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EVALUATION OF THE CARE WATER SUPPLY PROGRAM IN KENYA

WASH FIELD REPORT NO. 106

FEBRUARY 1984

Prepared for:
USAID Mission to the Republic of Kenya
Order of Technical Direction No. 157

WATER AND SANITATION FOR HEALTH PROJECT

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February 10, 1984

Ms. Allison B. Herrick
USAID Mission
Nairobi, Kenya

Attention: Chuck Mantione, Health Development Officer

Dear Ms. Herrick:

On behalf of the WASH Project I am pleased to provide you with 10 (ten) copies of a report on the Evaluation of the CARE Water Supply Program in Kenya .

This is the final report by David Donaldson and is based on his trip to Kenya from October 9, 1983, to October 30, 1983.

This assistance is the result of a request by the Mission on March 16, 1983. The work was undertaken by the WASH Project on August 31, 1983, by means of Order of Technical Direction No. 157, authorized by the USAID Office of Health in Washington.

If you have any questions or comments regarding the findings or recommendations contained in this report we will be happy to discuss them.

Sincerely,

David Donaldson

for Dennis B. Warner, Ph.D., P.E.
Director
WASH Project

cc. Mr. Victor W.R. Wehman, Jr., P.E., R.S.
AID WASH Project Manager
S&T/H/WS

DBW:ybw

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EXECUTIVE SUMMARY

In 1968 CARE/Kenya started a program of constructing small scale, low-cost self-help water systems. The program continued on a limited scale until 1976 when USAID/Kenya provided an Operational Grant (OPG) which allowed CARE to greatly expand its water supply effort. In 1978 the OPG was phased out and the activities were continued with the general donor fund. Between 1979 and 1983 over US$900,000 was invested in 68 water supply projects. This report looks at the past achievements and the current projects and problems of CARE/Kenya's water supply program and suggests methods for improving them. (While in the field, a procedures manual for examining the functioning and utilization of the individual water systems was prepared.)

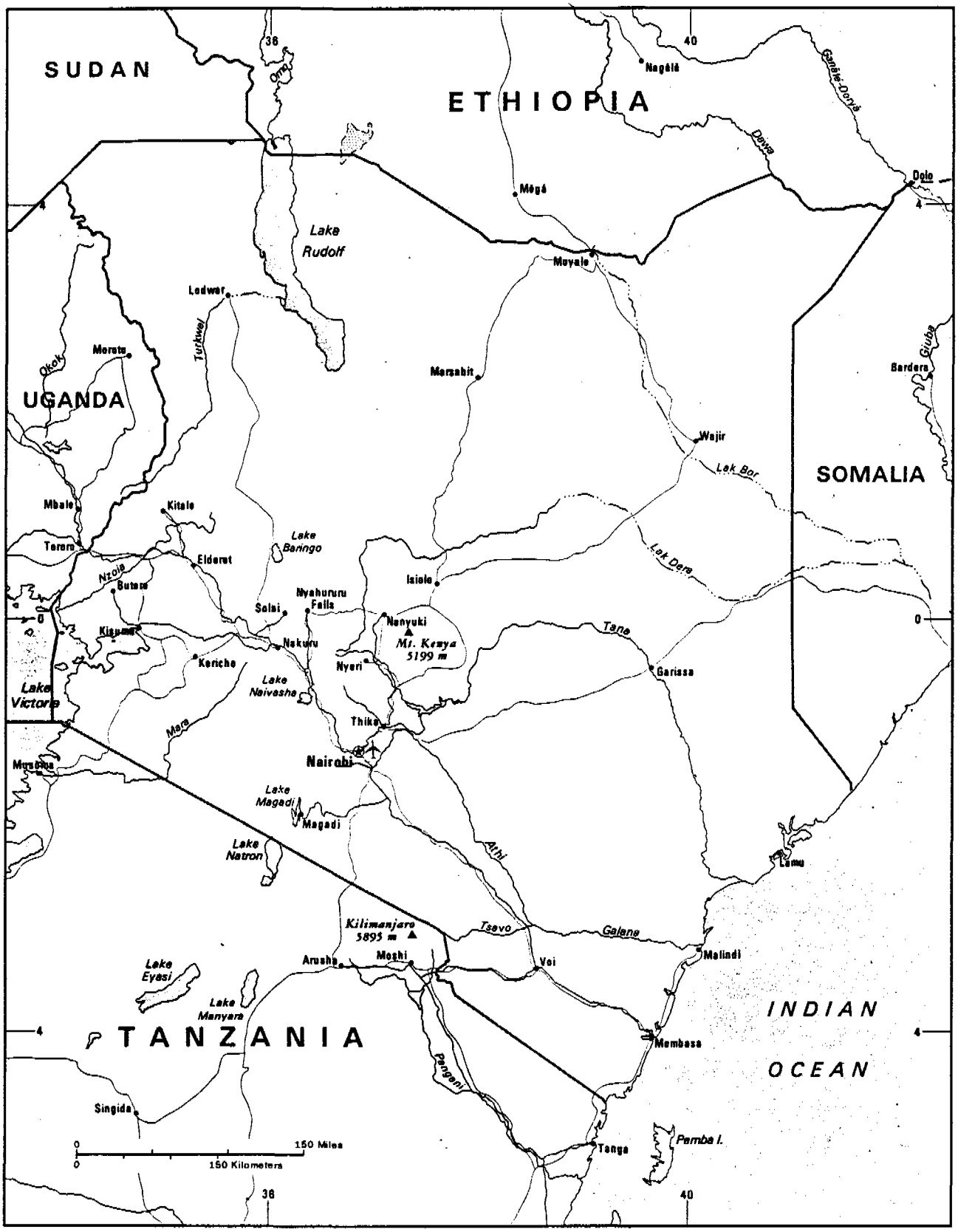
Chapter One presents the scope of work to be completed by the writer. Chapter Two reviews CARE's achievements and policies in the water supply sector with special attention to the changes and shifts in emphasis that are being experienced. Chapter Three examines in more detail the specific policies, strategies, staffing patterns, selection criteria, and guidelines being used by field officers.

