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COMMUNITY-BASED OPERATION AND MAINTENANCE  
OF RURAL WATER SUPPLIES : TOWARDS INCREASED  
COMMUNITY PARTICIPATION

Prepared by:  
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ZOMBA

July, 1990

UNIVERSITY OF MALAWI

# CENTRE FOR SOCIAL RESEARCH

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24 July 1990

The Secretary for Works,  
Private Bag 390,  
Capital City,  
LILONGWE 3.

(Attn: The Water Engineer-in-Chief) *Mr. Chaya*

Dear Sir,

Please find enclosed a draft of the final report on Community-Based Operation and Maintenance of Rural Water Supplies.

I am sending you the draft for your comments before producing a final copy. I would appreciate it very much if I can have your comments within the next two weeks before I embark on other major projects. Should you wish that we discuss this draft, please contact me so that we can arrange for the date and venue.

Looking forward to hearing from you.

Yours faithfully,



Louis A.H. Msukwa  
DIRECTOR

c.c.: Mr. M. Nyirongo, USAID

Encl.

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## I. EXECUTIVE SUMMARY

This report outlines the current organisation for Operation and Maintenance of rural water supplies, both ground and piped water. the problems faced and provides recommendations for the introduction of a community-based O&M that is sustainable.

MalaWi has a high reputation in the way it has involved the communities not only in the construction but also the maintenance of rural piped water schemes. The recent World Bank Report, "Sub-Saharan Africa: from Crisis to Sustainable growth" gives this as one example where community involvement has led to one of the most successful and sustainable water programmes in Africa. However, this image is in danger of being destroyed as more and more water schemes fall into a state of disrepair. The causes for this are many and varied but most important are:

1. Ineffectiveness of community institutions that have been charged with the responsibility of Operation and Maintenance. Committees have become inactive and efforts to reactivate them have been inadequate.
2. A weak and ineffective back-up system to support the community institutions in terms of skills, tools, equipment and spare parts.
3. Inappropriate technology like use of asbestos cement pipes where these are not suitable.
4. Poor design of some projects which have rendered large parts of some projects being inoperative.
5. Lack of clear definition of responsibilities between

Government and the community.

6. Inappropriate monitoring system that has not been able to utilise the information being collected for the management of the programme.

With groundwater schemes and where community structures have been created for O&M, the problems that affect the piped water also apply to these. In addition the implementation of the national borehole programme has not been conducive to community participation. As a result, the community sees them as Government projects and do not feel responsible for their maintenance.

In spite of these problems, we feel that community-based operation and maintenance is the only way of ensuring sustainable rural water supplies. What is even more encouraging is that the community are willing to play a greater part in O&M. What is required is to strengthen what is already in place and introduce appropriate incentives for community volunteers. We also feel that a strong intersectoral collaboration would help to remove some of the weakness identified. Local development institutions like Area Action Committees and District Development Committees must, in future, be more involved in the water schemes if community institutions are to be properly monitored and nurtured.

Based on what we have gathered through the baseline survey for groundwater and the series of workshops for piped water, we are proposing the establishment of community-based funds for operation and maintenance. We do realise that implementation of recommendations in this report is going to be costly and time consuming in the short term but it has to be done to have sustainable operation and maintenance systems in future.

## II. BACKGROUND TO THE STUDY

### 2.1 Introduction

In October 1988, the Centre for Social Research of the University of Malaŵi received a request from the Water Department for "a study aiming at determining whether or not further responsibility of operation and maintenance of water schemes should be devolved to the beneficiaries". The Department also requested the Centre to also "examine the reaction of the community to individual connections". This study, it was stated, would be a follow up to the report "Institution Building for the Maintenance of Rural Piped Water Schemes" written by the Centre for Social Research in 1986.

Initially, the study was only to involve the gravity-fed piped water schemes. However, following a number of discussions between the Water Department and various donor agencies interested in the subject, first the World Bank then the Danish International Development Agency (DANIDA) and finally the United States Agency for International Development (USAID), it was decided to include all rural water supplies. As a result of so many bodies showing interest in the subject, there was a considerable delay in having the project started and the terms of reference were changed more than once. The actual study commenced towards the end of 1989.

### 2.2 Objectives of the Study

The objectives of the study were finally outlined in the terms of reference worked out between the Water Department and a DANIDA Consultant and further elaborated by the Centre for Social Research in its final study proposal presented to the Water Department in August 1989. Thus the overall objective of the study was stated as "to arrive at an efficient system of community-based maintenance, with proper definition of responsibilities and backstopping



provided by Government, that will be sustainable". More specifically, the objectives and scope of the study were outlined as follows:

1. Analyse existing information and studies already undertaken in this field. Design and carry out a suitable programme of field work to supplement existing information on both piped and groundwater schemes.
2. Report on the degree to which communities with access to improved water sources continue to use traditional water sources. Comment on whether user cash contributions to maintenance would make it more or less likely that the improved sources would be used.
3. Report on how communities in different situations perceive their and Government's role in water supply programme, particularly in respect of on-going maintenance of piped schemes and hand pumps. Comment in particular, on the extent to which the Livulezi experience might be replicable and sustainable in groundwater schemes elsewhere in the country. In the light of these investigations, assess the willingness of the rural population to contribute in cash and in terms of labour towards (a) recurrent planned maintenance, (b) break-down repairs and (c) rehabilitation costs of ageing schemes.
4. Taking into account the social structure within rural communities, make proposals on the method of collection of funds and responsibility of control. In this regard, special attention should be given to collection mechanisms which incorporate a clearly identification link between the community contribution and the maintenance of the facility and which allow for control of the funds by the communities themselves.

5. Report on the ability of the rural population to contribute in cash to maintenance and/or rehabilitation and recommend the level of contribution which could be asked or proposed to the villager for payment.
6. Comment on the potential for schemes to include an element whereby water can be used for a range of productive purposes, thereby generating an income out of which payments for improved water supplies could be made.
7. In the case of piped schemes, report on the financial implications and the acceptability to the communities involved of allowing private connections. Make a recommendation on whether the current negative policy on private connections should be changed.
8. Taking into account recent experience and the likely capacity of Government institutions, including the proposed RWS Community Management Support Unit, make proposals on what type of overall management system should be adopted for maintenance of piped and groundwater schemes, from central Government to the communities themselves. Comment on the roles of different Government Ministries involved (Water Department, District Councils, Community Services, Health).
9. Based on discussions with all concerned ministries and authorities, propose the immediate steps which should be taken for the introduction of the policy.
10. Recommend a phased programme for extending the policy to cover all existing rural gravity fed piped schemes and rural groundwater projects.
11. Make a rough estimate of the financial implications of the phased programme for Government's recurrent budget,

quantifying both the costs of the proposed management system and the anticipated revenue from the user charges.

### 2.3 Methodology of the study

Given the complexity of the terms of reference and the various questions that had to be tackled, a number of techniques had to be employed. The Principal Investigator felt that in as far as piped water schemes were concerned, adequate community-based information was available to be able to answer most questions raised in the terms of reference. This information was available in various studies undertaken by the Centre for Social Research, USAID Missions, Visiting Research Fellows and the Water Department itself. Through these reports, we have a fair understanding of the current organisation for operation and maintenance, problems and weaknesses faced and some insight as to the causes of the problems.

For piped water schemes, it was decided to use the workshop approach as a means of involving the community in finding solutions to the problems they face. Four districts, with a high concentration of piped water schemes were purposively selected for the holding of the workshops. A total of 12 workshops were organised and held. In each of the four districts of Mulanje, Machinga, Ntcheu and Karonga, three workshops were organised, two at project and one at district level.

Participants to the project level workshops were members of water committees at various levels, traditional and party leaders, councillors and government officials from the Ministries of Health, Community Services and the Water Department. Participants at district level workshops were all members of the District Development Committee plus representatives from each project level workshop. In all, a total of 340 people took part in the workshops, 213 participants at project level and 127 participants at district level.

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4. Taking into account the social structure within rural communities, make proposals on the method of collection of funds and responsibility of control. In this regard, special attention should be given to collection mechanisms which incorporate a clearly identification link between the community contribution and the maintenance of the facility

parts B and C, reports were issued by the Centre for Social Research in June, 1990 as working papers 1 and 2 respectively.

In this report, we only provide summaries of working papers 1 and 2 and have extracted relevant information from the Gearheart report. The three documents contain some useful details and we strongly recommend that the Water Department should use these documents as reference materials when considering the implementation of recommendations outlined in this report. While every effort has been made to make this report as short as possible, we included as much information as possible so that readers who have had no access to the three documents can understand what the arguments are.

The rest of the report has been presented in four sections. The first section III is a summary of the groundwater baseline survey report while in section IV we provide summary of the workshop reports and our analysis. A financial analysis of O&M for piped water is presented in section V and a proposed O&M system is presented in the final section.

### III. SUMMARY OF THE BASELINE SURVEY REPORT FOR GROUNDWATER

#### 3.1 Introduction

The baseline survey was carried out in November/December 1989 on ground water supplies. The aim of the survey was to collect information to be able to:

- (a) Determine the socio-economic status of the population served by groundwater supplies;
- (b) Determine the extent to which communities with access to groundwater continue to use traditional sources and the reasons for this; *1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.*
- (c) Establish current organisation for operation and maintenance and assess its effectiveness;
- (d) Report on how communities served through different groundwater projects, boreholes and shallow wells, perceive their and government's role in water programmes, particularly with reference to on-going maintenance;
- (e) Make a comparative analysis on the willingness of the rural communities in different situations to contribute in cash or kind towards on-going operation and maintenance;
- (f) Assess the possibility of having a community-based O&M for groundwater similar to that under consideration for the rural piped water schemes.

The survey was undertaken in four districts, Karonga, Lilongwe, Ntcheu and Machinga. It covered four different groundwater programmes, the Karonga Integrated Groundwater Project, the Wells

Programme, the Livulezi Integrated Groundwater Project and the National Borehole Programme.

