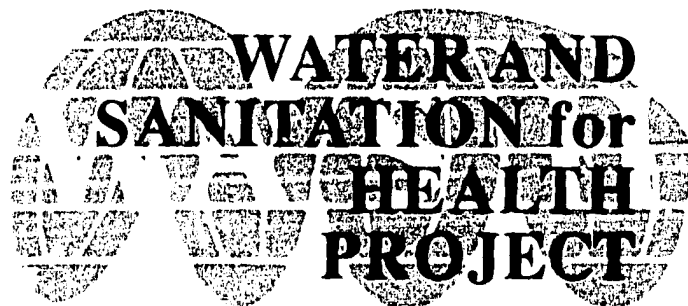


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O&M STRATEGY FOR
RURAL WATER SUPPLY IN ZAIRE
PHASE II: SET UP OF OPERATIONAL TESTS

Field Report No. 308
April 1990



Sponsored by the U.S. Agency for International Development
Operated by CDM and Associates

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WASH Field Report No. 308

O&M STRATEGY FOR RURAL WATER SUPPLY IN ZAIRE

PHASE II: SET UP OF OPERATIONAL TESTS

Prepared for the USAID Mission to the Republic of Zaire
under WASH Task No. 137

by

Robert E. Hall
and
Alan Malina

April 1990

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ACRONYMS

CNAEA	<i>Comité National d'Action de l'Eau et de l'Assainissement</i> (National Action Committee for Water and Sanitation)
ENFEA	<i>Equipe National des Formateurs de l'Eau et de l'Assainissement</i> (National Team of Water and Sanitation Trainers)
O&M	Operations and Maintenance
RWC	Rural Water Coordinator
RWS	Rural Water Supply
RWS/S	Rural Water Supply and Sanitation
SANRU	<i>Projets de Soins de Santé Primaire en Milieu Rural</i> (Basic Rural Health II Project—660-0107)
SNHR	<i>Service National d'Hydraulique Rurale</i> (National Rural Water Service)
USAID	U.S. Agency for International Development
WASH	Water and Sanitation for Health Project

EXECUTIVE SUMMARY

This report presents the research program to be tested as part of the second phase of a three-phase assignment conducted by the Water and Sanitation for Health Project (WASH). The three phases consist of 1) an assessment of operation and maintenance (O&M) at existing and planned water systems; 2) operational tests of selected recommendations to improve O&M and analysis of findings; 3) organization of a seminar to present the results to organizations and officials involved in the rural water supply sector.

Phase I was conducted in April-May 1989. A national round table discussion, entitled "Toward a Common Approach to Assure the Operation and Maintenance of Rural Water Systems," was organized in collaboration with the National Action Committee for Water and Sanitation (CNAEA) and held on May 24, 1989. The recommendations presented by the WASH team were accepted after some revisions and additions. The recommendations approved at the round table provide the foundation for a national O&M program.

The same consultant team, composed of a water engineer and a social scientist, returned to Zaire January 28 to February 24, 1990, to set up the implementation and testing of selected recommendations under Phase II. The team will return in approximately six months to review the results of the tests and to assess the level of incorporation and effectiveness of O&M program components.

The testing of selected O&M recommendations will attempt to answer three interrelated questions:

- (1) To what extent have specific elements of the recommended O&M program been incorporated into the field activities and approach of the technical service?
- (2) Have the recommended measures as implemented proven to be effective?
- (3) Do the recommended measures accomplish the objectives for which they were designed in an efficient manner?

The recommendations to be tested follow directly from the technical assistance provided by the WASH team to the National Rural Water Service (SNHR) stations and Rural Health Zones contacted. Specifically, the WASH team reviewed the status of O&M activities and needs and then developed, in conjunction with station staff or health zone personnel, a strategy for O&M.

A detailed analysis of the results of implementation of selected O&M program components will be made when the WASH team returns to complete Phase II. The third phase of the assignment will consist of the organization of a seminar to disseminate the national O&M policy and to discuss the results of Phase II. The timing of Phase III should be coordinated with the annual meeting of SNHR station chiefs.

Chapter 1

INTRODUCTION

1.1 Background

In February 1989 the Water and Sanitation for Health (WASH) Project received a request for assistance from the USAID Mission to the Republic of Zaire regarding operations and maintenance in rural water supply (RWS). A member of the WASH staff conducted an initial visit February 20-24, 1989, to develop the scope of work and funding arrangements and to delineate the primary issues around O&M.

The assignment that resulted from this visit includes three phases: 1) an assessment of O&M at existing and planned water systems; 2) operational tests of selected recommendations to improve O&M and analysis of findings; and 3) organization of a seminar to present the results to organizations and officials involved in the RWS sector.

Phase I was conducted April-May 1989. A national round table discussion, entitled "Toward a Common Approach to Assure the Operation and Maintenance of Rural Water Systems," was organized in collaboration with the National Action Committee for Water and Sanitation (CNAEA) and held on May 24, 1989. This round table provided the first major forum organized in Zaire to discuss an O&M strategy for rural water supply. All recommendations presented by the WASH team were accepted after some revisions and additions. The recommendations approved at the round table provide the foundation for a national O&M program.¹

The same consultant team, composed of a water engineer and a social scientist, returned January 28-February 24, 1990, to set up the implementation and testing of selected recommendations under Phase II. The team will return in approximately six months to review the results of the tests and to assess the level of incorporation and effectiveness of O&M program components.

¹ The results of the first phase are presented in WASH Field Report No. 273, "Development of an Operations and Maintenance Strategy for Rural Water Supply in Zaire, Phase I Report," by Robert E. Hall and Alan Mallna, May 1989.

1.2 Objectives of Phase II

The primary objective of the second phase of the WASH assignment is to test selected recommendations to improve O&M capabilities in Zaire. The test results will be analyzed and integrated into revised O&M programs for capped springs, gravity-fed piped water systems, and boreholes with manual pumps. A secondary objective of this phase is to provide direct technical assistance to USAID-financed RWS projects to identify deficiencies and to recommend measures to improve O&M programs.

The effectiveness of training materials and visual aids on O&M practices was to have constituted one of the major components of the Phase II testing program. Two WASH consultants assisted in the development of training materials for O&M during the fourth ENFEA² training-of-trainers workshop in November 1989. These materials were then used (and revised) in a training session for Rural Water Coordinators and other RWS personnel organized by SANRU³ in December 1989. A second session is planned in Bas Zaire in March 1990. A preliminary assessment of the effectiveness of the training materials will be attempted in Phase II. However, no definitive analysis will be possible since the materials are just now being put into use.

The development of visual aids for O&M activities was strongly recommended in the Phase I report. USAID financing was obtained and a visual aids specialist was provided by WASH in January 1990. Production of these aids is now underway; however, distribution prior to the completion of the second phase of this assignment is unlikely. Therefore, it will not be possible to include them in the testing program.

A different approach to testing is required to improve O&M capabilities for deepwell pump systems. A comprehensive O&M strategy was developed with the collaboration of the WASH team for Project 0116 in Lualaba. The effectiveness of specific program components, e.g., parts distribution system, fee requirements, and the use of written agreements, will be assessed during Phase II.

In the case of the drilling operations currently underway in Kabongo and in Bas Fleuve, the WASH mission for Phase II will be to provide direct technical assistance to the SNHR stations and rural health zones operating in these areas. The WASH team will assist in the development of an integrated program for village-level operations and maintenance for each station and rural health zone visited. These programs will be reviewed at the end of Phase II and measures to improve effectiveness proposed.

² ENFEA: *Equipe National des Formateurs de l'Eau et de l'Assainissement* (National Team of Water and Sanitation Trainers)

³ *Projets de Soins de Santé Primaire en Milieu Rural* (Basic Rural Health II Project—660-0107)

1.3 Approach

The WASH team requested that a senior staff member be designated from both SNHR and SANRU to collaborate in the development of the testing program and to accompany WASH consultants on visits to the field. Cit. Masumbuko, head of the planning division of SNHR, and Cit. Kalonji, SANRU's coordinator of water and sanitation projects, were designated and became members of the enlarged WASH team. They participated actively in every aspect of this assignment and assumed responsibility for overseeing field tests at the departure of the WASH consultants.

Upon the consultant team's arrival, meetings were held with the senior staff of major organizations active in the RWS/S sector. Discussions focussed on activities, progress, and problems related to O&M that have occurred since the end of Phase I. A list of persons contacted during the consultancy is found in Appendix A.

Two field trips were organized during the course of the mission. (See Trip Reports in Appendix B.) The first trip was from February 2 to 12, 1990. Rural water stations and health zones were visited in the Lualaba and Kabongo areas of Shaba region. The second field trip was conducted in Bas Zaire from February 14 to 17, 1990. The SNHR station in Kinzau Mvute and the Kinkonzi, Seke-Banza, and Kimpese Rural Health Zones were visited. The content of the research strategy and arrangements for data collection were developed during the field trips.

Chapter 2

RESEARCH PROGRAM

Research activities will be carried out in the three SNHR stations visited (Sandoa, Kabongo, and Kinzau Mvute) and in three health zones with Rural Water Coordinators. A system for monitoring the operational and sanitary condition of rural water systems will also be tested in ten health zones.

2.1 Research Design and Methodology

The operational testing of selected O&M recommendations will attempt to address three interrelated questions:

- (1) To what extent have specific elements of the recommended O&M program been incorporated into the field activities and approach of the technical service?
- (2) Have the recommended measures as implemented proven to be effective?
- (3) Do the recommended measures accomplish the objectives for which they were designed in an efficient manner?