To develop Chapter Four the author and CARE/Kenya staff visited six water projects of different types in various places. In addition, numerous reports were reviewed and visits were made to the Ministry of Health and Water Development.

Chapter Five presents the recommended evaluation procedure including the collection and analysis of data on 1) the functioning of the physical facilities, 2) the utilization of these facilities, and 3) the effectiveness of user education efforts.

The last chapter presents 15 recommendations related to designing and executing an evaluation, development goals and indicators, the most appropriate types of projects for CARE assistance, site selection, community based maintenance systems, baseline data collection, working with local water committees, linking water and sanitation, CARE projects as a focal point for Kenya water activities, water sampling and sanitary surveys, CARE's total package approach, community efforts, staff training, and linkages with other NGOs.

Kenya



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Chapter I

REQUESTED WASH ASSISTANCE

1. Background

1.1 CARE/Kenya's Request

In early 1983 CARE/Kenya through the USAID Mission in Kenya requested WASH services for "Technical Assistance." In this request CARE indicated that they had been providing assistance to small scale, low cost self-help water projects in Kenya since 1968 and that they were now in the process of drawing up a multi-year plan for the period of July 1983 through June 1986. To do this, CARE would like to evaluate past projects in order to establish realistic project goals and to develop a practical evaluation methodology for the future.

In their original request CARE asked WASH to assist in the following activities:

1. Design and execute an evaluation of four to five CARE water projects in Kenya over the past two to three years in order to determine what has worked, and why and what are the benefits to the recipient communities.

2. Recommend, based on the above collected data, viable community-based maintenance systems for future projects in Kenya.

3. Review and recommend realistic project goals and indicators for the CARE/Kenya multi-year plan based on data collection process which would be simple and easily managed by field staff.

4. Informally train one or more CARE/Kenya local staff members in evaluation approaches and methodologies during visits to project sites.

As a result of discussions between WASH and CARE/Kenya, the request for assistance was expanded to include activities for improving the delivery and monitoring of their Rural Water Program. Thus, the objectives of the WASH Mission were modified to: 1) provide CARE/Kenya with guidance regarding the types of water projects they should assist and 2) develop a system of ongoing evaluation for CARE/Kenya's Water Program starting in FY 84. The original scope of work was therefore modified and WASH assistance was expanded to include the following seven activities:

1. To design and execute an evaluation of four to five water projects which CARE had assisted over the past two to three years to determine what has worked and why and the impact on the recipient communities.