The detailed analysis of this survey was presented in June in working paper No. 1. We will not attempt to present the detailed findings here but will provide a summary of the major findings. Each of the four programmes covered is described in some detail in the working paper pages 9-13.

### 3.2 Socio-Economic Characteristics of Population

The socio-economic status of people interviewed during the survey is similar to the rest of the rural population in Malaŵi. Most of them, 62.4% are subsistence farmers. As will be observed from table 3.1, there are important differences between districts. The proportion of subsistence farmers ranges from a low of 36.5% in Karonga to a high of 73% in Ntcheu. In all areas, the most important crop grown is maize. Nearly 50% of household heads are illiterate.

Table 3.1: Occupation of HH head by district

<u>Occupation</u>	<u>Karonga</u>	<u>Lilongwe</u>	<u>Ntcheu</u>	<u>Machinga</u>	<u>Total</u>
Subsis. Farmer	36.5	70.5	73.0	68.7	62.4
Other Farmer	43.0	21.5	3.2	8.2	18.5
Fisherman	1.5	-	-	1.0	0.6
Business Person	2.0	1.0	2.3	5.6	2.7
Employee	14.0	5.5	12.6	11.1	10.9
Other	1.5	1.0	2.7	2.5	2.0
None	1.5	0.5	6.4	3.0	2.9

Average household annual cash income for the survey population was K400 which works out to about K82 per capita. There is a wide variation in the average household cash income ranging from K327 in Machinga to nearly K700 in Karonga. We provide the details in table 3.2 below. The higher cash income in Karonga can be

Individual reports have been produced for each of the three parts. Prof. Robert A. Gearheart released a draft report in February and a final report in June, 1990 "Community-based Maintenance and Cost Recovery of Piped Rural Water Schemes in MalaWi". Unfortunately, due to the limited time that the consultant had, the analysis did not cover groundwater. For parts B and C, reports were issued by the Centre for Social Research in June, 1990 as working papers 1 and 2 respectively.

In this report, we only provide summaries of working papers 1 and 2 and have extracted relevant information from the Gearheart report. The three documents contain some useful details and we strongly recommend that the Water Department should use these documents as reference materials when considering the implementation of recommendations outlined in this report. While every effort has been made to make this report as short as possible, we included as much information as possible so that readers who have had no access to the three documents can understand what the arguments are.

The rest of the report has been presented in four sections. The first section III is a summary of the groundwater baseline survey report while in section IV we provide summary of the workshop reports and our analysis. A financial analysis of O&M for piped water is presented in section V and a proposed O&M system is presented in the final section.



### 3.4 The Role of the Community in the Provision and Maintenance of Groundwater

The survey revealed that in the national borehole programme, the community's role is very minimal. Although most requests for a borehole would originate from the local leaders, the survey and drilling of the borehole is done by professional teams. In some cases, members of the community are requested to provide materials required by the drilling teams. Almost 94% of interviewees in Machinga said the borehole was provided by the Government.

One of the requirements for boreholes is that an apron and proper drainage must be provided by the community. None of the boreholes visited in Machinga district had an apron nor a drain. During maintenance, the community hardly plays any role since all maintenance is carried out through a network of Government maintenance units.

The situation is different with the boreholes in the Integrated groundwater projects. In Karonga, for example, 42% of the respondents said that the water point was provided by both Government and the community. The Karonga Project has tried to involve the community at every stage of the project development, siting, actual drilling, where hand drilling was done, provision of materials, etc. The situation with the Livulezi Integrated Water Project is different where all respondents said the government provided the water point (95.4%) or did not know (4.6%). In both places, a significant proportion of respondents, 84.5% for Karonga and 82.4% for Ntcheu said they did play some role during construction compared to only 53% in Machinga. Their contribution was in the form of materials, labour and actual drilling, in the case of Karonga or digging wells in Ntcheu.

Almost all the boreholes and wells within the Integrated projects have been provided with aprons and drainage. More than 98% of

respondents in Ntcheu said these were provided by Government while only 17% said so in Karonga. The majority of respondents in Karonga (82.5%) said aprons were jointly provided by the Government and community compared to only 1.4% in Ntcheu.

Unlike with the National Borehole Programme, community institutions have been created for operation and maintenance in Integrated Projects. In Karonga, three structures are in place, the village health and water committees, the pump committees and village caretakers. The project staff provide the required technical back-up to these institutions. It is anticipated that most of the maintenance work will be handed over to these institutions when the development period for this project comes to an end in December 1990. However, to date the community does not contribute any cash towards the cost of spares. Being a new project, all committees were found to be fairly active.

The Livulezi project has been divided into two sections each manned by a Water Department Maintenance Assistant. These are assisted by the water committees and the pump caretakers. The caretakers are supposed to undertake simple pump maintenance but most of them, including water committee members are no longer active.

Community participation during the construction of wells is very high. Over 86% of the respondents said the wells were dug by the community compared to only 1% and 0.5% for Karonga and Ntcheu respectively. Most wells under the wells programme were either dug by individual families or by village communities with Government providing technical assistance and materials such as cement and pump. The highest proportion of respondents, 85.2% said the apron was provided by community with the assistance of Government.

For the maintenance of wells in the Lilongwe North East Project, the organisation is similar to the one observed for Karonga Integrated Project. There are Village Water Committees, Pump

Committees and Caretakers. Most of these committees, however, stopped functioning sometime back especially where the wells have been out of order for a long period. Out of 20 wells sampled, 16 were not functioning at the time of the survey.

General community perception concerning ownership of the water facilities varies depending on the degree of their involvement. For boreholes on the National Programme, the general feeling is that these belong to the Government and Government should maintain them. This feeling is also strong in the Livulezi Integrated Project. The situation is different with Karonga and Lilongwe where most respondents feel the Water Supply is theirs and should Government fail to provide funds for maintenance the community would try to maintain them.

Table 3.3: What would happen if Government stopped support for maintenance of borehole/well (percentage of respondents)

	<u>Karonga</u>	<u>Lilongwe</u>	<u>Ntcheu</u>	<u>Machinga</u>	<u>Total</u>
System would					
breakdown	15.4	29.9	82.9	83.8	53.8
Community would					
maintain	61.5	49.2	4.5	5.6	29.5
Other agency would					
take over	0.5	-	8.6	1.0	2.7
Ask Gov't. not to					
pull out	6.2	9.1	3.2	4.0	5.5
Other	-	1.0	0.9	1.0	0.5
Don't know	16.4	10.7	-	4.5	7.7

Source: Working Paper No. 1, p.38

### 3.5 Community Willingness to contribute towards O&M

The next question we were asked to answer through the survey is "to what extent are communities willing to contribute in cash and/or kind towards on-going operation and maintenance". As has been demonstrated by data in table 3.3 above and the analysis provided in section 3.4, it is clear that a high proportion of respondents in Karonga and Lilongwe are willing and to certain degree contribute towards O&M. However, this does not mean people in other situations would not be willing. What table 3.3 above says is that the majority of people on the National Borehole Programme and Livulezi Project feel the system cannot be sustained without the Government's input.

We asked respondents a different question "would you be willing to contribute cash towards the maintenance of the borehole/well"? The answer is an overwhelming "yes" as can be seen from table 3.4 below. Ironically, the highest proportion of people answering "yes" was in Machinga which has the least community participation under current arrangements. One local leader in Karonga answered the question by asking whether the interviewer had a telephone in his home and when he received a positive response, the local leader went on "if you people are willing to pay for having telephones in your houses which contribute nothing to your life, why shouldn't we be willing to pay for water which is crucial for our very existence".

Table 3.4: Percentage of respondents willing to contribute cash for O&M

Karonga	90.0
Lilongwe	94.5
Ntcheu	94.1
Machinga	96.5

As has been demonstrated through piped water schemes, communities are willing to play a role in the provision of potable water. If it is possible with piped water, why should it not be possible with groundwater if the quality of water provided is the same. What is required for this to take place is proper community organisation and an effective mechanism for the support and nurturing of these organisations.

### 3.6 Towards Community-Based O&M for Groundwater Systems

From the discussions above it should now be clear that we think a community-based O&M similar to the one under piped water is possible in groundwater systems. It should be noted from the outset that even in the piped water schemes, as will be seen in Chapter IV of this report, things are not working very well. The system has been operational for over 22 years in piped water schemes and the lessons learned from these long experiences should make it possible to come up with a sustainable system for groundwater that will capitalise on the positive aspects of piped water. For this to happen, there must be adequate resource allocated for organising and educating communities, a change in the way some groundwater schemes are implemented and a genuine commitment to the principle of community participation as a means of bringing about true community development rather than just as a means of doing things more cheaply.

Efforts to bring about community O&M will differ from programme to programme. The required structure for community-based O&M is already in place in the Integrated Water Projects. What is required is to build on these structures and strengthen them. What must be done in these areas is the same as what is required in piped water schemes and we leave this for discussion in Chapter VI of this report. We have however, proposed the creation of block Health and Water Committees in Karonga and Section Committees for Lilongwe North East and Livulezi Projects. We have also

recommended that if communities are expected to play a major role in the actual repair work of the boreholes and wells, then an appropriate type of pump must be introduced, particularly in the Livulezi project.

The situation is not as easy where the National Borehole programme is concerned. Not only are there no similar community institutions created for O&M but also the boreholes are scattered and the technology used is not very conducive to community participation. Thus establishment of community-based operation and maintenance for these boreholes is going to be more expensive and is going to take a longer time.

On community institutions, efforts should be made to have village health and water committees set up. Each borehole should have a borehole committee with an appropriate number of people trained to do simple maintenance.

If the proposed national borehole rehabilitation is going to go ahead, it will provide the best opportunity for correcting the mistake of not involving the community. Meetings should be held with members of the community at which the programme of rehabilitation is going to be introduced and role of community during the rehabilitation and subsequent O&M explained.

