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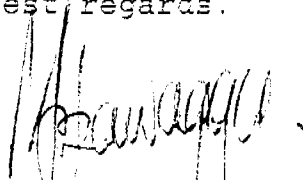
12 July, 1991

Dear Sir,

Reference is made to your letter of 14 March, 1991 ref:
46.882/710/HH/M/S.

Please find attached, as requested, copies of papers presented at
the Community Based Water Source Maintenance Systems (CBWSMS)
Regional Workshop held in Kampala last July.

Best regards.


Grace Ekudu
Asst. PO WES

encl.

Mr. Han Heijnen
GPO - Information
International Water & Sanitation
P.O. Box 98190, 2509 AD
The Hague
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FK:ck

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COMMUNITY BASED WATER SOURCE MAINTENANCE SYSTEMS

(WORKSHOP REPORT)

REGIONAL WORKSHOP

Held in Kampala - Uganda

31st July - 3rd August

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ACKNOWLEDGMENTS

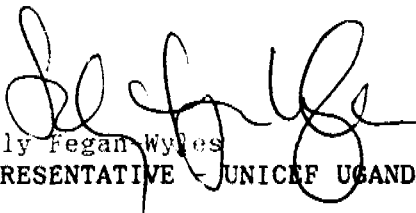
UNICEF Kampala is very grateful to the Government of Uganda, particularly the Ministry of Water & Mineral Development, as well as the Luwero District Administration, whose support and collaboration during the CBWSMS Workshop was essential.

Special thanks go to UNICEF's Regional Director, Dr. Mary Racelis, ESAR Representatives and WET New York, who selected Uganda to host this important workshop, the first of its kind to be held in the Region.

Highly appreciated are the very informative, lively and yet very serious discussions that were contributed by all the authors and presenters of papers, session chairpersons and of-course all the participants at the workshop.

The workshop organising team, the rapportuers, the secretariat and the transport team, who worked intensively and tirelessly to make the workshop a success.

Last but not least, thanks to Ms. Grace Ekudu - Assistant Programme Officer, WES UNICEF, who put together this report.


Sally Fegan Wyles
REPRESENTATIVE - UNICEF UGANDA

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List of Contents

1. Introduction
2. Opening Ceremony
3. Workshop Proceedings
4. Recommendations and Conclusions
5. Evaluation of the Workshop

List of Annexes

- (i) Organising Committee
- (ii) List of Participants
- (iii) Programme for the Workshop

1.

INTRODUCTION

1.1

Background to the Workshop:

In recognition of the interest shown in the established community based handpump maintenance system in Uganda, the UNICEF ESAR Representatives meeting requested Uganda Country Office to organize a workshop at which issues related to management of the community based water sources maintenance system (CBWSMS) could be addressed.

1.2

Venue:

The Workshop was held at the International Conference Centre in Kampala from 31 July to 3 August, 1990 and 50 water development officers from Angola, Benin, Burundi, Ethiopia, Kenya, Mauritius, Nigeria, Malawi, Sudan, Tanzania, UNICEF New York, and Uganda, as well as incountry NGOs, participated (see list of participants in Appendix 2).



1.3

Theme

The theme through the Workshop was to examine and recommend practical approaches for protecting and providing clean water to rural communities on a sustainable basis based on the various and shared experiences in the region.

1.4

Specific Workshop Objectives

These were to:

- i) Critically examine the different approaches in establishing a community based water source maintenance system.
- ii) Discuss the different technologies for providing water being used in the region.
- iii) Address the various administrative, funding and training issues closely related with CBWSMS.
- iv) Discuss the relevance and application of integrated health and water programmes.

1.5

Organization and Workshop Methods:

UNICEF Kampala - Water Section was responsible for the organization of this Workshop in close collaboration with the Water Development Department (WDD) of the Ministry of Water & Mineral Development, the Southwest Integrated Project (SWIP), World Vision International (WVI) and Luwero District Medical Office.

Workshop methods used included presentation of papers from various participants, plenary sessions, small group discussions, slides and video presentations and a field visit to Luwero - Uganda's longest established CBWSMS.

2.

Opening Ceremony:

This was officiated by Hon. David Pulkol, Uganda's Deputy Minister of Water & Mineral Development, and Ms. Sally Fegan-Wyles, UNICEF Representative - Kampala, introduced by Mr. Michel C. Nowacki, Head of the Water & Sanitation Section UNICEF Uganda.



In his speech, the Deputy Minister stressed the need for development of a long range comprehensive policy on CBWSMS as the alternative to the "traditional" central government maintenance system which, he said, could have been the key factor in the failure of the water programmes and the total collapse or short life span of their benefits in the past. He called on participants to take every opportunity to promote CBWSMS as an end product in itself and not only as a means. On behalf of the Government, he extended a hearty welcome to all participants to Uganda, and to the Workshop.

Ms. Sally Fegan-Wyles, in her introductory and welcoming remarks, pointed out that in spite of the long experience UNICEF has in working with communities, for every success there are about 10 failures. This she attributed to the fact that systems in place are often not carefully thought through. For instance governments tend to "off load" what they cannot achieve on to the communities, and donors tend to view community financed schemes as a cheap way of improving implementation compared with earlier development strategies. Good community-based projects are not cheap; on the contrary, they can be very expensive especially in terms of manpower. She therefore noted that there was need to rethink the strategies used in regard to financing schemes, intervention technology, re-orienting and retraining community working committees and especially establishing monitoring and follow-up structures to keep the system in motion.

WORKSHOP PROCEEDINGS

For purposes of this report, the workshop proceedings are presented under 3 main sections as follows:

1. Country experiences with CBWSMS
2. Group exercises
3. Workshop recommendations

3.1

Experience with CBWSMS:

Below is a list of papers presented by some of the participating countries, as well as papers on operational aspects of the CBWSMS.

1. **An Overview of the CBWSMS in Uganda** - by: Eng. B.K. Kabanda, Commissioner WDD Uganda
2. **CBWSMS Experience in Luwero District** - by: Mr. Moses Dombo, Project Officer, WVI Uganda
3. **Rapid Assessment Study on Luwero CBWSMS, April, 1990** - by: Ms. Grace Ekudu, Asst. Programme Officer, WES UNICEF Uganda.
4. **Working with the Community** - by:
 - Ms. Mwalimu Musheshe - Chairman URDT Uganda
 - Ms. Phoebe Baddu - Project Officer, Social Mobilization, SWIP Uganda.
 - Mr. Mustafa B. Nawai - Project Officer, Social Mobilization, UNICEF Sudan
5. **CBWSMS Nigeria Experience** - by: Mr. Lloyd Donaldson, Chief WES, UNICEF Lagos.

6. **CBWSMS Malawi Experience** - by: Ms. Maire Ni'chionna - WATSAN Officer, UNICEF Lilongwe and Ms. Linda Mauluka - Government Hydrogeologist, Lilongwe.
7. **Benefits of UII/UIII Handpumps** - by: Mr. Richard Cong, National Coordinator, WES/WDD Uganda.
8. **Experience With Gravity Schemes** - by: Mr. Bijaya Rajbhandari, PO WES UNICEF Uganda.
9. **The role of training in CBWSMS** - by: Mr. Sam Mutono, Project Leader WDD/Danida.
10. **Community Financing of CBWSMS** - by: Mr. Aron Kabirizi, WDD Uganda.
11. **Kenya Finland Water Supply Programme Experiences** (with a video presentation) -by:
 - Ms. Brenda Rakama, Sociologist, KENFICO
 - Mr. Logan Busolo, Liaison Officer, KENFICO.
12. **Rainwater Harvesting in Mauritius** - by: Mr. Folk Seng Ho Tu Nam, Liaison Officer, UNICEF Port-Louis.
13. **Implementing a CBWSMS: LWF Experience in Moyo District** - by: Mr. Jeremy Jose, LWF Kampala, Uganda
14. **Working in Conflict Areas** - by: Mr. Tony Burdon, Water Engineer, OXFAM Uganda.
15. **Integrating Health and Water Programmes (A People Centred Approach)** - by: Dr. J. Ndiku, PO SWIP Uganda.
16. **UNICEF New York WATSAN Policy Overview** - by: Mr. Carel De Rooy, New York.
17. **WATSAN Project in Benin** - by: Mr. Julien Dossou-Yovo, Ingenieur Hydraulieur, UNICEF Benin. (Paper arrived late and was not presented, copy enclosed in the report).

Although there were varied technologies being deployed in the provision of safe water in the region, papers generally attempted to define the "Community" and, based on their experiences, described the process involved in preparing and follow-up activities in a CBWSMS with special emphasis on the role of women. Discussion also focused on issues that require and have been given attention when establishing sustainable community managed schemes, as an alternative to the "traditional" central government maintenance water systems.

This report, however, highlights the main issues raised during sessions after each presentation since the full texts of the papers were distributed at the workshop and can be made available on request.

Issues noted were that:-

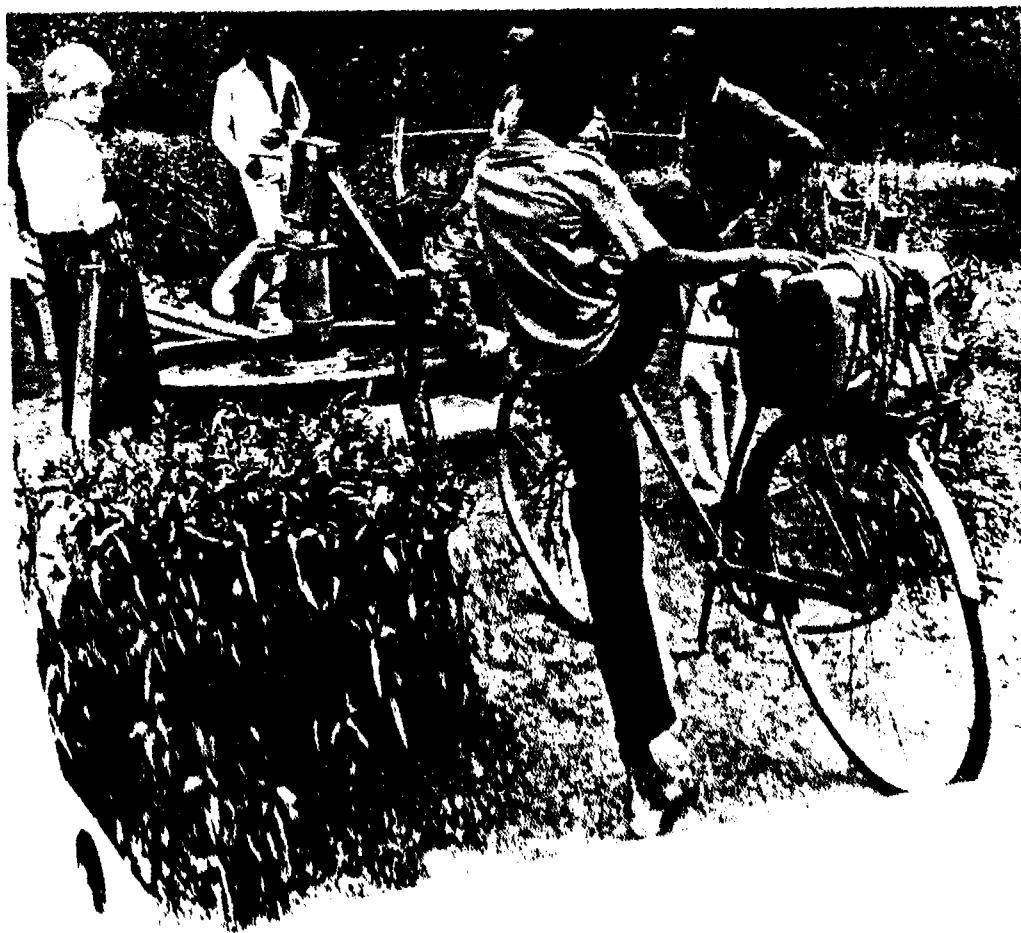
- (i) **Community participation**, as the active involvement of the community in all phases of project planning and execution was one key element of achieving sustainability of water supply. This therefore called a concerted effort on the part of all involved for the community's word to be listened to and appreciated, both felt and real needs addressed and structures established for the empowerment of communities in regard to their water schemes.
- (ii) The need to **quantify both community and mobilisation inputs**, and to clearly define what can be offered and what communities can afford was noted as a very essential stage in developing any community based projects. If well done, the facts could be used for advocacy vis-a-vis talking to people with nothing to offer to avoid raising false expectations and frustrating later mobilisation efforts.

- (iii) What people pay for water during periods of scarcity represents the affordable level of contribution to maintenance. However, because voluntary commitment is not usually costed and often not quantified, the long term maintenance input from communities has not received sufficient attention. If too much is asked for 'water', one should bear in mind deprivation of funds for other development projects.
- (iv) Water quantity and quality if not satisfactory could greatly affect the success of CBWSMS. The problem of 'aggressive' or bad tasting water therefore need to be addressed. In Nigeria, it was reported that the private sector is involved in developing suitable PVC pipes since stainless steel is very expensive.
- (v) Reviewing the construction technology of borehole and gravity schemes etc. was an ongoing activity reported by many countries present, in view of the fact that some of the installations were done years ago and were of diverse types. For example in Malawi pumps installed as early as 1930's although durable were too heavy for community maintenance because of maintenance costs which cannot be afforded by users. In principle a good technology was described as one which should be adaptable to local needs, reliable, and easily understood by the users. Therefore use of the VLOM type in handpumps, replacement of U1 and U2 straight away to U3 India Mark and a direct action pump for shallow wells were strongly recommended.

In Mauritius an extensive rain harvesting programme in Rodrigues is being encouraged, using low cost gutters of individual dwellings, and concrete cisterns as stores of nominal capacity up to 1400 litres. These cisterns constitute of stock during dry seasons and greatly reduces the time and labour in collection of water usually for women and children.

(vi) Involvement of women in CBWSMS was a generally accepted principle by all countries, with a number of varied experiences. Sudan, Kenya and Malawi unlike some other countries, noted high involvement of women in maintenance of water sources. The progress in these countries is noted to have been possible because women's involvement has been institutionalised and there has been extensive social mobilisation. Women were made to appreciate that as the prime users of water, it would be in their best interest to take care and ensure continuous supply of potable water. In the case of Malawi, from the start of the CBWMS (particularly of the gravity fed systems), most of the trained water source caretakers have been women (85%).

In other countries where women's participation was low, this situation was attributed to women considering themselves non-leaders and not perceiving water activities as having any direct economic benefits. More mobilisation for both women and men was seen as the tool for not only promoting women's participation, but also encouraging men to carry water. Developing suitable modes of carrying water, say by wheelbarrow was cited as an example of encouraging a positive attitude towards carrying water since the mode is more acceptable to men.

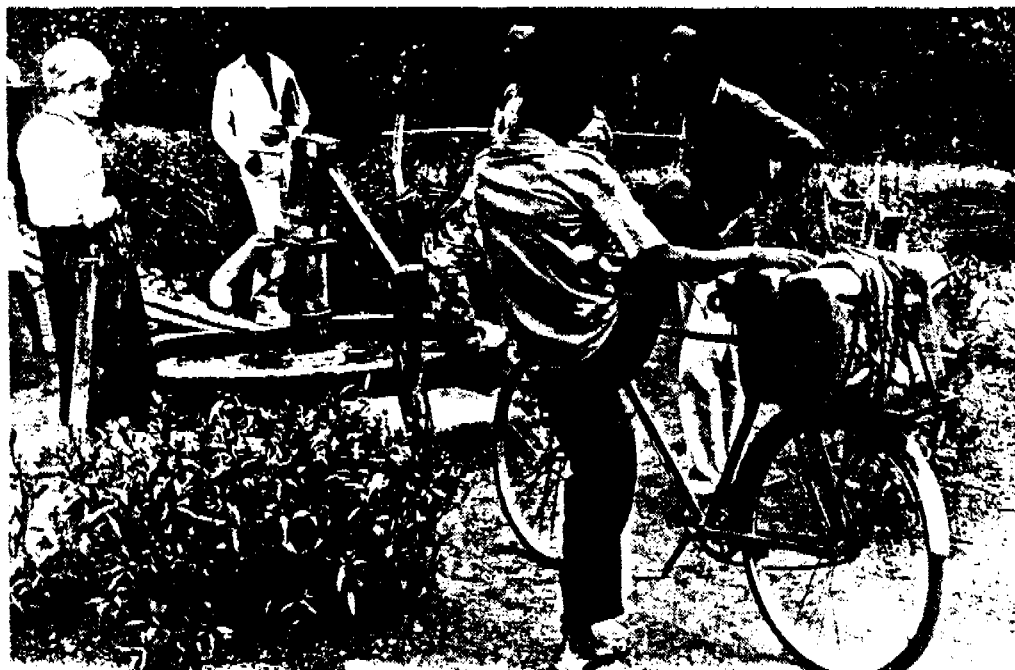


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Caution was given here that care should be taken not to add further burden to the heavy workload women already shoulder. Uganda experience had shown that the closer you go to the grassroots of community the greater the participation of women.

- (vii) In the majority of countries, **management of funds for water sources** is usually left to water committees at the community level. The paper on community financing pointed out that if any system of community financing is to work well, budgeting, collection, custody, utilisation and accountability must be well done. This, therefore, calls on the programmes at national and district levels to advise and train water committees on management, usage, record keeping and accountability to reduce the problems of mismanagement and misappropriation of funds and materials as was the experience by many of the programmes.

KENFICO the Kenya Finland water supply programme in Western Kenya had gone a step further to strengthen the committees by encouraging them to register with Government as self help groups to generate and manage their own resources. Furthermore, the link between CBWSMS and **income generating activities (IGA)** was recognised to be a major strength to enhance community financing by many programmes present and should therefore be encouraged.

- (viii) **Involvement of "external NGOs"** for monitoring and follow-up purposes as was the case with WVI in the Luwero CBWSMS. the pilot project in Uganda, was not felt to be a necessary requirement for all programmes. It is common with NGOs that they often operate within a short term project framework and soon hand over follow-up responsibility to relevant government departments. The use and strengthening of the existing local and government infrastructure to ensure "continuity" was therefore advocated for. Uganda has already identified the urgent need to develop a follow-up system within the government structure.

- (ix) The differences in prices between imported and locally manufactured pumps and spares was found to be a general problem. Members recommended, that first, governments be requested to waive importation taxes on raw materials for local manufacturers and subsidies should be considered during initial stages of the industries. Secondly, local industries should be encouraged as a long term development strategy, bearing in mind that donors (including UNICEF) can pay only a small premium, to be discussed on a case by case basis, over the CIF price of imported parts.
- (x) Community participation could be strengthened through training, monitoring and evaluation. This has been reflected in 1990s WET global goals to strengthen monitoring and evaluation capacities both at global and country levels with the aim of strengthening community managed schemes. The main role of training in CBWSMS was defined as optimising the function of different categories of people involved, in terms of awareness, knowledge and skills.



(xi) The need to conduct **socio-economic impact studies** to measure benefit accruing from provision of WATSAN services was recommended as important, to provide knowledge based on affordability of technology at community level and as information to use when mobilising communities prior to intervention. The importance of evaluation/assessment studies such as the rapid assessment study on Luwero CBWSMS in Uganda was noted. however it was observed that communities should always be consulted and involved in designing such studies and give feed back on the findings for purposes of improving performance.