2. To review and recommend realistic water program goals and indicators for the CARE multi-year plan.

3. To recommend types of water projects for CARE assistance.

4. To develop site selection guidelines for CARE water projects.

5. To recommend viable community-based maintenance systems for the projects.

6. To informally train one or more CARE local staff member(s) in evaluation approaches and methodologies and baseline data collection keeping the collection process simple and manageable by field staff.

7. To prepare a baseline data collection approach to be used for each water project site for both evaluation and program planning.

1.2 WASH's Response

Because of contract renegotiations WASH technical services were delayed. The WASH consultant arrived in Kenya on 9 October 1983 for a three-week period.

Chapter 2

CARE'S WATER SUPPLY ACHIEVEMENTS AND POLICIES

2.1 CARE'S Water Achievements

2.1.1 CARE/International

Between 1967 and 1975 CARE implemented water projects in 28 countries. These included construction of 655 water distribution systems of various types, the digging of 1,548 wells and the distribution of 3,712 pumps. During 1976 the improvement of community water systems was the largest single CARE activity after food and nutrition. In this period most of the assistance was provided to rural communities.

In FY 81 CARE's assistance in water and sanitation accounted for almost 20 percent of the organization's assistance package. In 1981 CARE implemented 26 water projects in 14 countries and renovated 300 systems. In addition, CARE aided in the installation of 118 wells, four sewerage systems, two community water supply/irrigation systems and 505 latrines. Further, CARE assisted in conducting 277 health, sanitation, and hygiene education courses and helped to train 818 technicians in construction, maintenance, or management.

In FY 82, CARE International planned to implement 39 water, sanitation and irrigation projects in 20 countries with an estimated total value of over US$11 million.

2.1.2 CARE/Kenya

Assistance for construction of small scale, low-cost self-help water systems was one of its first efforts when CARE started its operations in Kenya in 1968. At this time water supply was a component of the Community Development Program. These efforts continued on a limited scale until 1976 when an Operational Program Grant (OPG) was obtained from USAID/Kenya. This grant allowed CARE to develop a larger scale water supply program. In 1978 the OPG was phased out and general donor funds were then used to continue the activity. In 1978/79 CARE/Kenya started a Management Advisory Component under which CARE advisors visited selected projects to help the local self-help water committees assess their operation and maintenance problems. In addition, the advisors provided guidance on simple bookkeeping procedures.

Between 1979 and 1983, CARE/Kenya implemented over 68 water projects that had a value of about US$911,000 (see Table 2.1).

TABLE 2.1

CARE Assisted Water Supply Projects in Kenya

Year	No. of Project	Amount of US$
1983	13	180,000
1982	9	156,000
1981	5	75,000
1980	12	240,000
1979	29	260,000

Since its inception in 1968, CARE assistance has evolved from relatively small inputs to quite substantial ones as it became necessary to provide increasing amounts of supplies and/or equipment. In the early stages of the Program a project would typically consist of CARE's providing a tank or a pump or a rising main while the community or the Ministry of Water Development (MOWD) would provide the remaining items. Currently the community is required to have a Water Supply Committee and CARE/Kenya provides only those materials that the community needs to complete a section of the project from the intake to the user (see Section D of supplement for selection criteria).

In addition to a change in the type of project being sponsored there have been changes in the process for selecting CARE/Kenya projects. Up to 1983 CARE/Kenya's projects were selected from a list given them by the Government of Kenya Interministerial Committee (IMC). As in most years, more projects were assigned than could be funded. The Water Program staff visited the projects on the IMC list and, by using the selection criteria mentioned above, selected the projects for that year. The remaining were considered as potential projects for the following years. It is expected that this situation will change substantially as the GOK shifts its resources to the District level in response to the government's policy of "District Focus."

Examining the drinking water situation of Kenya one finds that currently only 10 percent of the rural population has benefited from "improved water supplies" (i.e., those initiated by the Government). Taking into account current population growth rates it is not likely that this figure will increase very much in spite of CARE and MOWD efforts. This means that a large number of people--mainly children and women--will have to continue to carry limited quantities of water of doubtful quality over long distances in order to satisfy basic needs. As one examines the human, technical, and financial resources that are available for providing water to "communities" (i.e., semi-concentrated populations) it is clear that the main problem concerning water in Kenya has been--and will continue to be--not only exploiting the numerous water sources but making them more readily accessible at a cost the user can afford. CARE/Kenya's approach of assisting the community to build low-cost simple self-help water schemes has been focused on one of the country's major problem areas.