A list of recommendations made for the establishment of O&M for groundwater is given in appendix A.

#### IV. REPORT OF THE PROJECT AND DISTRICT LEVEL WORKSHOPS ON O&M OF PIPED WATER SCHEMES

##### 4.1 Introduction

The discussions during the workshops centred around three broad questions: What is the current Organisation for Operation and Maintenance of rural piped water schemes?; How well are the schemes maintained or what problems are being experienced now?; and what should be done and by whom to have a sustainable operation and maintenance system? These questions stimulated lively discussions in all the workshops.

The design of the project level workshops was such that participants spent the whole morning, from 9:00 hrs to 13:00 hrs discussing the first two questions above. After introductions by officials from the Water Department and the Centre for Social Research, participants would go into their respective project groups to discuss current organisation for O&M problems faced and why they faced these problems. Each group then presented its findings to a plenary meeting. These presentations were then followed by general discussions.

In the afternoon, participants at project level workshops would be divided into mixed groups to discuss the third broad question "What should be done to have a sustainable operation and maintenance system for rural piped water schemes?" The group discussions were followed by presentation to a plenary meeting before general discussions.

The design for the district level workshop was slightly different. Each district workshop lasted four hours. After introducing the objective of the workshop, a summary report of the project level workshops was presented followed by general discussions on the

report. Then participants would be divided into groups to discuss the following questions:

1. How well do participants think the projects are working?
2. What has the District Development Committee done in the past to help communities with the maintenance of water supplies?
3. What should the official status (powers) of water committees be so as to make them more effective?
4. How could water committees be linked to the D.D.C.?
5. What future role could the D.D.C. play in supporting a community-based operation and maintenance?

Each group would then present the results of their discussions to a plenary meeting which was followed by general discussions.

#### 4.2 Current Organisation for Operation and Maintenance

There are two major participants in the organisation for operation and maintenance, the Malaŵi Government through its monitoring staff and the community through various community institutions. At the very beginning it was thought that piped water schemes could mostly be maintained by the people themselves with little government involvement. It soon became clear that Government would have to provide a strong back-up system if the water schemes had to be properly maintained and introduced monitoring assistants in 1980.

At the community level, the most important institutions for O&M are the Main Committees, the Repair Teams and the Tap Committees. Although not all projects have repair teams, nearly all have had, at one time or the other a main committee and tap committees. Over



the years, other institutions have evolved in many projects. Several projects have got caretakers and in some projects, Area Action Committees have become involved in the O&M of piped water schemes.

Although not written down, there is a division of responsibility between the government monitoring assistants and community institutions. How well each of these institutions is working is one of the questions discussed during the workshops. What follows below is a brief description of the performance of each of the organisations as revealed through the workshops.

#### 4.2.1 The Main Committees

The Main Committee is mostly composed of 10 members, Chairman, Secretary, Treasurer and their vices plus four committee members. In one of the projects in Machinga, the Traditional Authority is coopted into the committee as an advisor.

The duties and responsibilities of main committees vary from project to project depending on how active the committee is, the performance of the project, the specific structure of operation and maintenance, etc. Generally, the duties of main include:

1. To supervise the activities of Repair Teams and Tap Committees and ensure these organisations are functioning properly;
2. To inspect the pipeline and report any major problems to the monitoring assistant/water operator or ask the Repair Team to take necessary action where it is judged the latter could do the work;
3. To organise fund raising for the paying of the caretaker;
4. To employ and supervise project caretakers;

5. To consider requests for additional taps and pass these requests to the Water Department officials;
6. To report to the Area Action Committee on the functioning of the water project and seek assistance of the AAC where necessary (only in some projects);
7. To organise people for self-help labour whenever this is required;
8. In some projects, members of the main committee carry out the actual maintenance work;
9. To receive visitors to the project.

#### 4.2.2 Repair Teams

Unlike Main Committees, Repair Teams are a most recent introduction to the O&M of rural water supplies. Not all projects have repair teams. Although most of the projects that do not have repair teams are small and old, some large and more recent projects, like Kawinga and Lichenya have no repair teams. In some projects members of the main committee are trained to undertake repair work.

Officially, repair teams are the technical arm of the main committees. However, due to the fact that in some projects, members of the main committee do the repair works and in other projects, main committees are inactive, some of the responsibilities of the repair teams are similar to those of the main committees. In some projects, like Iponga, they have only one team whose membership ranges from two to over 10, while in others, mostly large projects, each branch line may have its own repair team. In a number of projects, it was reported that repair team members work individually rather than as a team or committee, e.g. Phalombe project.

Generally the duties of repair team members have been outlined as follows:

1. To inspect the pipeline and carry out repair work when necessary;
2. Report major problems to monitoring assistants/water operators;
3. Deal with requests for additional taps;
4. Clean the intake where there are no caretakers employed.

#### 4.2.3 Tap Committees

Except in one project, Ighembe, all project groups that took part in the workshops reported the existence, at one time or the other, of tap committees. In the Ighembe project, the person whose house was nearest to the stand pipe took up the responsibility of tap committees. Tap Committees, where they exist and are active have the following responsibilities:

1. To check that the tap site is always clean;
2. To organise work for clearing the tap site and cleaning the soak-pit whenever necessary;
3. To charge people who deliberately break the tap;
4. To raise money for the replacement of worn out or stolen tap heads and buying of cement to repair broken aprons;
5. Settling disputes that may arise at the tap;
6. To repair breakages at the tap - tap head or broken apron.

The number of members on each tap committee varies from three to ten. While most members of the Main Committee and Repair Teams are men, tap committees are in most cases all women.

#### 4.2.4 The Caretakers

Originally, the work for cleaning the project intakes was the responsibility of the Main Committee. From time to time villages would be asked to go and clean the intake in turns. However, this practice was found unpracticable for large projects where the furthest village may be more than 20 kms from the intake. For this reason, many projects either employed full-time caretakers or appointed individuals to work as caretakers and gave them some honoraria.

The current situation is that some projects have no caretakers and intakes are cleaned by the whole community in turns while others have two full-time caretakers. Lufira, Liwonde and Chagwa projects, for example, have two caretakers each being paid K10 each per month for Lufira and respectively K15 and K18 each per month for Liwonde and Chagwa. The rest of the projects in Karonga pay their caretakers K5 per month. In Ntcheu, only two projects, Nanyangu and Ntonda have caretakers who are respectively paid K10 and K15 per month. Seven of the 10 projects covered in Mulanje, Mulanje West, Lichenya, Chilinga, Sombani, Migowi, Chambe and Phalombe have caretakers. Their pay ranges from K7.50 in Chilinga to K45/month for Lichenya and K2.40 per each day worked in Mulanje West.

The situation is that all projects in Karonga reported having a caretaker, two out of eight projects in Ntcheu had one each, three out of six projects in Machinga had at least one caretaker each and seven out of ten in Mulanje had a caretaker each. This means of the 28 projects that took part in the workshops, 11 had no caretakers. Where they had caretakers, their responsibilities were

outlined as follows:

1. To clean the in-take and screening tank;
2. Repair minor breakages at the intake; and
3. Keep spares and tools used by repair teams (only in 2 projects).

#### 4.2.5 The Role of Area Action Committees

The Area Action Committee is responsible for the coordination of all development self-help activities at the Traditional Authority (T.A.) level. Above each AAC is the District Development Committee and below it is the Village Action Committee. All AACs were in one way or the other, involved in the water projects during the construction stage. However, involvement of AACs during maintenance has varied from area to area and project to project.

At one extreme, there are situations where the AAC has virtually done nothing in as far as O&M of piped water schemes are concerned. At the other end you get situations where the AAC has not only ensured that water committees are functioning by having them report at AAC meetings on the functioning of water projects but also, the AAC pays the caretakers. In some projects, especially in Karonga, members of the Repair Teams have been exempted from participating in all other self-help projects in the area so that they concentrate on water schemes. Between these extremes, there are various degrees of AAC involvement.

The degree to which an AAC gets involved in a project depends on a number of factors. Where the AAC itself is active, the water affairs are often discussed at its meetings and when it has become obvious that water committees have serious problems, the AAC has

intervened. In some cases, the leadership of the AAC is the same as that of the water committees e.g. Chairman of Sub-AAC at Iponga is also Chairman of the Main Water Project Committee. In some situations, the AAC itself is inactive and its involvement in the affairs of water projects has therefore been minimal or non-existence.

Related to the role of the AACs is what the District Development Committees have done to assist in the O&M of rural water supplies. In all the four districts, members of the D.D.C.s clearly stated that their involvement during the maintenance phase of rural water schemes has been minimal. In Mulanje district, members have raised questions in the D.D.C. on water and these questions have been directed at the water supervisor. Questions have been centred on what is the Water Department doing about this or that problem and the answer appears to have been the problem will be passed on to higher authorities in the Water Department.

It became clear during the district workshops that D.D.C.s did not know about most of the problems that came out of the project level workshops. More importantly, D.D.C.s said they did not know whether they had any role in completed projects and if so what their role was. As a result none of the problems concerning water were seen as a responsibility of the D.D..C.

Below is a sample of statements made at district level workshops to illustrate the point above:

"In the past, the D.D.C. has not involved itself with water projects after completion. We never discussed any of the problems outlined. Everything has been left to water committees and we thought things were OK all through"  
(Machinga).

"Most complaints that are discussed at D.D.C. meetings are

related to water supply. The Water Supply Supervisor is always invited to attend D.D.C. meetings where he gives reports. The D.D.C. only hears these reports and does not suggest any solutions nor take any action. We have always assumed these problems are passed on to higher authorities in the Water Department for appropriate action" (Mulanje).

"During construction, the D.D.C. through AACs was heavily involved in the water projects. However, after completion there has been a break in the relationship between D.D.C. and water committees. Most of the problems we heard to-day are not known to the D.D.C." (Ntcheu).