It should be noted that the physical maintenance and long-term sustainability of rural water systems is not being directly tested at this time; six months is not a long enough period to determine whether O&M activities will be carried out. The experience to date with manual pumps suggests, for example, that most pumps will require few if any repairs for the first 18 months to two years of service. Rather the presence, effectiveness, and efficiency of specific O&M program components are to be assessed. (See Appendix C, Assessment of Spare Parts Status.)

By incorporation of program components, we are referring specifically to (1) the use of a written agreement clearly detailing the responsibilities of each party (Convention d'Engagements Mutuels); (2) the establishment of a mandatory monetary payment or contribution to be paid by the community for a clearly defined expenditure, e.g., construction materials, spare parts for pumps, and taps for standpipes; (3) the assembly and distribution (against payment) of spare parts kits for manual pumps; and (4) the development of a training program for local repairmen and water committee members.

The effectiveness of the recommended O&M program components refers to the extent to which they accomplish specific as well as general objectives. The specific objective of a written agreement is to inform the population of the responsibilities that each party has prior to, during and after construction. (See Appendix D, Model Written Agreements.) The general objective of such an agreement is to encourage the population to assume responsibility for the long-term sustainability of the water system.

The efficiency of a recommended O&M component refers to the relationship between the cost incurred to implement it and the value of the results (community maintenance) obtained. The use of a written agreement may not be efficient, for example, if it requires multiple visits by technical service personnel to clarify misunderstandings and convince local leaders to sign it.

The recommendations to be tested follow directly from the technical assistance provided by the WASH team to the SNHR stations and Rural Health Zones contacted. Specifically, the WASH team reviewed the status of O&M activities and needs and then developed in conjunction with station staff or health zone personnel a strategy for O&M (see Appendix D). In each station, written agreements were designed in a fully participatory manner that are to be integrated henceforth into the village community development or *animation* program. Experiences gained from the use of these agreements will be reviewed in six months.

2.2 Planned Tests

The Phase II program consists of the following points.

2.2.1 Sandoa

- 1) Springs: assess the level of maintenance of springs capped with the use of a *convention* and *animation* visits and of those capped by a technician without using written agreements or *animation* personnel. Data from follow-up visits by station technicians will be used to assess the relative effectiveness of these two approaches.
- 2) Piped water systems: study the effectiveness of the use of a negotiated agreement detailing the specific tasks to be accomplished, materials to be provided, amount of monetary contribution and the responsibilities for O&M of the community and the technical service for the Dilolo Poste piped water system. A *convention d'engagements mutuels* was developed in collaboration with station and project staff members.

Data collection will be accomplished by the *animateur* assigned to the Dilolo Poste adduction and by a local resident to be selected by Cit.

Kabagema, Project 0116 community development specialist. A "topical guide" was developed to provide structure to the journals to be kept by the local resident and the *animateur*. An English version of the Journal Topical Guide is presented in Appendix E.

- 3) **Manual pumps:** A number of revisions were made in the O&M program in use at Sandoa. The overall effectiveness of the revised strategy will be reviewed at the end of Phase II. Specific points to be assessed include:
 - (a) the reaction of communities that were skipped (boreholes were not drilled) due to lack of payment of the mandatory contribution to be exchanged for the spare parts kit;
 - (b) the utility of specific changes in the *conventions*, such as the estimation of the financial value of the contribution of the community and of the technical service, details of labor requirements, and the requirement that the written agreement be negotiated with the population at large rather than with members of the water committee alone;
 - (c) the effectiveness of using local administrative authorities as conduits of information regarding project activities, the distribution of *conventions*, and the organization of monetary contributions.

- 4) **Incorporation of elements of the O&M program:** The WASH team will also review the level of incorporation or accomplishment of a number of program components, including:
 - (a) training of local repairmen;
 - (b) assembly and distribution of spare parts kits in exchange for community monetary payment;
 - (c) establishment of a logistical system for spare parts distribution and resupply;
 - (d) implementation of a three-tier repair system and distribution of tool kits to be used by certified repairmen.

2.2.2 Kabongo

The testing program for capped springs and manual pump systems involves the use of the written agreements, organization of a mandatory monetary contribution for spring capping, and discussion of optional approaches to the organization of community labor contributions. Management of funds contributed for well drilling and for purchase of spare parts kits will also be reviewed. The Rural Water Coordinator of the Kabongo Health Zone has agreed to maintain a journal according to instructions provided to him by the WASH team.

2.2.3 Kinzau Mvuete

Written agreements were also developed with the SNHR staff at Kinzau Mvuete to be used for capped springs and manual pump systems. The use of a written convention as part of an initiative to resolve serious O&M problems in existing piped water systems was also discussed for the Maduda and Mbata Siala adductions. Three primary O&M issues will be assessed during Phase II: (a) the use of *conventions* prior to construction of the water system; (b) the organization and management of the monetary contribution; and (c) the preparation and distribution of spare parts kits. The amount of progress made in the implementation of the three-tier repair system, the training of repairmen, and the development of a system for the distribution of spare parts will also be assessed.

2.2.4 Rural Health Zones

Written agreements and monetary payments are to be used in the Kinkonzi and Kimpese health zones. Both zones have Zairian Rural Water Coordinators and Peace Corps Volunteers working in water and sanitation. Journals of the experiences of using the *conventions* are to be maintained by the Peace Corps Volunteers.

2.2.5 Monitoring System

A system for providing (some) routine monitoring of the operational and sanitary conditions of rural water systems was developed in collaboration with health zone staff and SNHR stations. Agreement to introduce the system was obtained in the five health zones visited by the team: Sandoa, Kabongo, Seke-Banza, Kinkonzi, and Kimpese. A monitoring form and instructions for its use were developed by the WASH team, including Cit. Kalonji and Masumbuko (see Appendix E). Copies of this form and instructions are to be sent to ten Rural Health Zones and then distributed to each Health Center in the selected Zones. The forms are to be completed by the local health center staff as part of their routine monthly reports. At the zone level, the RWC or a zone supervisor, is to compile a summary report which is then to be communicated to the nearest SNHR station.

The effectiveness of the reporting form and the operation of the monitoring system as a whole will be reviewed at the end of the second phase of this assignment.

Chapter 3

FUTURE ACTIONS

The WASH consultants are to return in approximately six months to complete the second phase. A detailed analysis of the results of implementation of the selected O&M program components discussed above will be made at that time.

The third phase of the assignment will consist of the organization of a seminar to disseminate the national O&M policy and to discuss the results of Phase II. The timing of Phase III should be coordinated with the annual meeting of SNHR station chiefs.

APPENDIX A

LIST OF PERSONS CONTACTED

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APPENDIX A

LIST OF PERSONS CONTACTED

USAID/Kinshasa

Ray Martin	Head, HPN
Chris McDermott	Project Officer
Rhonda Smith	Project Officer
Beth Moracco	Shaba ADO

CNAEA/Kinshasa

Prof. Kadima Muamba	Secrétaire General Permanent
Cit. Kabamba Bilonza	Sous Directeur
Cit. Lwanuna	Chef de division, Suivi et Evaluation

SNHR/Kinshasa

Cit. Sowa Lukono	Director
Cit. Luvula	Chef, Service Technique
Cit. Masumbuko	Chef, Suivi/Planification
Cit. Kalunga	Chef de Logistics

SANRU/Kinshasa

Dr. Duale Samba	Director
Dr. Franklin Baer	Project Manager
Cit. Kasongo Ntambwe	Chef de Division des Infrastructures
Cit. Kalonji Nsenga	Coordinateur des Projets d'Eau et Assainissement
Cit. Itoko	Resp. de formation eau et assainissement

UNICEF/Kinshasa

Cit. Lubila Samba	Administrateur des Projets
-------------------	----------------------------

C.B.Z.O.

Paul Fountain	Village Water Supply Project
Cit. Ndombe Mafana Soddy	Village Water Supply Project

SNHR/Sandoa (USAID Project 116)

Cit. Mudahama Terera	Chef de Station, chef de Projet
Cit. Luyindula	Assistant Technique
Cit. Kabagema	Chef de Service Animation (AIDRZ)
Alain Pimay	Maitre Sondeur (AIDRZ)

SNHR/Kabongo

Cit. Tsimba di Mavunga
Cit. Mbouyou
Cit. Nkumimpoko Lempwa
Cit. Fungamali Bendera
Cit. Nyimi Phuabu
Cit. Ngoma Pibu
Cit. Songa Nsompela
Cit. Kalambay Mbuy
Cit. Lulu
Cit. Rugendabanga
Guy Piron

Chef de Station
Animateurs
Technicien
Secrétaire
Assistant Administratif et Financier
Technicien
A.C.U. Forage "D"
Magasinier
A.C.U. Forage "C"
Assistant Chef Foreur
Conseiller Technique Forage

Zone de Sante/Sandoa

Dr. Tshimpanga
Cit. Liamby

Medecin Chef de Zone
Administrateurs

Zone de Sante/Kabongo

Cit. Muganga
Cit. Kiluba
Cit. Kumwimba Kabongo

Administrateurs
Superviseur-Formation
CEA

Water Committees

Dilolo Poste
Muyeye
Twite

SNHR/Kinzau Mvute

Cit. Vita wa Ngongo
Cit. Bilambo-Kalama
Cit. Otsha Musafiri
Cit. Paka Mafuila
Cit. Vumpa-wa-Vumpa
Cit. Ndaye Muambikayi
Cit. Tshipele Kelol
Cit. Matundu Longo

Chef de Station
Ingenieur de Sondage
Hydrogeologue
Mecanicien
Monteur de pompe
Adjoint Technique
Responsable de l'animation
Secretary

