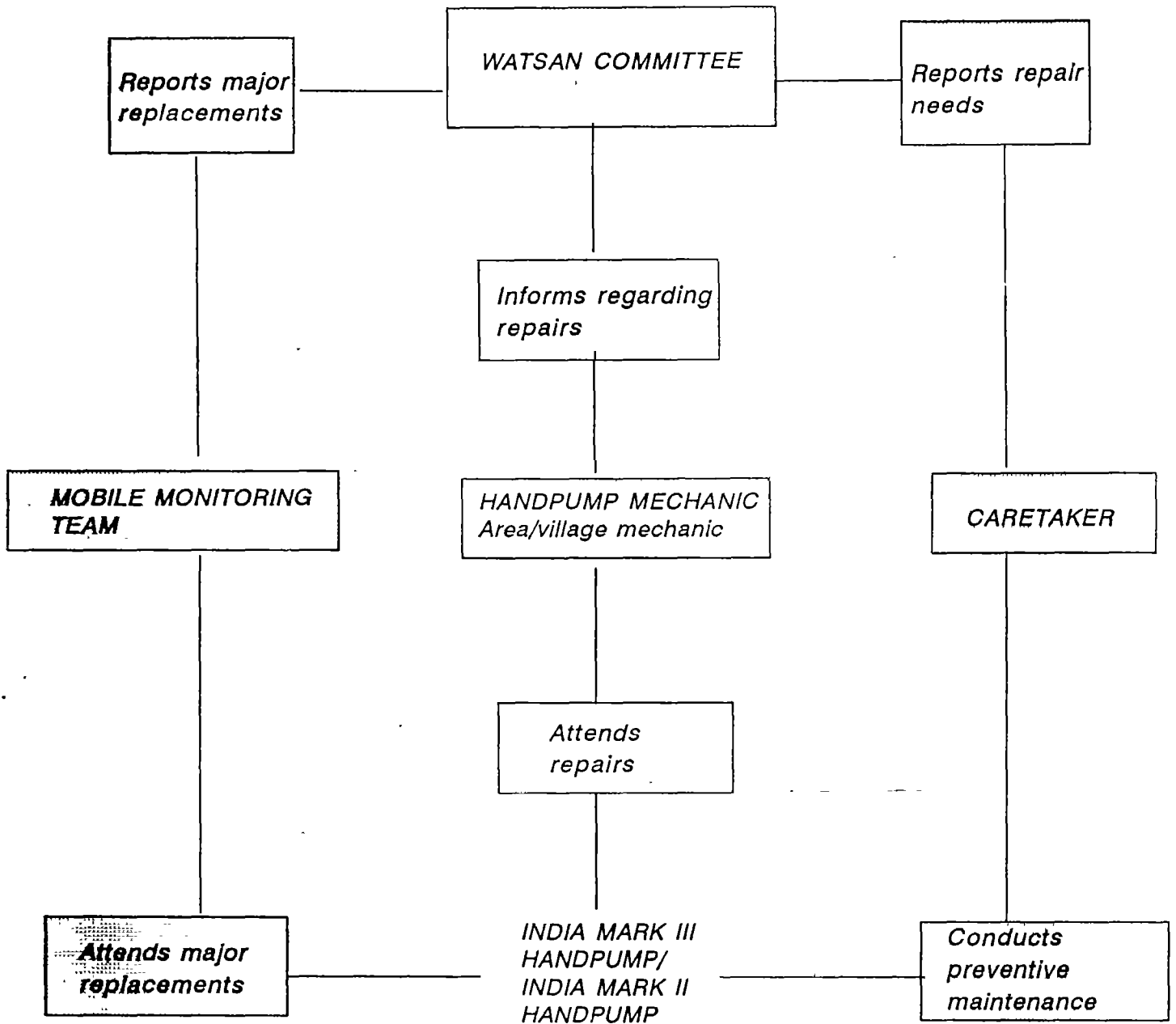
*Village WATSAN committee*

## BLOCK/DISTRICT

*Back-up monitoring  
and maintenance team*



# FUNCTIONING





### **3.5 Village handpump caretakers**

*Each handpump in the village is taken care of by two people, preferably women users, selected by the WATSAN committee. These women should be capable enough to take on the responsibilities of the caretaker. Certain criteria should be kept in mind while selecting the village handpump caretakers to ensure that the person performs her roles and responsibilities seriously.*