"After completion of construction, D.D.C. has done nothing to help the water committees. Even AACs are not clear on what their exact role is in the water projects" (Karonga).

#### 4.3 The Performance of and Problems faced by Community Institutions

Only in one project were existing community institutions said to have been functioning well by the workshop participants. These were from the Muloza Crater Project. The rest of the committees reported serious problems.

The best way of describing the state of various community organisations that were created to manage the O&M system of rural piped water schemes is "institutional decay". The problems that have led to this decay have been made known to the water authorities through such reports as the 1980 CSC Evaluation Report, the 1981 report by the Centre for Social Research "Water by the People" and the more recent, 1986 report by CSR "Institution Building for the Maintenance of Rural Piped Water Schemes".

Most of the Main Committees were elected at the beginning of

construction work or immediately after completion of construction work. Several members have dropped out, died or left the area altogether and not been replaced. It is not uncommon to find the original 10 member committees having been reduced to one or two members still active.

For example Liwonde project reported only 3 to 4 members being active out of the original 11; Main Committees for Nanyangu and Kalitsiro ceased operating some years back; only 3 of the original 10 members of the Chambe project Main Committee are active; and only one member, the Chairman of Iponga project is active. These examples are given to illustrate the point that the problem of dying committees is almost everywhere.

The story is not different with the other committees, tap committees and Repair Teams. Most tap committees in the Chambe project are said to have died; all people who had been selected as repair team members for Chambe and Lichenya projects have ceased to operate as repair team members; out of the four repair teams trained for Kalitsiro, only one is operating; out of the original 16 repair team members trained for Lufira, only 4 remain active.

These and numerous other examples are a clear indication that community institutions created for the purpose of O&M of rural water supplies are becoming extinct. No wonder that very few of the committees hold regular meetings. The big question is, why are committees dying? Results from previous surveys and information collected from the workshops reveal the problems are many and for most of them the Water Department is responsible.

There are four major reasons which have led to or contributed to the current situation. The first is that some committees were elected 15 or more years ago. Obviously, some members have died, others may have left the area and others just got fed-up with the work and became inactive. As remarked by participants at one of



the workshops "Once elected these people become like village chiefs who stay on until they die". We made similar observations in 1986 "The greatest weakness of the current system is that there is no fixed number of years each committee is required to serve. The decision whether to hold another election or not is left to the individual monitoring staff or to the AAC" (p.39). From that observation, we made the following recommendation No. 6:

"Each committee should serve for a fixed period, say 3 to 4 years, after which fresh elections should be held .... Elections for main committees must be organised by AAC while that of tap committees by the Main Committee" (p.56).

These recommendations were made exactly four years ago but apparently, no action has been taken. It should always be kept in mind that these people work as volunteers and it should not be assumed that if they show interest in their work during the 1st year they will always remain interested.

The second reason for the current problems is related to the way each project is functioning. One of the major projects in Mulanje, Namitambo, did not send any participant to the workshop. Further investigations revealed that those chosen to attend the workshop did not turn up because they considered it would be a waste of time as their project, has for the past several years, not been functioning. Taps that stopped providing water some time back have no tap committees and likewise, main committees of problematic projects have either completely died or been reduced to a few members.

A lot of the problems of committees that were reported from Phalombe, Kawinga, Chambe, Nanyangu and Lufira projects have to do with the technical performance of these projects. It is only natural that members of a committee coming from a section of the project that has no water stop being active in whatever committee

they are serving. Again, in 1986, we observed that committees in technically problematic projects were ineffective and became inactive as soon as they realised their project was not giving water and the fault was beyond the committee's technical competence. An example of Sombani project was given.

The third problem is that none of the community institutions have been given clear terms of reference. Participants at all the four district level workshops saw this as one of the greatest weaknesses. Again in our 1981 and 1986, we did point out at these weaknesses and recommended that responsibilities of each community institution be clearly spelt out.

Lack of training for committee members at all levels is the fourth major problem area. This problem was mentioned at every workshop. While members of repair teams are given some training, members of other community organisations are given none at all. This aspect was a major theme in the 1986 and we do not wish to repeat the justification for this here. We must, however, repeat that the few hours training given to members of repair teams is inadequate if they have to form the backbone of a sustainable system of operation and maintenance. It seems that the Department thinks you can train these people once and forget about it. This is a myth that must be dispelled. A continuous programme of training and retraining is a must not only for committee members but also the Department's field staff.

Training will not only make members of various committees more effective but it will also boost their morale to work as volunteers. At the moment, there is a general feeling that committees have been abandoned.

Other problems mentioned include lack of cooperation from members of the community, members being discouraged by others who do not see the reason why they work on the projects without pay and in a

few cases, inadequate material support e.g. protective clothing for caretakers.

In short, the major problems as identified through the workshops are:

1. Dwindling committee membership as a result of failure to hold regular elections;
2. Most committees do not hold any meetings;
3. Inadequate skills for both committee and repair team members;
4. Lack of a clear definition of the responsibilities of the various committees;
5. Lack of commitment on the part of some members of the community.

#### 4.4 The Department of Water

This study did not focus very much on the organisation of O&M of the Water Department. In looking at the functioning of community institutions, participants at the workshops often linked the problems these institutions face to the Water Department and more particularly to its monitoring personnel.

The Operation and Maintenance of Piped Water Schemes is done through 4 Monitoring Supervisors and 36 Monitoring Assistants or water operators as they are called in some areas. A fifth supervisor, based at Chitipa is also involved in construction work of new projects. Thus on average, each supervisor is responsible for almost 14 schemes and 2,064 taps. The monitoring assistants, on average, cover 1.5 schemes and 229 taps of the 55 completed

projects.

The workload of both supervisors and monitoring assistants is by no means equally distributed. The table below shows that while 1 monitoring assistant in the North and Centre was responsible for more than 2 projects, there was at least one monitoring assistant per project in the South. On the other hand, the number of taps per monitoring assistant ranges from 196 in the North to over 300 in the Mulanje area.

Table 4.1: Distribution of Monitoring Assistants by Region

<u>Region/ Area</u>	<u>Monitoring Assistants</u>	<u>Total No. Completed Projects</u>	<u>Total No. of Taps</u>	<u>Projects/ MA</u>	<u>Av.No.of Taps/MA</u>
North	8	19	1,571	2.4	196
Central	5	11	1,091	2.2	218
South(Zomba)	14	13	2,864	0.9	205
Mulanje	9	12	2,709	1.3	301
<u>Total</u>	<u>36</u>	<u>55</u>	<u>8,235</u>	<u>1.5</u>	<u>229</u>

The monitoring assistants report the status of the scheme, cost of materials and community participation are documented in a series of reporting forms. They have responsibility to ensure that the scheme meets design expectations in making available the highest quality of water on a regular and uninterrupted basis to the community. Thus they are the technical frontline workers of the Department.

In addition to providing technical services, monitoring assistants are supposed to collect information designed to be used by the rural water staff to improve technical and management aspects of the schemes. They do this through completion of a total of 10 reporting forms as presented in table 4.2.

Table 4.2: Operation and Maintenance Monitoring Forms

<u>Form Title</u>	<u>Information</u>
1. Tap Inspection Form	Tap Status/Committee Activity
2. Tank Inspection Form	4 times/yr/wear/repairs required
3. River and Gully Inspection Form	
4. Intake Inspection Form	Operational Status/Condition/ Repairs
5. Record of Breakage Report	Repair History/Cause
6. Record of Work by the Community	Community Participation Meetings
7. Stores Consumption on Maintenance	Stores Consumption by Item
8. Tap Request Forms	To Engineer/Excess Capacity Calcul.
9. Weekly Report	Breakages/Taps/Apron Work
10. Fortnightly Work Programme for Monitoring Assistant	MA Breakdown/Monitoring/ Superv.

The monitoring assistants pass on these reports to the Water Supervisor and the evaluation unit in Zomba. Some of the information collected on these forms is summarised by the evaluation officer but only a small fraction of the data collected is analysed. Most of these half year reports by the evaluation unit deal with monitoring assistants reporting performance, number of weekly and fortnightly reports turned on, and the PVC pipe breakage history by size of pipe and cause of breakage. Status reports of various parts of the schemes are made; intake, intake line, storage tanks, taps, aprons, etc.

As reported in the Gearheart report, the reporting system is cumbersome and ineffective in supplying critical information to the

community, to the water supervisor, to the design engineer and to the Headquarters. Monitoring Assistants are required to spend a considerable amount of their valuable time in collecting this massive information which, although potentially very useful, is not made use of. The information flow is one directional with little feed-back. The post of Evaluation Officer has remained vacant for several years now and the Water Supervisor for Zomba is currently acting Evaluation Officer. This is asking too much for a man who also supervises projects in the Southern Region with the exception of Mulanje District.

As we have seen in table 4.1 above, monitoring staff are thinly spread. They are required to cover large areas and where they cover more than one project, these are often very far apart. Thus the quality of information that is being collected through the numerous forms is questionable. The general outcry during the workshops was that the field staff were inadequate and in some cases, staying too far from project areas. In two districts, workshop participants complained that the monitoring assistants were incompetent and did not know how to handle local people. (See for example summary of workshop reports for Machinga).

Again, in our 1986 study, similar observations were made with regard to a few of the monitoring assistants. It was observed "In order to build up effective organisations for maintenance, monitoring assistants need more than technical skills. Apart from skills in working with communities and groups, they need to have good behaviour as individuals. In one or two projects, monitoring assistants may be doing more harm than good in the way they behave" (p.50).

One of the things that Prof. R.A. Gearheart, the WASH Financial Analyst Consultant, did was to ask a number of questions to the Monitoring Assistants who were attending a refresher course in Zomba on the problems that they faced and their training needs.

One of the problems frequently mentioned was that they did not have adequate supply of materials required for Operation and Maintenance. The other problem was that the area they had to cover was too vast to be effectively covered on a push bike. On training needs, apart from more technical skills, a number of them mentioned skills on how to motivate local leaders and the community.