(xii) In a good number of countries, **water programmes** have often had to provide water in "conflict" (i.e. war-torn) areas where there is severe community disruption and destroyed infrastructure and poverty. Members called on flexibility and adaptability by big donors to give more attention to these prevailing circumstances particularly on this continent. It was further recommended that it is very important that under emergency programmes relief alone without development can be detrimental to CBWSMS in the long run. Both felt and real needs should be addressed so as to go beyond relief and incorporate some development activities (perhaps not at the same pace), and not only maintain water schemes.

(xiii) **Holistic framework for water resource development and environmental health.**

Discussions on integrating health and water programmes centred on the elements, levels and strategies of facilitating the strategy which contributes to the attainment of the global goal of All for Health and Health for All. Most countries reported concerted efforts to integrated approaches through, for example, "area based programmes".

However, several important lessons have been learnt. While the relationship between health and water is well known, changes in attitudes and behaviour take a long time, compared to the time needed to protect the water supply. Also, the demand for water is much higher in communities than the demand for preventive health care. However, the experiences show that community organisation, education and motivation for water or for health have common features and together could form a nucleus on which other development programmes can be further integrated.

3.2 Group Work

Two sessions proceeded in small group work:

- A group exercise based on three case studies allowed participants to address issues of importance in programme/project planning processes. In six working groups, the exercise required designing:-
 - a Community financing structure
 - a PHC project proposal
 - and WATSAN monitoring indicators.
- The other was the field visit on the third day which offered all participants, divided in five groups, to observe the Luwero CBHMS and make comparisons with the several CBWSMS approaches existing in the region with the aim of making recommendations to improve CBWSMS. Observations made were later discussed and shared in plenary, and basic principles about CBWSMS management were advanced.

In Luwero, discussions with the district and subcounty administrations as well as the communities noted a fairly well established and generally accepted CBWSMS with a high awareness of "sense of ownership" among the borehole users. The establishment of the RC system is supposed to be the base for CBWSMS, where people participate in site, pump mechanic, and source caretaker selection. A recent study of the CBHMS in the district which has existed since 1986 - 87 (June 1990 L.T. Munro, Grace Ekudu, UNICEF Kampala), showed, however, that local communities and institutions e.g schools, have adopted their own methods of handpump maintenance and the RCs are not always involved. The report revealed that 81% of the 520 hand pumps installed were working at any one time and 75% of all pumps were working and in regular use compared to 27% of pumps in working order in areas of Uganda not yet covered by a CBWSMS.

This represented a radical improvement in the water supply situation in the area, and offered a really positive example of a low cost, sustainable water maintenance system for other countries in the region.

Only Malawi was more advanced in their experience than Uganda. The Government and UNICEF were generally commended on the approach they had developed in Luwero. However, the following general points were raised for further consideration and adoption by implementors of CBWSMS at country level.



1. The need to revolutionise management at all levels was noted as key to the empowerment of the community as the primary "MANAGERS" of the system and not merely contributing to the "maintenance" of the system. Particular examples in Luwero were the implications in moving the management of maintenance funds from RC3 to RC1. This would require an efficient monitoring and evaluation system to be in place, to ensure full support of the higher levels of administration, and enforcement of clear standing procedures to facilitate management of the sources. Practical suggestions given included:

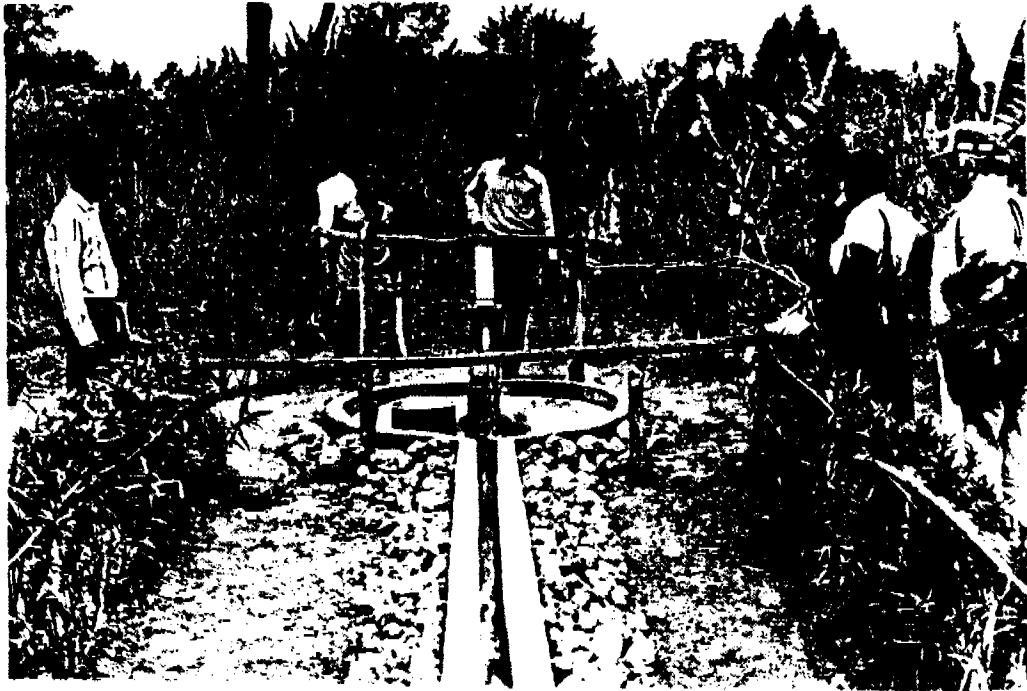
- (i) Establishing clear policies on finance collection and pump mechanic remunerations.
- (ii) Categorisation of payments for various repair charges into minor, medium and major ones.
- (iii) Training in resources management (including bookkeeping) at all levels in the system to facilitate accountability of resources used. Regular provision of resources such as maps, health education posters, record keeping/monitoring forms would help.
- (iv) Improve information flow; for example, lack of details on spare part prices was a major concern at the sub-county and community levels.
- (v) Decentralising technical services from central government departments such as WDD to district level.

(vi) Extensive women's involvement i.e. on water source management committees and as caretakers was recommended.

(vii) Exploring linkages of IGAs to WATSAN programmes could strengthen on community operations.

2. The CBHMS in the district was found to be lacking the integrated health and water approach, as implied by the minimal dissemination of basic health messages by both caretakers and health community workers found by Munro and Ekudu in their report. It was also observed by one group that latrines usage level was unknown yet the same information on water seemed to be known. The development of an integrated district water development plan and building on existing health programmes such as school health and health education programmes was recommended.

3. Under-utilization of boreholes due to high iron content, foul smell and rapid replacement of pump buckets and lather caps was recognised to have a negative impact on maintenance systems. While some of these factors could be attributed to some deficiencies in borehole construction, it was emphasised that user communities should always be informed of technical limitations, given enough guidance on siting as well as enough information on alternative intervention technology such as springs, rainwater catchment construction etc. Use of Nitrile-cups, already ordered; superior lather washers and cups for the handpump plunger was recommended.



Although the Luwero CBHSMS was initially an emergency water programme, communities still felt that there is gross maldistribution of present handpumps and a need for more handpumps. This might have reflected poor community mobilisation and involvement most likely at planning stages and could have negative affects CBWSMS in the long run since they were not fully aware of cost implications of maintenance. (It should be noted here that in the Luwero example, a second phase of borehole installation was planned by Government with Italian support, in 1988, but it has not yet materialized).

4. Community ownership of the land where Schemes are constructed must be obtained to ensure free access to the water source.

4.

Workshop Recommendations

It was the common understanding that Community Based Systems should be recognised as longterm social and economic investments. With particular reference to CBWSMS, benefits could include: reducing Government responsibility and maintenance costs per water source in favour of increased community self reliance, recognised women's role and possibly wider service coverage with limited funds. However, there still remains a challenge as to how the system could remain attractive and ensure sustainability. The following recommendations were therefore made to improve and enhance the intervention strategies of CBWSMS that in most cases were fortunately found to be already in place.

Recommended was:

1. The shift of emphasis from more community maintenance of water sources to more Community MANAGED Systems. This was viewed to be important in ensuring full participation of communities at all stages of programme development and implementation.



2. That although the gender issue is of critical global concern, meaningful women's participation and involvement can materialise only if their heavy work-load predicament is adequately addressed. Strategies recommended include, liberation dialogues with men, development of labour saving devices, promoting IGA to improve income bases, and with introduction of VLOM technologies, institutionalisation of women's involvement in the decision making problem-solving a management processes at all levels.
3. That while income levels of user communities pose severe constraints on community "financed" Schemes, this was apparently not the major problem, rather the mismanagement of already collected funds. Possible solutions suggested were to incorporate training in financial management, public accountability and strengthen supervisory capacities in relevant Government departments.
4. The promotion of local manufacturing industries for pumps and spares as along term development strategy. Government should be requested to waive import taxes on raw materials for local manufacturers, and subsidies considered during initial stages of the industries. However, as a short/medium term strategy, with due consideration of cost implications, cost effective procurement options should be sought.
5. As a broader policy issue, Community Management being described as affordable and sustainable, implies the use of appropriate technology on a large scale. Installation of VLOM (e.g. replacement of U2-3 or U1 straight to U3), be effected as the standard for more community involvement and reduction in maintenance costs. Furthermore, the essence of sustainability should be to encourage full cost recovery of maintenance and eventual take over of capital depreciation of handpumps by the communities.

6. Improvement of water supply and sanitation must be complementary and combined with health and hygiene education as well as other closely related sectors in order to maximise benefits. Integration should be a central theme and viewed as an opportunity to contribute to the attainment of the Global Goal "All for Health and Health for All".
7. To consolidate monitoring and evaluation strategies particularly conducting socio-economic studies to measure benefits and impact of WATSAN services.
8. Under emergency programmes, big donors must address both real and felt needs and go beyond "relief" alone. (as has been done in the Luwero project).
9. Specifically for the Global goals of Health, Nutrition, WATSAN and Education, the growing acceptance of community responsibility for management should be linked for the benefit of success in all.



Conclusion

In conclusion. Participants called on African Governments to invest more in services aimed at promoting better living standards of the people bulk of whom live in the rural areas. Although many of these community-based initiatives require to a large extent the contribution and participation of the water source users, it was observed that donors should continue supporting these programmes. Finally, exchange of experiences through workshops of this nature in the region enhances development and accelerates continental independence and should therefore be encouraged.

EVALUATION OF THE WORKSHOP

This is the analysis of the daily and end of workshop evaluations exercise the workshop was evaluated in terms of:

(i) Very useful; (ii) Useful; (iii) Little useful; (iv) Not useful.

in regard to:

(A) Applicability in your own country:	(i)	(ii)	(iii)	(iv)
	50%	35%	15%	0%
(B) Sharing of Experiences:	(i)	(ii)	(iii)	(iv)
	59%	40%	0%	1%
(C) Learning more about Community-Based Maintenance	(i)	(ii)	(iii)	(iv)
	28%	59%	13%	0%

Other comments to note were:-

- The majority felt rushed through presentations, and not enough time allowed for discussion, suggested fewer presentations but on the other hand could be a tribute to the interest the workshop aroused.
- Appreciated contact with Uganda CBWSMS and UNICEF New York WATSAN Policies.
- Suggested that more studies like Munro & Ekudu's Luwero rapid assessment could have allowed objective comparisons.

Recommended one day more and better sitting arrangement.

Finally: Commended the very good organisation and management of the workshop.

ORGANISATION

Organising Committee

1.	Michel C. Nowacki	-	Head WES (Chairman)
2.	Steve Adkisson	-	PO PDME
3.	Peggy Robbins	-	PO Basic Education
4.	Lauchlan T. Munro	-	Asst. PO Statistics PDME
5.	Lillian Lubega	-	Asst. Info. Officer
6.	Grace Ekudu	-	Asst. PO WES
7.	Bijaya Rajbhandari	-	PO WES
8.	M. L. Wickramasinghe	-	Prog. Communication Officer
9.	Richard Cong	-	WDD
10.	Elijah Mutyaba	-	WVI
11.	Christine Sekadde	-	Snr. Admin. Personnel Asst.

Rapporteurs

1.	Bijaya Rajbhandari	-	PO WES
2.	A. Kabirizi	-	WDD
3.	Pheobe Baddu	-	SWIP

Secretariat

Connie Kisito	-	UNICEF (WES)
Olive Lwesanya	-	UNICEF (WES)

LIST OF PARTICIPANTS

Annex 11

	NAME	DESIGNATION	ORGANIZATION	CONTACT ADDRESS
1.	Hon. David Pulkol	Deputy Minister	Min. of Water & Mineral Development	Box 7096 Kampala - Uganda
2.	Mr. N. Odoi	Ag. Permanent Secretary	"	"
3.	Dr. Mary Racelis	Regional Director	East & Southern Africa Region (UNICEF)	UNEP HQs Gigiri, Nairobi - Kenya
4.	Ms. Sally Fegan-Wyles	Representative	UNICEF	Box 7047 Kampala - Uganda
5.	Mr. Lloyd Donaldson	Chief, WATSAN	UNICEF	Lagos - Nigeria
6.	Mr. Folk Seng Ho Tu Nam	Liaison Officer	UNICEF	Box 253 Port-Louis - Mauritius
7.	Mr. Carel De Rooy	Chief, WATSAN (WET)	UNICEF	New York HQs.
8.	Mr. Alan Lindquist	Consultant	UNICEF	New York HQs.
9.	Mr. Vadim Yevstafiev	Water Engineer	UNICEF	P.O. 2707 Luanda - Angola
10.	Mr. Harry Philippeaux	Chief, WATSAN	UNICEF	Burundi
11.	Mr. Taye Tadesse	Mechanical Engineer	Govt. Water Supply & Sewerage Authority	Box 33047, Tel: 182766, Addis Ababa - Ethiopia
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13.	Mr. Dauda Wurie	Project Officer	UNICEF	Dar Es Salaam - Tanzania
14.	Ms. Maire Ni'chionna	WATSAN Officer	UNICEF	Box 30375 Lilongwe
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19.	Mr. Pertti Murtovaara	Drilling Supervisor	"	"
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P R O G R A M M E

THE COMMUNITY BASED WATER SOURCE
MAINTENANCE SYSTEMS WORKSHOP31ST JULY - 3RD AUGUST, 1990
KAMPALA INTERNATIONAL CONFERENCE CENTRE, UGANDA

TIME	SESSION	ACTIVITY	PRESENTER	FACILITATOR
DAY ONE 31/07/90				
	1.			
8.30-9.00	1.1	Registration of Participants		Grace Ekudu - UNICEF
9.00-9.30	1.2	Introductory Remarks		Michel Nowacki - UNICEF
9.30-10.30	1.3	Official Opening of Workshop		Ms Sally F. Wyles
			Hon. Deputy Minister of MWMD	
10.30-11.00		TEA BREAK		
	2.	PRESENTATIONS:		
11.00-11.30	2.1	CBWSMS - Overview of Uganda Experience	Commissioner - WDD	M.C. Nowacki - UNICEF
11.30-12.00	2.2	CBWSMS - Luwero Experience	Moses Dombo - WVI	"
12.00-12.30	2.3	CBHMS - Luwero Study	Grace Ekudu	"
12.30-14.00		LUNCH BREAK		
	3.	WORKING WITH THE COMMUNITY		
14.00-15.00	3.1	Presentation and discussions on the community, its structure, how to prepare the ground, follow-up of CBWS, involvement of women.	URDT Phoeb Baddu	Ms. Maire Ni'chionna
15.00-15.30	3.2	Discussion		"
	4.			
15.30-16.20	4.1	Group Exercise	Grace Ekudu	
16.20-17.00	4.2	Group Presentation		
17.00		TEA BREAK		

TIME	SESSION	ACTIVITY	PRESENTER	FACILITATOR
DAY TWO				
1/07/90				
9.00-9.10		Introduction to the Day's Sections	M.C. Nowacki	
9.10-10.00	5.	CBWMS Nigeria Experience	Donaldson	Commissioner - WDD
10.00-11.30	6.	PRESENTATION AND DISCUSSION ON:		
	6.1	1. Benefits of UII/UIII handpumps	A. Kalaw/R. Cong	
	6.2	2. Experience with Gravity/Spring Schemes	R. Rajabhandari	
	6.3	3. The role of training in CBWSM	Sam Mutono WDD/Danida	
	6.4	4. Community Financing	WVI/WDD Kabirizi	
11.00-11.30		TEA BREAK		
11.30-12.30	7.	KENFICO PRESENTATION	Brenda Rakama	De Rooy, N.Y.
12.00-14.00		LUNCH BREAK		
14.00-15.00	8.	PRESENTATIONS ON:		De Rooy, N.Y.
	8.1	1. Rainwater Harvesting (Mauritius)	Ho Tu Nam	
	8.2	2. LWF Experience	M. Dillon	
15.00-15.45	9.			
	9.1	Integrating Health and Water Programmes. "Experience"	John Ndiku	De Rooy, N.Y.
15.45-16.15		TEA BREAK		
16.15-16.40	10.			
	10.1	UNICEF N.Y. Policy Statement on Water and Sanitation	De Rooy	
17.00-17.15	11.	Briefing on the Field Visit	Grace Ekudu	

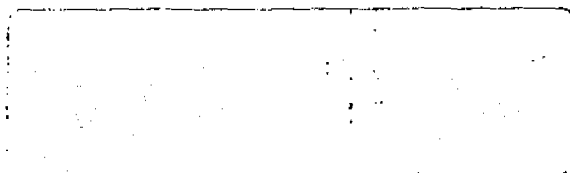
TIME	SESSION	ACTIVITY	PRESENTER	FACILITATOR
DAY THREE 2/7/90				
8.15	11.	Departure for Luwero		Grace Ekudu A. Kabirizi
9.30-10.30	11.1	Meeting Luwero District Administration	DMO/DNI	Elisha Mutyaba Moses Dombo B. Rajbhandari
10.30-11.00		TEA BREAK		
11.00	11.2	In 5 groups, visit various sub-counties	All participants	
19.00-20.00		COCKTAIL AT NILE HOTEL GARDENS		

TIME	SESSION	ACTIVITY	PRESENTER	FACILITATOR
DAY FOUR 3/08/90	12.			
09.00-09.10	12.1	Introduction to the Day's Sessions		M.C. Nowacki
09.10-10.00	12.2	Preparation of Field Reports (in groups)	All Participants	
10.00-10.30		TEA BREAK		John Ndiku
10.30-12.30	12.3	Group presentations and discussion		
12.30-14.00		LUNCH BREAK		
14.00-14.45	12.4	Summary of Group presentations	M. Elias (ESARO)	
14.45-15.45	13.	Group discussions to generate resolutions and recommendations of the workshop:	All Participants	
	13.1	1. Appropriate technology in provision of water.		
		2. CBWMS sustainability- community financing issues.		
		3. Management of the system - reporting system - follow up - training		
		4. Integration of health and water programmes.		
15.45-16.15		TEA BREAK		
16.15-17.00	13.2	Presentation and discussion of recommendations of the workshop		Carel De Rooy
17.00-17.30	13.3	Closing of the Workshop	D/Minister MWMD	Sally S. Fegan Wyle PS
19.00-20.30		BUFFET DINNER		

***** END OF WORKSHOP *****

**THE COMMUNITY BASED WATER
SOURCE MAINTENANCE SYSTEMS WORKSHOP**

31 July - 3 August, 1990
Kampala International Conference Centre



THE ROLE OF TRAINING IN CBWSM

SAM MUTONO

Project Coordinator

WDD/DANIDA - UGANDA

THE ROLE OF TRAINING IN COMMUNITY BASED WATER SOURCE
MAINTENANCE (CBWSM).