2.2 CARE's Water Policies

2.2.1 CARE/International

Section B of the supplement of this report is the CARE/International outline of its rationale for intervention in water supply. This document points out that in recent years there has been a shift in donor rationale from justifying water supply efforts on the basis of a direct health benefit to that of including the following concepts:

- o "That the developmental impact of water supply projects extends far beyond their direct health benefits and that this fact should be reflected in both the financing of such activities and their structure/content."

- o "That the economic benefits inherent in providing large quantities of water at more reliable and accessible points are often...clearly and...highly valued by the communities..."

CARE/International states that the components to be built into particular water supply projects should not be fixed and pre-determined but should depend on the assessment of needs and technical and economic feasibility for the case at hand."

Finally, they indicated that in their opinion the range of final water supply project profiles is very broad and should include linkages to such areas as:

- Agriculture
- Animal and/or artisanal production
- Primary health care
- Excreta disposal
- Health education
- Personal hygiene

2.2.2 CARE/Kenya

In its "Statement of Mission Strategy: Multi-Year Program, Part II (Period of FY 84-86)" CARE/Kenya presents the setting for its program efforts. To do this it reviewed: 1) host government policies and resources; 2) looked at indigenous entities; and 3) examined the activities of other international agencies. The document looked at CARE program strategy as it relates to the country's development needs and to its water supply program's focus and objectives. This review reinforced the concept that the "harambee" (self-help) movement must continue to be the cornerstone for the implementation of projects supported by CARE during the plan period" (i.e. FY 84-86). The document then goes on to describes the five program areas and the ten districts into which CARE will concentrate its efforts and outlines how CARE/Kenya will develop a geographical focus that will allow greater coordination and integration with the Government's district focus for rural development. For example, to do this CARE field officers (FO) will work closely with the Location, Division and District Development Committees (DDC)

in the 10 districts indicated above. In its district-oriented approach CARE plans to try to transfer the lessons learned in the numerous research activities that have been carried on by the various agencies throughout the country. In this effort CARE will give special attention to working with the primary schools, village polytechnics, and women's groups. At the same time, CARE/Kenya will continue to expand its technical expertise, primarily through the employment of Kenyan technicians, in the areas of rural water supplies, agroforestry, building construction, and animal husbandry.

Thus, while CARE/Kenya will continue to assist local water committees to complete small scale, low-cost, self-help schemes for piping adequate quantities of safe water nearer to the user it is clear that there will be many changes in where and how the water supply program will be carried out. These shifts in emphasis are presented in the next chapter.

Chapter 3

COMMENTS ON CARE/KENYA'S WATER PROGRAM

As part of its planning for the period FY 84-86 CARE/Kenya has developed a series of documents to guide its staff. This Chapter will summarize these documents and present comments and recommendations for changes and/or modifications.

3.1 Project Identification Brief

Developed as Annex A to the Mission Strategy Document (FY'84-86), this document (see Section C of the supplement to this report) calls for the elements shown in Table 3.1. It is apparent that for the FY'84/86 water program:

- The District Focus will be a principle theme.
- Pumping systems for gravity fed systems will be deemphasized.
- CARE will continue to work with MOWD but will make greater use of its own staff (or other NGO's etc.) for design and supervision.
- CARE has set as goals in its water program:
    - improved access to water
    - increased water utilization
    - increased productivity for women
    - reduced hygiene-related disease and child morbidity
    - new approaches to water supply such as dug wells and locally made handpumps and windmills
    - increased management efforts with local water committee
    - more attention to project evaluation.

It is apparent from the above that CARE/Kenya is proposing a number of shifts in policy which will have a significant impact on current staffing patterns. Recommendations for modifications are included in the final chapter of this report.

TABLE 3.1

Key Elements Proposed for CARE/Kenya's Rural Water Efforts During (FY 84-86)

Section In Report	Key Elements In Each Section
I. Background	Not applicable
II. Project Background	" "
III. Project Design	
A. Statement of Problem	GOK defines "access" to a water supply as: - High-potential areas - water within 1 km. - Mid-potential areas - water within 2 km. - Low-potential areas - water within 5 km.
B. Project Approach	1. CARE/Kenya will focus assistance on small scale, self-help water supply projects in predetermined districts. In doing so they will coordinate with other water activities Government, NGO's, religious groups, etc. 2. CARE/Kenya will deemphasize the use of high technology inputs (i.e. will favor gravity flow systems over pumping and will look at dug wells, boreholes, handpumps, and windmills). 3. CARE/Kenya will continue to work with the MOWD for project design and to obtain technical supervision during project implementation. 4. CARE/Kenya will continue to work through community based water committees. 5. CARE/Kenya will supply communities with materials and then work with MOWD technicians for project implementation. 6. Emphasis will be on water taps for groups of households with connections to those who can afford them.