Zone de Sante/Seke-Banza

Dr. Bualuti-Niangi
Cit. Kapita-Mbangu

Medecin Chef de Zone
Administrateur

Zone de Sante/Kinkonze

**Dr. Konde
Cit. Mbumba**

**Medecin Chef de Zone
Administrateur**

Zone de Sante/Kimpese

**Dr. Ndongosieme
Cit. Nketani
Cit. Diengidi
John Yanulis
Irene Brammertz**

**Medecin Chef de Zone
CEA
Administrateur
PCV - Water
PCV - PH Admin.**

Maduda

**Cit. Soki Muanda
Members of the Water Committee**

Chef de Collectivite

APPENDIX B

Trip Reports

- I. Sandoa and Kabongo SNHR Stations, Shaba;
February 2-12, 1990
- II. Bas Zaire; February 14-17, 1990

TRIP REPORT

WASH TASK NO. 137 Robert Hall, Alan Malina

Dates of Travel: Feb. 2 - 12, 1990
Region Visited: Sandoa and Kabongo SNHR stations, SHABA
Participants: Robert Hall, Alan Malina, Cit. Masumbuko (SNHR), Cit. Kalonji (SANRU)

<u>Date</u>	<u>Site Visited</u>	<u>Activity</u>
2/2	Lubumbashi	Arrive Lubumbashi, meeting with Beth Moracco, Team meeting.
2/3	Lubumbashi	Team meeting, discussion of research strategy.
2/4	Sandoa	Arrive Sandoa, initial planning meeting with Project 0116 senior staff.
2/5	Sandoa	Staff meeting. Review of project history and activities since earlier WASH visit. Review of evolution of community development (<i>animation</i>) approaches, problems. Presentation of Phase II objectives.
2/6	Sandoa, Kasaji, Dilolo Poste, Twite, Muyeye	Station Chief Mudahama and Cit. Masumbuko travel to Kasaji to review status of adduction system and discuss outstanding issues with political authorities and Water Committee. Hall, Malina, Cit. Kalonji and Kabagema, and Pimay travel to Dilolo Poste with stops at Muyeye and Twite. Meetings with representatives of Water Committees, Missions, health centers. Review of planned Dilolo Post adduction system and pumps in other communities.
2/7	Sandoa	WASH Team meeting. Meeting with Zone de Sante staff; agreements on monitoring by health agents. Development of research program with Project senior staff; development of community agreements (<i>Conventions</i>) for pumps and adductions. Review of spare parts needs with station technicians.
2/8	Sandoa, Kabongo	Finalize research strategy for capped springs, pumps and adductions. Flight to Kabongo. Meeting with senior staff to set agenda for visit.

2/9	Kabongo	Review of drilling and spring capping activities, community development and O&M strategies. Meeting with Zone de Sante staff, Rural Water Coordinator. Inventory of available spare pump parts.
2/10	Kabongo	Meeting with Station senior staff to define improved community development and maintenance approaches including development of written community agreements. Training session, facilitated by Cit. Masumbuko and Kalonji, with all station staff to discuss the approved community development and maintenance strategy.
2/11	Kabongo, Lubum	Flight to Lubumbashi, WASH team meeting.
2/12	Lubum, Kinshasa	Meeting with SHADO staff. Return to Kinshasa.

FINDINGS

I. Sandoa SNHR Station/Project 0116

This is the second trip made by this WASH team to the Sandoa area. Overall, the Station has made progress in incorporating elements of the O&M strategy developed during the earlier visit in April, 1989. However, irregular flow of Project and Station funds has seriously affected the pace of programmed activities. In particular the continued unavailability of spare parts, tools and training materials has delayed implementation of a number of activities. Responsibility for these matters had been assumed by USAID and SNHR in Kinshasa but have yet to be acted upon fully.

A. Spring capping

The spring capping program in Sandoa is just about completed, with 6 out of 503 springs remaining to be capped. As spring capping activities progressed, the Station modified its approach to the beneficiary communities. Whereas, initially, the Station had a structured community development program implemented by animateurs with the use of written agreements, with time the awareness of the benefits of spring capping by the communities lessened the need for an intensive animation program which was then taken over by the spring cappers themselves and the use of the agreements was abandoned. The fact that the animateurs had tremendously increased workloads due to personnel changes and increased drilling activities also influenced this change in strategy.

B. Piped water systems

The Musumba piped water system is operational and apparently the local Water Committee has assumed responsibility for O&M activities. Project staff acknowledged that organizational difficulties linked to community participation in financing and management continue to threaten the longterm sustainability of the system.

The Kasaji piped water project consists of two distinct water systems. Kasaji I, the smaller of the two systems, provides water to two small communities including mission operated health and educational facilities. The system is gravity fed and consists of only two sets of community standpipes. This system is operational and responsibility for O&M has been assumed by the local Catholic mission.

The larger, more technically complex Kasaji II system has experienced a number of difficulties. Kasaji is, in effect, a small town rather than a village and many of the current problems result from the more heterogeneous makeup of the community, and the fact that it also serves as the seat for subregional administrative authorities. A military detachment is also stationed there.

The highly participatory community development approach which has proven to be successful in small communities does not appear to be appropriate to semi-urban centers such as Kasaji. The magnitude of labor required for large piped water systems and the questionable legitimacy of local leaders tends to discourage popular willingness to contribute labor or even finances. Community participation in construction has been very uneven and generally unsatisfactory despite optimistic indications early on. The Water Committee has been unsuccessful in mobilizing community labor resulting in substantial delays in the construction program.

Changes in political (and military) authority have also had negative consequences. Current political leaders appear to have adopted a confrontational attitude toward the Project and toward the Kasaji Water Committee. Due to the presence of State authorities, the Water Committee has little autonomous decision making capability. Committee members suggested that "legalization" of the committee would help overcome this apparent lack of power.

The Project has not used written agreements between the Technical Service and the community for piped water systems. Senior staff seemed to feel that there were too many responsibilities for the Committees to take on for their communities. However, the Kasaji Water Committee responded positively to the concept of a written agreement.

The Project is attempting an interesting new approach to community participation for the planned turbo-pump piped water system at Dilolo-Poste. In an attempt to avoid the lengthy delays in construction encountered in piped water systems due to inefficient and unpredictable mobilization of voluntary labor, senior staff calculated the value of anticipated community labor and material contribution. The intention was that all local labor costs would be paid by the community and that local laborers would then be hired by the Project and paid from the funds contributed by the population. The money contributed by the community would therefore return to the community in the form of wages and the Project would have greater control over the quantity and quality of manual labor. Senior staff decided that the estimated financial contribution of 5,500 Z per family was excessive relative to disposable income and the decision was made to divide the required contribution into two components: a monetary contribution of 1,500 Z per household and the remainder, 4,000 Z, in the form of labor contribution. The value of labor was set at 250 Z per day, the going wage for unspecialized workers; each household would therefore contribute a total of 16 days of labor in addition to the monetary payment.

Although this approach represents a step in the right direction, it remains overly complex in regard to the formulae for labor contribution. The WASH team recommended that:

- (a) a clear distinction be made between specialized and non-specialized labor and that funds collected from the popular monetary contribution be used only for the former;
- (b) rather than require a set number of days of labor per household that specific labor tasks be assigned to the community and that the internal organization of the labor contribution be left to the local Water Committee; and
- (c) that a formal written agreement between the community and the Project be negotiated, clearly detailing the obligations of all parties. This agreement is to be discussed in each quartier and signed by local authorities and popular representatives.

Funding for the Dilolo Poste piped water system has yet to be approved. If the Dilolo Poste piped water system is to be completed in the months remaining before the end of the Project, it is absolutely essential that a decision be made quickly and communicated to Project officials. The Team assisted the Project staff in developing a model of a detailed written agreement to be used for the adduction in Dilolo Poste.

The Water Committee of Dilolo Poste responded positively to the concept of a written agreement, if they could discuss the contents with the population before signature. They also suggested having the Chefs de Localites sign, as well as the Committee to encourage better participation.

D. Hand Pumps

Again, many of the recommendations from the Round Table are being implemented in the Project Area. Financial contributions are now required from the villages before the drilling and have a very specific purpose - the purchase of a spare parts kit. So far, 169 pumps have been installed of which about 30 are blocked due to the lack of or incomplete financial contribution from the responsible villages. The Project has received authorization from the Project Management Committee to withdraw the pumps from those villages that have made no effort towards the financial contribution. This will be carried out in a couple of selected villages in the near future. It is hoped that these examples will encourage other recalcitrant villages to pay their dues.

Drilling has been slowed down by financial constraints. This has permitted the much reduced animateur team to forge ahead in their village preparation tasks. Most of the planned drilling sites are located in communities along two roads: Sandoa - Kafakumba and Sandoa - Kapanga. The decision was made not to drill wells in villages that had not paid the totality of the financial contribution prior to arrival of the drilling rig on the outgoing trip. Wells would be drilled on the return trip to the Station base only if the payment had been completed.

The WASH team assisted the Project in preparing a more detailed written agreement to be negotiated between the community and the technical service itemizing the commitments of both parties. Included in these agreements are the estimated financial values of each party's contribution. These agreements will be used in the remaining villages.

The Project has improved its artisan reparateur training program, but has been unable to carry out any training sessions due to the lack of complete tool kits and the delay in the production of the repair manual in Kinshasa. It was suggested by the team that when all was ready for the training the Project technician should work with Cit. Kabagema, an ENFEA trainer, to prepare an artisan reparateur training guide that could be used by others Stations and projects using the Modified Mark II pump.

The Project has adopted the WASH team's suggestion of drilling a hole in the follower to permit easier dismemberment of the check assembly by the use of a simple rod. This technical alteration has apparently not been disseminated to other Stations. Other Modified Mark II pump models seem to have notched followers permitting easier disassembly. Project 0116 staff proposed manufacturing the no. 19 wrench from 3/4" pipe welded to rebar, rather than purchasing imported ones. These wrenches would be sold in the kits for each pump to permit greasing of the chain.