1. INTRODUCTION/BACKGROUND

It is now generally accepted the whole world over that third world development process should best be approached from the strategy of grass root participation. In this sense, Government aid or any other aid should be given with the view of equipping the intended beneficiaries with the capacity in terms of awareness, knowledge, skills etc. to help themselves.

The CBWSM is one of the programmes are directly aimed at rural communities.

The medium and long-term objectives of rural water supply include:-

- Improving the social and economic conditions (quality of life) of the rural population.
- Improving the health conditions particularly reduction in child mortality and morbidity.

However, the attainment of the above objectives and avoidance of wastage of investments depends on, among others, continued functioning and use of the rural water sources. This problem demands as much attention as the increased construction of adequate sources. Ultimately, coverage of water supply depends on number of units functioning and not number constructed. It is common in had pumps programmes the world over, to find 50% of the facilities out of order. In 1983, a study found that only 30% were working in Uganda.

There are no easy answers to this problem, only options and we have to choose the most appropriate improvement. Only an improved system, not an perfect one, may be possible e.g. in Uganda where social, political and environmental systems are complex and problems widespread.

We have chosen CBWSM as our improvement in this line. Maintenance should be local user's responsibility with the government only providing the necessary support and supervision. The aim is to build local capacity to handle most major repairs and develop a system in which recurrent costs are met by beneficiaries.

NEED FOR TRAINING

The development promotion and success of CBWSM strategy hinges on a number of preconditions which include:

- That the community feel responsible and have a sense of ownership to the source.
- That the community is aware of the need for the source
- That the community know how to and actually use the source.
- That the community have the required skills to keep it in operation (including technical and managerial)
- That the technology is appropriate
- Multi-sectoral approach/co-ordination

The outlined conditions cannot be just assumed. In most cases at least here in Uganda, they have to be developed. The ideology of community development and the reality of problems in rural areas imply the need for spontaneity, flexibility, local initiative and decentralized decision making, yet, the idea of community development programme involves deliberate planning, budgeting, rule-bound and even-handed decisions.

Such is the paradox of community participation - promoting bottom-up development often requires some top-down effort. This effort in the case of CBWSM will take the form of training among many other things.

2.0 TRAINING AND CBWSM

Training has a role to play in CBWSM so as to optimise functioning of the different categories of people involved especially when programmes are organised on a large scale (like SWIP and East Uganda Project in Uganda).

Money should be spent to meet identified training needs. Training should be included in forward planning to meet - objectives not just an addition, a by the way. Special educational programmes will be required in the various phases of establishment of the CBWSM, including:-

- Information and Health Education
- training for delegated tasks
- Orientation to the realities of CBWSM
- Multi-disciplinary approach/coordination
- Social mobilization.

And after construction, the educational programmes remain indispensable for technical continuity and attainment of project objectives.

Those normally involved in implementation of CBWSM and therefore requiring the necessary training include:-

- The intended beneficiaries
- Local technicians
- Promoters/extension workers religious leaders, NGO, etc.
- Administrative committees
- trainers
- Government/Donor agency officials.

2.1 WHO TO TRAIN AND IN WHAT

i) Community.

In planning a rural water supply one should start with people who are going to benefit.

Training/educating the community for CBWSM should include:-

- Creating awareness and need
- Health Education on relationship between water, sanitation, and health.
- Facilitating participation and involvement of intended beneficiaries.
- Changing attitude, behaviours and practice of users.
- Promoting community ownership and responsibility and self reliance.

Women:-

Specific provisions for involving women need to be made not only in decision making but also in training as they are major beneficiaries. Their training, more than any other single activity, will help reach the aim of CBWSM, the "decade goals". By nature of division of responsibility, women decide whether to use a proposed water traditional source and whether it is worth the expenditure of effort and resources to maintain it.

Thus community willingness to use and maintain the new water supply very much depends on women. In addition, women are the deditators of change and most often they are controllers, and purveyors in the local learning system related to water, health and sanitation, hence the role they have to play in health education/training.

- ii) Administrative Committees:-- Experience from other countries reveal that the presence of a committee contributes to better maintenance. Apart from community mobilisation and health education, the committee members need to be given basic training in how to conduct meetings, keep records, make reports, keep accounts procedures, keep store in order, coordinate and integrate with other activities monitor and evaluate CBWSM

This could be in form of training courses by field workers or directly by a project.

- iii) Local Caretakers: These are important for early recognition of trouble. Guidance in ensuring proper use, preventive maintenance, keeping surroundings clean, organising queues and reporting defects is required. Basics knowledge of educating people on the relationship between water and sanitation is also necessary. This could be done by construction/maintenance teams, pump mechanics, health inspectorate staff.

- iv) Local Hand Pump Mechanics: The required training includes preventive and corrective maintenance, preparation of records and reports on repairs, maintenance of tools in good condition, community approach and basic Health education.

The training is best carried out on the job, in the home area during construction/rehabilitation by the technical teams and extension staff.

- v) Where promoters are used, say, extension workers religious leaders, school teachers, NGO etc., There is need for training (including refresher courses) in:-

- Community organisation
- Community motivation
- Community analysis including the possible involvement of the community in the process.
- Sanitation, Health education in cooperation with other health workers and organisations in community.

This could be on the job or through additional

periodic courses. Manuals should be availed.

- Vi) Trainers various cadres of people, as indicated above, will be included in transfer of skills, knowledge and attitudes. They need to be given some instruction techniques (training of trainers).
- vii) Personnel of the agencies involved (especially technical staff in the field).

It is sad but true that most government departments (Water Development Department in this case) are not oriented towards working effectively with intended beneficiaries, but have a legacy of paternalistic or technocratic if not authoritarian relations with the public. Water Development Department should not be expected to have skills and motivation for community participation. Attitude and performance will indicate how much re-orientation is needed to effect collaborative development efforts with target community. There is also need to develop in the mind of every worker at all levels:- the concept of "service to community" and to stress the importance of:

- Multi-disciplinary approach
- Community involvement
- Relationship between sanitation, water and health
- Upward, downward and horizontal communication.

- viii) Donor agencies are also likely to need some re-orientation of their own personal practice, rules, incentives and procedures, if they are to be consistently supportive of the CBWSM. The aim should not be impressive input statistics, but long term output rates.

2.2 ISSUES TO BE CONSIDERED

- i) Location:- Training courses for field workers and community members should be based on the conditions in which they have to work and the type of educational approach that will be expected from them at community level.
- ii) Staged training may be necessary where, progressively, workers are gradually trained for

increasingly difficult tasks.

- iii) Good communication is the corner stone of any strategy. A problem - solving approach - discussing problems together and jointly agreeing on solutions should be promoted at all levels.
- iv) Initial training can only be basic. Training needs to be organised on a continuous basis through refresher course, seminars, meetings and mass media. Preparation of manuals could also be useful here.
- v) There is need for identification and use of national training institutions capable of a or already experienced in water related training for community participation.
- vi Assistance to the incorporation of training in socio aspects in engineering and other technical training and refresher courses could be useful.
- vii special efforts should be made to involve, and train women and children who are the main beneficiaries.
- viii) Special orientation & training courses for community participation and education of field workers for technical staff, promotion of local health workers and other community workers to whom CBWSM tasks will be delegated.
- ix)- Visits to share experiences with other similar programmes should be promoted.
- x) Evaluation of training in CBMSM need to be done to identify essential elements of government/donor support and how resources can be used more effectively CBWSM requires modesty to accept mistakes (which will inevitably be made) and lessons.
- xi) There is a lot of demand for cost sharing now in social services (Education, Health, water). The priority will vary with communities. It will be necessary to assist the communities in setting priorities right, at least from the point of view of promoting preventive measures, vis-a-vis curative medicine. Promotion of income generating activities could also help in this respect.

2.1 Conclusion

- i. As we discuss CBWSM we should not lose sight of our overall objectives. Water supply is probably a necessary condition for achieving development in the rural economy and public health, but not sufficient. The question is not whether water supply can have an

impact on health but how to transform the potential impact into reality. Improvement of water supply and sanitation must be complementary and combined with health and hygiene education, as well as being closely related to other health programmes and programmes in other sectors in order to maximise benefits.

ii.) Rural development problems are interrelated and lessons must be learnt to use starting places as the coming of a water supply and introduction of CBWSM to reach into opportunities for establishing the foundation for development activities. In planning and organisation, enhancement of each community's capacity to organise itself for future developmental efforts should be included.

~~Para~~
iii.) Support should to be given to activities promoting CBWSM, community education, sanitation, multi-disciplinary approaches and coordination between and with bodies involved. Continuing and increasing programmes of relevant training in each case are essential if communities are to understand the need for the functioning and maintenance of their systems and realize the health and economic benefits to be gained from them.

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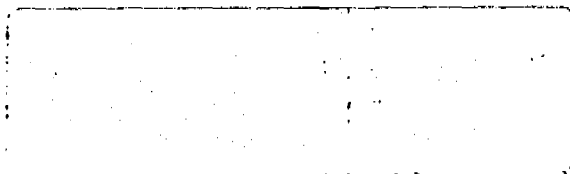
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**THE COMMUNITY BASED WATER
SOURCE MAINTENANCE SYSTEMS WORKSHOP**

**31 July - 3 August, 1990 .
Kampala International Conference Centre**



BENEFITS OF UII/UIII HANDPUMPS

RICHARD CONG
Executive Engineer
WDD - UGANDA

31 July - 3 August 1990

BENEFITS OF U2/U3

By Richard Cong

EXECUTIVE ENGINEER WDD

1. INTRODUCTION

The success of community based maintenance system for community water supply using handpumps will undoubtedly depend among others on handpump design, selection and quality of manufacture. The choice of appropriate handpump, especially with respect to maintenance, can enhance community involvement and participation.

The pump should generally be simple, durable, robust and spare parts (especially those that require regular replacement) must be readily available and affordable (cheap). Standardation on a few handpumps will facilitate community maintenance of pumps and spares.

Such pumps must meet the following criteria:

- (a) Must be repairable at village level (VLOM)
- (b) Adequate flow at both low lifts and high lifts
- (c) Adequate reliability at heavy use ($8m^3/d$)
- (d) Adequate corrosion resistance

This paper, therefore tries to analyse two pumps (U-II/U-III) currently selected as standard handpumps in Uganda.

2. BACKGROUND OF HANDPUMPS IN UGANDA

Between 1930 - 1980 over 5000 boreholes were drilled and installed with standard handpumps, known as U-I. U-I pumps was developed as a modification from the Zimbabwe bush pump (see diagram 1). The pump a reciprocating deep well force pump, had relatively good discharge (over 1 litre/stroke) and easy to operate (Mechanical advantage of 12 to 1). However, the installation and repair of these pumps required trained personnel, specialised tools and lifting device, so it needed mobile team (BMJ). A baseline survey (1981) revealed that about 75% of U-I were broken

In 1981 WDD with UNICEF assistance restocked BMU with spares and equipment. The situation didn't improve much, as 68% of U-I were still broken down by 1983 (survey report).

It was at this time that government decided to seek for alternative pump to ease the maintenance procedure and community participation. Few pumps, (shortlisted by World Bank) India Mark II, monolift, Moyno, Consallen, etc were field tested. Based on cost, durability, easy, of maintenance, potential of local manufacture, etc, the India Mark II ~~was~~ was chosen as a possible standard pump in 1983.

All boreholes (both new and old) were to be fitted with India Mark II (standard) which was eventually renamed U-II in 1984.

In 1989, India Mark III, ~~was~~ renamed U-III was introduced to improve on the VIOM and a few has been installed for field testing.

Government has imported hand-pumps 55 from Cuba under barter arrangement. Handpumps is Demp-ster derivative with operational depth of upto 30 m. Thus it is a shallow well pump. The cast iron pump head, handle and pedestal make it less robust and not suitable for a large community useage, but the downshole component seems good. Since they are already in the country (about 3200 No.) the government is keen is using them whenever possible.

3.0 U-II (India Mark II)

3.1 Descriptions

U-II is a lever action deep well pump developed in India with UNICEF support (Drawing No.2). The above ground components

(pedestal, water tank and handle) are made of galvanised steel. The underground assembly include: A brass-lined cast iron cylinder, foot valve, galvanised steel rising main ($1\frac{1}{4}$ " ϕ x 3m) and connecting rod ($\frac{1}{2}$ " x 3m).

A chain link the pump rod with handle. With standard connecting rod, a minimum depth of cylinder of 24m is required to enable gravity return. Otherwise, heavier rods are required for shallower depths. U2 is widely used (over 5000 in Uganda and over 1.5 million worldwide). Well provened, robust pump with performance characteristic listed in Table 1.

Table 1 : Performance data (typical values) - 63.5_cylinder

Head (m)	7	25	45
Pumping rate (cycles/min)	40	40	40
Discharge (l/min)	12	12	12
Input (Watts)	47	92	140
Mechanical efficiency (%)	30	55	65
Maximum handle force (Kg-f)	13	20	30

3.2 Performance of U-2 pumps

- (i) U-2 is a relatively cheap pump, at US \$ 450, CIF Kampala
- (ii) The U 2 pump is reliable for about 200 users at 20 l/day. With combine "Meantime before failure (MTBF) and "Mean downtime of at least 6 months. However, for more users over 400 the frequency of breakdown and repairs, is excessive thus it becomes unreliable.
- (iii) U-2 standard pump operate between cylinder depth of 24 m to 45 m. For greater depth up to 90 m India Mark II, extra deep well pump has been developed and some pumps have been installed in Uganda. At shallower depth an heavier connecting rod or direct link between rod and handle is required.

(iv) U - 2 can be manufactured locally within a moderately development/established workshop. A local firm, Victoria pumps Ltd (based in Kampala) with assistant from DANIDA is in final stages of starting the manufacture of U 2 and U 3 pumps. However, the cost for locally manufactured appear high. The cost of U 2 pump with accessories is estimated at US \$ 698 compare with US \$ 450 for imported one.

The factory has annual capacity of 4000 pumps. Some would be exported. Another local firm (based in Jinja) Ushirika Engineering works have tried to manufacture a modified U 2 pumps out of available materials (refer to the New Vision of Saturday 21 July 1990 relevant photocopy attached) However, these are still at the experimental stage and would need encouragement and quality control.

(v) U-2 is not very suitable for village level operation and maintenance (VLOM). It requires a trained area pump mechanic, with assistance from at least 3 people to lift the downhole component with lifting tools. The tools and equipment ~~are~~ weigh 50 - 70 kgs. A visit by mobile crew once every 6 months may be necessary. However, in Uganda, the trained community pump mechanic has been in position to carry out repairs on U-2 successfully within 2 to 3 hours. Annual maintenance cost is estimated at US \$ 0.42 per capita.

(vi) The galvanised steel rods and rising mains, make U 2 pumps not corrosive resistance in aggressive water. Use of plastic pipes and stainless steel rods could help

(vii) U-2 pump is not capable of pumping sand - water especially from boreholes with tendency of siltration, otherwise, the cap leather would need replacement frequently.

4. U-III (India Mark II)

4.1 Description

U-III is a modified version of India Mark II to enhance village level operation and maintenance (VLOM). An open-topped cylinder is used in a 2½" ϕ galvanised steel siring mains, which allows the plunger and rods to be removed without the rising mains. Tools needed for most repairs are reduced to 7 kgs. The pump has "a quick change drive head. The nitrile rubber seals instead of cap leather seals, allow it to withstand sand laden water to an extend. 150 Nos. U 3 pumps have been imported from India, and 2 Nos U 3 pumps have been installed so far in Mbarara and Lira for field testing.

4.2 Performance of U - 3

From field test in India by UNDP/WORLD BANK and UNICEF shows U 3 is a reliable pump and promising as highlighted below:

- (i) The pump is relatively cheap. The pump with accessories cost about US \$ 500 CIF Kampala.
- (ii) The pump is more reliable than U 2 for heavier use upto 8m³/day i.e 400 people at 20 l/d/capita
- (iii) U 3 is easy and less expensive to maintain than U 2

Need fewer tools for normal repairs and reduced time to service downhole component. Community pump mechanic can easily contain the repairs (with fewer viallges to assist) and need for visit by mobile team is once in six (6) years. The annual maintenance

cost of the U 3 is estimated at 5% of the capital cost, therefore at capital cost of US \$ 500, the annual maintenance cost is US \$ 25. For 300 users, the annual cost would be US \$ 0.083 per capita compared with US \$ 0.42 per capita for U 2.

- (iv) The U 3 just like U 2 can be manufactured locally within a moderately development/established workshop. A local firm, Victoria pumps Ltd, with assistance from Danida has also procured equipment to allow production of the U 3.

However, the cost of locally manufactured U 3 pump and accessories would be high at US \$ 1029 compare with US \$ 500 for imported one.

- (v) The nitrile rubber seals allows the pump to withstand sand laden water to an extend. Reduces the frequency of replacement of seals, which are usually worn out due to abrasion.
- (vi) However, U 3 is not corrosive resistant in aggressive water, The steel rods and mains would be attacked regularly. The use of plastic mains and stainless steel rods would reduce the effect, but may not solve the problem completely as the pump cylinder is still vulnerable.

5. Conclusion

Taking into consideration the above factors U 2/U 3 will remain to be the standard handpumps in Uganda for some time, though U 3 seems more favourable. However, alternative pumps may be required for specialised situations and which is still VIOM, besides U2/U3.