C. Final Goals

Improve well-being of 15,000 rural families through improved access to water.

D. Intermediate Goals

1. Improve access to water for 200,000 people.

2. Increase average water consumption by 50 percent and increase water utilization for drinking, cooking, bathing, and agriculture by 50 percent.

3. Increase productivity of 75,000 women users by allowing them 50 percent more time for work in the shambas and women's group activities.

4. Decrease hygiene-related disease by 25 percent and child morbidity by 25 percent among 200,000 users.

E. Project Activities

1. Site Selection: Will use CARE/Kenya technical staff to do survey and design work when MOWD technicians are not available. Will also use other NGO technicans to do this work. Will identify all sites at start of fiscal year.

2. Gathering Baseline Data: Will continue and strengthen this effort. Will obtain health data through Integrated Rural Health/Family Planning Project.

3. Purchase of Materials: All materials will be purchased in Kenya and delivered by the seller. Will seek low maintenance items and new materials such as locally produced windmills and handpumps.

4. Technical Supervision: Will rely on CARE/Kenya technical staff and MOWD technicians.

5. Development of Water Committees: CARE/Kenya will assist only projects that have a water committee. Will continue management efforts to strengthen their responsibilities

(dig trenches, raise funds, provide protection for taps, collect fees, etc.)

6. Evaluation: CARE/Kenya will give more attention to this than in the past.

IV. Financial Plan

	FY 84	85	86
US$	365,500	414,720	473,600

Apart from recommending that CARE Kenya should also include rainwater catchment in its water supply program, it is felt that more attention should be given to developing underground water resources via protected dug wells, sanitary boreholes, and electrically driven pumps. These elements will be covered again in the reports recommendations.

3.2 Selection Criteria For CARE/Kenya Water Projects

The selection criteria to be used by CARE/Kenya for its FY 84/86 projects (see Section E of supplement) have been substantially expanded over those that were used to select past projects (see Section D of supplement).

The major differences between the two are that the FY 84/86 guidelines: 1) stress local participation by calling for harambee, cash contributions, provision of materials, etc., 2) call for the broadest possible user coverage, 3) require that the human resources to finish the project be available locally--a local fund, 4) require that the community be prepared to use the CARE-donated materials once they are delivered, and 5) the community must complete the CARE component within three to nine months of receiving the materials.

These additions have strengthened the concept that CARE Kenya's participation must result in a finished workable self-help water supply project that has MOWD input and is directed towards the poorer segment of Kenya's water sector. In addition, they call for the project to be completed within three to nine months of the delivery of the materials. All these elements are important factors in donor relations.

3.3 Water Guidelines for Field Officers

The CARE/Kenya Project has developed a set of Guidelines for their redeployed FOs. This document was reviewed by the WASH consultant and has been modified to include a series of suggestions to bring them more into line with the Project Identification Brief, the Revised Selection Criteria and the proposed evaluation scheme. In addition, the consultant revised the various forms that the FOs will need to complete as they carry out the project cycle (see Chapter 4, below).

3.4 Water Project Staff

Currently the water staff consists of only one Officer (Peter M. John) stationed at CARE/Kenya Headquarters in Nairobi. Up until recently he was assisted by two water technicians, but these along with three others have now been redeployed as Field Officers and have been given additional supervisory duties in four of the five CARE/Kenya program areas (i.e., primary schools, village polytechnics, women's groups, and water). Thus, it appears that the Water Staff has effectively been reduced at a time when projects are increasing in number and type and there is an increase in the water budget. The need for and duties of any additional water program staff need to be reassessed once the former water technicians have settled into their new roles as FOs. In their new job each will be assigned two or three Districts for which they will become the program coordinator for the four areas mentioned above (agroforestry will have its own representatives). Thus, in the case of the former water technicians they will pass from being specialists to being coordinators/field representatives with multi-area responsibilities.