Spare parts issues have not been fully addressed in the Project area. At this point there are no parts available to replace those used from the repair kits. In fact, there are not enough parts to complete all the repair kits. The Station was informed that this was being taken care of at the national level. This is becoming a pressing problem that needs to be addressed in the near future, if a parts distribution system is going to be established in the Project area before PACD. The Team obtained a list of parts needed to complete the kits, as well as a request from the Project to purchase a sizeable stock of replacement spare parts for the Station for long term maintenance of the pumps.

At this point, the Project has carried out all repairs. These have consisted mainly of replacing worn piston rings.

E. Health Zones

The health zones in the Lualaba sub-region are modestly functional at best. The subregion was hit hard by the history of armed conflict and social service infrastructure has yet to recover fully. The WASH team met with a number of public health personnel, including the Medecin Chef de Zone of Sandoa. Discussions with health personnel revealed strong interest in potable water and rural water systems in general. The Rural Water Coordinator for the Sandoa health zone was judged to be ineffective despite having participated in three training sessions and was removed from this function. A replacement has been designated and is awaiting training. There are no RWCs in the other health zones served by the Project.

A key factor underlying the sustainability of RWS is regular monitoring. However, no system for routine monitoring had yet to be developed in Zaire. SNHR stations do not and will not have the personnel or transport resources required to monitor all rural water systems in their service areas. Health zones theoretically cover the entire area of the country, and although

many are not fully operational, they generally have some level of physical presence in rural areas through the Health Centers.

A strategy for enlisting the participation of Health Center personnel in monitoring rural water systems in their respective aire de Santé was developed in collaboration with the staff of the Sandoa health zone. The WASH team is to develop a standard reporting form to be distributed to health centers in each Zone. Health center personnel are to report on the operational and sanitary conditions of each RWS visited during the month with the objective of visiting each RWS in the area covered by the center at least one time each quarter. A summary report is to be prepared from the information provided by the various centers in a health zone and communicated to the local SNHR station. Follow-up on these reports may be made by either the Rural Water Coordinator or the Station, depending on the system and level of technical intervention required.

The WASH team also met with Brother Jeff and Sister Trinidad at the Dilolo Poste mission. Brother Jeff currently operates three hydraulic rams to provide water to the hospital and to mission facilities. He has also volunteered to collaborate with the Project in developing an improved water supply system for Dilolo Poste. The Catholic sisters have established a network of eight nutrition posts and were interested in incorporating water and sanitation information into their program in conjunction with the development of potable water resources in the area.

II. KABONGO SNHR STATION

A. Spring Capping

The Kabongo Station has capped 25 springs in 6 villages. It relied on the Rural Water Coordinator to prepare the communities. The capping team would then organize the labor provided by the community. Two people, a man and a woman, were named as caretakers responsible for the maintenance activities surrounding the spring. Initially, the communities could not understand why the paid members of the Technical Team should require the voluntary labor of the community. As more springs were capped, understanding by the community of its role improved. The lack of availability of "local" materials, such as rock and gravel, has been raised as a problem with the possibility of the community paying for them as a solution.

The Station is beginning to receive requests from communities to cap springs.

B. Hand Pumps

In the year since the two drilling rigs have been at Kabongo, 17 boreholes have been drilled in 6 villages. The assessment of the various factors influencing this lack of productivity lies outside the scope of work defined for this WASH assignment.

The approach adopted by the Station to the communities which are to receive hand pumps included many of the ideas developed at Sandoa. The amount of the financial contribution

for each pump was decided by the Station and the Development Committee of the Zone. The Z 12,000 contribution was for the purchase of gravel needed in the boreholes which was not available locally. The very active Rural Water Coordinator of the Kabongo Health Zone preceded the rigs into villages to prepare them for their role in the water system, including requesting the monetary contribution. Most of the villages have paid without excessive difficulty, though most preferred to do so after water came out of the pump.

Regarding O&M, the Station has had only vague ideas of what was necessary. The village development committee would name a caretaker for each pump whose primary role was to maintain discipline around the pump. The idea of the village spare parts and repair kit had been adopted without working out any of the details regarding composition, costing or distribution and the Station was simply awaiting delivery of the kits from Kinshasa. It was found after taking an inventory of the storeroom that a significant number of pump spare parts were already available at the Station and that basic kits could be put together with these parts. However, there were no tools available for the artisan reparateurs, and no training program had been planned.

Indeed, there was no repair program planned by the Station and the three tier pump repair system recommended as appropriate for the India Mark II hand pump was not understood by Station personnel. This is not a criticism of the Station as such, but more a comment on the understanding of O&M needs in general, and the danger of inadequate preparation and planning of borehole and handpump programs.

A model written agreement between the Station and the community was prepared in collaboration with senior Station staff. This agreement was used as the basis of a training session facilitated by Cit. Masumbuko and Kalonji for all Station personnel.

C. Health Zones

Responsibility for community development activities for rural water systems has been assumed entirely to date by the three Rural Water Coordinators. The WASH team was able to meet with the RWC of the Kabongo Health Zone. Since most of the RWS installed by the Station have been located in his health zone, this very dynamic coordinator has carried the weight of village preparation, organization and follow-up. The coordinator has participated in all three of the training sessions organized by the ENFEA, most recently attending the session of RWS O&M. He also participated actively in the training session held with SNHR station personnel regarding overall O&M strategy and the use of a written agreement.

As was done in the Sandoa area, the proposal of assigning routine monitoring responsibilities to health center personnel for RWS was advanced and accepted.

PERSONS CONTACTED

USAID/Lubumbashi

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HPN Project Monitor

SNHR/Sandoa (USAID Project 116)

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Cit. Luyindula
Cit. Kabagema
Alain Pirnay

Chef de Station, chef de Projet
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Chef de Service Animation (AIDRZ)
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SNHR/Kabongo

Cit. Tsimba di Mavunga
Cit. Mbouyou
Cit. Nkumimpoko Lempwa
Cit. Fungamali Bendera
Cit. Nyimi Phuabu
Cit. Ngoma Pibu
Cit. Songa Nsompela
Cit. Kalambay Mbuy
Cit. Lulu
Cit. Rugendabanga
Guy Piron

Chef de Station
Animateurs
Technicien
Secretaire
Assistant Administratif et Financier
Technicien
A.C.U. Forage "D"
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A.C.U. Forage "C"
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Zone de Sante/Sandoa

Dr. Tshimpanga
Cit. Liamba

Medecin Chef de Zone
Administrateurs

Zone de Sante/Kabongo

Cit. Muganga
Cit. Kiluba
Cit. Kumwimba Kabongo

Administrateurs
Superviseur-Formation
CEA

Water Committees

Dilolo Poste
Muyeye
Twite

TRIP REPORT

WASH TASK NO. 137 Robert Hall, Alan Malina

Dates of travel: February 14 - 17, 1990
Region visited: Bas Zaire
Participants: Robert Hall, Alan Malina, Cit. Kalonji, Cit. Masumbuko

<u>DATE</u>	<u>SITE VISITED</u>	<u>ACTIVITY</u>
2/14	Kinzau Mvuate	Flew to Boma on MAF. Drove to Kinzau Mvuate. Discussed spring capping and piped water systems activities and approach of SNHR station with station personnel.
2/15	Kinzau Mvuate	Met with Medecin Chef of the Seke-Banza Health Zone. Developed monitoring strategy for RWS in service area of health centers. Reviewed well drilling program and approach to hand pump systems. Inventoried stock of hand pump spare parts. In a general meeting of all station personnel, developed capped spring and manual pump model written agreements to be used in Bas Fleuve subregion by SNHR station.
2/16	Kinkonzi, Maduda	Accompanied by Animateur and Technical Adjoint of SNHR station. Met with Administrator of Kinkonzi Health Zone. Left copies of model agreement for spring capping and request for participation in test of agreements to be given to Peace Corps volunteer and Rural Water Coordinator who were both on assignment. Visited Maduda piped water system. Met with Chef de Collectivité, officers and representatives of Maduda water committee. Discussed problems and organizational options for O&M. Returned to Kinzau Mvuate.
2/17	Kimpese	Met with Medecin Chef de Zone of Kimpese, Administrator, Water and Health Administration Peace Corps Volunteers and Rural Water Coordinator. Reviewed Zone RWS activities and approach. Discussed use of and rationale for model agreements. Returned to Kinshasa.

FINDINGS

I. Kinzaou Mvuete SNHR station

Since the last visit of this WASH team to the Bas Fleuve subregion, the SNHR station has relocated from N'Sioni to Kinzaou Mvuete, constructed a new base (primarily with Japanese aid linked to the first phase of a well drilling project), and witnessed substantial turnover in station personnel. Because of the latter factor, the institutional memory of the technical staff is quite limited; only the station chief, Cit. Vita, is able to provide some background information on RWS installed prior to 1989.

Two notable changes in the station's orientation and capabilities have taken place. First, with the securing of Japanese financial and technical assistance, the station is involved in a major deep well drilling program. This program is financed and managed by the Japanese, with responsibility for the well drilling operation accorded to a private company. The level of integration of well drilling activities with the overall program of the station is quite minimal. SNHR personnel are assigned to the well drilling team and are being provided with technical training, the station chief allocates an important proportion of his time and energy to liaison and technical duties. However, all transport resources and equipment purchased with Japanese aid are reserved for use by the drilling teams. Since the station does not have other means of transport, other station activities are hindered.