Table 3 : PUMP RATINGS (WORLD BANK)

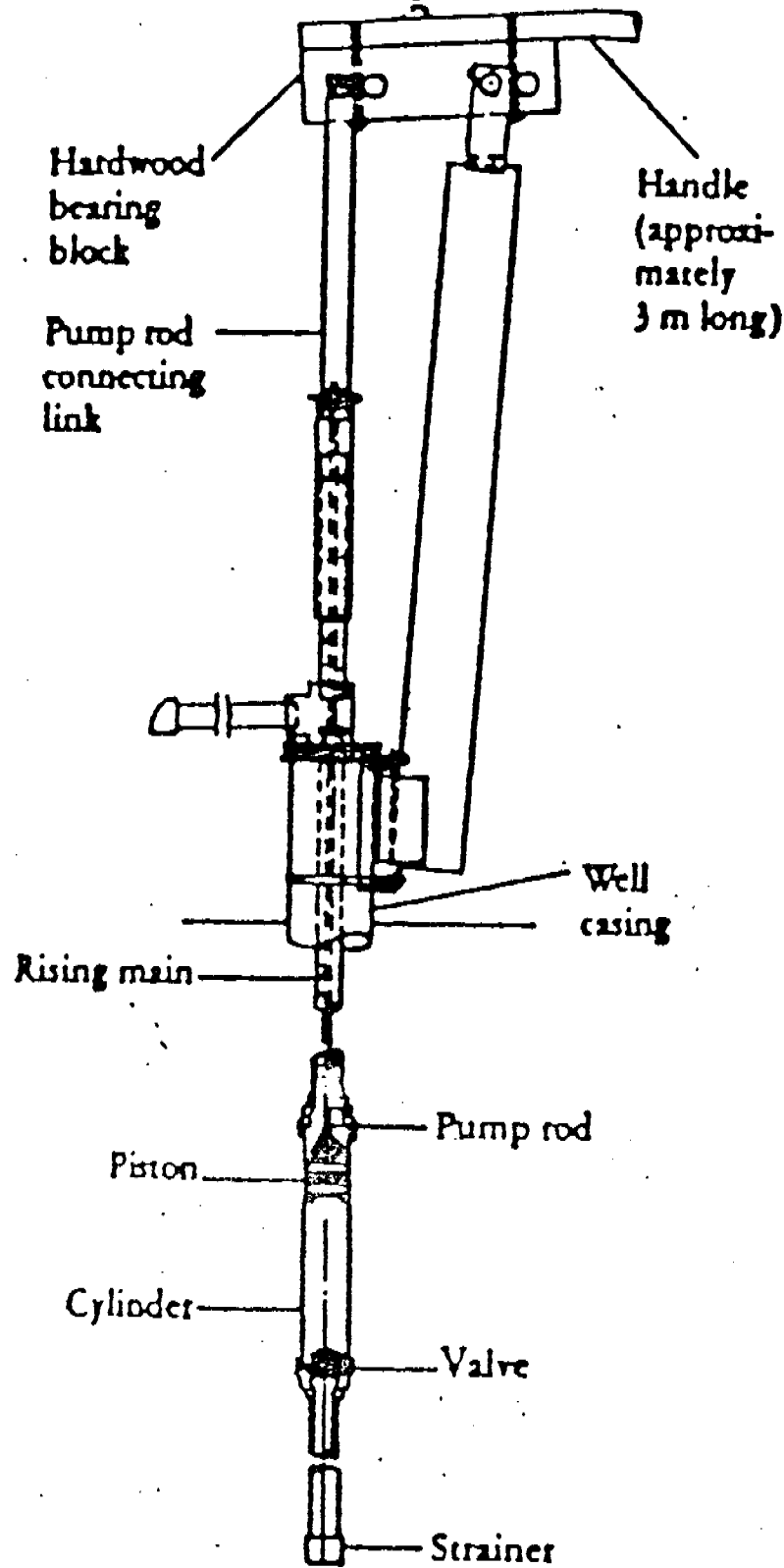
Characteristics	U2		U3		
	25m	45m	25m	45m	
Discharge rate (Adequate discharge rate)	10 l/min **	7l/min **	10 l/min **	7l/min **	
Ease of maintenance					
(a) Village caretaker	-	-	-	-	U 2 for Area may frg (m)
(b) Area mechanic	*	*	**	**	
(c) Mobile units	**	**	**	**	
Reliability for m ³ /day					
4	*	-	**	*	
8	*	-	*	*	
Corrosion Resistance	-	-	-	-	
Abrasssion Resistance	-	-	*	*	
Manufacture needs					
1. Low industrial base	-	-	-	-	
2. Moderately developed Industrial base	*	*	*	*	
3. Well developed Industrial base	**	**	**	**	

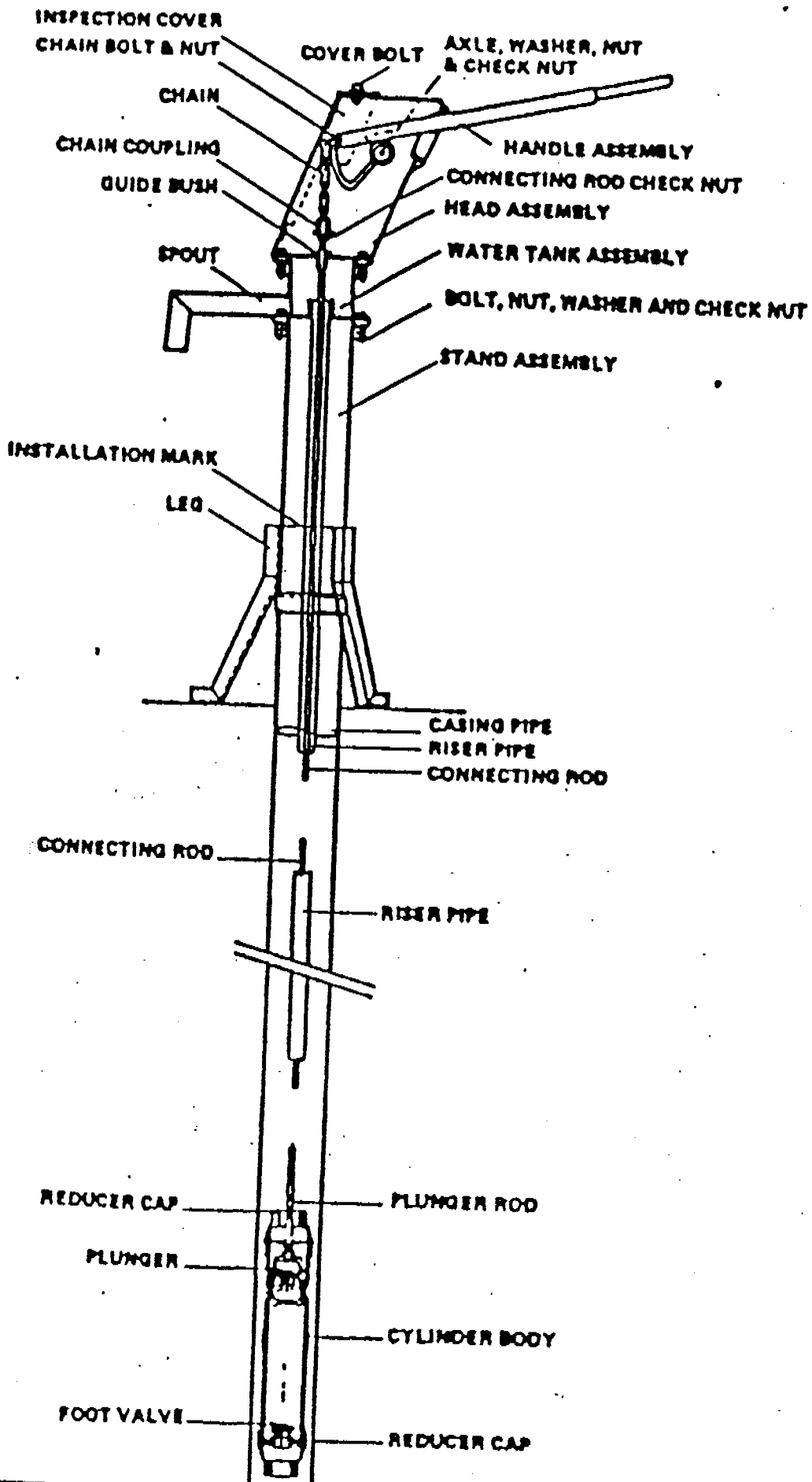
Notes:

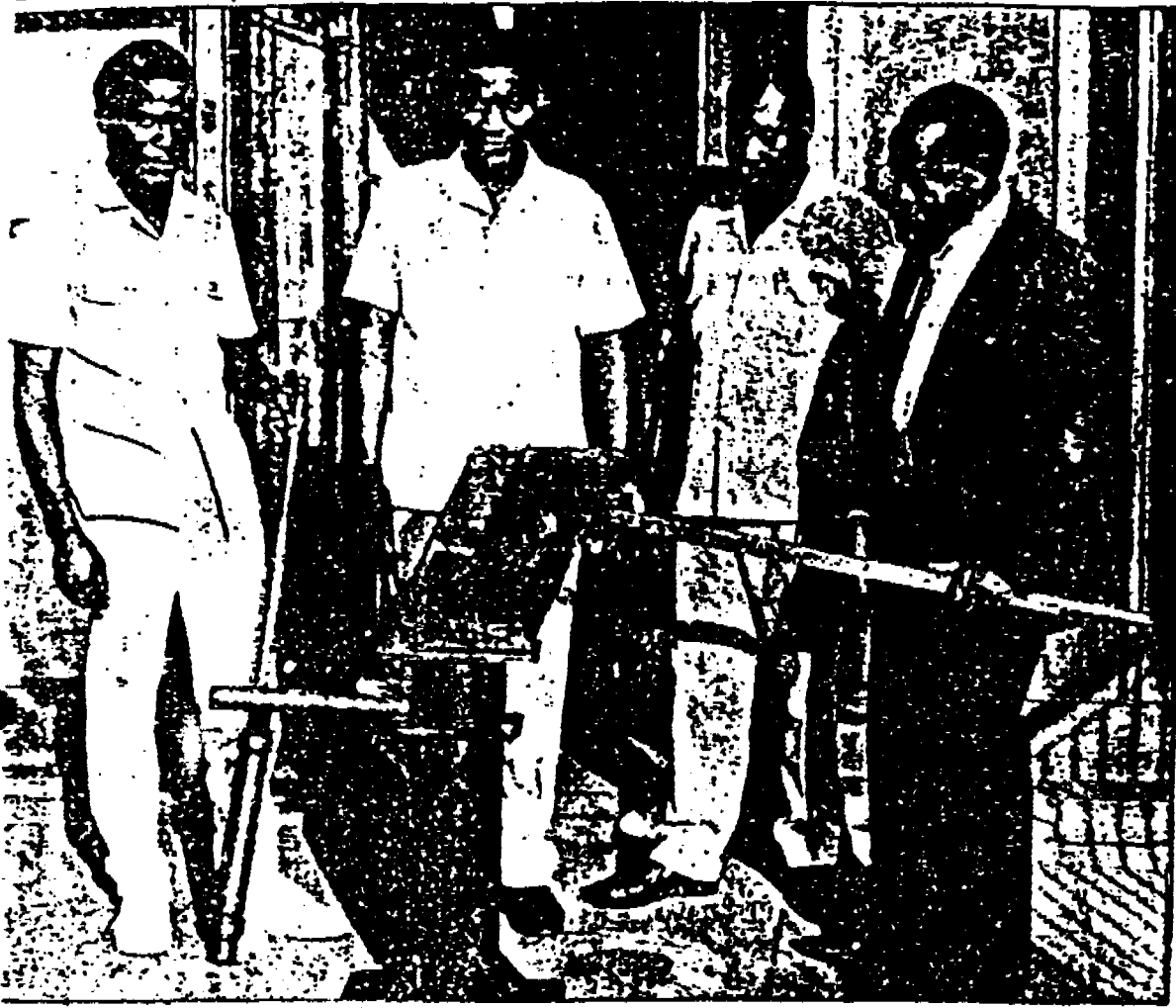
- Shows that the pump does not meet the minimum requirements
- * Means that it is adequate
- ** Indicates that the pump is well suited

Hand Pump: ZIMBABWE.

Reference number: A0503006



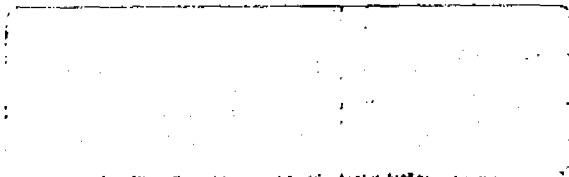




THE Minister of Mineral and Water Development Mr Henry Kajura (right) inspecting a borehole pump manufactured by a Jinja firm, Ushirika Engineering Works. The occasion took place at the ministry headquarters in Kampala on July 16, 1990. According to the manufacturers Messrs Sam. Ikotot and Ivan Nsimbi, (first & second from left of picture respectively), the system has the capacity to draw water from 200 feet below the surface, pump to a distance of 200 yards and 30 feet into a water tank stationed on the roof of a house. Looking on (second right) is the RC 5 Chairman Moyo Mr Phillip Idro who noted that most of the boreholes in Moyo, Nebbi and Arua districts have to be maintained by spare-parts which are imported, so "such simple and serviceable technology will save lots of foreign exchange if properly developed and sustained". (Picture by Alfred Wasike).

**THE COMMUNITY BASED WATER
SOURCE MAINTENANCE SYSTEMS WORKSHOP**

**31 July - 3 August, 1990 .
Kampala International Conference Centre**



COMMUNITY BASED WATER SOURCE MAINTENANCE REGIONAL WORKSHEET

31ST JULY 1990

COMMUNITY BASED MAINTENANCE SYSTEM IN UGANDA

OVERVIEW

BY ENG. B.K. KABANDA COMMISSIONER WDD

1.0 General - Uganda

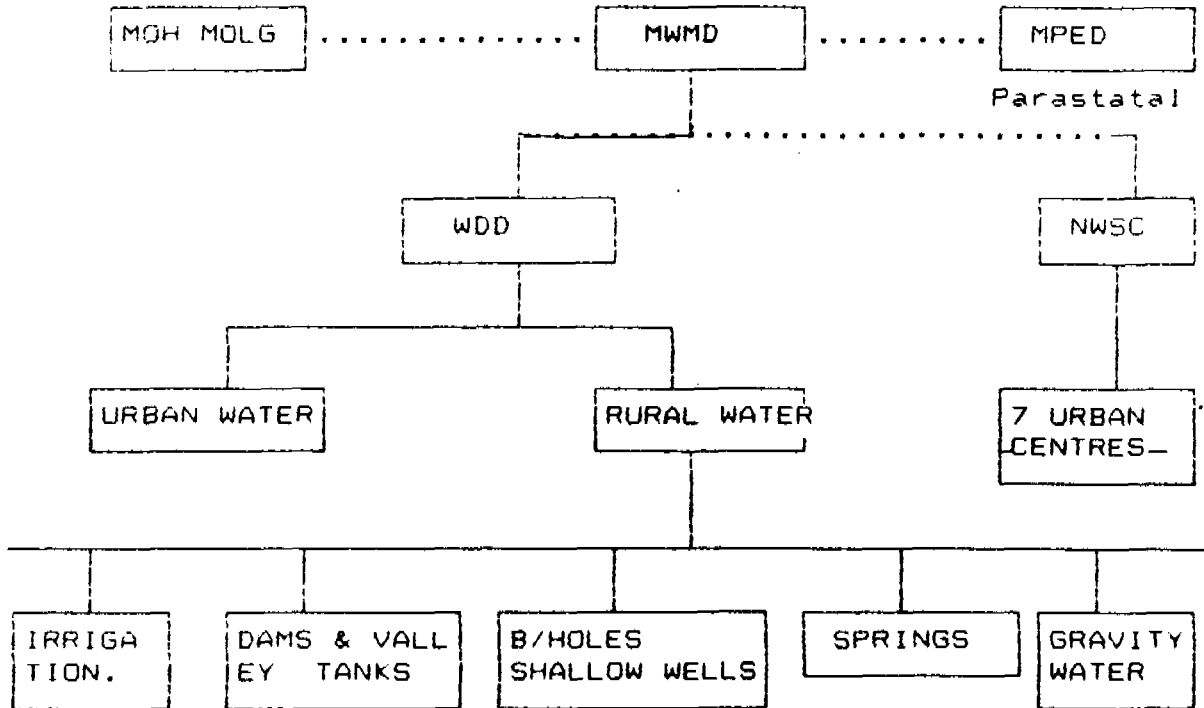
Uganda is landlocked country located in Eastern Africa, sharing boundaries with Kenya, Sudan, Zaire, Rwanda and Tanzania. It covers a total area of 235,690 km² of which is about 15% is open water and is about 2% is swamps (Uganda Atlas). Rainfall ranges from an annual mean of about 500 mm in the North East to 2000 mm in the North west of Lake Victoria and most of the country can rely on 1000 mm or more in an average year.

Uganda's total population is about 17 million of which about 90% live in the rural areas. The main activity is peasant subsistence agricultural farming on individual small scattered plots of land. A few parts are inhabited by pastoralists.

2.0 Rural Water Supply

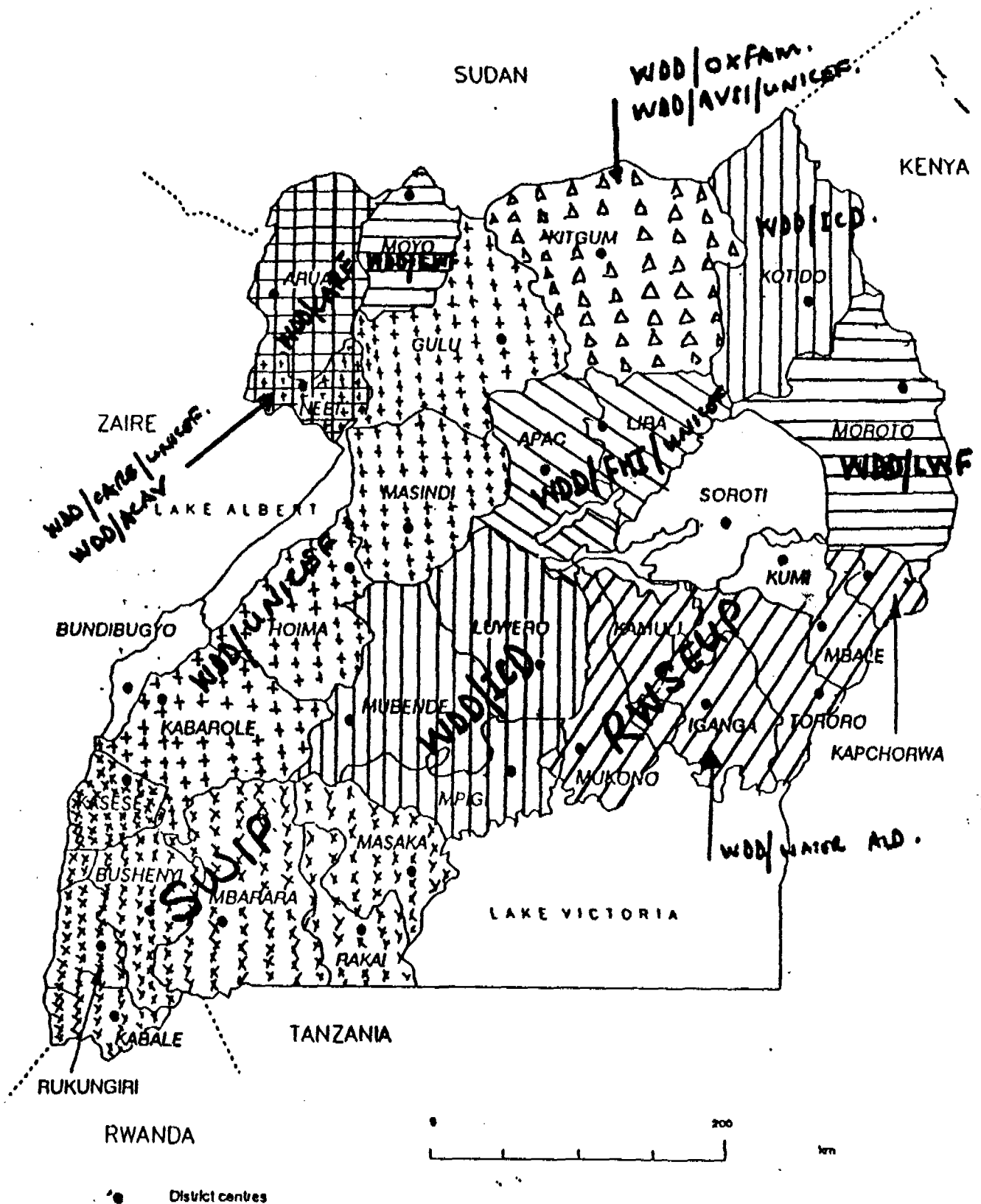
The responsibility for the development rural water supply falls under the Water development Department, in the Ministry of Water and Mineral Development. The task requires collaboration with other concerned ministries such as Health and Local Government. Fig 1 shows the present arrangement.