#### 4.5 General Project Problems

In the preceding section, we have dealt with problems of community institutions as well as monitoring staff. In this section, we will present the general project problems as revealed through the workshops.

The most common problem that came up at every workshop was that of "poor design". Participants claimed that in some projects pipes were too small for the size of the population served by the project. In others, they claimed that tanks were at lower levels than some of the taps being supplied by these tanks as a result of which, most of these taps have never given water since installation. Nearly all projects covered in the workshops mentioned problems that were related to design. This, they say, has resulted in some parts of the projects not having water. For example it was reported that half of the Muloza East Project has no water; three taps of Muloza Crater project provides water only at night; a large section of the Phalombe project has no water; a full section, 17 taps of Kawinga project does not provide water; only 98 out of the 221 taps in the Nanyangu project are functional; etc.

The second problem, related to the one of design is the frequent burst of asbestos - cement pipes where these have been installed. A good example of this is the Namitambo Project which, for all purposes, is dead due to A/C pipes that burst almost everyday when water is flowing.

The third problem mentioned in every district is inadequate supply or non-availability of spare parts and tools required for maintenance by repair teams. Solvent cement, tap heads, pipes and fittings, hacksaw blades and spanners were often mentioned as supplies that were lacking. A related problem is that these tools and/or equipment are kept by monitoring staff who, as we have seen above, are far apart. Even if monitoring assistants have these in stock, committee members have to travel long distances, sometimes over 15kms, to obtain them. As a result of this, it may take several days before a member of a committee can get to the MA to obtain, say, a worn out tap head.

Another complaint that frequently came up is inadequate number of taps which leads to congestion at tap sites. They said that in some areas taps are too far apart and because of long distances, some people use unprotected sources of water. Related to this is the problem of people who took part in the construction of the project but were never supplied with piped water.

Some taps are poorly located in relation to the population or settlement pattern. There are cases where a tap is sited near an individual's house who is far away from the rest of the population that is supposed to be served by that tap or a tap sited next to a graveyard, far from people's homes.

A growing and worrying problem is vandalism and theft. In all the four districts, participants complained of people stealing steel parts of the water system for the purpose of making implements like hoes while in others tap heads and even pipes were being stolen for sale elsewhere. In others, pipes were being deliberately cut to divert water for irrigation or watering livestock or just to disrupt the flow of water. Thus there are two sides to this problem. The first involves theft, where people steal the parts so that they can make money either by selling the project parts or making implements out of the parts and selling them later on. The



second category is sheer vandalism where the flow of water is disrupted by individuals who, as it was put in one of the district workshops, feel they have been cheated.

With regard to theft, workshop participants in Machinga, Mulanje and Ntcheu, bitterly complained against the police, who they say, have not adequately assisted them in dealing with the problem. The following examples are given to illustrate the problems:

In Machinga, a man was caught with a steel pipe cut from a river crossing in one of the projects. Local leaders took the culprit together with the stolen pipe as evidence to the Police. After taking the statement, the police released the man and this was several months ago, nothing has been heard about the case nor the whereabouts of the pipes taken to police as exhibit.

In Mulanje, thieves came with a truck, loaded the truck with pipes that were meant for one of the new projects. Local Leaders followed up the case until they apprehended the culprit and found the stolen pipes. The man was taken to the Police where he was detained for a couple of days. Participants say they now see this man happily driving his truck and have not been told of what has become of the case.

In Ntcheu, traditional and MCP leaders rounded up all people making hoes in one area, collected the materials that were suspected to have been taken from public installations, including water, took these people to police together with the materials - these people were released in no time. Local leaders have not been told why these people were released and these same people are laughing at the local leaders.

Again in Ntcheu, local leaders apprehended a person who had stolen a pipe, took that person to the police but when the

local leaders returned home later that day, the man was already at home and the man sarcastically asked "where are you coming from"? Participants suggested this man was given warrants back to his home while the committee member who took the culprit to the boma had to walk back.

The deliberate cutting of pipes is believed to be done by people who are frustrated either because they themselves have no piped water, even though they took part in the construction or are in a part of the project that has stopped functioning.

Another problem reported in some projects in three of the four districts is encroachment of intake. In projects like Chilumba, Lufira, Chilobwe, Kalitsiro and Chagwa, people have either settled beyond the intake or are being allowed to cultivate or graze animals above the intake.

In Karonga, two projects mentioned disruption of water flow by the road construction company which has led to several communities having no water. Although this is a problem mentioned in only one district, it raises one fundamental question "What is the status of the water projects vis-a-vis other development programmes"? We raise the question because, in this respect, the contractors said they were not obliged to repair the system, according to the contract that they had with the Malaŵi Government.

Lastly, participants raised the issue of requests for private connections. They say that as local leaders, they are confronted with several requests for private connections.

#### 4.6 Suggested Solutions to the Problems

In order to improve the situation, participants made a number of

recommendations. These recommendations were in two parts, those directed at the Government and those directed at community institutions and the community. Participants emphasised that if all these were done, it would be possible to institute a sustainable community-based operation and maintenance.

#### 4.6.1 Recommendations to Government

1. All problematic projects should be rehabilitated before the community could be asked to play a greater role in O&M.
2. The Government should ensure that necessary spares and tools are always available. These should be kept within each project area by monitoring assistants, where they are present or by water committees.
3. The Government should provide training to members of various committees - main committees, repair teams and tap committees. This training should cover technical aspects as well as other aspects that would help make these committees more effective including committee procedures and simple accounting.
4. The Government should consider increasing the number of monitoring assistants.
5. The police should assist the community by appropriately punishing those who steal water pipes or vandalise the projects.
6. The Government should ensure that all people who have not been provided with piped water but took part in the construction of the project and were promised piped water should be given taps. Where possible, additional taps

should be installed where they are far apart or where they are too many people being served by one tap.

7. Every project must have repair teams.
8. Where there is adequate water, the Government should relax the rule against individual (private) connections. However this should only be allowed where all public taps are providing adequate water and where it is ascertained that provision of individual tap connections would not lead to parts of the project having no water.
9. The Water Department should liaise with the Forestry Department to ensure that all project catchment areas are protected against any forms of encroachment.
10. For projects which had no aprons provided, Government should provide cement to the community for the construction of aprons. \*
11. Cattle drinking troughs should be provided in project areas with high livestock population. x
12. Government should continuously monitor the quality of water in every scheme. Where water is found to be polluted, the water should be appropriately treated. *for abandoned site*
13. Government must work out the terms of reference for all water committees.

#### 4.6.2 Recommendations to Community

1. The community should continue to buy taps, at full cost and any such materials that the community can afford.

2. Every project should employ caretakers.
3. Efforts will be made by all local leaders to ensure that members of the community fully cooperate with the water committees.
4. Every project should establish a fund for community-based operation and maintenance of piped water schemes. Each project committee should open a bank account or keep the money at the Post Office Savings Bank.
5. All committees must meet regularly. The main committee should from time to time organise public meetings to discuss matters affecting the piped water schemes and any problems that they may be facing.
6. All committees should serve for a specified period of time, 3-4 years, at the end of which, fresh elections must be made.
7. Traditional leaders should not allow people to settle beyond the intake and where possible, people who have settled above the intake must be removed.
8. Members of water committees must inspect the whole pipeline regularly.
9. Members of the Repair Teams should be compensated for the work they do (by being paid honoraria) - only one workshop mentioned this.

#### 4.6.3 On the Role of D.D.C. and A.A.C.

All workshops recommended that in future, the District Development Committees and the Area Action Committees should show greater

interest in the functioning of completed water schemes and be more involved in O&M. The following recommendations were made at the project level and/or district level workshops:

1. Chairmen of the water committees should be members of the Area Action Committee to make sure that water affairs are always discussed at AAC meetings.
2. The AAC should exempt members of repair teams from all other self-help activities as an incentive to them.
3. The AAC should supervise elections of all main water committees.
4. Since the D.D.C. is the main body responsible for development activities in a district, it should play a central role in the operation and maintenance of piped water schemes.
  - Monitor the activities of all water committees through the AAC;
  - Ensure that elections of committees are held regularly;
  - Organise training for members of various water committees;
  - Help to solve problem of people settling beyond the intake;
  - Assist the community and the Police in stumping out theft and vandalism;
  - From time to time, conduct meetings with water committees;
  - Form a District Water Supply sub-committee;

## V. THE COST OF O&M FOR RURAL PIPED WATER SCHEMES

### 5.1 Cost of O&M to Government

According to Prof. Gearheart's analysis the cost of operation and maintenance born by the Government in 1989 was K1,147,430. As can be seen from table 5.1, nearly 66 percent of the expenses went to personnel costs, office costs and transport. Out of the K395,000 spent on maintenance, nearly 76 percent was spent on rehabilitation. Supplies and material costs for routine maintenance were only 8 percent of total O&M costs.

Table 5.1: 1989 MOW/Piped Rural Water Scheme - Maintenance - Expenditures (10 month actual extrapolated to 12 months)

	MK	% of total Cost
Personnel		
Posted Position	220,000	
Temporary (MA)	<u>99,544</u>	
	321,544	28.0
Personnel Support		
Leave Money	5,002	
Uniforms	40,426	
Hotel	18,104	
Subsistence	<u>29,065</u>	
	92,597	8.1
Transport		
Fuel and Lubricants	121,940	
Maintenance of Vehicles	145,388	
Public Transport	10,324	
Hiring Charges	15,123	

Reimburse/Private	<u>9,682</u>	
	302,452	26.4
Supply and Material for Maintenance of Schemes		
Rehab./Rebuild Due to Washouts (est.)	300,000	
Routine O&M Materials	<u>95,000</u>	
	395,000	34.4
Office		
Cleaning Materials	9,037	
Consumable Stores	12,349	
Stationery	13,244	
Publication	<u>1,202</u>	
	35,832	3.1
Total	1,147,430	

The above amount works out to a cost of K138 per tap per year and K0.92 per person per year. Nearly K87.00 of the average costs per tap or 63% of total is the cost of personnel and transport.