The second change involves capabilities. A community development specialist (animateur) was assigned to the station in late October 1989. The animateur previously worked at the Sandoa station and was familiar with Project 0116 approaches to community participation and animation. These experiences and others gained at DPP in Idiofa guide the animateur's approach in his new appointment. The addition of a CD specialist follows WASH recommendations from Phase I. To date, this agent has been responsible for preparing villages for the well drilling program as well as for involvement with other RWS activities, specifically capped springs.

Overall, serious problems persist in the area of operation of the SNHR station in Bas Fleuve. None of the more critical O&M problems identified in the Phase I report have been resolved, although the presence of an animateur does provide some hope for their eventual resolution.

A. Spring Capping

Thirteen springs have been capped by the station during 1989 and the first part of 1990. Since the arrival of the animateur, community development activities now precede the arrival of the technical team in the village. At the time of this visit, no written agreement specifying community and technical service responsibilities was in use. Nor had a clear strategy for assuring long term sustainability and routine maintenance been elaborated. Spring caretakers were not required; rather the Animateur encouraged the community to propose and institute their own method of assuring that maintenance be carried out. Community members were not requested to make a financial contribution for the construction; only labor and some local materials were to be provided by the community. The station provided all cement, pvc pipe and sand. Although there was some confusion regarding the composition of spring capping teams, it seems that a team generally consists of from five to seven station members. So far,

the spring capping teams return to the station at the end of the day and therefore do not require lodging to be provided by the community. Station personnel acknowledged some difficulty in obtaining community labor participation, especially in cases where construction was interrupted by the technical team (to go get materials for example).

Based on the information available to the WASH team, the station's spring capping program appears to be inefficient, costly and relatively unproductive. Community resources are not used fully whereas the station provides an overabundance of manpower and unnecessarily increases the cost per capped spring by chauffeuring personnel to and from the capping site each day. It was unclear whether any work was done when transport was not available. Despite the size of the station technical team, each capping is estimated to require between four and six days to complete.

The spring capping program was reviewed with the WASH team and the use of a negotiated written agreement, obligatory monetary contribution and designated spring caretakers was suggested. A model Convention d'engagements mutuels for capped springs was developed with the participation of all station personnel. The matter of requiring a monetary contribution to be paid to the station and assigned to a fund for water projects was sharply debated. The idea of a mandatory financial contribution as such was not contested, however, the attribution of the contributions collected was seen by some as a serious obstacle to the adoption of this recommendation.

More pointedly, doubt was raised in (1) the station's legal right to raise funds in such a manner, and (2) the station's ability to assure proper financial management of any monies made available to them. Financial management problems are not specific to this station, nor to SNHR alone but are endemic among public services in general as well as among private sector, NGO and even confessional organizations. It is indeed quite reasonable to question whether community monetary contributions would be reserved for expenditures for future water projects, such as buying cement or other materials, rather than attributed to other expenditure needs of the station. This is a serious issue and one that must be addressed if SNHR stations are ever to become even minimally self-financing in the future or are to be trusted with significant amounts of materials or funds for specific projects.

B. Piped Water Systems

No piped water systems are currently under construction and only one system is planned for this year. The planned system to be installed in Kionzo has yet to receive financing and given the current funding situation for the water sector, it is unlikely that work will begin this year.

Serious problems continue to plague existing piped water systems in the station's area of operation. Specifically, no progress has been made in resolving the problems raised during the Phase I visit of this WASH team. The system at Mbata Siala is not maintained and no effort is known to have been made to revitalize the local water committee or to work with the population in addressing O&M concerns. Although a trip to Mbata Siala had been planned for Phase II, it had to be cancelled due to time constraints. However, a proposed

course of action was laid out for the station, involving the animateur and the Kinkonzi Rural Water Coordinator.

The WASH team, Cit. Kalonji and Masumbuko, accompanied by the Technical Adjoint and the Animateur from Kinzau Mvute visited the Maduda piped water system. A meeting with the recently elected Chef de Collectivité and members of the Maduda water committee was particularly interesting and instructive. The previous water committee was dissolved in December 1989 for 'lack of effectiveness and poor management' and new officers elected in January 1990. The current President is a retired Protestant pastor. The concentration of local political authorities that was raised as a point of concern during Phase I was no longer apparent. The new committee has proposed a mandatory contribution of Z 50 per household per month, as well as a flat fee of Z 1,000 for the Catholic and Protestant Missions, the hospital and secondary school to finance O&M needs. This proposal has yet to be approved by the population and no collections have been made or planned to date.

Furthermore, the new head of the collectivity appears to be quite cooperative and eager to work with the station to resolve the myriad problems besetting this USAID financed piped water system that began operation in May 1989. Eleven specific points were advanced by the water committee during the meeting, ranging from inadequate pressure and nonfunctional standpipes to reports of vomiting and diarrhea linked to the water provided by the system.

Cit. Masumbuko, SNHR head of planning and member of the enlarged WASH team, instructed the station technical adjoint to return to Maduda with a full technical team and the animateur and to remain for one to two weeks to conduct the necessary studies and to resolve the technical and the organizational problems afflicting the system.

The Kinzau Mvute piped water system is still incomplete, although seven of the 26 planned standpipes are in operation. The water committee interviewed during the Phase I visit had been dissolved by the Chef de Collectivité and replaced in mid-January by a "Syndicat d'Initiative". The composition, manner of constitution and objectives of this group are not known. At the present time, no O&M strategy or approach has been defined by the station although the technical team is well aware of the lack of maintenance, broken or leaking taps and other problems. The animateur has proposed the establishment of local water committees for each standpipe and has already created one such committee. This proposal is in keeping with the recommendations advanced during Phase I and its implementation is strongly encouraged.

C. Hand Pumps

Twenty Modified India Mark II hand pumps have been installed in 17 communities. An additional 95 manual pumps and five electric pumps are to be installed during the second phase of the Japanese financed project. The private firm managing the well drilling operation is involved exclusively with the technical operations: training of Zairian staff and production of completed boreholes. The lack of any consideration for the role of the communities involved and of longterm sustainability of the systems created was compensated in part by the decision made at the national level to assign a community development

specialist to the station. This animateur has developed a program for community involvement and has encouraged, though not required, the mobilization of a financial contribution for the purchase of replacement parts. According to his reports, all communities that have received pumps have collected most or all of the recommended amount (Z 10,000). However, no specific objective has been defined for the contribution nor has a list of spare parts or the value of parts been established. No written agreement was in use by the station.

The WASH engineer assisted by station personnel conducted a physical inventory of pump parts and tools. Station personnel appeared to be unaware of the existence of a substantial cache of spare parts and no inventory had yet been undertaken by the station. After assessing stock levels, the WASH engineer determined that sufficient stock existed to constitute the 115 spare parts kits that will be required by the end of the second phase of the Japanese project.

The expanded WASH team, in collaboration with station personnel, developed a model written agreement to be used for pumps. The need for a three tier system of pump repair and a system for spare parts distribution was also discussed and options presented.

II. Health Zones

The team visited the health zones of Kinkonzi, Seke-Banza, and Kimpese. In all three cases, the use of health center staff for monitoring the operational and sanitary status of RWS was proposed and accepted. Monthly reports of sites visited by health center staff are to be sent to the zone along with other routine monthly reports. Water supply information will then be reviewed and summarized by the Rural Water Coordinator or supervisor and the summary report communicated to the nearest SNHR station.

In the Kinkonzi health zone, a model agreement for springs was left for the PCV and the RWC (who were both absent) along with a request that they adapt it to local conditions and experiment with its use. The PCV and RWC in Kinkonzi capped 10 springs in 1989. A fee of Z 2,000 was requested prior to spring capping to be used for the Health Zone's water and sanitation program.

In the Kimpese health zone, the team was able to discuss the recommended O&M approach as well as the use of written agreements for RWS with the PCV and RWC. They have consented to adapt the written agreement and to introduce it to villages for which capped springs or hand dug wells are planned. Last year alone, the RWC capped 19 springs; 34 springs have been capped since 1986. The Kimpese health zone has decided to request a cash payment equivalent to the price of two sacks of cement per capping. At the time of this visit, no clear objectives for use of these funds had been established. Options for use of the funds were discussed with the WASH team.

GENERAL OBSERVATIONS

The following observations were made following completion of the field trips to Shaba and Bas Zaire.

- 1) The recommendations approved during the Round Table Conference of May 1989 had not been consistently disseminated to rural water stations nor to other RWS actors.
- 2) Station personnel had not received clear directives from the National Rural Water Service in regard to a number of key O&M program components, e.g. the use of written agreements, the discussion of RWS and O&M costs, arrangements for the establishment of a coherent pump repair program, the linking of community monetary contributions with well defined expenditures, etc.
- 3) With the exception of the Sandoa station, spare parts had not been inventoried and no program for the distribution of spare parts had been developed.
- 4) The training of local repairmen for piped water systems and manual pumps has not yet occurred (except for one initial session in Sandoa in February 1989). At this time, all repairs are being performed by station personnel.
- 5) Selection criteria for pump systems do not appear to be clearly defined nor consistently applied. In the case of Bas Zaire, population requirements for the installation of a pump were lowered from 500 to a minimum of 100 inhabitants.
- 6) Follow-up visits to verify the technical performance of recently installed systems and to determine community acceptance, utilization and maintenance of the systems are not being systematically conducted.
- 7) The community participation approach used in the construction and maintenance of rural water systems in village communities does not appear to be appropriate for semi-urban systems. The higher cost and labor requirements of these systems, and in particular of large piped water systems, present special problems in labor organization and resource mobilization in the context of socio-economic and ethnic diversity characteristic of semi-urban communities.
- 8) The role of local authorities in the organization of rural water systems needs to be clarified. The recommendation adopted at the May 1989 Round Table regarding the need to inform and encourage the support of local and regional political and administrative authorities should be put into effect more effectively.