*It is important to focus on women as handpump caretakers for effective handpump maintenance as it is women who face extreme hardship wherever there is a problem of non availability of clean drinking water and frequent breakdown of handpumps. It has been observed that women who understand how crucial safe water is in their lives and in the lives of other villagers can be motivated easily to take up the role of caretakers.*

*The recommended tasks for the village handpump caretaker are :*

*Be an active member of the WATSAN committee.*

*Educate the community on proper usage of the handpump and ensure the surroundings of the handpump and platform are clean.*

*Act as a motivator to promote health, hygiene practices and sanitation in the village.*

*Be responsible for the preventive maintenance of the handpump. Service all the handpumps in the village at least*

*once a week.*

*Inform the WATSAN committee regarding the repair needs of the handpump in the village.*

*Help the village handpump mechanic in repairing the handpump.*

#### **Selection criteria**

*The caretaker should be -*

- \* preferably a woman from the user community.*
- \* a permanent resident of the village.*
- \* preferably literate and motivated to undertake the activity.*
- \* willing to make herself free from household responsibilities, and work without financial compensation.*



## *Training of the caretakers*

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### **4.1 Organization of the training**

*The village handpump caretakers are given a two day training.*

*The main objective of the training of the village handpump caretakers is to develop the skills of the women caretakers for undertaking preventive maintenance and minor repair of the India Mark III handpumps installed in the village.*

*The training programme for the village handpump caretakers is organized by the implementing department (Public Health Engineering Department/Water Boards/ Rural development department) in consultation with the district and block authorities, local Non Governmental Organizations and WATSAN committee members. The trainers team includes functionaries from the Public Health Engineering Department - Assistant Engineers, Junior Engineers, or Non Governmental Organization representatives involved in the programme.*

*A list of equipment and materials that should be arranged for the training programme is given in the annexure 1.*





## **4.2 Training schedule**

### **Day 1**

<b>9.00 - 9.45 a.m.</b>	<b>.....Registration and Introduction</b>
<b>9.45 - 10.15 a.m.</b>	<b>.....Inaugural</b>
<b>10.15 - 11.15 a.m.</b>	<b>.....Importance of Safe Water</b>
<b>11.15 - 12.00 p.m.</b>	<b>.....Handpump based water supply system</b>
<b>12.00 - 12.45 p.m.</b>	<b>.....Anatomy of the India Mark III handpump or India Mark II handpump *</b>
<b>12.45 - 1.30 p.m.</b>	<b>.....Installation requirements *</b>
<b>1.30 - 2.30 p.m.</b>	<b>.....Lunch</b>
<b>2.30 - 4.00 p.m.</b>	<b>.....Handpump maintenance - Present maintenance systems and community based handpump maintenance system</b>
<b>4.00 - 5.00 p.m.</b>	<b>.....Role of WATSAN committee members, village handpump mechanic and recommended tasks of the caretaker</b>
<b>5.00 - 5.30 p.m.</b>	<b>.....Planning next day's proceedings.</b>

\* **Subject content for this session depends on the handpumps installed in the area ie. India Mark II or India Mark III (VLOM) handpumps.**



## Day 2

- 9.00 - 9.30 a.m. ....*Review of previous day's sessions*
- 9.30 - 11.00 a.m. ....*Steps in preventive maintenance of the India Mark III handpump*
- 11.00 - 12.30 p.m. ....*Identification of defects and curative action for each defect.*
- 12.30 - 1.30 p.m. ....*Recommended tasks for the proper usage of the handpump*
- 1.30 - 2.30 p.m. ....*Lunch*
- 2.30 - 3.30 p.m. ....*Promotion of safe water and sanitation in the village*
- 3.30 - 4.30 p.m. ....*Game on recognizing the pump components, spare parts and tools for carrying out maintenance.*
- 4.30 - 5.00 p.m. ....*Evaluation of the training. Post knowledge test.*
- 4.30 - 5.30 p.m. ....*Closing ceremony & handing over of certificates.*