In the next table, we present a breakdown of materials and their cost for maintenance of five projects. It will be noted that the largest single item, in terms of total cost, is replacement of taps which is over 44% of total material costs. The cost of taps is shared between the Government (K16.51) and the community (K12). Thus the cost to the government for materials was K6,030.23 or K4.66 per tap for the 5 schemes.

Looking at the five schemes, the actual cost for routine operation and maintenance is quite reasonable as seen at the cost of materials. It should be noted that the cost of taps in hardware shops was about K40.00. The level of subsidy on this item is about K11 per tap. Even if this subsidy was not there the average cost



of materials per tap comes to only K6.74/year. This amount is not beyond the community to raise.

Table 5.2: Stores Consumption for 1989 - Chambe, Sombani, Kawinga, Ntonda and Ighembe Projects  
Total taps = 1,295

<u>Name of Item</u>	<u>Size</u>	<u>Qty</u>	<u>Cost/item MK</u>	<u>Total MK</u>
Solvent cement	Tins	38	15.18	576.80
Hacksaw blades	12 T.p.i	39	0.93	36.27
Cleaning fluid	500mm bottles	7	5.91	41.37
Rags	Roles	5	11.20	56.00
Gate valves	3"	1	801.72	801.72
" "	1"	5	13.18	65.90
" "	3/4	6	10.75	64.50
" "	1 1/4	1	30.46	30.46
Adaptors F/M	90mm x 3"	2	40.00	80.00
" F/M	40mm x 1 1/4"	2	9.00	18.00
" F/M	32mm x 1"	10	8.00	80.00
" F/M	25mm x 3/4"	16	7.00	112.00
" F/M	20mm x 1/2"	4	6.02	24.08
PVC Pipes	90mm	1	13.42	13.42
" "	160mm	10	62.51	625.10
" "	63mm	4	6.55	26.20
" "	40mm	3	3.00	9.00
" "	20mm	4	1.21	4.84
" "	25mm	3	1.76	5.28
" "	32mm	7	2.31	16.17
Taps	1/2"	115	28.51	3,278.65
Tap Washers	1/2"	94	0.37	34.78
Galv. steel pipes	4"	5	103.64	518.20
" " "	3"	2	72.61	145.22
" " "	3/4"	1	13.81	13.81
Air valve	3/4"	1	10.75	10.75

Tee pieces	3"	1	65.00	65.00
" " equal	75mm	1	65.00	65.00
" " "	110mm	1	82.00	82.00
Cement	Pockets	12	18.30	219.60
Plugs	1/2"	6	1.05	6.30
Sockets	1/2"	2	2.20	4.40
"	4"	2	20.00	40.00
Elbows	1/2"	2	3.01	6.02
Nipple	1/2"	1	1.29	1.29
Reducing bushes	Various	3	av.69.00	207.00
Rubber ring	160mm	1	25.00	25.00

Total material cost for 5 projects = MK7,410.23

Av. material cost per tap = MK5.72

Source: Calculated from Gearheart's draft Report:  
appendix F.

## 5.2 Cost of Operation and Maintenance to the Community

It is much more difficult to determine annual contribution to operation and maintenance by the community since most of it is in kind. Moreover the level of community effort varies from project to project depending on how active community institutions are.

In spite of this limitation, we have made an attempt to determine how much the community contributes, in money terms, to O&M and the figures are presented in table 5.3. The easiest figure to calculate was the cost to community of tap replacement. As pointed out, community contribution on tap replacement is only 42% of what the Department pays to central stores. The other item to which community's contribution is mostly in cash is the pay for caretakers. However, the amount of pay ranges from K5 per month to K45.00. For this calculation, we have used the minimum wage for rural areas.

Table 5.3: Community Contribution towards Operation and Maintenance costs (1989 Estimates)

	<u>Kwacha/Year</u>
Tap replacement (K12/tap)	
92% replacement/year (760 taps)	9,120.00
Pipe breakages 1,240 breaks/year	
at 3 hours/break	3,720.00
Caretakers (assume 60 at K41/mo)	29,520.00
Main Committee (assume each work for	
1/2 day/wk)	14,300.00
Repair Teams	34,320.00
Ta Committees (assume at least 3 active	
members/tap)	106,000.00
Total	<u>196,980.00</u>

Source: Calculated from Gearheart's draft report: appendix F.

## VI. ESTABLISHMENT OF A SUSTAINABLE O&M FOR RURAL WATER SUPPLIES

### 6.1 Summary of Current Problems

In Chapters III and IV of this report, we did present a summary of the current O&M situation as revealed through the baseline survey for groundwater and the workshops that mostly discussed the piped water schemes. In both systems, major weaknesses have been identified which must be addressed to if a sustainable O&M is to be in place. Most problems are common to both ground and piped water systems while others are specific to the type of schemes.

First the general problems:

1. Committees, where they exist, were elected on the completion of the projects and have stayed unrenewed for long periods. Some members have died others have been incapacitated while others have lost interest.
2. There has not been a clear cut division of responsibilities between the Government and the community. Committees charged with responsibility of carrying out O&M have not been given clear terms of reference.
3. The third problem is that for problematic projects - that break often and are not quickly repaired, the community has lost confidence and, more or less, given up. Committee members do not see any reason for continuing as members of the committee when they feel ineffective in ensuring sustainable water supply
4. Lack of on-going training for members of various committees is another problem. For piped water and Integrated groundwater committees some rudimentary training was provided.

However this was far inadequate. To ensure that people are adequately prepared to carry out their responsibilities, not only must training be intensive but also it must be a continuous process. It is false to believe that you can train volunteers once and forget about it.

5. The last problem is poor and ineffective back-up system. Both in groundwater and piped systems, the general complaint is inavailability of spares and tools and a thinly spread extension service that does not appear to have been prepared for the tasks they are supposed to do.

As pointed out in our 1986 report, most of these staff have no skills at all for repairing "dying" community institutions.

Problems that are specific to groundwater are:

1. Boreholes on the national programme have been implemented by either government or private contractors without involving the community. This has created an attitude of "it is a government borehole and lack of a feeling of responsibility on the part of the community.
2. The scattered nature of the boreholes make it difficult to create a hierarchy of committees as is done in piped water or integrated projects.
3. Inappropriate technology for community-based operation and maintenance that has been fitted on most boreholes. This refers to pumps that cannot be repaired without using truck mounted lifting equipment and also simple well pumps but for which spares are not available.

Problems that are only specific to piped water schemes include:

1. Poor design.
2. Growing vandalism in several schemes is creating a major problem.
3. Encroachment of the intake area.
4. Frequent bursts of asbestos cement pipes for which spares are not available.

## 6.2 Recommendation for a Sustainable O&M

### 6.2.1 Introduction

For a sustainable community-based operation and maintenance certain things or essential elements must be in place. These include:

1. Strong and effective community institutions;
2. Adequate skills must be developed among the community which will enable the community to carry out most of the maintenance work;
3. The community should have a supportive attitude towards the scheme and this will come by through the way the community is involved at every stage of the project development;
4. An effective <sup>clarity of</sup> extension services must be provided;
5. The scheme must provide a level of service acceptable to the community;
6. The technology used must be appropriate;

7. There must be adequate resource input both by the government and the community;
8. An effective supportive system and service must be provided. All that is required from outside the community, spare parts, equipment, technical expertise, etc must be provided on a timely basis;
9. Allocation of responsibilities between the government and community must be made clear at the start of the project and these must be executed in a timely fashion.

The simple prescription to the Water Department is to say "go ahead and make sure each of the above element is in place". The big question is, how do we go about putting in place the above elements within the Malaŵi context? We will in the next few pages put our views as to what we think must be done to ensure all essential elements are in place.

#### 6.2.2 Institutional Requirements for O&M

All workshops recommended that Water Committees must be structurally linked with the Area Action Committee and therefore, the District Development Committee. Thus in every district, the D.D.C., through AACs, must ensure that all institutions set up for the purpose of operation and maintenance of rural water supplies are working effectively.

The D.D.C.s and AACs should set up interministerial task forces with membership from the Ministries of Community Services, Health, Local Government, Agriculture and the Water Department. The District task force will work out a training programme for water extension workers as well as for committees at various levels. Once trained, the members of the Area task force will take upon themselves the responsibility of training water committees.