- 9) **Technical services involved in the construction of rural water systems are not taking full advantage of the presence of local NGOs and other local associations in disseminating information, mobilizing popular support and reinforcing O&M activities for the longterm sustainability of rural water systems.**

PERSONS CONTACTED

SNHR/Kinzau Mvueté

Cit. Vita wa Ngongo	Chef de Station
Cit. Bilambo-Kalama	Ingenieur de Sondage
Cit. Otsha Musafiri	Hydrogeologue
Cit. Paka Mafulla	Mecanicien
Cit. Vumpa-wa-Vumpa	Monteur de pompe
Cit. Ndaye Muambikayi	Adjoint Technique
Cit. Tshipele Kelol	Responsable de l'animation
Cit. Matundu Longo	Secretary

Zone de Sante/Seke-Banza

Dr. Bualuti-Niangi	Medecin Chef de Zone
Cit. Kapita-Mbangu	Administrateur

Zone de Sante/Kinkonze

Dr. Konde	Medecin Chef de Zone
Cit. Mbumba	Administrateur

Zone de Sante/Kimpese

Dr. Ndongosieme	Medecin Chef de Zone
Cit. Nketani	CEA
Cit. Diengidi	Administrateur
John Yanulis	PCV - Water
Irene Brammertz	PCV - PH Admin.

Maduda

Cit. Soki Muanda	Chef de Collectivite
Members of the Water Committee	

APPENDIX C

ASSESSMENT OF SPARE PARTS STATUS

MEMORANDUM

Date: Feb. 21, 1990

From: Alan Malina, WASH consultant
To: Chris McDermott, Project Officer

Subject: Hand Pump Spare Parts.

Ref.: A) Reftel Kinshasa 19093
B) Strategie et dispositif pour l'organisation de la maintenance des pompes installees au Lualaba par le Projet USAID 660-0116, AIDRZ, April 1989

In response to ref. A para 3C request for WASH assistance in hand pump spare parts procurement, the consultants included in their tasks an analysis of the spare parts situation. After conducting inventories in Sandoa, Kabongo, Kinzau Mvueté (SNHR Station where hand pumps are being installed) and in SNHR HQ in Kinshasa and including known orders for spare parts, a list (attached) of spare parts available in country was established in collaboration with Cit. Kalunga, the Chief of Logistics of SNHR.

With the exception of Project 116 at Sandoa, which is quite far advanced in spare parts replacement and repair strategy (see ref.B), the situation can be summarized as follows:

1. Nobody had inventoried spare parts. The parts the consultant inventoried had to be unearthed from the depths of the storerooms.
2. Though just about every SNHR Station visited was aware of the concept of the spare parts kit to be sold to the villagers, no one had an idea of the contents, the value or the distribution mechanism of the kits. They were all waiting for the kits to be sent from SNHR/Kinshasa.
3. No one was quite sure of the names of the parts.
4. No strategy had been adopted for the long term repair of the pumps.
5. No clear idea existed of the tools available for repairs.
6. An unknown quantity of unmodified Mark II pumps and spare parts exists in the areas covered by the Stations at Luputa, Ngandajika, Bunia, Bikoro and in Bas Zaire. No inventory for these pumps and parts is available, nor are the location and operational status of installed pumps known at this time.

This is not a direct criticism of the Stations involved, but more a comment on the lack of experience at the Station and at the National level in the maintenance of a hand pump program. SNHR, a government service that is less than 5 years old, has received nearly 1000 pumps and 6 drilling rigs in the last 2 years. It has no experience in setting up a coordinated national spare parts distribution and repair system. Project 0116 has developed a strategy than may be expandable to the national

level, but it is the opinion of the consultant that SNHR would need targeted technical assistance for this to occur.

It is recommended that a full-time Zairian staff member be named at the national level to oversee all hand pump activities. It is also recommended that a technical advisor be assigned for a minimum of six months to accomplish the following tasks:

1. Locate and inventory all existing Mark II modified and unmodified pumps.
2. Standardize the French names of all pump parts, and the equivalent numbers/names for ordering purposes. This standardized nomenclature for the parts should then be disseminated to all concerned parties.
3. Investigate the possibility of local purchase or manufacture of selected spare parts.
4. Organize the national spare parts store room and the Station storerooms including training of the magasiniers.
5. Conduct a detailed inventory of all existing spare parts for all Mark II pump models. Make a comparison of interchangeability of all Mark II pumps parts (Tata, Dempster, modified, unmodified, and other brands).
6. Assure a coherent distribution of all existing spare parts.
7. Order any necessary supplementary spare parts.
8. Analyze repair characteristics of hand pumps so as to assure the appropriateness of composition of spare parts kits.
9. Establish a comprehensive and integrated logistical system for the purchase and distribution of spare parts. Such a system must include the routine revision and communication of part prices, the determination of an appropriate spare parts distribution system and mechanisms for accounting for monies collected from the sale of spare parts. Special attention should be given to integrating the private sector into the distribution network.
10. Implement the recommended three tier repair system and clearly define the tasks of each level: caretaker, artisan repairman, regional mechanic.
11. Determine tool requirements at each level of intervention, conduct inventory of tools and assure the purchase or local manufacture of those needed for the establishment of the repair system.
12. Assure adequate training of artisan repairman and regional mechanics.
13. Set up systems for distribution or purchase of tools for caretakers, artisan repairmen and regional mechanics.
14. Establish a policy for the regulation of repair fees.

All of these tasks fall within the strategy attempted by Project 0116 and the recommendations of the O&M Round Table, but have yet to be implemented at the national level. Enough spare parts exist in country at this point to satisfy immediate repair needs. To assure long term survival or sustainability of the hand pumps in the villages all future spare parts purchases should be integrated into a national, structured spare parts distribution and repair program through the SNHR.

MARK II MODIFIER

Commande

No.	Designation	260p	100p	115p	400p	Tata	70p	1145p
		Sandoa	Kabongo	Kinzan	USAID Dempster	200p UNICEF	Kinshasa (à compléter)	TOTAL
1.	Boulon M12 X 40	1200	196	675	1600		22	3693
2.	Ecrou M12	2400	463	1350	3200		150	7563
3.	Rondelle	300	132	170	600			1202
4.	Boulon Axe de Chaine	225	?	125	800		3	1153
5.	Ecrou Nyloc	375	258	210	400		34	1277
6.	Boulon de Couvercle	150		85	400		30	665
7.	Accouplement Hexagonal	150	147	85	300		25	707
8a.	Segment de Refoulement (PC)	750	480	420			247	1897
b.	Segment de Refoulement (Cuir)			198	2000		96	3184
9.	Joint en Cuir	1350	850	760	750		590	4300
10a.	Joint de Soupape Inferieur (GD)	375		210				585
b.	Joint de Soupape Inferieur (petit trou)		248		800?		130	1178
11a.	Joint de Soupape Superieur (PT)	375		210				585
	Joint de Soupape Superieur (petit trou)		375		800?		1	1175
12.	O Ring	375	250	210	400		125	1360
13.	Clapet de Soupape Inferieur (GD)	150?	72	45	150		3	420
14.	Clapet de Soupape Superieur (petit trou)	150?	104	85	150		44	533
15.	Roulement	450	169	255	800			1674
16.	Axe de Levier	75	50	45	400		48	618
17.	Chaine de transmission	225	99	135	400		130+25 (nom modifier)	1014

APPENDIX D
MODEL WRITTEN AGREEMENTS

APPENDIX D

MODEL WRITTEN AGREEMENTS

(CONVENTIONS D'ENGAGEMENTS MUTUELS)
M E M O R A N D U M

Date: Feb. 21, 1990

From: Alan Malina, WASH consultant
To: Chris McDermott, Project Officer

Subject: Hand Pump Spare Parts.

Ref.: A) Reftel Kinshasa 19093
B) Strategie et dispositif pour l'organisation de la maintenance des pompes installees au Lualaba par le Projet USAID 660-0116, AIDRZ, April 1989

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2. Though just about every SNHR Station visited was aware of the concept of the spare parts kit to be sold to the villagers, no one had an idea of the contents, the value or the distribution mechanism of the kits. They were all waiting for the kits to be sent from SNHR/Kinshasa.
3. No one was quite sure of the names of the parts.
4. No strategy had been adopted for the long term repair of the pumps.
5. No clear idea existed of the tools available for repairs.
6. An unknown quantity of *unmodified* Mark II pumps and spare parts exists in the areas covered by the Stations at Luputa, Ngandajika, Bunia, Bikoro and in Bas Zaire. No inventory for these pumps and parts is available, nor are the location and operational status of installed pumps known at this time.

This is not a direct criticism of the Stations involved, but more a comment on the lack of experience at the Station and at the National level in the maintenance of a hand pump program. SNHR, a government service that is less than 5 years old, has received nearly 1000 pumps and 6 drilling rigs in the last 2 years. It has no experience in setting up a coordinated national spare parts distribution and repair system. Project 0116 has developed a strategy that may be expandable to the national level, but it is the opinion of the consultant that SNHR would need targeted technical assistance for this to occur.