### **4.3 Session-wise subject content and methodology**

#### **Day 1 :**

<b>Session</b>	<b>Registration and Inaugural</b>
<b>Objective</b>	<i>To know the background of the trainees and formally welcome them.</i>
<b>Methodology</b>	<i>After an introduction &amp; welcome to the course, refer to the format for registration and to the attendance register for trainees. Ask them to fill up the background information forms.</i>
<b>Session</b>	<b>Introduction</b>
<b>Objective</b>	<i>To initiate the process of cohesive group formation and briefly outline the objectives of the training.</i>
<b>Subject content</b>	<i>Familiarization with the background of the participants. Status of the handpump installation in the Rural Water supply programme. Problems of the prevailing maintenance system in the state. Need for community based handpump maintenance. Scope and objectives of the training programme.</i>
<b>Methodology</b>	<i>Sub-divide participants into groups. Allow time for discussions &amp; familiarization among the trainees. Ask one trainee to introduce her group mate to the entire group. Name, occupation, qualifications, village, workplan, family background etc. of the participants should be narrated by different participants. Participatory discussion facilitated by the training programme coordinator on the objectives of the training.</i>
<b>Session</b>	<b>Importance of safe water</b>
<b>Objective</b>	<i>To highlight the hazards of unsafe water and emphasize the importance of safe sources of drinking water.</i>
<b>Subject content</b>	<i>Water borne diseases. Link between unsafe water, sanitation &amp; health. Importance of a safe source of drinking water.</i>
<b>Methodology</b>	<i>Discussion using the visual aid for training of caretakers (Flip 2-6). The modified photodisplay set on sanitation and films like "Story of Drinking water" and "Prescription for health" (in regional languages) may be used to illustrate the disease transmission cycle.</i>



<b>Session</b>	<b><i>Handpump based water supply system</i></b>
<b>Objective</b>	<i>To highlight the importance of ground water resources and create an understanding about the functioning of handpumps to lift water.</i>
<b>Subject content</b>	<i>Importance of ground water as a resource for safe water supply. Basic aspects of construction of a bore/tubewell to lift ground water. Mechanism of the handpump and how it ensures protected water supply.</i>
<b>Methodology</b>	<i>Discussions using the visual aid (flip 7-9) as well as the model of the handpump.</i>
<b>Session</b>	<b><i>Anatomy of the India Mark III or India Mark II handpump</i></b>
<b>Objective</b>	<i>To create an understanding of the different parts of the India Mark III (VLOM) or India Mark II handpump and its functioning mechanism.</i>
<b>Subject content</b>	<i>Anatomy of the handpump - above-ground and below-ground components Operating principles.</i>
<b>Methodology</b>	<i>Discussions using the visual aid for training caretakers (flip 10-12), posters and the handpump model.</i>
<b>Session</b>	<b><i>Installation requirements</i></b>
<b>Objective</b>	<i>To create an understanding of the installation requirements of the handpump.</i>
<b>Subject content</b>	<i>Installation requirements of the India Mark III/ India Mark II handpump.</i>
<b>Methodology</b>	<i>Discussions using the visual aid for training caretakers (flip 13-14), posters and the handpump model.</i>





<b>Session</b>	<b><i>Community based handpump maintenance system</i></b>
<b>Objective</b>	<i>To introduce the trainees to the prevalent handpump maintenance systems and create an understanding of the community based handpump maintenance system.</i>
<b>Subject content</b>	<p><i>Community based handpump maintenance system.</i></p> <ul style="list-style-type: none"> <li>- <i>Problems of the prevalent maintenance system through a centralized mechanism.</i></li> <li>- <i>Need for the community to take responsibility and accountability for community based maintenance system.</i></li> <li>- <i>Key aspects of community based handpump maintenance system.</i></li> <li>- <i>Structure, and</i></li> <li>- <i>Functioning of the community based handpump maintenance system.</i></li> </ul>
<b>Methodology</b>	<i>Discussions on the community based handpump maintenance system using the visual aid for training of caretakers (flip 15-18).</i>
<b>Session</b>	<b><i>Role of the handpump caretaker</i></b>
<b>Objective</b>	<i>To explain the roles of different functionaries in the community based handpump maintenance system and create an understanding of the recommended tasks of the handpump caretaker.</i>
<b>Subject content</b>	<p><i>Role of the WATSAN committee, handpump mechanics, handpump caretakers and the mobile maintenance team in the maintenance system.</i></p> <p><i>Recommended tasks of the caretaker.</i></p>
<b>Methodology</b>	<i>Discussions using visual aid for training of caretakers (flip 19-22).</i>