Fig. 1. Government Roles for Water Supply.



- MWMD = Ministry Of Water & Mineral Development
- MOH = Ministry Of Health
- MOLG = Ministry Of Local Government
- MPED = Ministry Of Planning & Economic Development
- NWSC = National Water & Sewerage Corporation
- WDD = Water Development Department

ONGOING AND PLANNED RURAL WATER AND SANITATION PROGRAMMES



The main sources of water in the rural areas include boreholes, shallow wells, springs, gravity water schemes, dams and valley tanks. Maintenance of boreholes is more complicated and more costly to communities than other simpler sources. More emphasis will be put on boreholes. in the discussion of Community Based Maintenance system in Uganda.

2.0 Boreholes

To date, boreholes form and are likely to remain the main source of clear water supply in the rural areas. This is mainly because of their flexibility to suit the settlement patterns and because of the many areas where alternative water sources do not exist. As of early 1990 successful boreholes in Uganda were over 8300 and it is estimated that up to 20,000 more would be required to meet rural water demands in addition to other forms of water supply. Most of these boreholes are fitted with handpumps. The cost of boreholes installed is of the order of US \$ 6 million and those needed is US \$15 million.

It is, therefore, clear why government and WDD place much emphasis on maintenance of boreholes.

15 Borehole Maintenance Units

Drilling of boreholes in Uganda started in the 1920's and by 1980 approximately 5000 boreholes were drilled and equipped with handpumps, the U-1. Maintenance of all handpumps in Uganda was a responsibility of government (WDD) through a network of 15 boreholes maintenance units evenly distributed all over the country. A borehole survey in 1981 (WDD/UNICEF) revealed that 75% of all the handpumps were broken down. In the same year an emergency borehole rehabilitation programme was launched countrywide with assistance of UNICEF.

Impact of the Borehole Maintenance Units

Two years later in 1983 another survey conducted and revealed that 68% of the boreholes were out of order, indicating that the impact of rehabilitation was very small compared to the inputs. The problem was, therefore, different and needed to be redefined.

Need For Community Involvement

It was seen that the communities needed to be involved in the maintenance and there was need to enhance community ownership of the handpumps. Up to now in many areas and in many government services this element of community participation is missing. The type of handpump also required attention. Fortunately at that time the World Bank was carrying out a study on performance of various

hand pumps. This helped us to standardise the handpump as we introduced the community based maintenance system in Uganda.

3.0 COMMUNITY BASED MAINTENANCE SYSTEM IN UGANDA (CBMS)

- 3.1 CBMS was first introduced in the country with the assistance of UNICEF in 1984 under the borehole drilling programme in the east and north. Local mechanics were trained and equipped with tools and bicycles to carry out repairs. There was however, no clear government policy on the organisation and management of the system especially the mode of payment of the mechanics - government or the community. The system could, therefore, not take off due lack of this basic policy.

When the current government came to power in January 1986, with the policy of self reliance, authority was granted so that other communities could pay for maintenance of their water sources. CBMS was once more initiated in the district of Luwero where there was an emergency water and sanitation project assisted by UNICEF involving boreholes drilling borehole and rehabilitation, spring protection, VIP latrine construction, social mobilisation and Health education. Guidelines, were made to at least start and are contained in the book "Community Based Maintenance System in Uganda". Luwero has been and continues to be the area for experimenting and learning much has been and is being developed and is being used to replicate the system elsewhere in the country. We do owe our success of the CBMS to the introduction of the Resistance Committees and the new philosophy of the UNICEF and NGOs.

3.12 CBMS Coverage/Future Plans

With the experience from Luwero the system is being replicated under the following programmes,

i) Area Based Programme (UNICEF)

This is an integrated water and health programme in South Western Uganda. To date, CBMS has been established in the districts of Mbarara and Bushenyi and will eventually cover the other districts of Rukungiri, Kabale and Kasese.

ii) National Water and Sanitation Programme (UNICEF)

Under this programme the already trained pump mechanics in Lira and Apac, (pre-Luwero era) have undergone refresher training with definition of new

roles and the new approach. The system has also been initiated in Masaka, Rakai and Gulu and plans are under way to start in Kabarole, Bundigbugyo, Hoima Masidi, Soroti, Kumi, Kitgum and Nebbi in phases up to 1995.

iii) WDD/DaNIDA/WaterAid

The system has been started in Jinja and Kamuli. Committees have been formed and some mechanics trained. It is planned that under this programme of water and sanitation the system will be set up in the districts of Iganga, Mbale, Tororo and Kapchorwa.

iv) WDD/LWF (Borehole drilling and rehabilitation and Spring protection

Under this programme CBMS has been started in the districts of Moroto and Moyo.

v) WDD/CARE

CBMS was introduced in Arua district and it is planned to extend to Nebbi.

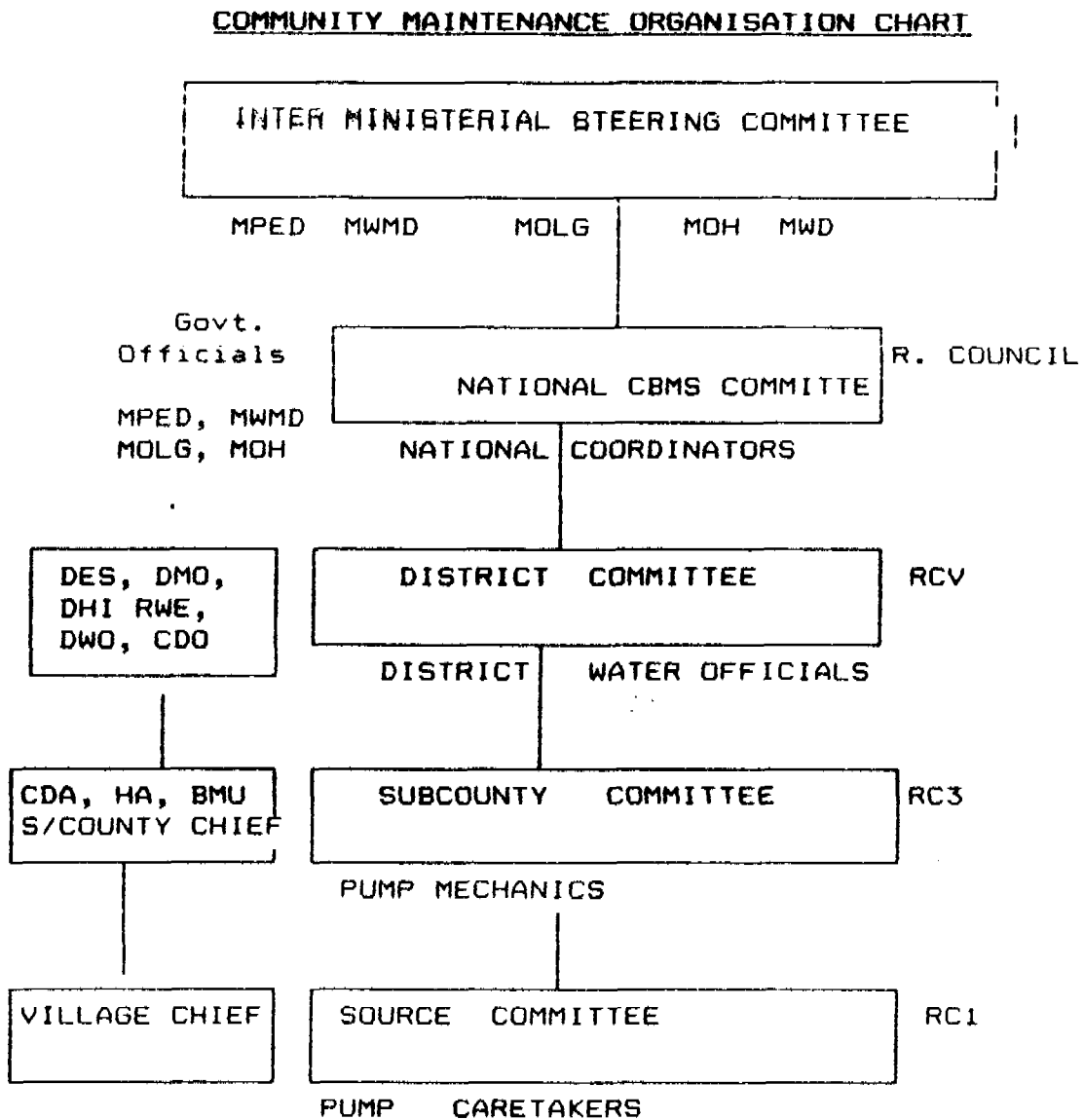
vi) WDD/OXFAM

CBMS is expected to be introduced under proposed programme in Kitgum.

3.3 CBMS Organisation structure

The organisation structure involves formation of water committees at various levels as indicated in the organisation chart fig.3. These committees have been formed in some places. The water Committees relate to the Resistance Committees and to the government officials for policy and technical guidance respectively.

Fig. 3

4.1 Committees (fig.3)Interministerial Steering Committee

ii) The interministerial committee is responsible for coordination at Ministerial level and approval of policies concerning the CBMS among others. It is composed of :

- Permanent Secretaries of MPED (Chairman)
- MWMD, MOLG, MOH, MOWD, MOF, UNICEF, DANIDA representatives, Commissioner WDD and Commissioner Community Development

iii) National Committee

The national CBMS committee is responsible for policy formulation and recommendations. The committee is composed of:

Technical Representatives from all the national projects, Representatives from MPED, MWMD, MOLG, MOH and RCV. All activities of this committee are coordinated by the National Coordinator Pump replacement and maintenance (WDD).

iii) The Subcounty Committees

The sub-county committee is responsible to mobilise and supervise all water source maintenance activities in the subcounty and provide support to the pump mechanic. The committee is composed of sub-county government representatives of MOLG, MOH, MWMD, RC3 officials and other influential leaders.

iv) The water source committee does ensure the upkeep and maintenance of the water source and provide support to the caretaker. For each source the community selects caretaker to be trained in preventive maintenance, basic health messages and upkeep of water source surroundings. The committee is composed of the village chief, Headmasters RCs and other influential village leaders.

4.2 Training and Social mobilization

Mobilisation to create awareness and change of attitude is a major input in setting up CBMS. We have therefore incorporated a social mobilisation component in all our rural water supply project. This taken together with

training will promote sustainability of CBMS and this sustainable and reliable water supply installations. A syllabus for technical training has been developed and being reviewed to incorporate all other levels and aspects like administrations and financial matters relationship between water, sanitation and health.

Training social/mobilisation activities are carried out before during construction of the water sources and are to be organised on a continuous basis through refresher course, seminar, meetings and mass media.

It is also felt that the communities should request for the development and rehabilitation of water sources to enhance community involvement and participation.

The communities select at least two mechanics per subcounty to be trained in maintenance skills (by WDD) and basic health messages (by MOH). Training is undertaken only after an agreement and is on a continuous basis through refresher course, seminars, meetings and mass media.

5. Inputs

CBMS in Uganda is basically joint effort involving beneficiaries backed up by government.

Government through WDD is responsible for procuring of all necessary equipment and hand pump, spares, and distribute them to the various district depots. The communities then purchase the spare parts and government fixed prices from the district depots. The funds from the district are remitted to WDD for purchase of more spares. WDD is also responsible for major repairs such as cleaning of wells, fishing of pipes and monitoring of the quality of water.

Purchase and delivery of spares from the district depot, remuneration of mechanics is a responsibility of the communities. The ultimate goal should be that the spare parts are sold through private traders and pump mechanics operate privately.

6. Monitoring and Evaluation

Assessment of performance of the system is done through an inbuilt monitoring through monthly reports of the respective committees at all levels. Evaluation surveys are at times done in selected areas to confirm the monthly reports and identify bottlenecks. Indicators of success include percentage of peritoneal water sources at any one time, down time.

7. Handpump Standardisation

The CBMS can only work best with a limited number of types of handpumps because of uniform spare parts, tools and skills required. In our case we have the India Mark 11 as the standard pump has versions like the extra deep U-11 and of recent Uganda mark in the India Mark 111, which we are introducing and it is expected to ease maintenance even further. As of now, arrangement for local manufacture are at advanced stages and trial pumps are expected by end of 1990.

The ordinary U-11 goes up to 45m, the extra deep U-11 goes up 90 m. The U-11 is same as the above versions only that underground parts can be extracted without necessary removing the rising mains. A well requires less tools and skills.

To cope with aggressive/corrosive water, in certain areas of the country, consideration is being given to use of plastic pipes and rods or stainless steel or use of alternatives to be selected and tried. A decision has yet to be taken as to which pump should be adopted for the shallow wells.

8. Conclusion

As this is a new development in an entirely different setting (the centralised system) we have to ascertain as to whether we defined the problem correctly. We have therefore had to carry out surveys in Bushenyi and Luwero districts. On average 82% of all boreholes are working at any one time and down time is reduced from the several months to less than 9 days. Per capita cost is estimated and US \$ 0.42 compared 2.33 with the centralised system.

It should however, be noted here that the system works on elimination of friction or conflict between people not just good supervision.

- The quality and quantity of water must be reliable, otherwise people loose confidence and interest and this raises the issue of acceptable yield of a borehole.
- The people to be trained or mobilised must be identified with care. Level of basic education plays a big role here.
- Such cases which involve changing a system, meet a lot of resistance from the people managing the existing system. It is always better to use independent new persons to spearhead the start. In our case we appointed a National Coordinator who had never been part of the borehole maintenance system. Personal interest must be exploited.

- The communities (beneficiaries) should never be left on their own. There must always be somebody to encourage them to stay as a group (normally immediately officers go away project fail)

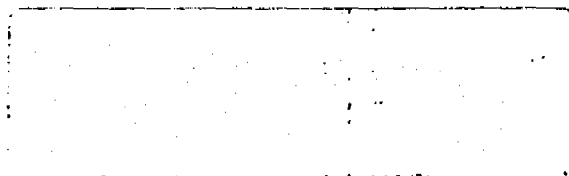
- There is always a time scale in problem development. We must therefore strengthen information sharing, workshops like this one so that we do not repeat mistakes or try to invent what has already existed elsewhere.

ANNEX 1List Of Abbreviations

MWMD	=	Ministry Of Water & Mineral Development
MPED	=	Ministry Of Planning & Economic Development
MOH	=	Ministry Of Health
MOLG	=	Ministry Of Local Government
WDD	=	Water Development Department
MWWID	=	Ministry Of Women In Development
NWSC	=	National Water & Sewerage Corporation
RC	=	Resistance Committee
DES	=	District Executive Secretary
DMO	=	District Medical Officer
DHI	=	District Health Inspector
RWE	=	Regional Water Engineer
DWO	=	District Water Officer
CDO	=	Community Development Officer
CDA	=	Community Development Assistant
HA	=	Health Assistance
BMU	=	Borehole Maintenance Unit
S/County	=	Subcounty
LWF	=	Lutheran World Federation
SWIP	=	South West Integrated Project
ICD	=	Italian Cooperation and Development
RWSEUP	=	Rural Water and Sanitation East Uganda Project (WDD/DANIDA)
FTH	=	Food For The Hungry

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COMMUNITY BASED WATER SOURCE AND SANITATION MONITORING/MAINTENANCE SYSTEMS
-- WORLD VISION'S EXPERIENCE IN LUWEERO DISTRICT

1.0 WORLD VISION'S ACTIVITIES IN LUWEERO

World Vision an International Rehabilitation and Development NGO, started work in Luweero district in 1986 when the organisation provided relief items to people who were just returning to the district after the 1981-86 war.

community Based Hand Pump Maintenance system monitoring is an addition to World Vision activities in Luweero. Currently, the organization is operating 13 Community Based Development projects in the districts. The basic goals for each of these projects are: Education, Health, Agriculture, Income Generation Skills, Shelter, and Water Development. Beneficiary communities participate in project identification, implementation, management as well as project evaluation.

2.0 TYPES OF WATER SOURCES IN LUWEERO

In Luweero district, there are both natural and man-made water sources. These include open wells, protected and unprotected springs, swamps, boreholes, valley dams and roof catchment tanks.

In the north of the district which is semi-arid and where people are mainly cattle keepers, there are no natural sources like springs or wells. Therefore, people in these areas use valley dams and boreholes to meet their daily water requirements. The emergency water programme which was introduced in 1986 covered only two sub-counties in the north, namely Wabinyonyi and Kakooge. There are 22 boreholes in Wabinyonyi and 60 in Kakooge but even then, they are not enough to meet the water demand in these areas. Parishes like Wajjala and Kyamuyingo in Wabinyonyi, and Katuugo in Kakooge are still waiting for a day when they will have boreholes.

While valley dams in these areas are very helpful in cattle farming, their poor sanitation is proving to be a difficulty in people's health. In absence of an alternative source people are forced to drink valley dam contaminated water which was meant for animals.

In the southern part of the district, there are more settlements and therefore more water demands. Natural water sources are still few. There are some springs, both protected and unprotected mainly in Katikamu and Nyimbwa subcounties and a few scattered in places like Makulubita and Nakaseke. Swamps are also used as a water source in this area. Similar to the effect of valley dams in the north, swamps promote the water related diseases in the south. People who live near to the swamps are attracted to drink this contaminated water more easily than having to walk long distances to the borehole areas. Such cases are many in Kalagala, Kapeeka and Semuto. Protecting springs in this area whenever they are available could be an economical solution to the health problems but it requires some level of skilled labour which is not always easily available in these rural areas. Therefore, a borehole is the apparent hope for a safe drinking water source in Luweero district.

The project has 520 boreholes distributed in 13 subcounties. The subcounties are; Wabinyonyi, Kakooge, Butuntumula, Luweero, Kikamulo, Nakaseke, Kapeeka, Semuto, Makulubita, Katikamu, Nyimbwa, Bamunanika and Kikyusa.

3.0 CONCEPT OF COMMUNITY BASED WATER SOURCE AND SANITATION MONITORING/ MAINTENANCE SYSTEMS

Right from the past, people in the rural areas used to maintain their wells (open wells) on self help basis popularly known as "Bulungi Bwansi." People in the same village would come together and construct something that was of a common interest. These included roads, wells and other types of infrastructure. In most of these activities, someone's contribution was in form of labour and any locally available materials like trees or logs. There was however lack of skilled manpower in most of these communities.

Before the project was established in 1986, the few boreholes which existed in Luweero were maintained by the Government Borehole maintenance units (BMU) as it were in several other places of the country. Borehole maintenance unit s staff had to move long distances to repair pumps deep in the villages. It was costly and time consuming, and with inadequate facilities, most of the boreholes collapsed.

In 1986, the maintenance system in Luweero was revised. It is obvious that the system needed to be changed and is supported by a number of striking advantages which can be pointed at in Luweero Community Based Hand Pump Maintenance system. Some of them are:

- (a) Low cost of maintenance rated at \$84.67 compared to \$466.7 before 1986.
- (b) Assurance of a responsible caring person always looking after the pump.
- (c) Promotion of community corporate efforts thus a step ahead in social-economical development among rural communities.
- (d) For 4 years now, over 90% of the installed U-two pumps have been working at any one time compared to the 25% figure before 1986.