It is recommended that a full-time Zairian staff member be named at the national level to oversee all hand pump activities. It is also recommended that a technical advisor be assigned for a minimum of six months to accomplish the following tasks:

1. Locate and inventory all existing Mark II modified and unmodified pumps.
2. Standardize the French names of all pump parts, and the equivalent numbers/names for ordering purposes. This standardized nomenclature for the parts should then be disseminated to all concerned parties.
3. Investigate the possibility of local purchase or manufacture of selected spare parts.
4. Organize the national spare parts store room and the Station storerooms including training of the *magasiniers*.
5. Conduct a detailed inventory of all existing spare parts for all Mark II pump models. Make a comparison of interchangeability of all Mark II pumps parts (Tata, Dempster, modified, unmodified, and other brands).
6. Assure a coherent distribution of all existing spare parts.
7. Order any necessary supplementary spare parts.
8. Analyze repair characteristics of hand pumps so as to assure the appropriateness of composition of spare parts kits.
9. Establish a comprehensive and integrated logistical system for the purchase and distribution of spare parts. Such a system must include the routine revision and communication of part prices, the determination of an appropriate spare parts distribution system and mechanisms for accounting for monies collected from the sale of spare parts. Special attention should be given to integrating the private sector into the distribution network.
10. Implement the recommended three tier repair system and clearly define the tasks of each level: caretaker, artisan repairman, regional mechanic.
11. Determine tool requirements at each level of intervention, conduct inventory of tools and assure the purchase or local manufacture of those needed for the establishment of the repair system.
12. Assure adequate training of artisan repairman and regional mechanics.

13. Set up systems for distribution or purchase of tools for caretakers, artisan repairmen and regional mechanics.
14. Establish a policy for the regulation of repair fees.

All of these tasks fall within the strategy attempted by Project 0116 and the recommendations of the O&M Round Table, but have yet to be implemented at the national level. Enough spare parts exist in country at this point to satisfy immediate repair needs. To assure long term survival or sustainability of the hand pumps in the villages all future spare parts purchases should be integrated into a national, structured spare parts distribution and repair program through the SNHR.

CANEVAS DE CONVENTION D'ENGAGEMENT MUTUEL

SOURCE

Nous, habitants du village _____, Groupement _____
Collectivité de _____ Zone de _____,
nous engageons à aménager la source _____ avec
l'assistance du (Service Technique) _____ et la
Zone de Santé de _____.

I. A cet effet, le village s'engage à:

1. Ouvrir la piste d'accès
2. Nettoyer le site pour l'aménagement
3. Rassembler les matériaux locaux suivants avant la construction :
 - sable (quantité définie par exemple en tas)
 - graviers (quantité définie par exemple en tas)
 - moellons (quantité définie par exemple en tas)
 - argile (quantité définie par exemple en tas)ou l'équivalent au prix d'achat de Z _____
4. Collecter une contribution monétaire préalable d'un montant de Z _____ à verser au (Service Technique) _____ avant la construction.
5. Fournir la main-d'oeuvre pour toute la durée de la construction et les outils à usage courant. (Les besoins en main-d'oeuvre seront déterminés avec le capteur au début des travaux).
6. Désigner deux Responsables (dont une femme si possible) pour l'entretien qui doit suivre toutes les étapes de la construction.
7. Entretenir la source; ses environs et sa piste d'accès.
8. Assurer la sécurité du Personnel, matériels et matériaux sur le chantier.

II. Le Service Technique _____ s'engage à:

1. Apporter l'assistance technique au village pour l'aménagement de la source.
2. Fournir le matériel nécessaire pour la construction.
3. Fournir les matériaux suivants:
 - tuyau _____
 - ciment _____
 - fer à béton _____
4. Former les membres du Comité et les Responsables de la source sur toutes les activités de l'entretien.
5. Vérifier l'aménagement dans les six mois qui suivent la fin du captage de la source, pour s'assurer de son bon fonctionnement et de son entretien par la Communauté.

III. La valeur de la contribution de la Communauté, en main-d'oeuvre, matériaux, locaux et en espèce est estimée à: Z _____

IV. La valeur de la contribution du Service Technique en matériel et matériaux est estimée à Z _____.

Fait à _____ le _____

CANEVAS DE CONVENTION D'ENGAGEMENT MUTUEL

ADDITION DE DILOLO POSTE

Nous, habitants du village _____, Groupement _____
Zone de _____, nous engageons à construire l'adduction _____
_____ avec l'assistance du (Service Technique) _____
_____ et la Zone de Santé de _____

I. La population s'engage à assurer la réalisation des travaux suivants:

1. Ouvrir les pistes d'accès
2. Nettoyer le site pour l'aménagement
3. Exécuter le terrassement
4. Creuser et remblayer les tranchées d'amenée et de refoulement
5. Creuser et remblayer les tranchées de distribution
6. Fournir les outils à usage courant

Ces travaux seront réalisés dans les délais déterminés en collaboration avec le Service Technique.

II. La population s'engage à fournir les matériaux locaux suivants:

1. Sable : 110 m3
2. Graviers : 160 m3
3. Moellons : 370 m3
4. Briques : 10.000

La qualité de ces matériaux sera spécifiée par le Service Technique.

III. La population s'engage à cotiser 1.500 Z/ménage qui seront recueillis par le Comité d'Eau et déposés en un endroit sûr pour financer les travaux spécialisés.

IV. La valeur estimée de la participation communautaire est estimée à 2.766.875 Z. (Main-d'oeuvre, matériaux, locaux, cotisations)

V. La population s'engage à:

1. Désigner un Responsable et un Assistant (dont une femme si possible) pour chaque borne fontaine.
2. Acheter deux robinets pour chaque borne fontaine avant la fin des travaux.
3. Proposer quelques candidats pour suivre une formation continue pour devenir réparateurs du système.
4. Entretenir et réparer le système d'une façon permanente.
5. Assurer la sécurité du Personnel, matériels et matériaux sur le chantier.
6. Fournir un logement au Service Technique.

VI. Le Service Technique s'engage à:

1. Apporter l'assistance technique au village pour réaliser toutes les étapes de l'adduction.
2. Fournir le matériel nécessaire pour la construction, par exemple, camion, truelle, etc...
3. Assurer le transport des matériaux locaux fournis par la population se trouvant à plus de 5 Km du site.
4. Fournir les matériaux suivants:
 - Tuyauterie, turbo-pompe, ciment, fer à béton, vanne, robinet et autres matériaux spécialisés.

La valeur estimée des matériaux apportés par le Projet est de

Z. _____

5. Recruter et organiser en collaboration avec le Comité, la main-d'oeuvre spécialisée locale et à rémunérer celle-ci avec les fonds cotisés par les bénéficiaires.
6. Former les réparateurs du système, et les Responsables des bornes fontaines.
7. Vérifier l'adduction, dans les six mois qui suivent la fin des travaux pour s'assurer de son bon fonctionnement et de son entretien par la Communauté.

Fait à _____ le _____

CANEVAS DE CONVENTION D'ENGAGEMENT MUTUEL

POMPE (SANDOA)

Nous, habitants du village _____, Groupement _____
Zone de _____, nous engageons à aménager le puits foré muni de
pompe _____ avec l'assistance du Service Technique de _____
_____ et la Zone de Santé de _____

I. A cet effet, la population s'engage à :

1. Déterminer l'emplacement en collaboration avec le Service Technique.
2. Rassembler la somme de _____ Z pour chaque pompe préalablement au forage, en échange d'un Kit de réparation. Ce montant sera augmenté en fonction du taux d'inflation de la monnaie.
3. Rassembler les matériaux locaux.
 - Sable : _____
 - Gravier: _____

Ou l'équivalent au prix d'achat de Z _____
4. Ouvrir les pistes d'accès et assainir l'emplacement du forage.
5. Fournir la main-d'oeuvre nécessaire pour réaliser le forage et l'installation de la pompe.
6. Désigner un Responsable et un Assistant (dont une femme si possible) pour le bon fonctionnement de la pompe.
7. Veiller à ce que le Responsable de la pompe assiste au forage et à l'installation de la pompe et suive la formation accordée.
8. Assurer la sécurité du Personnel, équipement et matériaux.
9. Assurer un logement au Service Technique.
10. La valeur estimée de la contribution de la population dans la construction est évaluée à Z _____
11. Payer toutes les pièces de réparation, les frais du Réparateur et de transport.

II. Le Service Technique s'engage à:

1. Apporter l'assistance technique pour réaliser le forage sur les sites déterminés en collaboration avec la population.
2. Assister la population pour construire la margelle et installer la pompe.
3. Fournir la pompe et le ciment nécessaire pour l'aménagement.
4. La valeur estimée de l'apport du Service Technique dans la construction est évaluée à:
 - Pompe _____
 - Forage _____
 - Matériaux _____
5. Former les Responsables locaux des pompes.
6. Former un Artisan-Réparateur par aire de réparation définie par la Station.
7. Assurer la disponibilité des pièces de rechange.
8. Rembourser le montant versé pour l'achat du kit de réparation en cas d'échec du forage.
9. Vérifier le point d'eau dans les six mois qui suivent la fin des travaux pour s'assurer de son bon fonctionnement et de son entretien par la Communauté.

Fait à _____ le _____

CANEVAS DE CONVENTION D'ENGAGEMENT MUTUEL POMPE

(KABONGO)

Nous, habitants de la localité de _____, Collectivité de _____ Zone de _____, nous engageons d'assurer la réalisation du forage avec pompe manuelle avec l'assistance de la Station d'Hydraulique Rurale de Kabongo et la Zone de Santé de _____

I. A cet effet, pour chaque pompe, la Communauté s'engage à:

1. Déterminer l'emplacement du site avec l'assistance de la Station,
2. Préparer le site pour recevoir le matériel de forage,
3. Rassembler les matériaux locaux suivants:
 - Sable 1 m3 (à définir en tas à la localité)
 - Briques 50
 - Moellons _____
4. Cotiser Z _____ pour la fourniture de graviers nécessaires et Z _____ pour l'achat d'un Kit d'entretien soit un montant total de Z _____.
Ce montant doit être versé avant l'arrivée de l'équipe de forage,
5. Fournir la main-d'oeuvre nécessaire pour toute la durée de la construction. Les besoins en main-d'oeuvre seront déterminés avec l'assistance de la Station.
6. Désigner un Responsable et un Assistant (dont si possible une femme) pour l'entretien et qui devront assister à toutes les étapes de forage et d'installation de la pompe.
7. Assurer la sécurité du Personnel, matériels et matériaux sur le chantier,
8. Assurer le bon fonctionnement de la pompe en cotisant pour les pièces de rechange, le transport et la prestation du réparateur.
9. Garantir le logement à l'équipe technique.