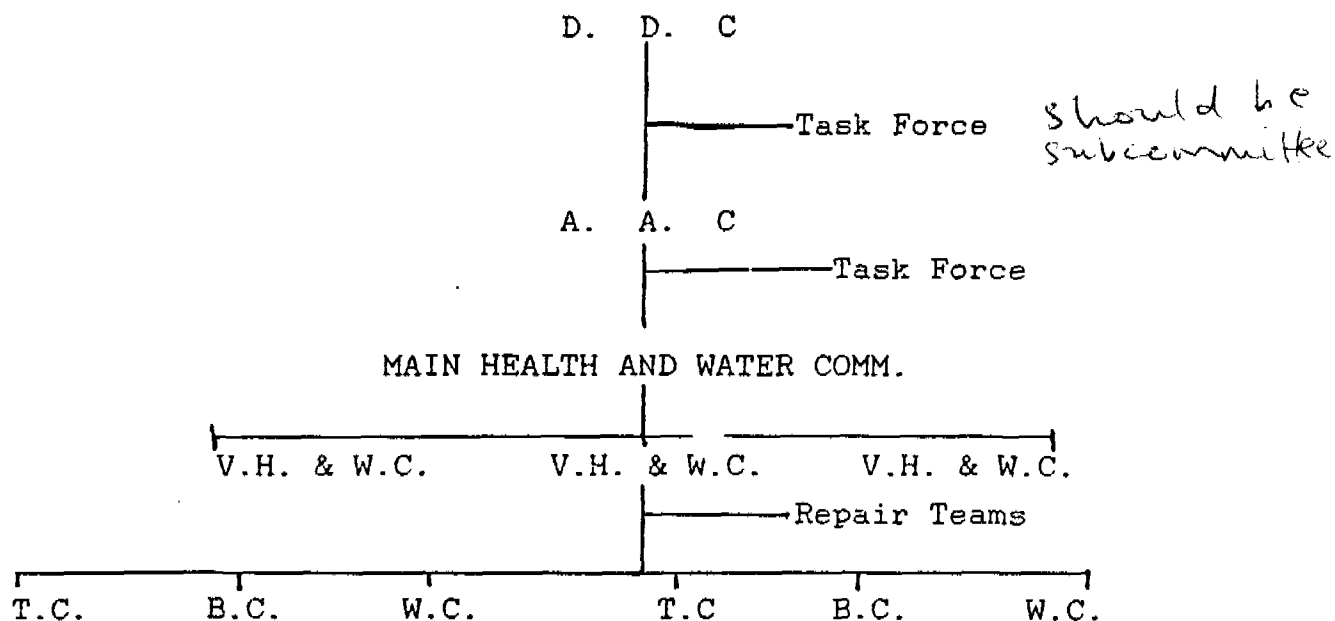
At the village level, water committees should be joined with the Health Committee to have a village Health and Water Committee whether the area is served by boreholes or piped water. Above the village committee, there must be a Section/Block/Main Committee. Every water point should have a tap, borehole or well committee.

The proposed organisation will be as outlined in figure 1 below. The district and area task forces will respectively be sub-committees of the D.D.C. and A.A.C. Repair Teams will be the technical wing of the village health and water committee.

Each community organisation must have a fixed term of office (say 3 years) and clear terms of reference should be defined for each committee.

The Area Action Committee shall organise the holding of elections for every main committee as soon as its terms of office expires. The main committee will in turn organise elections for village committees who will do the same for water point committees and supervise the activities of caretakers.

Fig. 1: Proposed Organisation for Community-based O&M





T.C. = Tap Committee; B.C. = Borehole Committee; W.C. = Well Committee

### 6.2.3 The Back-up Support Service

The community institutions will need technical support as well as a constant supply of materials, spare parts and tools. The technical support should be provided by Water Department and Ministry of Health personnel and the proposed task forces. In Karonga, for example, there are proposals to set up vegetable gardens around the water points as a means of raising funds for the maintenance of pumps. This activity will need the services of the Ministry of Agriculture. The key to the successful operation of the community-based operation is intersectoral cooperation and coordination.

With regard to the piped water schemes the number of monitoring assistants must be increased. The criteria for posting of monitoring assistants should be based on number of taps that can be effectively covered by the MA as well as distance. This is also true for the wells and the Integrated groundwater projects.

Spare parts should be as near as possible to the project areas. Consideration should be given to having main committees keep the spares and sell them through a Spares Revolving Fund.

### 6.2.4 Training

The importance of training cannot be over emphasised. This training will be required for both extension staff and members of various community organisations. For the Water Department personnel, apart from technical training, they should be taught skills in community mobilisation, motivation and committee procedures. They should also be trained in collecting monitoring data and interpreting such information so that they can use it for

the management of the schemes. Monitoring assistants should not only be used as tools for collecting information for use by higher authorities.

The biggest training gap is in the community institutions. Even the caretakers or pump attendants are poorly trained. They should receive training that will give them adequate skills to be able to maintain water systems without having to wait for monitoring assistants. If the caretakers are adequately trained, monitoring assistants will have more time for the promotion of community institutions and the actual monitoring of the projects. At the moment, they spend so much time on actually doing the repair work that they have no time for anything else.

Committee members at various levels will require training. Since, we are proposing the establishment of community based funds for O&M, it is important that committees that will be handling the money are properly trained. In our 1986 study, it was found that very few committees kept records of their meetings or of funds raised and dispersed. A comprehensive training programme must be developed and implemented.

It is important that training is done on a continuous basis to upgrade the skills of committee members and caretakers and train new members to replace those who drop out. Moreover, training seminars provide a good incentive for those involved.

#### 6.2.5 Need for Community-based Fund for Operation and Maintenance

The need for increased community contribution in cash and kind towards O&M of rural water supply was one of the primary reasons for commissioning this study. Through the years communities drinking water from piped water schemes have at one point or the other contributed cash for O&M. At the time of the workshops, some schemes had up to K3,000 or more in their accounts. Cash

contribution for these people is therefore not new.

For groundwater systems, the situation is different. Communities have never been asked to contribute cash for O&M. However as we saw in Chapter III of this report almost all respondents covered in the baseline survey said they would be willing to contribute cash. We therefore think that even in groundwater, people are willing to contribute cash for O&M. The big question is, what will be the logistics for implementing this?

We feel that money raised within the communities must be used within those communities. They must be able to directly link their contribution to the water they drink. Otherwise they will feel alienated. For this reason, we recommend the introduction of community-based fund for operation and maintenance that must be kept and controlled by the committees themselves.

In piped water schemes various methods have been used for raising money for the paying of caretakers. The most common is household contributions. Each tap is requested to raise so much per year that goes to a project account. In other parts communities have provided ganyu labour as a means of raising such cash. Yet in others, every village headman served by a water scheme has been asked to contribute so much per year. In the Karonga Integrated Water Project, it is proposed that one of the ways they are going to use for fund raising will be growing vegetables for sale using project water.

All the above means must be encouraged and each community must be left to devise their own means of raising cash. What needs to be done is a minimum amount that must be raised by all those drinking from one water point, a tap or borehole. Fixing individual charges by the Government must be avoided. In piped water schemes, for example, if each tap was requested to raise K10.00 per year or about 42t per household per year K80,235 would be realised, this

would be enough to pay for the caretakers and pay for all materials required for routine maintenance at the 1989 level.

Another, potentially important means of raising money is through individual connections. Assuming that on average, 5% of the community were provided with such a service this would mean 12,381 households, excluding Mpira/Balaka project. If each household was requested to contribute K3.00 per month or K36 per year, it would add another K445,716, enough to cover all the material costs in 1989 of major repairs and rehabilitation. Even if such households contributed only K1 per month nearly K149,000 would be raised. We strongly recommend that the policy against private connections be eased but this should only be done for schemes that have adequate capacity to provide for private connections as well as all stand pipes.

#### Fund Management Mechanisms

The main or block committee should be given the responsibility of keeping the money. The money would be kept in a bank (or Credit Union) account. A minimum of three signatories would be appointed and the district task force would have the responsibility of auditing such accounts every year. For the system to work, money raised by the community must be properly used and accounted for. It is therefore important to have all those going to be involved in handling community funds properly trained.

The money will be used for such activities as replacement of materials, replacement of tools, pay for caretakers, latrine revolving fund, etc. As a start, communities using piped water should be requested to pay for the full cost of replacing a tap and the cost of such simple things as solvent cement, washers, PVC pipes, and simple tools. As the community funds get built up and the people gain experience in managing the fund other more costly items like gate valves could be added.

## 6.2 What Needs to be done

We have outlined a number of things that need to be done to establish a sustainable community based operation and maintenance. Although it is not possible to establish exactly how much this will cost, we have no doubt that it will require a lot of money and staff time. Whatever it requires to do this would be worth investing because that is the only way of ensuring that the over 37 million kwacha invested in rural piped water schemes and an even higher amount in groundwater supplies is not wasted.

At the time of writing this report the Department of Water has taken steps to implement some of the recommendations. A number of piped water schemes have been or are scheduled for rehabilitation; boreholes in integrated water projects have been rehabilitated; training of committee members in some piped projects has been started; etc. These efforts are commendable but they appear to be done on piecemeal.

Technical rehabilitation must be done together with institutional rehabilitation. For projects that are planned for rehabilitation, adequate funding must also be provided for community rehabilitation and donor funding be sought for this aspect as well. On the other hand, it would be futile to try to reactivate committees in a project that is not functioning to the satisfaction of the community due to design problems or inappropriate technology.

The Water Department should seek the cooperation of other ministries in order to implement fully what is recommended in this report. We have seen how the close cooperation between Community Services, Ministry of Health, Local Government and the Water Department has led to genuine community participation in the Karonga Integrated Water Project. It is an example of cooperation and collaboration that should be followed.

For this to happen, this report should be discussed at a meeting involving Community Services, Health, Agriculture, Local Government, Office of the President and Cabinet and the Water Department. A medium term plan for the establishment of community-based O&M should be drawn up with clear definition of inputs by the various ministries.

Once it is agreed to establish the structures as proposed in this report, the proposed Rural Water Supply Community Management Unit, should be established as soon as possible. This unit, assisted by the District Task Forces will spearhead the community rehabilitation aspects of the projects. However, it will need the support of the task forces because we do not believe a small unit based in Lilongwe would be effective on its own. This unit should be manned by Social Scientists, preferably people with experience in Community Development.

Once it is clear on the aspects of the report that are to be implemented, a programme worked out and the roles of each sector defined, seminars should be held in every district to introduce the new O&M system. The roles of Government and community should be clearly explained during these seminars. The Water Department should spearhead the organisation of the seminars but other key ministries should be closely involved in their planning and implementation.

Once Government is clear on what it wants to do a meeting of donors should be convened to discuss the financing of the programme.