4.0 COMMUNITY BASED WATER SOURCE AND SANITATION MONITORING/MAINTENANCE SYSTEMS EXPERIENCES IN LUWEERO

World Vision has been monitoring the CBHMS in Luweero since 1987. Among the many experiences gone through the following are highlighted:

- 4.1 In the Luweero situation, the impact of water on communities is centred on the 520 boreholes as they outnumber any other improved water source in the district.

This district which had suffered all kinds of losses in the liberation war, was privileged to receive safe water in relatively short walking distances.

The existence of boreholes has reduced the burden on women and children who are always doing the donkey work of the home.

Community Based hand Pump Maintenance meetings have caused more opportunities for interactions among the people in an area and have led to a process of empowerment in all kinds of Community Based Development schemes. With the aim of mobilising the communities to the awareness of the Community Based Maintenance System, seminars were held all over the district in February this year. It is interesting to note that many subcounties had already gone into Community Based Development schemes. There are some big ones like Kikyusa Oil Mill.

4.2 COMMUNITY PARTICIPATION IN THE SYSTEM

For the community based maintenance to function, the beneficiaries must develop a sense of ownership for their boreholes.

In Luweero, the sense of ownership is realised and has contributed greatly to the success of the system. Lack of enough alternative water sources in the area has in one way led people to appreciate what they have at hand. It is more strengthened when ownership is well defined in people's minds.

The mobilisation and training of communities was necessary in order to begin to convince them of their responsibility towards the boreholes. There was an old belief, that boreholes belonged to government and that therefore it was solely government's business to maintain them. In any community based endeavour, the target should always be the grassroot people -- the water consumers. They should be made to participate in the initial planning including selection of borehole sites and their distribution in the area. Communities need to be fully mobilised for participation at all levels. They need to be taught how the community based system operates. This could be done through a programme of training aimed at ensuring sustainability of the system at the district, subcounty and pump levels.

4.3 KEY PEOPLE IN THE SYSTEM

In Luweero, one finds the communities being the owners of the water sources. These are normally homesteads surrounding the source which range between 20 and 30 homesteads. Among them lives a person selected to attend to the source who is known as the caretaker. He has the responsibility of mobilising the fellow villagers to clean around the pump, collecting pump maintenance funds and all that is in connection with maintenance of the pump.

In its organisation the maintenance system has linked up closely in the already existing government structures known as Resistance Councils. (RC I, RC II, RC III). These are grassroot level structures through which communities are represented to government. The system therefore utilises this set up and incorporates the RC I Chairman as the basic local authority at the pump level who handles the administrative affairs.

It should be noted that the caretaker and the RC I Chairman are members of the user community. They do not get any payment for their services. Therefore to get their commitment they need to be made aware of the advantages of the boreholes and the importance of their role in maintenance of this borehole.

At the lowest level of administration is the village which forms RC I. The next one is the parish which forms RC II and then the next is the subcounty which forms RC III. At the subcounty level there are 4 key people in the Community Based Hand Pump Maintenance System. They are the RC III Chairman, the subcounty chief and two pump mechanics.

The subcounty chief and RC III Chairman normally sit in the same office but doing different functions. One acts as government representative and policy implementer at the subcounty level and the other is the people's representative and planner still at the same level.

The system utilises these two key positions to centralise the communities in monitoring and administration. People in these positions are paid by government and they take community Based system as part of their job since it falls in the sphere of area development.

The two pump mechanics at the subcounty level are selected and sponsored by the community for their training. They are supervised and report directly to the RC III Chairman at the subcounty level. Payments for their services are in some subcounties effected directly at the pump level by the user communities and in others indirectly through RC III.

The thirteen subcounties are also overseen by the District Administration in Luweero, there is the District Health Inspector who is doing the supervision and is in charge of the spare parts depot at the district level. For sustainability of the maintenance system, Water Development Department has placed a water officer at the district who will coordinate between communities and Water Development Department especially in connection with higher technical needs of the pump.

4.4 LINKING CORDS IN THE SYSTEM

Something to realise in the system is that there are some key people who are paid for their services and yet others are not. This could easily affect the individuals' morale and efficiency. However, it could easily be contained by taking into account the linking cord in the system. This is the relationship between the people involved in the system.

With good relationships one is inspired to do the work with great care and efficiency even if he/she is not paid. It is the duty of mobilisers and the monitor to facilitate this sensitive aspect of the system. They should be ready to resolve any conflict as soon as it arises, motivate the relationship where it seems to be weak and encourage it where it is good.

In Luweero, caretakers are not paid in cash. Where the relationship between caretaker and communities is good, he does everything with commitment. He is always ready to listen to the people and vice versa. When it comes to maintenance funds collection, there is no strain at all. The best examples are in Nakaseke and Makulubita subcounties.

Relationship needs to be respected even at higher levels of pump mechanic and subcounty authorities. Although the mechanic is paid, his pay is not sufficient to motivate him work efficiently amidst community conflicts. Sometimes the RC III might fail to raise the pump mechanics payment for several months. But if their relationship is good, the mechanic will in most cases be enthusiastic. In Luweero, very often the mechanics morale is more raised by the communities token whenever he repairs a pump. This can be a chicken, a bunch of bananas or a delicious meal after work. Thus payment is often in kind.

Relationships are also important at the monitoring level. With bad relationship, people at all stages can easily feed you with wrong information. Our monitoring in Luweero has been successful because of the close association we have developed between ourselves and the communities at all levels. One must respect their interest and utilise their ideas whenever possible.

It is important that the goal owner/monitor like the newly appointed Water Development Department, district water officer be given extensive orientation before he can be in position to handle such a sensitive system.

4.5 FUNDS COLLECTION AND ACCOUNTABILITY

In the community based hand pump maintenance system, funds collection and community contributions play two important roles thus ensuring maintenance on one hand but also in creating a sense of involvement and ownership amongst the communities on the other. In Luweero, this contribution is made in the form of cash, in kind and labour. The last two are easy to handle but the first is always a tricky one to handle.

In the system, money is needed for purchase of spare parts, payment of mechanics, maintenance of the bicycles and other supportive schemes. The issues to look at here are: who should raise this money, how much should be raised, how often should it be raised and who should keep it and manage it? It is important to note that there are different types of funds collection in different subcounties.

In Butuntumula for example every tax payer is supposed to pay 200/= per year alongside graduated tax. The problem arose when some tax payers in one part of the subcounty which didn't receive boreholes were also told to pay this money. They were not happy and they regarded it as a government levy. Being undefined, this collection system therefore turned into oppression other than a self help goal.

Through dialogue it was later communicated that every home in Butuntumula enjoys water directly or indirectly. Those who do not have boreholes nearby at least have children who go to schools where there are boreholes. With time it became more and more clear to people's minds and now people pay this money alongside graduated tax. There are also other subcounties in Luweero which have adopted this method.

In Nakaseke, money is collected by the caretaker, taken to RC II (Parish head) and then passed on to RC III treasurer for keeping and managing.

In Semuto, money is collected only when there is need for a pump repair. In this way collection and management is done and completed by the caretaker with the help of the RC I Chairman.

The above indicates that there is still some flexibility as to who collects funds, how much is collected and where it is kept and managed. Such a situation demands for a close and continuous follow up. However, some efforts have been already made to standardise the method of funds collection and integrate it in the awaited National Water Policy. It is hoped that communities will reach a stage of operating savings accounts and even be in position to finance their monitoring.

4.6 TRAINING AND REPORTING

At the time of project implementation, all people in the system received some form of training. Pump mechanics were trained to handle the elementary mechanical problems of a U-two pump. They were also educated on how to mobilise communities and improve on their health and sanitation conditions. Caretakers were also given some form of training as to how to grease the pump and community mobilisation. RCs were educated on how to report and manage the affairs of the community based hand pump maintenance.

But with time there have been many changes in RC representation and this has affected the system. New RC officials come in knowing nothing about the system and so there is need for fresh training, orientation and relationship building occasionally. This has often hampered and slowed down progress. Sometimes, the outgoing RC have carelessly disappeared with all project records. This has had negative effects on the system.

There are places which keep good records of their system management. For example Nakaseke and Bamunanika.

Basically, information was meant to flow from caretaker through RC I, RC II, RC III, monitor to the facilitating institutions. Changes in RCs supplemented by some individuals with negative attitude towards long bureaucracy have made it difficult for the smooth flow of information. Consequently the monitor has to use his good relationship to extract the required information at relevant points in the system.

The above indicates the need for continuous training at all levels in the system.

4.7 CONCLUDING REMARKS

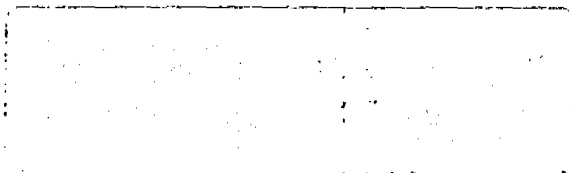
With the cooperation and determination in all the parties involved Luweero Community Based hand Pump Maintenance System has been very successful and it is right to recommend it to other parts of the country.

In this pilot project on community based hand pump maintenance system, its important to note a good example of communities' reaction towards different issues. In a developmental process difficulties will continue to emerge but the quality of the outcoming system will depend on how the difficulties are handled.

Improvement in health of communities and sanitation are key indicators in the impact of the introduced water system. Therefore more emphasis has to be put on health and sanitation education as efforts are put in to establish a sustainable maintenance system. The above therefore calls for continual training of all parties involved in the system and important topics like monitoring reporting, funds collection and accountability, managerial skills should be emphasised.

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SOURCE MAINTENANCE SYSTEMS WORKSHOP**

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COMMUNITY BASED WATER SOURCE MAINTENANCE REGIONAL WORKSHOP
31ST JULY - 3RD AUGUST 1990.

By A.M.Kabirizi
Water Development Department
Ministry of Water and Mineral Development
UGANDA.

1.0 Introduction:

In the Uganda context, introduction of community based maintenance of protected water sources refers to nothing else other than COMMUNITY FINANCING. This is because maintenance of the traditional water sources has always been done on communal basis but with no involvement of funds at all. The Traditional sources of water were mainly water holes just excavated into the ground and water just withdrawn using ropes and/or buckets. However, with the introduction of improved technologies in order to get the communities, more, safe, and reliable water supply, funds have come into play (for maintenance of such installations).

Installations referred to date are mainly:-

Springs:-

Protected using cement and will require cement and skilled labour for maintenance.

Gravity Schemes:

Which require purchase of pipes, fittings and at times chemicals for treatment and skilled labour.

Dams and Valley tanks

Which require slashers, wheelbarrows for normal maintenance and sophisticated machinery and skilled labour for desilting.

Deep boreholes and Shallow Wells:-

Installed with hand pumps or motorised pumps and require spare parts, fuel, skilled labour.

Operation and maintenance of all the above water systems require funds and the source is either the Centralised government funding or the user community or a combination of both. More consideration will be put on hand pumps as boreholes are the most common source of water in the rural communities (91% of the population) and require more funds for maintenance.

And due to the current economic situation government is constrained and cannot meet all this funding.

2.0 Centralised government funding system:

In most cases funds are released from the Central government treasury and, follow through the Ministry of Water and Mineral Development to Water Development Department and then to the field. With this system no funds were required to be generated from the users at all. The problems associated with this arrangement include:-

- (i) Inadequate and late release of funds from an already limited budget (O & M, budget is first to be slashed) so you either starve or feast.
- (ii) More costly in terms of per capita cost.
- (iii) Longer down time due to government bureaucracy.
- (iv) Lack of morale of staff due to poor remuneration, no logistical support and they are never considered doing important work.

3.0 Community Financing

The NRM government policy is Self Reliance and therefore communities have been encouraged to meet the operation and maintenance costs of their water sources. This has thus led to the introduction of the Community, Based financing of Maintenance of water sources and hand pumps in particular.

3.0.1 Advantages of this systems:-

- (i) Reduces cost in terms of per capita maintenance cost.
- (ii) More efficient i.e less down time
- (iii) Reduces government administrative and financial constraints thus concentrate on development of new sources.
- (iv) Enhances development of skills within communities.

- (v) Promotes sense of ownership and therefore more care and sustainability.

The recent expansion of the banking scheme in the rural areas and existence of cash safes at subcounty has been great strength. However it may be affected by:-

- (i) General economical conditions with respect to affordability.
- (ii) The existing government financing systems i.e. collection of Graduated Tax and the general attitude that government should finance all the services.
- (iii) Poor public finance management skills within the communities.
- (iv) Inadequate or inconsistent supply of water i.e. once people pay for a service they will always demand for continuous supply just like in the urban areas.
- (v) Walking long distances
- (vi) Poor water quality
- (vii) Lack of mobilisation

From the above discussion it is clear that, none of the systems is ideal. Community financing seems to be more feasible though with some shortcomings as well. A system that therefore that works well is community financing, backed up with the centralised system in terms of major financial inputs of say repairs and at times when a community cannot afford.

3.1 Requirement for Community Funds:-

In community Based Maintenance System, funds are needed for:-

- Purchase of spare parts and any other materia and equipment required during operation and maintenance.
- Allowances to the community artisians to repair the installations.

- Operation of district depot - stationery etc.
- Allowances for field extension staff, as back up support by government.

3.2 Methods of raising the funds:-

- Agreed levies for tax payer or per household
- Agreed fee per unit quantity
- Payment in kind
- Separate fee to the sub-county for allowance to mechanic and maintenance of bicycle and another fee for purchase of spare parts.
- Fines and penalties against misuse
- Fund raising functions
- Levy per user in public places (markets and institutions).

At least each one of these or a combination are operating in some place depending on setup of the society. The methods are devised by the communities.

3.3. Collection of funds

Methods of collection can be divided into two categories.

(i) Continuous, where by funds are budgeted and collected periodically say annually and just awaits the requirements. This is advantageous in that it reduces down time of the water sources, as spares can be stocked. It can however be grossly affected by inflation, and limited financial management skills in the communities.

(ii) When the pump breaks down.

This has the advantage that funds will be utilised immediately they are collected and will not face gross mismanagement and inflation. Community

funds are however seasonal so down time may be highly increased if repairs are required during low season (no crop sales). It may at times require more money for each repair.

3.4 Management of funds (control)

If the system of community financing is to work well budgeting, collection, custody, utilisation and accountability must be well catered for;

This requires:-

- Planning and budgeting at all levels involved in the system e.g. source, through district to National level.
- Proper book-keeping at all levels
- Public accountability
- Separate bank accounts for the funds
- Coordination and monitoring of utilisation by selected authorities at all levels i.e district officials must monitor all funds in the communities.

Conclusion:

Community financing is advantageous and is a possible venture. Our examples of Luwero and Bushenyi where the system is almost complete indicate this very clearly. Percentage of boreholes working is over 80% and down time 10 days and less.

It is apparently clear that affordability is not the major problem instead mismanagement of already collected funds. Our solution to this has been to incorporate training in financial management, Public accountability and supervision of utilisation by the office of the district administration, and RC IV.

Sources shared between Public institutions and communities have at times caused us some problems. As a solution, institutions have been encouraged to pay for any repairs and collect funds from the public through their established channels.

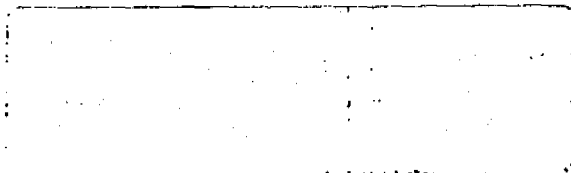
Inflation has been another limiting factor as the price of spare parts has to change every half year and allowance to

the mechanic needs revision and yet income in the communities is always constant. Local manufacture and perhaps improved economy will help us here.

The amounts of money collected varies with community. Right now it ranges between 200 - 500 per household per year, which is affordable by an average rural Ugandan if it is collected at the time when he has it (Crop selling season)

**THE COMMUNITY BASED WATER
SOURCE MAINTENANCE SYSTEMS WORKSHOP**

**31 July - 3 August, 1990 .
Kampala International Conference Centre**



IMPLEMENTATION OF COMMUNITY BASED PUMP MAINTENANCE

EXPERIENCE IN MOYO DISTRICT - WEST NILE

LWF - UGANDA

REF: 16N 8868
LOC:

NOTES ON THE IMPLEMENTATION OF COMMUNITY BASED PUMP
MAINTENANCE IN MOYO DISTRICT - WEST NILE.

HISTORICAL DATA

Training of mechanics took place during the second half of 1988. This consisted of theoretical and practical work culminating in the secondment to our pump installation crew for a short period. Training was completed in five months and the equipment and bicycles were issued at the end of December 1988. This was done in a formal manner with the RC3 and the mechanic signing papers indicating the rules pertaining to the use of the issued items.

During November 1989 meetings were held in East and West Moyo with the mechanics RC's and water committee members to assess the schemes progress.

Due in part to the above mentioned meeting and general feed back more meetings were made in April 1990. These were based at parish level and specifically targeted towards women. A point was made and adhered to that any meeting would not commence until at least 50% of those present were women.

PRESENT SITUATION

After completing the drilling of 82 boreholes in West Moyo and 51 in East Moyo drilling is now being undertaken in Aringa County - Arua District. Here C.A.R.E./E.I.L. had already trained the pump mechanics and issued them with tools and bicycles.

Drilling started in mid May and we have to date run a short seminar of two days targeted at R.C.'s and water committee members, with the aim of making officials aware of the structure of the scheme.

We are presently seeking a local government worker who will meet with each individual community that receives a handpump to try and establish a working structure for maintenance. Also we feel that a good time to make the initial contact is during the drilling process when local enthusiasm and interest is running high.

FEEDBACK FROM MEETINGS

NEGATIVE

=====

1. Indiscipline of mechanics.

This has been highlighted by the removal of parts from one borehole for the purpose of either selling to repair another borehole, or plainly to hold a community to ransom.

2. Misuse of tools and bicycle by the mechanics and RC's.

3. Problems of fund-raising.

a) The concept is new and somewhat alien to them.
People still refer to the B.M.U.

b) Some water committees have misappropriated ie, spent the money received.

c) If money is banked then there are problems of access when required for the purchase of parts.

4. Mechanics tend to feel after their training that they have a saleable skill and loose sight of their community spirit

5. Everyone in our area is a returnee from Sudan/Zaire. They complain of little expendable income after school fees, graduated tax and now medical fees.

In this area there are few income generating sources.

6. Mechanics have left their positions in a number of cases, one has joined the L.D.F. and is often not available for repairs.

When new R.C's were elected then requests were made to train new mechanics as the previous people were not the choice of the community.

POSITIVE

=====

1. At the present drilling location with the benefit of simultaneous community motivation by R.C's we are seeing a greater appreciation for community involvement.

2. Spare part sales are marginally on the increase.

3. There has been interest in short courses to be run within villages to instruct on basic book-keeping and other skills required for water committees.

4. Stores are to be set up at county level at the request of the County Chiefs. Their offices seem well placed in terms of ease of supply from central stores and of distribution to mechanics.

5. If areas suffer when mechanics fail in their duties, we try not to interfere but on occasions it has proved necessary. The community's however were willing to pay for the repairs which included a 1000/= service charge.

OBSERVATIONS

The West Nile region is not typical in terms of the rest of Uganda and therefore may have specific problems in terms of implementing community based pump maintenance. Our observations have led us to present the following points.