**Day 2 :**

<b>Session</b>	<b><i>Preventive maintenance procedures</i></b>
<b>Objective</b>	<i>To train on different steps in the routine preventive maintenance of the handpumps installed.</i>
<b>Subject content</b>	<i>Steps/procedures for preventive maintenance:</i> <ul style="list-style-type: none"><li>- <i>Tightening of the nuts and bolts on the pump body.</i></li><li>- <i>Checking discharge</i></li><li>- <i>Checking pump body</i></li><li>- <i>Cleaning of pump surroundings.</i></li><li>- <i>Identifying defects that need repair/overhauling of the pump.</i></li></ul>
<b>Methodology</b>	<i>Discussions using visual aid (flip 23-29). Demonstration &amp; hands-on training on different aspects of handpump maintenance.</i>
<b>Session</b>	<b><i>Identification of defects in the handpumps</i></b>
<b>Objective</b>	<i>To teach the trainees about how to identify defects needing repair or curative maintenance.</i>
<b>Subject content</b>	<i>Identification of the defects - observations, investigation, and curative actions to be taken for the different problems.</i>
<b>Methodology</b>	<i>Discussions using visual aid (flips 30-34), posters, models and hands on training.</i>
<b>Session</b>	<b><i>Recommended tasks for proper usage of the handpump</i></b>
<b>Objective</b>	<i>Inform the trainees about the steps in proper operation and usage of the handpump.</i>
<b>Subject content</b>	<i>Procedures in proper operation of the India Mark III handpump. Define the recommended tasks of the trainees in maintaining cleanliness around the handpump and imparting health education.</i> <i>Proper usage of the handpump.</i> <i>Handling of drinking water.</i>
<b>Methodology</b>	<i>Discussions using visual aid (flips 35-39), posters and film "Components of Sanitation" and "Concept of Sanitation".</i>



<b>Session</b>	<b><i>Promotion of safe water and sanitation in the village.</i></b>
<b>Objective</b>	<i>To inform the trainees about the various methods to promote sanitation in the village and specify their role in promotion of the use of safe water and village sanitation.</i>
<b>Subject content</b>	<i>Village sanitation. Sanitation in the home : - Sanitary latrine - Cleanliness Safe water handling practices. Activities for promotion of safe water usage and sanitation in the village.</i>
<b>Methodology</b>	<i>Discussions using visual aid (flips 40-44).</i>
<b>Session</b>	<b><i>Identification of pump components and tools through games</i></b>
<b>Objective</b>	<i>To refresh the memory of the trainees on the functions, positions, of pump components and tools through games.</i>
<b>Subject content</b>	<i>Identification of all the components of the pump, tools &amp; spares.</i>
<b>Methodology</b>	<i>Write names of the pump components &amp; tools/spares on slips of paper &amp; put them in a box. Draw lots and ask each trainee to pick a paper &amp; then identify the pump components spares and tools.</i>
<b>Session</b>	<b><i>Evaluation of the training and Closing ceremony.</i></b>
<b>Objective</b>	<i>To evaluate the implementation of the training programme and assess the effectiveness of training materials.</i>
<b>Subject Content</b>	<i>A questionnaire is framed to evaluate the following aspects. Contents of the training programme, the resource persons' treatment of the subject, the sequence of topics, the adequacy of time allotted for each topic, the training facilities available, the problems faced during the training programme and suggestions for improvement etc.</i>
<b>Methodology</b>	<i>Initiate discussions and encourage the trainees to put forth their views on the training programme. Note down the important suggestions and the criticism pointed out by the trainees. Do not prevent criticism on any aspect of the programme because</i>



*the main purpose of this evaluation exercise is to get indicators as to how to improve future training programmes.*

<b><i>Session</i></b>	<b><i>Distribution of materials and winding up of training programme</i></b>
<b><i>Objective</i></b>	<i>To close the training programme formally and distribute materials that the trainees will need during their work.</i>
<b><i>Methodology</i></b>	<i>State the results of the evaluation and give a few words of encouragement to all the trainees. Distribute the certificates to the trainees along with the participant kits. If some senior official or dignitary is present request him to distribute the material and say a few words of encouragement to each trainee. Say good bye to trainee and close the training programme.</i>





## **RECOMMENDED LIST OF MATERIALS IN THE CARETAKERS' KIT**

1. *Bag, notebook and pen.*
2. *Booklet with only the visuals /sketches in the flipchart visual aid.*
3. *Caretakers' spanners.*
4. *Flipbook on safe water and sanitation (developed as a part of the NDWM package) in the regional language.*
5. *Booklets "Reaching out" on modes of communication and process of communication in the regional language.*
6. *Set of six pamphlets on sanitation in regional language.*
7. *Set of 8 posters on handpumps in regional language.*
8. *Set of three buntings from the NDWM package.*