## APPENDIX A

### Summary of Recommendations for O&M of Groundwater

1. Steps should be taken as soon as possible to implement community-based operation and maintenance of groundwater supplies. → projects.
2. The District Development Committee Structure should be used in building up community institutions and monitoring the performance of these institutions. effectiveness?
3. In Karonga block committees should be created and in the other Integrated Water Projects, section committees must be created and they should be under Area Action Committees.
4. In districts and areas not covered by Integrated groundwater projects, investigations should be made as to the possibility of creating section committees (where there is enough concentration of boreholes). Where this is not possible, Area Action Committees should be encouraged to form Health and Water Sub-Committees.
5. <sup>sub committee</sup> Interministerial Task Forces must be created at D.D.C. and AAC levels whose membership will include Ministries of Health, Agriculture, Local Government and Community Services and the Department of Water serving as the Secretariat.
6. Clear terms of reference must be worked out for each community organisation and members' term of office clearly specified.
7. Except for Karonga where committees have only recently been formed, elections for all committees in Integrated Water Project areas must be held as soon as possible.

The AACs should spearhead the organising of these elections as soon as the terms of reference of these committees have been defined.

8. In areas outside Integrated groundwater supplies and rural piped water schemes, efforts should be made to have Village Health and Water Committees elected. *What's the function of the committee, clarify roles maybe from experience*
9. All extension<sup>activities</sup> staff working for the Water Department must receive training in Community Development principles and practice.
10. Training programmes must be worked for members of various community institutions - health and water committees, pump committees and caretakers. Depending on the participants, the training should include leadership skills, book-keeping and accounting, technical skills in water maintenance and sanitation, etc. The training and retraining must be a continuous process. *Costs related to prog.*
11. Every committee must be encouraged to have a water maintenance fund raised through whatever means the community may decide including household contributions, agricultural activities, other fundraising activities, etc. The control of such fund must be in the hands of community organisations but all monies must be kept in Commercial Bank or the Post Office Savings Bank, whichever is most convenient to the community.
12. A Parts Revolving Fund should be created. Donor-funding should be sought for initial financing of the fund. *clarify*
13. The Government back-up system should be strengthened. *clarify*



APPENDIX B - RECOMMENDATIONS BY PROF. R.A. GEARHEART ON PIPED WATER SCHEMES

A set of recommendations were developed for the MOW/Piped Rural Water Programme and Community-Based Maintenance, included in these recommendations:

- Decentralise O&M evaluation component of programme requiring more of monitoring and maintenance to be done by the community.
- Make the regional MOW office accountable for the on-going day-to-day MOW's involvement in the operation and maintenance of these schemes.
- Refine the monitoring assistance role to more of a trainer community mobilizer, and facilitator in routine monitoring and evaluation.
- Determine the status of all 55 piped rural water schemes by August 1 of this year.
- Based upon water scheme evaluation determined lessons learned in planning, community participation/construction, community participation/O&M, water scheme design, water scheme construction, supplies and material, and MOW evaluation unit.
- Base upon results from the workshops consider policy that communities pay full price for all routine O&M materials and supplies (remove subsidies).
- Establish posted position in rural water to ensure that the

O&M of these schemes are carried out and that the over 4.5 million Kw of investment in building those schemes, with their intrinsic benefits, are protected.

- Move as fast as possible to develop system for storing and analyzing monitoring data. Also develop capability to design/analyze piped rural water schemes with the aid of a computer.
- Use video tape capability to capture lessons learned in community based maintenance at project and district level workshops. Use this information in developing community involvement in new projects and in existing project needing new direction.
- Organize and facilitate a donor's committee on WS/S for the rural area. This committee can assist MOW by sharing ideas, maximizing resources, coordinate approaches, etc.
- Evaluate deformed maintenance requirements for each scheme to determine if rehabilitation investment would be cost effective in terms of long term maintenance requirements.
- Implement operational research on slow sand filters and sedimentation tanks.

#### Community-Based Maintenance

- Working through/with district development committee and other village committees to determine means and methods for community to assume a greater role in the O&M of these piped rural water schemes. This is an objective of the workshops.
- Community should immediately be trained to do routine monitoring of their systems. They should report to local government of a regular basis to be monitored by the

monitoring assistance.

- Community establish and manage funds for paying caretakers, etc. and for purchasing materials.
- Communities should be trained in bookkeeping and financial matters to allow for local management of these funds.
- Communities should review existing committee make-up and representatives in light of new requirements and direction and reform/reconstruct if necessary.

Main Committee - Suggestions Shaped by Outcomes from Workshops

- Assigns responsibilities to various tap committees to develop monthly report of the status of the system.
- Manage funds for the operation and maintenance.
- Determining training needs communicate to monitoring assistant.
- Communication on a regular basis to local government and party officials the status of the system and needs the community have which they might be able to assist in obtaining.
- Ensure that tap committees are functioning properly.
- Review the activity of the repair team.

**APPENDIX C - SUGGESTED MONITORING FORM**

DRAFT/STATUS OF PIPED RURAL SCHEMES 12 MA

Scheme \_\_\_\_\_ District \_\_\_\_\_ Region \_\_\_\_\_ River \_\_\_\_\_ Yr. Comp. \_\_\_\_\_  
 Design Pop. \_\_\_\_\_ Est. Pop. \_\_\_\_\_ Design Flow \_\_\_\_\_ #Taps \_\_\_\_\_ # Intakes \_\_\_\_\_  
 #Sed. \_\_\_\_\_ Treatment \_\_\_\_\_ #Storage \_\_\_\_\_ Total Vol. \_\_\_\_\_ Total Static Head \_\_\_\_\_  
 #Air Relief \_\_\_\_\_ #Break Storage \_\_\_\_\_ Total KM of Pipe \_\_\_\_\_ Dist. to Last Tap \_\_\_\_\_  
 KM Steel Pipe \_\_\_\_\_ Dist. Intake to Sed. \_\_\_\_\_ Watershed Area \_\_\_\_\_  
 Watershed Cond. \_\_\_\_\_ Trad. Water Source(s) \_\_\_\_\_  
 # of Households \_\_\_\_\_ # of Latrines \_\_\_\_\_ Types San Plat \_\_\_\_\_ Trad. \_\_\_\_\_

	Community		Tap Comm.		Repair Team		Carriaker		Mont. Asst.		MOW Dist. Reg		O&M	
	E	Kw	E	Kw	E	Kw	E	Kw	E	Kw	E	Kw	Prob.	Fixed
Inake Res.														
Inake Line														
Treat-ment														
Sediment Storage 1														
Storage 2														
Mainline														
Branch Distribution														
Tap Leaks														
Tap Replaced														
Aprons														
Soak Pits														
Latrines														
<b>TOTAL</b>														

#of Caretakers \_\_\_\_\_ Salary/Year \_\_\_\_\_ Tap Request \_\_\_\_\_ Private Taps \_\_\_\_\_  
 Local Gov't Committee (Name) \_\_\_\_\_ Role \_\_\_\_\_ Activity \_\_\_\_\_  
 Main Committee #Members \_\_\_\_\_ Activity \_\_\_\_\_ Rec. \_\_\_\_\_  
 Wtr & Health Committee #Members \_\_\_\_\_ Activity \_\_\_\_\_ Rec. \_\_\_\_\_  
 Repair Team #Teams \_\_\_\_\_ #Members \_\_\_\_\_ Activity \_\_\_\_\_ Rec. \_\_\_\_\_  
 Tap Committees #Comm. \_\_\_\_\_ #Members \_\_\_\_\_ #Inactive \_\_\_\_\_  
 Community/Tap Fund \_\_\_\_\_ Annual Total Collected \_\_\_\_\_  
 Time of Collection \_\_\_\_\_ Control \_\_\_\_\_ Balance \_\_\_\_\_  
 Water Quality #months Silt/Turbidity \_\_\_\_\_ Bacteriological \_\_\_\_\_  
 Days W/O Water Intake \_\_\_\_\_ Tap-Days \_\_\_\_\_ Tap Flow \_\_\_\_\_

... Status/Completed By Main  
 Committee - Reviewed By Monitoring Assistants

me \_\_\_\_\_ District \_\_\_\_\_ Region \_\_\_\_\_ Qtr. \_\_\_\_\_ Year \_\_\_\_\_  
 W/O Water to Storage \_\_\_\_\_ Days W/O Water To Taps \_\_\_\_\_  
 m O&M Activity Days With Poor Quality \_\_\_\_\_  
 em - Description of Problems/Days/Dates Out of Operations \_\_\_\_\_

	Community		Tap Comm.		Repair Team		Caretaker		Mont. Asst.		P.W. Dist. Reg.		O&M	
	E	Kw	E	Kw	E	Kw	E	Kw	E	Kw	E	Kw	Prob.	Fixed
Intake Res.														
Intake Line														
Treatment														
Sediment Storage 1.														
Storage 2.														
Mainline														
Branch Distribution														
Tap Leaks														
Tap Replaced														
Arms														
Soak Pits														
Lattices														
TOTAL														

ity Activity/Problems \_\_\_\_\_  
 overnment \_\_\_\_\_  
 mmittee \_\_\_\_\_  
 eam \_\_\_\_\_  
 mmittee \_\_\_\_\_

Maintenance Problems

id Rehabilitation Needs

**Quarterly Report of Tap Activity Status/Completed By  
Tap Committee/Reviewed by Monitoring Assistants**

Scheme \_\_\_\_\_ District \_\_\_\_\_ Region \_\_\_\_\_ Tap \_\_\_\_\_  
 Days W/O Water \_\_\_\_\_ Days With Poor Quality \_\_\_\_\_  
 Washer Replaced \_\_\_\_\_ Tap Replaced \_\_\_\_\_  
 Tap Leaking \_\_\_\_\_  
 Soak Pit Functioning \_\_\_\_\_

	Community		Tap Comm.		Repair Team		Caretaker		Mont. Asst.		MOW Dist. Itcg		O&M	
	E	Kw	E	Kw	E	Kw	E	Kw	E	Kw	E	Kw	Prob.	Fixed
Inake Res.														
Inake Line														
Treatment														
Sediment Storage 1														
Storage 2														
Mainline														
Branch Distribution														
Tap Leaks														
Tap Replaced														
Atrous														
Soak Pits														
Lattices														
TOTAL														

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