1. There must be confidence in those who administer finances, with some form of accountability.

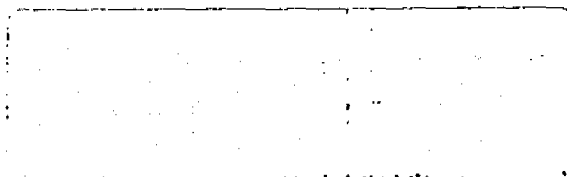
2. As fund raising seems to be major stumbling block, then perhaps R.C's should be empowered to raise some form of local water tax.

3. Mechanics need some form of legally binding contract to prevent the poor performances noted in some areas.

4. A standard system of mechanic remuneration should be drawn up, as they often do not receive any form of payment.

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EXPERIENCE IN GRAVITY FLOW SCHEMES IN UGANDA

**Bijaya Rajbhandari,
Project Officer , National Water Supply and Sanitation.
July 1990**

EXPERIENCE WITH GRAVITY FLOW SCHEMES IN UGANDA

- GRAVITY SCHEMES IS AN EFFICIENT MEANS FOR DISTRIBUTING SAFE WATER.
IT IS THE APPROPRIATE TECHNOLOGY IN THE FOLLOWING CONDITIONS.
- PER CAPITA COST IS LOW FOR DENSELY POPULATED AREAS COMPARED TO BOREHOLE DRILLING.
- WHILE COMPARING THE COST WITH OTHER TECHNOLOGY, IT IS IMPORTANT TO CALCULATE ON THE SAME LEVEL OF SERVICES OF GRAVITY SCHEMES VIS-A-VIS BOREHOLES, VIS-A-VIS SPRINGS.
- INSTALLATION COST IS NOT THE ONLY FACTOR IN SELECTING THIS TECHNOLOGY.

ADVANTAGES OF GRAVITY SCHEMES	DISADVANTAGES OF GRAVITY SCHEMES
<ul style="list-style-type: none"> • LESS OPERATING/MAINTENANCE BURDEN (IF PROPERLY INSTALLED!) • MORE WATER POINTS IN COMMUNITY - IF ONE TAP BREAKS, ANOTHER WILL BE NEAR • MORE SCOPE FOR COMMUNITY INVOLVEMENT, MORE TIME FOR INTERACTION, BETTER PROSPECTS FOR FOLLOW-UP ACTIVITIES. • TAP USER GROUP SIZE SMALLER THAN BOREHOLE USER GROUP SIZE, MAKING MAINTENANCE EASIER. • REPAIRS USUALLY WITHIN TECHNICAL COMPETENCE OF LOCAL PEOPLE. • GOOD ENTRY POINT FOR OTHER DEVELOPMENT COMPONENTS DUE TO LONG INTERACTION PERIOD WITH THE COMMUNITY. 	<ul style="list-style-type: none"> • NEEDS VERY CAREFUL DESIGN AND INSTALLATION. • NEEDS SOURCE PROTECTION TO MAINTAIN QUANTITY AND QUALITY. • VULNERABLE TO EROSION. • ONE EVENT (E.G. MAIN PIPELINE BREAKAGE) CAN AFFECT LARGER POPULATION SERVED THAN A BOREHOLE • REQUIRES COLLABORATION BETWEEN COMMUNITIES SERVED.

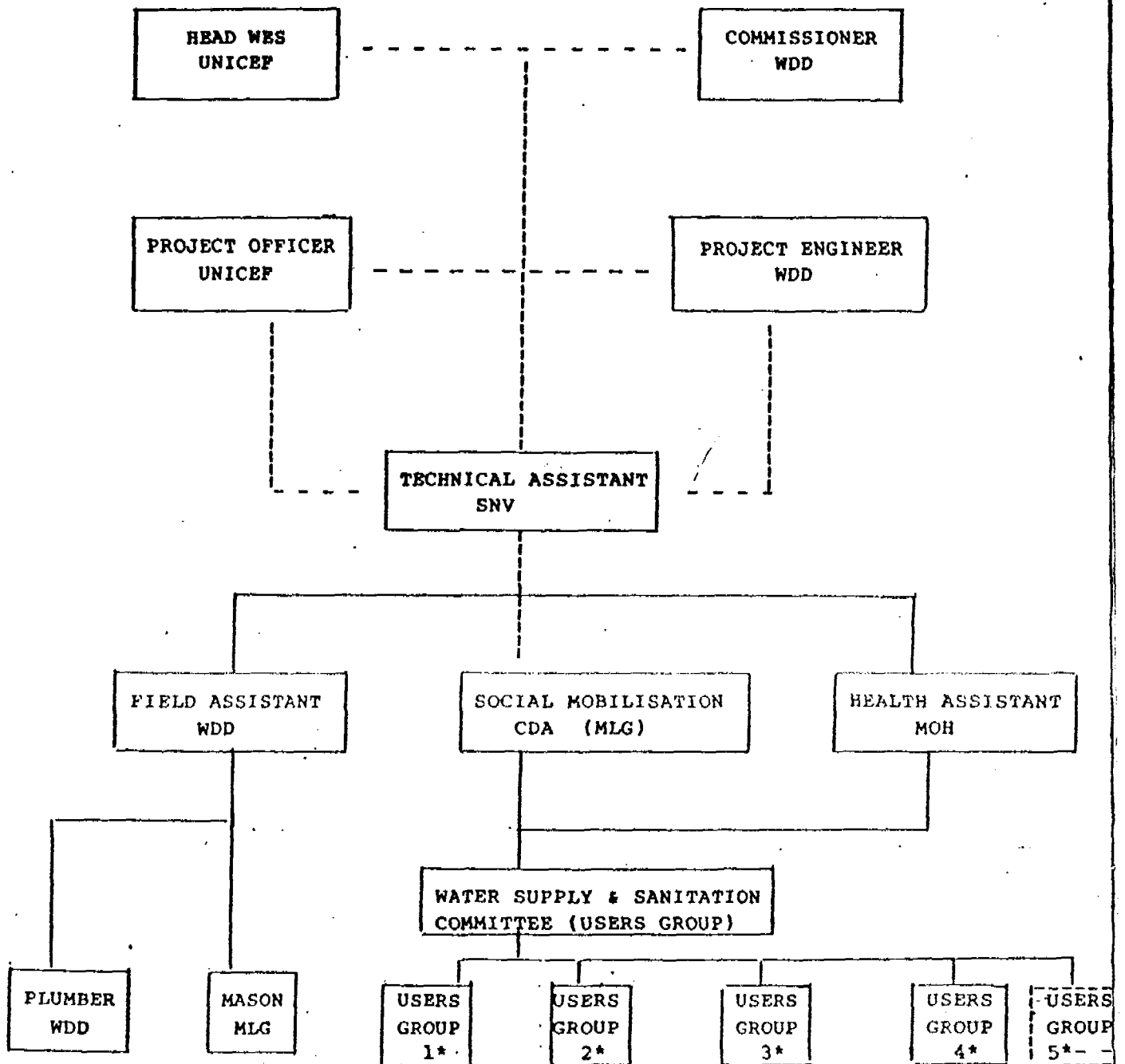
IT IS DIVIDED INTO THREE PHASES:

1. PRE-CONSTRUCTION PHASE
2. CONSTRUCTION PHASE
3. POST CONSTRUCTION PHASE

DESIGN CRITERIA USED IN UGANDA

• DESIGN PERIOD	20 YEARS
• PER CAPITA DEMAND	40 LITRES PER DAY
• MAXIMUM RESIDUAL PRESSURE	15 METERS AT TAPSTANDS
• MAXIMUM WALKING DISTANCE TO TAP	500 METERS
• MINIMUM USERS GROUP PER TAPSTAND	60
• MAXIMUM USERS GROUP PER TAPSTAND	113
• MINIMUM FLOW AT TAPSTAND	0.1 L/S
• MAXIMUM FLOW AT TAPSTAND	0.3 L/S
• PEAK DEMAND FACTOR	3.75

GRAVITY FLOW SCHEMES CONSTRUCTION ORGANISATION CHART
IN UNICEF-ASSISTED PROGRAMME (UGANDA)



*Tap

PRE-CONSTRUCTION PHASE

1. APPLICATION - MUST COME FROM COMMUNITY
ONE OF THE MOST IMPORTANT STEPS IGNORED
AT PERIL !
2. PRELIMINARY SURVEY - TO ASSESS FEASIBILITY AND PRIORITY
.INCLUDES COMMUNITY FEASIBILITY
.TECHNICAL FEASIBILITY
3. SELECTION - BASED ON 2 ABOVE
4. DETAILED SURVEY - TO DESIGN SYSTEM, START COMMUNITY PROCESS
.FORM COMMITTEE
.EXPLAIN ROLES
.MAKE WORKPLANS
5. TECHNICAL DESIGN - REQUIRES EXPERIENCE AND SENSITIVITY TO
COMMUNITY COMPOSITION, GEOGRAPHY, OTHER
INFORMATION, ETC.
6. ORDER MATERIALS

PRE-CONSTRUCTION PHASE

PROCESS	TECHNICAL	SOCIAL	REMARKS
APPLICATION	STANDARD APPLICATION FORM TO BE DEVELOPED AND ISSUED TO DISTRICT	MUST COME FROM THE COMMUNITY	ONE OF THE MOST IMPORTANT STEPS IGNORED AT PERIL
PRELIMINARY SURVEY	USING ALTIMETERS, PEDOMETERS, MEASURING TAPE, BRUNTON COMPASS.	LOCAL LEADERS TO PARTICIPATE IN SURVEY. 2 MEETINGS WITH USERS (BEFORE AND AFTER SURVEY) AIMED AT INVOLVING THE COMMUNITY IN IDENTIFYING THE PROBLEMS AND HELPING COMMUNITY TO SOLVE THEM.	TEAM COMPRISING OF TECH AND DISTRICT EXTENSION GOOD TIME SHOULD BE TAKEN FOR SELECTION AS IT IS VITAL FOR TIMELY CONSTRUCTION AND FUTURE MAINTENANCE
SELECTION	A. COMMUNITY WITH THE GREATEST NEED IN TERMS OF TRAVEL TIME, WATER QUALITY OF PRESENT SOURCE AND YIELD OF SOURCE. B. LARGER POPULATION REQUIRING SHORTER SCHEME IN TERMS OF COST.	-NO DISPUTE ABOUT THE SOURCE -FEWER DEVELOPMENT PROJECTS -SUFFICIENT VOLUNTARY LABOUR	BASIC CRITERIA ESTABLISHED TO PRIORITISE THE SCHEME
DETAILED SURVEY	THEODOLITE, ABNEY LEVEL, MEASURING TAPE, FIELD SURVEY BOOK, BRUNTON COMPASS	LOCAL LEADERS TO PARTICIPATE IN SURVEY. 2 MEETINGS WITH USERS (BEFORE AND AFTER SURVEY) PURPOSE: MAINLY TO PREPARE COMMUNITY FOR CONSTRUCTION, MAINTENANCE AND SANITATION.	

CONSTRUCTION PHASE

PROCESS	TECHNICAL	SOCIAL
AGREEMENT WITH THE USERS	DETAILS WITH THE QUANTITY OF MATERIALS TO BE CARRIED AND LENGTH OF PIPELINE TO BE DUG	MEETING HELD EXPLAINING THE COMMITMENTS OF THE COMM AND THE ASSISTANCE FROM THE GOVERNMENT CULMINATING IN WRITTEN AGREEMENT (AFTER FORMATION OF COMMITTEE).
FORMATION OF WATER COMMITTEE AND PREPARING WORKPLAN		FROM USERS GROUPS, REPRESENTING ONE FROM EACH TAPSTAND EXCEEDING THIRTEEN NUMBER OF MEMBERS.
SELECTION OF CARETAKER BY THE COMMUNITY	ON THE JOB TRAINING BY THE PROJECT STAFF DURING THE CONSTRUCTION PERIOD.	-CARETAKER WILL BE A NON-VOTING MEMBER SELECTED BY THE COMMUNITY. WITH MUTUAL AGREEMENT, WITH PROJECT TECHNICIAN, THE REMUNERATION AGREED ON AT THE TIME OF SELECTION. -COMMITTEE/CARETAKER CONTRACT TO BE SIGNED BEFORE CONSTRUCTION IS COMPLETED. (NO PROJECT OR GOVERNMENT IN-PUT).
SELECTION OF TAPSTAND CARETAKERS		-SELECTED BY TAPSTAND USERS GROUP -PREFERABLY WOMEN TAPSTAND CARETAKERS -RESPONSIBLE ONLY FOR ONE RESPECTIVE TAPSTAND.
WATER COMMITTEE MEETINGS	-CHANGE OF LOCATION OF TAPSTAND -LOCAL CONTRIBUTIONS -ANY OTHER ISSUES RELATED TO PROJECT	-HELD ONCE IN 2 WEEKS, MORE OFTEN IF NECESSARY -MAINTENANCE IS ONE OF THE ISSUES ALWAYS DISCUSSED, WAY FOR CBMS

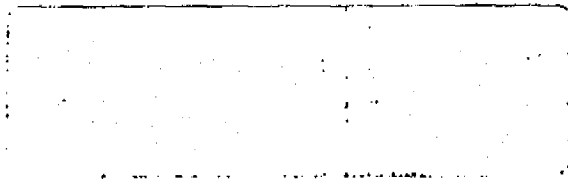
POST CONSTRUCTION PHASE

PROCESS	TECHNICAL	SOCIAL*
FINAL INSPECTION OF THE COMPLETED PROJECT	<ul style="list-style-type: none"> -TO INSPECT THE COMPLETED PROJECT FROM THE SOURCE TO LAST TAP, INCLUDING ALL PIPELINE AND OTHER COMPONENTS. -THE FUNCTION OF EACH COMPONENT, ITS MAINTENANCE, ETC, ARE TO BE SHOWN. -ENSURE THE SYSTEM IS COMPLETED TO THE REQUIRED QUALITY. 	<ul style="list-style-type: none"> -ALL THE MEMBERS OF THE COMMITTEE JOIN THE INSPECTION TEAM. -AFTER INSPECTION, COMMITTEE SIGNS COMPLETION REPORT.
HANDING OVER TO COMMITTEE	INITIAL SET OF TOOLS AND FAST MOVING SPARE PARTS FOR THE CARETAKER.	<ul style="list-style-type: none"> -OFFICIAL HAND-OVER TO THE COMMITTEE WITH DRAWINGS, TOOLS AND SPARE PARTS. -RE-EMPHASIZE ABOUT CBMS
FORMAL TRAINING FOR CARETAKER	<ul style="list-style-type: none"> -USE OF TOOLS, SPARES -PURCHASE OF SPARE PARTS 	<ul style="list-style-type: none"> -REPORTING SYSTEM -HEALTH EDUCATION -SETTING GOOD EXAMPLE FOR OTHERS
FORMAL TRAINING FOR COMMITTEE	-PURCHASE OF SPARES	<ul style="list-style-type: none"> -HOW THE COMMITTEE SHOULD FUNCTION -REPORTING SYSTEM -FINANCIAL MANAGEMENT -PURCHASE OF SPARE PARTS

*ALL FUNCTIONS UNDER TAKE PLACE IN PRE-CONSTRUCTION AND CONSTRUCTION PHASES AND ARE EMPHASIZED IN POST CONSTRUCTION PHASE.

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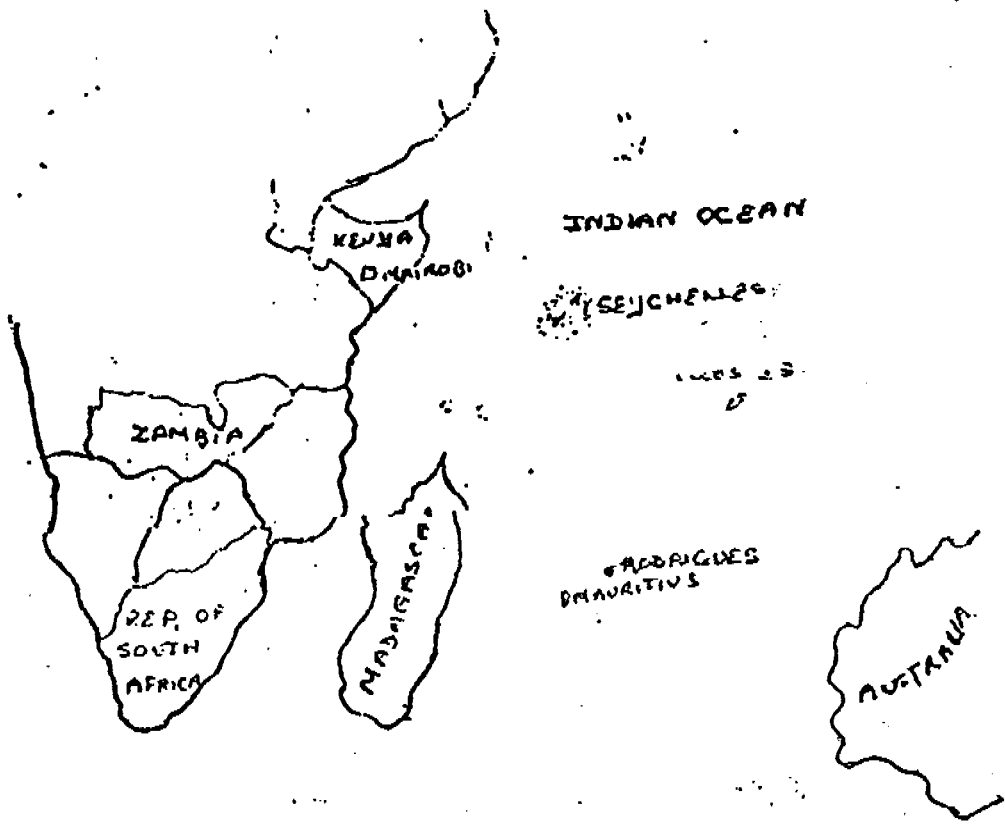


RAINWATER HARVESTING

MAURITIUS EXPERINCE

RAINWATER
HARVESTING
PROJECT

Rodrigues
July 1990



Objective

To harvest and store rainwater using the roofs of individual dwellings as catchment ones and concrete cisterns of nominal capacity 1400 litres as storage.

How

The Rodrigues Council of Social Service (NGO) encourages some 300 families annually in Rodrigues to have the required installation (gutters and a cistern) at their dwelling places.

Benefits

This provides a supply of potable water at hand and at low cost.

Constitutes of stock during the dry seasons.

Reduces the time and labour involved in collecting water (usually by women and children).

Beneficiaries and Types of Assistance

The beneficiaries are grouped in three categories

<u>Category</u>	<u>Characteristics</u>	<u>Facilities offered</u>
A	Those who have the means to do the necessary installation but who have not done it.	They are motivated, grouped and trained. As a group they have the opportunity to buy the building materials in bulk and to borrow equipment (moulds). And also to work together sharing experiences and abilities.
B	Those who find it difficult to raise the necessary amount for the required installation though they have substantial fixed monthly incomes.	In addition to the above they are provided with loan facilities from a Revolving Fund for purchasing building materials (set up for the purpose).
C	Those who have very low income and/or are physically handicapped.	They get the materials free of charge. The community provides labour for the installation

~~CONFIDENTIAL~~

After 3 years of implementation some 1000 families have now the required installation at home to harvest and store rainwater.