II. La valeur de l'apport de la population est estimée à Z 45,000,00.

III. Le Service Technique s'engage à:

1. A apporter toute l'assistance technique à la Communauté pour la réalisation du forage au site déterminé,

2. Fournir l'équipement du forage, le ciment nécessaire pour la margelle et la pompe manuelle,
3. Fournir le gravier contre la cotisation préalable,
4. Echanger un Kit d'entretien contre la cotisation préalable,
5. Rembourser les cotisations perçues en cas d'échec du forage,
6. Former les Responsables de pompes pour le bon fonctionnement et l'entretien du système,
7. Vérifier le point d'eau, dans les six mois qui suivent l'installation de la pompe pour s'assurer de son bon fonctionnement et de bon entretien par la Communauté,
8. Assurer la disponibilité des pièces de rechange.

IV. La valeur de l'apport et la Station d'Hydraulique est estimée à:

- Forage	<u>Z 500.000,00</u>
- Pompe	<u>Z 500.000,00</u>
<u>Total</u>	<u>Z 1.000.000,00</u>

Fait à _____ le _____

CANEVAS DE CONVENTION D'ENGAGEMENT MUTUEL

" S O U R C E " (KINZAU MVUTE)

Nous, habitants du village _____, Groupement _____
Collectivité de _____, Zone de _____
nous engageons à aménager la source _____ avec l'assistance du
(Service Technique) _____
_____ et la Zone de Santé de _____.

I. A cet effet, la Communauté s'engage à :

1. Ouvrir la piste d'accès.
2. Nettoyer le site pour l'aménagement.
3. Rassembler les matériaux locaux suivants au site de l'aménagement de la source avant la construction:
 - Sable : _____ tas / seau
 - Moellon : _____ tas
 - Gravier : _____ tas
 - Bois de coffrage : _____
 - Briques ou bloc - : _____
ciment : _____ briques/bloc.
4. Donner une contribution financière de: _____ Z.
5. Assurer le logement de l'équipe technique sur le terrain.
6. Fournir la main-d'oeuvre pour toute la durée des travaux de construction et les outils à usage courant; (les besoins en main-d'oeuvre seront déterminés avec le capteur au début des travaux).
7. Réaliser les travaux de protection de l'ouvrage:
 - Planter le paspalum
 - Creuser le canal de déviation
 - Clôturer l'aire de captage
8. Entretenir la source, ses environs et sa piste d'accès.
 - Tailler le paspalum
 - Curer le canal de déviation et d'écoulement.

9. Désigner un Responsable de la source qui doit suivre toutes les étapes de construction.
10. Assurer la sécurité du Personnel, du matériel et des matériaux au chantier.

II. Le Service Technique s'engage à:

1. Apporter l'assistance technique au village pour l'aménagement de la source.
2. Fournir le matériel nécessaire pour la construction.
3. Fournir les matériaux suivants:
 - Tuyaux
 - Ciment/béton
 - Fer à béton
4. Former les membres du Comité et le Responsable de la source sur toutes les activités de l'entretien.
5. Vérifier, l'aménagement, dans les 6 mois qui suivent la fin de la construction, pour s'assurer de son bon fonctionnement et de son entretien par la Communauté.

III. La valeur de la contribution de la Communauté s'élève à: _____
(Main-d'oeuvre, matériaux locaux, contribution financière).

IV. La valeur de la contribution du Service Technique s'élève à: _____

Fait à: _____ le _____

CANEVAS DE CONVENTION D'ENGAGEMENT MUTUEL

" P O M P E " (KINZAU MVUETE)

Nous, habitants du village _____, Groupement _____
Collectivité de _____, Zone de _____
nous engageons à aménager le puits foré muni de pompe _____
avec l'assistance du Service Technique de _____ et la Zone
de Santé de _____

I. A cet effet, la Communauté s'engage à:

1. Déterminer l'emplacement du forage en collaboration avec le Service Technique.
2. Rassembler la somme de Z. _____ pour chaque pompe en échange d'un KIT de base dans un délai de deux mois. Ce montant sera augmenté en fonction du taux d'inflation de la monnaie.
3. Ouvrir les pistes d'accès et assainir l'emplacement du forage.
4. Fournir la main-d'oeuvre nécessaire pour réaliser le forage:
 - terrassement
 - creuser le bac à boue
 - malaxage du béton
 - construire un abri
 - puits perdu
 - évacuer les sédiments du forage.
5. Assurer la sécurité du Personnel, équipement et matériaux.
6. Désigner un Responsable et un Assistant (dont une femme si possible) pour le bon fonctionnement de la pompe.
7. Payer toutes les pièces de réparation, les frais de réparateur et de son transport.
8. Assainir les abords de la pompe et veiller à son bon fonctionnement.

II. La valeur estimée de la contribution de la population dans la construction est évaluée à Z.: _____.

III. Le Service Technique s'engage à:

1. Apporter l'assistance technique pour réaliser le forage sur le site déterminé en collaboration avec la population.
2. Fournir l'équipement de forage, la margelle et la pompe manuelle.

3. Faire l'analyse de l'eau pour s'assurer de sa potabilité.
4. Fournir un KIT de base en échange de la cotisation.
5. Former les Responsables locaux de pompe.
6. Former le réparateur par aire de réparation définie par la Station.
7. Assurer la disponibilité des pièces de rechange.
8. Vérifier le point d'eau dans les six (6) mois qui suivent la fin des travaux pour s'assurer de son bon fonctionnement et de son entretien par la Communauté.

Fait à: _____ le _____

APPENDIX E

MONITORING FORM AND INSTRUCTIONS

JOURNAL TOPICAL GUIDE

VILLAGE O&M ACTIVITIES LIST

INSTRUCTIONS POUR LE REMPLISSAGE DE LA
FICHE DE SUIVI DE POINTS D'EAU

- * Nous vous demandons de visiter tous les ouvrages hydrauliques dans votre aire de santé au minimum une fois par trimestre.
- * Veuillez remplir la fiche de suivi de points d'eau en suivant les instructions ci-après:

1. Type de points d'eau

- * Source * Adduction
- * Forage avec pompe manuelle
- * Puits à grand diamètre avec ou sans pompe
- * Collecte des eaux de pluie

Indiquez tous les points d'eau visités au village et faites des commentaires sur chacun d'eux.

2. Etat de fonctionnement

Pour noter l'état de fonctionnement du système, veuillez apprécier les points suivants:

- Etats des drains (canal d'écoulement, canal d'évacuation, etc...)
- Fuites (mur de retenue du captage, conduites, réservoir, etc...)
- Etat de l'équipement (robinet, levier de pompe, etc...)
- Problèmes d'érosion.

Dans cette colonne, répondez avec:

- normal, s'il n'y a pas de problème
- anormal, s'il y en a et écrivez-les dans la colonne observations.

3. Etat d'assainissement

Pour noter l'état d'assainissement du système, veuillez apprécier les points suivants:

- Etat d'hygiène au point de puisage
- Propreté des alentours
- Présence des flaques d'eau aux alentours.

Dans cette colonne, répondez avec:

- Propre ou
- Sale - notez les causes dans la colonne des observations.

4. Appréciation des usagers

Demandez aux usagers s'ils boivent l'eau de l'ouvrage et ce qu'ils pensent de sa qualité (coloration, goût, odeur, etc...) et de la quantité disponible.

Dans cette colonne, répondez avec:

- Satisfait
- Non satisfait - Notez les appréciations négatives dans la colonne des observations.

**JOURNAL ON COMMUNITY DEVELOPMENT ACTIVITIES
AND EXECUTION OF RURAL WATER SYSTEMS**

Part One: Topical Guide for each village

- I. Name of Village**
- II. Date of first visit**
- III. Local Committee: method of selecting members; representivity of membership.**
- IV. Written Agreement (Convention): date of delivery; manner of negotiation and approval of agreement; reactions of the population to various sections of the agreement; date of signature of the agreement; social standing/occupation of signatories.**
- V. Contributions: organization of monetary contribution; objective and amount; collection system; delay given for collection; date when funds collected are deposited, and with whom.**
- VI. Labor organization: method used to mobilize/organize labor for construction, for example: Salongo, division of activities by quartier, determination of labor requirements by task, payment by community of local laborers, etc. Observations on the productivity of labor provided by the community.**

Part Two: General Comments and Observations

A. ACTIVITES AU VILLAGE

_ Education Sanitaire

- Inventaire des ressources en eau
- Prise de contact villageoise au sujet des besoins en eau
- Animation de la Communauté
- Création et animation du Comité
- Discussion des options (avec coût de construction, entretien, etc...)
- Elaboration d'une convention définissant les responsabilités mutuelles
- Cotisation
- L'organisation de la Communauté pour la construction
- Désignation des Responsables d'unité du système
- Construction
- Inauguration et certificat de réussite
- Entretien de l'ouvrage
- Suivi de vérification de l'ouvrage et de fonctionnement du Comité
- Suivi régulier

B. FORMATION

_ Formation des Trésoriers

- Formation des Présidents
- Formation des Responsables de l'unité
- Formation des réparateurs

C. AU NIVEAU PROGRAMMATIQUE

_ Développement d'un système logistique de pièces de rechange

- Développement d'un système de réparation
- Evaluation