Some 352 heads of household have received credit facilities totalling Rs 294,000 from the Revolving Fund with a capital fund of Rs 90,000 donated by UNICEF.

The project originally funded by UNICEF is becoming self-supporting but have received assistance both from foreign and local donors for expansion.

Organisation

A team of five persons

- organises and runs training sessions for village leaders
- participates at meetings/workshops at village level to inform, motivate and train
- controls the movements of equipment from one village to another
- helps the villagers to buy materials in bulk
- keeps the accounts and makes necessary reports
- manages the Revolving Fund.

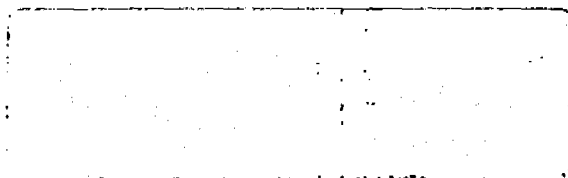
Revolving Fund

The fund helps the purchases of materials and provides loan facilities with long terms repayment (10 months).

The written application for a loan is addressed to the managing committee. The latter verifies the information given and pen their views. When loan is approved materials are supplied to beneficiaries in lieu of cash.

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**COMMUNITY BASED WATER MAINTENANCE SYSTEMS
THE NIGERIAN EXPERIENCE.**

SOME BASIC DATA ON NIGERIA.

Location Lat. 4-14 North, Longitude 2-14 East.

Area 923,766 square kilometres.

Geology 60% Basement, 25% Sedimentary and 15%
Alluvium.

Climate Pronounced rain (May-October) and dry
(November-April) seasons. Mean annual
temperature range from 25 to 30 degrees.

Population 110 million (projected from 1963 census) with
distribution as follows (World Bank data):

Type	Community Size	Population	% of Total.
Urban	> 20,000	43.7 M	40%
Semi-urban	5-20,000	19.6 M	18%
Rural	< 5,000	47 M	42%

Rural Service Coverage

Water Supply	22%
Sanitation	15%

Administration

Political

Three tier Government structure viz. Federal, 21 States plus the Federal Capital Territory, and 450 Local Government Authorities (LGAs). There are about 2,500 Districts (also called Clans and Autonomous Communities) and over 90,000 villages.

Socio-Traditional

About 250 ethnic-linguistic groups. Each Community is headed by a Traditional Ruler (Emirs, Obas or Chiefs).

PROJECTED DEMAND FOR HANDPUMP TECHNOLOGY.

Handpumps are a feasible option for between 47 and 55 million people. Assuming a service of 500 people per handpump, a population growth rate of 3.2% then the required coverage rate to achieve the target of full coverage by year 2000 there is need to provide service for about 10 million per year. This translates to a potential requirement for 20,000 handpumps per year.

PROBLEMS WITH HANDPUMP MAINTENANCE

These can be grouped as follows:

Use of different types of Pumps requiring different spareparts and tools.

Poor logistic arrangements for supply of spareparts and components.

Limited consideration of spareparts requirement during siting and construction of boreholes. These include insufficient hydro-chemical investigations to ascertain the appropriate material for the down the hole pump components.

Inappropriate institutional arrangements. Many handpump programmes depend on a centralised maintenance arrangement with an associated long response time for repairs, need for expensive transport and a significant bureaucracy to manage maintenance.

Insufficient planning of the financial needs and method of financing maintenance.

Failure to involve the intended beneficiaries in planning for maintenance.

Of course, if maintenance is not well planned and managed then the investment in providing the facility is wasted since there will be no developmental or health benefits. This was recognised in the Abidjan Statement of 1986 when the representatives of 30 Sub-Saharan Countries stated;

"Maintenance is the key to long term success. Community maintenance, supported by a national policy of standardisation and well organised distribution of spareparts, brings increase in reliability and reductions in recurrent costs bringing per capita costs down substantially when compared with the alternative

of centralised maintenance practised in many countries...."

STRATEGIES BEING FOLLOWED IN NIGERIA.

Policy on Maintenance

The Government has adopted Community maintenance. This was supported by a Handpump Testing Project (With support from World Bank, UNDP, UNICEF and involvement of Community, LGA, State and Federal Government). Two VLOM pumps are being promoted for local manufacture by the private Sector. The potential manufacturers are being briefed on the need for on-line quality control and external competent inspectors to ensure the quality control as well as the need to include spareparts manufacture and appropriate geographical distribution network to ensure availability of pumps for replacement and spareparts.

Empowerment of the Community

Information is being channelled to the Community e.g. by wide circulation of the whys and hows of maintenance coincident with extensive training at the LGA level which will train the community artisans. This demystifying of technology places maintenance in the hands of the beneficiaries.

Widespread Introduction of VLOM Pumps

By end of 1990 there should be over 2,000 VLOM pumps installed.

Support For Operational Research to Lower Cost

UNICEF is supporting private sector initiative to develop PVC/Polypropylene alternative to expensive stainless steel riser mains. This will also contribute towards import substitution which is a fundamental ingredient of the Government's Structural Adjustment Policy (SAP). We cannot yet say "Eureka" but the prospects seem good. Fifty five installations are still functioning after one year and there are plans to install about 100 more (with improved polypropylene couplers by the end of this year). The performance will continue to be monitored especially that of the comparative cost against that for stainless steel.

Linking Maintenance to Other PHC initiative (e.g. Bamako Initiative).

Application of Appropriate Communication Techniques

Use of KAP Studies to determine affordability levels, willingness and potential of community to contribute to maintenance are being undertaken.

Giving due regard to the transport requirement

Use of bicycles where appropriate to reduce cost associated with use of four wheel vehicles.

Recognition of Important Contribution of Mechanics.

Give vests, involve them in community meetings and during visits of officials and develop credit systems so they can equip themselves for their jobs.

Linking Maintenance with Income generating activities to source the funds to pay for maintenance.

ROLE OF UNICEF.

What has UNICEF contributed to this advance? Materially compared to the demand the contribution has been a small percentage but this has been used catalytically which provided the basis for reasonable success in political, sociological, and technological advocacy. Beginning by learning through doing in the model building Project in Imo State it gradually inculcated the maintenance ethic in the main stream of project execution and now all the six State Projects include allocation for maintenance in the budgets. The projects are spearheading the development of the methodology to decentralise the ethic to the LGAs which are being assisted to train maintenance artisans at the village level. The target is to train one artisan for every 10-15 handpumps and to increase the number of women participating in the exercise. This approach has the potential to provide the mechanism through which community contributions for maintenance will pass directly from the receivers of the service to the executors of the service.

The UNICEF assisted projects are spearheading the movement towards increasing the participation of women in the exercise. In addition to the normal bias to select women as Village Based Workers (VBWs), initiatives to form Mothers Clubs in areas where religious customs (such as the purdah system) preclude active roles for women. Including in their community contributions is a caretaker role in handpump maintenance. Others are income generating activities such as manufacture of clay pots with taps.

manufacture of children's clothes, ORT, EPI promotion, breastfeeding, nutrition and adult education. Incentives for formation of Women's Clubs include provision of improved seedlings (soya beans and oil palm) and training in local crafts.

SOME PERSPECTIVES.

There is a school of thought that what people pay for water during periods of scarcity represent the affordable level for contribution to maintenance. The posers are "how does this fit into the development perspective, do people willingly pay this and is this the same as ability to pay."

There is a generally accepted premise that urban water supply systems require one employee for every 600 people served. Is this a reasonable goal for rural low cost systems. This would be so if we aim at one artisan for each handpump. The premise of one to 10-15 handpumps will obviously be more inkeeping with the goal of full coverage for water supply by year 2000.

We must learn from the spirit of the Bamako Initiative, a revolutionary African plan for self financing of PHC and extend precepts to community maintenance (and sanitation and drinking water security) with the ultimate goal of linking all into Community management.

Specifically for the global goals for Health, Nutrition, WATSAN and Education the growing acceptance of community responsibility for maintenance should be linked for the benefit of success in all. For health, through B.I., for nutrition by ensuring that the saving in energy is channelled into development especially for the target groups (women and children), for WATSAN to advance the chance of success for full coverage by year 2000, and for education to ensure that the gains are not lost to posterity.

Colleagues, I thank you for your kind attention.

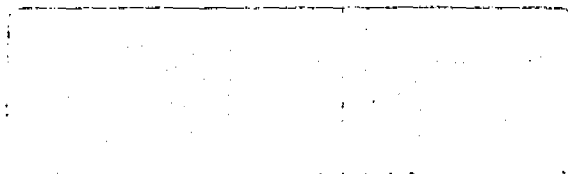
Lloyd Donaldson.

WATSAN - UNICEF, Lagos.

For Workshop in Kampala (July 31 to August 4, 1990).

THE COMMUNITY BASED WATER
SOURCE MAINTENANCE SYSTEMS WORKSHOP

31 July - 3 August, 1990
Kampala International Conference Centre





REPUBLIC OF BENIN

MINISTRY OF EQUIPMENT AND TRANSPORTATION

WATER AND SANITATION PROJECT IN BENIN

PRESENTED BY :

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August 1990

Situated in West Africa, Benin is bounded in the South by the Atlantic Ocean, in the North by both Niger and Burkina Faso, in the East by Nigeria and in the West by Togo. With 112,622 square kilometers, Benin possesses two climatic zones. One the South, as far as the latitude of Savè, there exists two dry seasons and two rainy seasons. The northern region, on the other hand, has but one dry season and one rainy season.

Hydrography :

There exists two river systems :

- The southern system which contains three large rivers : the Ouémé (400 km long), the Mono (360 km long), and the Zou (150 km long). These three rivers empty into the Atlantic Ocean.

- The northern system which contains four rivers : the Mékrou (250 km long), the Alibori (360 km), the Sota (9380 km) which empties into the Oti, and the Volta.

Relief :

Benin contains a coastal plain in the South, plateaus with valleys other rock formations, and hills in the center which extend into the North-West. The soil consists of very ancient rocks covered in places by recent sedimentary formations, granita-type soils found in the northern Zou comprise a genuine obstacle in drilling.

Population :

The population of Benin is estimated to be 4,606,244 in 1989 (INSAE). The repartition by department is as follows :

Atacora	630,628	inhabitants
Atlantique	986,299	"
Borgou	656,321	"
Mono	665,990	"
Ouémé	884,133	"
Zou	792,873	inhabitants

Access to potable water

The research of water requires ungainly and costly means in certain region. In 1986, only 09 % of the registered needs were covered in the rural environment whereas less than half (40-45 %) had been covered in the urban environment and a little more than one quarter of the chief towns of a system of potable water. In the goal to remedy this deplorable situation, it had been decided to assure, at least, one water source (well or pump) in each village of 200-500 inhabitants. The direction of hydraulics hopes to cover 50 % of the needs in 1990. The number of drillings needed by province in the fight for the elimination of Guinea worm is estimated at more than 1000.

Surveillance of Dracunculiasis in Benin today

Benin is situated in the heart of the Guinea worm belt and, according to estimates, possesses the highest rate of incidence of Guinea worm. Dracunculiasis exists in the endemic state in every province and in at least 38 of the 86 districts.

.../...

During the seventies and eighties, several regional investigations had been accomplished by diverse groups using diverse methods and permitted the identification of the highly elevated incidence of Guinea worm in the Zou province. In 1981, the Direction of hydraulics of the ministry of public works, construction and habitat, led an investigation on Guinea worm in the Atacora, Mono, and Ouémé provinces. About 25 % of the villages in each province had been covered. The rate of incidence was 17 % in the Atacora, 27 % in the Ouémé, and 37 % in the Mono. In 1982, a project financed by the West African Bank of development carried out an investigation in all of the administrative villages of the Atlantic and southern Zou provinces. The rate was revealed to be 53 % for the Atlantic and 72 % for the southern Zou.

At the national level, data from passive surveillance, gathered with the help of the system of community health care, are available for the years 72 and 74-76. These investigations revealed that for all six provinces of Benin in 1972, there were 1480 cases of Guinea worm ; in 1974, 820 cas ; in 1975 and 1976, 160 and 110 cases respectively (Division of studies and planning, minister of public health, Republic of Benin). This data underestimated the actual incidence of dracunculiasis to such an extent that it had not planned a single campaign for the elimination of Guinea worm. In 1985, a national investigation had been carried out following a questionnaire system distributed in all health center in each district. In 1988, a similar investigation had been conducted with questionnaires distributed in all of the regional centers of action for rural development (CARDER).

In 1988, a national investigation was taken into the school system. Questionnaires were distributed, in 2400 primary schools, to every school director in the six provinces. For five of the six provinces, the rate of response varied between 67-87 %. In the Atlantic province, where the rate of response was judged to be insufficient, the estimated incidence was based on the investigations carried out in health centers or agriculture centers.

In early 1990, UNICEF financed an investigation of Guinea worm covering the entire national territory. These investigations, preceded before hand by the training of agents, are completed in all of the departments of Benin. The principal objective of these investigations was to track down all of the administrative village which are Guinea worm endemic. The specific objectives concerned : the determination of the regional incidence of Guinea worm, the census of all of the localities and hamlets related to the administrative villages ; the census of educational and sanitary infrastructures and water resources in these villages. The examination of all of these investigations is currently in progress and the results will be available in August, 1990.

Regional fight against Guinea worm

The water and sanitation project of the northern Zou, financed by USAID, UNICEF, the Peace Corps, whose activities were started in June, 1987, has as an objective to reduce the incidence of Guinea worm by 30 % in the zone as well as water supply, health education, and sanitation. For this purpose, the biannual investigations are carried out in the six districts of the northern Zou. These results show that in 1988, there were 13,366 cases of Guinea worm ; the global incidence for this region was 30 %.. The two districts the most affected are Dassa with an incidence of 7,1 % (4449 cases) and Savalou 3,3 % (3237 cases).

.../...

For the period from July, 1989 to June, 1990, the number of cases of Guinea worm is 5692, or an incidence of 1,27 %. This figure indicated a reduction of 46 % during the period of July, 1988 and June, 1989 and a reduction of 60 % compared to the first investigation in December, 1987 (figures 1 and 2). All of the districts recorded a decrease in the number of cases detected except Glazoué. The most remarkable decrease was established in the district of Bantè where the number of case passed from 1477 in 1898 to 142 in 1990 which represents a 90 % decrease. On the contrary, in Glazoué, there was an increase from 786 to 1069 cases for 1989-1990, more precisely in the commune of Aklampa who had not yet been touched by the hydraulic program. The districts of Dassa and Savalou, as in the past, continuent to point out more than one half of the cases recorded in the project zone.

Activities

To attain the objective of a 30 % reduction of Guinea worm in the northern Zou, the following activities are currently in place :

- biannual investigations done in April and December (transmission period)
- monthly investigations is a limited numbers of villages where the biannual investigations revealed 150 or more cases.
- the development of didactic material : formation manuels, cartoon strips, audio-visual aides etc...
- the creation and formation of village committees having as objectives to sensibilize villagers and make then responsible for doing the animation within their own villages
- health campaign in villages and educational establishments : prevention against Guinea worm, utilization of potable water, utilization of tamis-filters at home and in the fields in order to filter swampwater, utilization of audio-visual aides, etc...
- hydraulic installations with an annual contrubution of 60,000 CFA for the maintenance and eventual replacement of the pump
- campaign for contribution renewal
- chemical treatment of certain water sources with Abate R
- radio broadcasting in local languages across the entire national territory
- T-shirt distribution
- sensibilization meetings on the local level for notables, influential people, officers, executives, managers, and any field agents
- training of craftsmen - repairers for the maintenance and repair or pumps
- funishing tool hopes for pumps repair
- providing spare parts
- intervention of Peace Corps volunteers for operational research.

1°) Village identification

Criteria for choosing villages :

- a) the presence of Guinea worm
- b) the demande for a water source
- c) a population of at least 150

.../...

2°) Social mobilization

Social mobilization consists of motivating the villagers in order to :

a) organize themselves and form a committees for each water source, whose objectives are to attend to the maintenance of the water source and health education activities.

b) in general, promote community development.

For social mobilization, first of all one needs to make contact with the notables and influential persons. With their agreement and the collaboration of these authorities, one starts the villager sensibilization activities, with the goal of forming, first of all, a committee. The activities are brought into the village with the help of field agents trained in the different areas which will be presented during the course of the mobilization campaigns.

In order to establish the committee, one proceeds by :

- election of committee members. The members are democratically elected by the villagers : 7 permanent members and 5 at large.

- 3 of the elected members must be women. Women represent the most important and most influential group to mobilize since they are in charge of the education and wellbeing of the family.

- contribution of 60,000 CFA each year for the maintenance and eventual replacement of the pump.

- training of the members in order to fulfill their tasks and roles in the village.

- member participation in health education activities and community development.

Remark

The criteria of choosing a village and committee establishment must be fulfilled before the implication of drilling and the starting of health education activities.

Organization

The zone of intervention is the northern Zou, where 6 sous-prefectures (Dassa, Savalou, Savè, Bantè, Glazoué and Duessè) actively participate in the activities. The population is 443,318 and the total number of villages is 512. The villages are surrounded by 23 pluridisciplinary agents (social affairs, health hygiene). These agents are supervised by medecin-chefs numbered at one per district.

In addition, 8 Peace Corps volunteers give technical assistance to the project.

3°) Health education

The training is done in a cascade fashion :

- One team of trainers train animation agents who in turn train village committee members to do animation, open discussions, and demonstrations on health education themes.

.../...

- Methodology

Adult education

Presented themes :

- social organization and mobilization
- training of committee members on their roles and tasks
- potable water
- Guinea worm prevention

Themes to present :

- sanitation (fecal-oral contamination, use and upkeep of latrines)
- a clean village
- personal hygiene

4°) Health campaign

The themes are presented in a health campaign which consists of an average of 4 visits with each committee over a period of two months which coincides with the Guinea worm transmission period.

This campaign is done by an animation agents who covered around ten villages during 2 months . During the course of the first meeting, 4-6 committee members are trained on the following points :

- origin of Guinea worm
- mode of transmission
- symptoms
- complications
- treatment
- socio-economic effects
- prevention.

This information is presented with help of :

- illustrated flipcharts
- demonstration of water filtration with filters made with local material.

During the second and third meetings, the animator helps the committee member or village animators, whom he has trained, to hold discussions in his village.

The fourth meeting, held one month later, consists of assuring that all of concessions in the village have been visited by the village animator and to reinforce the action of the animators.

.../...

5°) Rural radio

Health campaigns are accompanied by broadcasted programs of rural radio across all of the territory in order to reinforce the themes which were presented during the course of the campaigns.

6°) Informational meetings with notables and civil servants

Informational meetings are organized to sensitize the notables, political and administrative authorities, teachers, as well as agents of health, social affairs, literacy, rural development, so that the themes presented during the course of the campaign become popularized.

7°) Training the craftsmen-repairers

All of the sous-prefectures feature two to three repairers who were trained by the direction of hydraulics. Each craftsman-repairer must be in charge of 15 pumps and must make systematical visits to each pump. He is paid by the villagers and serves as the liaison between where spare parts are sold and the villagers.

8°) Other activities

- Literacy program for committees.

This program puts the accent on the literacy of women. Women are added to the committee members in order to become literacy trained.

- Market gardening in the vicinity of the pumps
- Identification and realization of income generating activities for women
- Putting into practice systems of small water adduction./.