Whether the new FO's will have the time or, in the case of those who were not water technicians, the knowledge to properly carry out the promotion and design/redesign of systems as well as the supervision of construction and/or operation needs to be watched very closely. At the very least, the new FOs, who now have water added to their portfolios, will need training in water project identification, construction, and follow- up if they are to function effectively.

Thus, it can be seen that the urgency for replacing the reassigned water technicians will depend on such factors as the:

- Types of new projects to be done in FY 84/86. Will solar projects be considered? Will more sanitary surveys be conducted? Will more management advice be given to water committees? Will CARE/Kenya do water and sanitation programs as only water projects?

- Modus-operandi of the water supply program. Will all design changes be done by central office staff or FOs in the field? What will be the role of the central office staff and the DDCs during project identification? What will be the FO's role in project construction and operation?

- Timing, numbers, location, and complexity of the projects accepted. A number of remotely located small pumped systems will require more staff time than the same number of gravity systems located in the same area. A project that has a weak committee will require more staff time than one that is strong.

- The management style of the new FOs. Will FOs try to resolve technical problems in the field or will central office staff be called in on a consulting basis? Are supplies, materials, and pumps to be purchased locally or centrally to obtain better prices and quality control?

While the consultant was unable to determine answers to many of the above questions because of the many changes that the water program is undergoing (i.e., new FOs, loss of staff, district focus, etc.) it does appear that additional water program staff will be necessary if CARE/Kenya is to carry out the approach indicated in its project brief. This report contains recommendations regarding the type of staff that will be needed. The number required will depend on the services needed (i.e. management consultant teams, sanitation, country surveys, etc.), but it is not unreasonable to expect to have to replace at least the two water technicians.

3.5 CARE/Kenya Water Strategies

CARE/Kenya plans on continuing to support small scale self-help water projects, the majority of which will be for piped community supplies. In a departure from the past, it will give priority to projects that are located in pre-determined geographical locations within their ten priority Districts.

In carrying out this new policy CARE/Kenya will coordinate closely with all the other on-going development activities in the District regardless of whether they are being carried out by Government, NGOs, religious groups, or multi-lateral organizations, etc. It is felt that by coordinating CARE/Kenya's activities with those of others, both will benefit.

In addition, it is planned that future efforts will de-emphasize the use of high technology, especially diesel engine driven pumps. In the future, priority will be given whenever possible to gravity flow systems. While hand-dug wells or boreholes with handpumps or windmills should also be considered, the unit cost to the user will continue to make piped systems the preferred solution in all but the driest areas.

In carrying out their water program efforts, CARE/Kenya will continue to work closely with MOWD in the design and construction of projects, whereas, locally-based water committees will continue to be the focal point for action in order to optimize community inputs and resources. The policy of locating water supply points as close as possible to the maximum population concentration will make it possible for individual users to enjoy safe water as close as possible to the point of use.

To ensure proper feedback, CARE/Kenya will conduct systematic evaluations of its water program. For a simple procedure that will require minimal staff inputs to measure system functioning, utilization, and user education impact see Chapter 5, below.

Chapter 4

DESCRIPTION OF AND CONCLUSIONS CONCERNING SITE VISITS

4.1 Description of Site Visits

The following are summaries of the visits that were carried out by the author and CARE/Kenya staff to six projects. Of these, five have been funded by CARE/Kenya and are considered as completed projects and one is under consideration for CARE/Kenya funding. Of the five completed projects, four were found to be operational. At the fifth, the team found that while the source, pump, and storage tank were completed, only one distribution point had been installed. A failure at the source had resulted in the project's being shut down for about a year. Table 4.1 shows the major details regarding the systems visited.

Prior to visiting each site, the team reviewed files and records in the CARE office for background. Thus, in reporting on the sites visited this report will eliminate the usual project descriptions and will examine the component parts of the projects (source, storage tank, distribution mains, and taps) and then look at the systems management and maintenance. The Chapter will close with some general observations.

4.2 Observations From Site Visits

4.2.1 Type of Systems

Of the systems observed, the majority were gravity fed from the source to a storage tank. All had gravity fed distribution systems that carried safe water to public taps with a few private connections. While this concept responds well to the widely spaced houses that are called a "community" in Kenya (see Photo 4.1) it necessarily results in long and expensive transmission and distribution lines. Serving the users from public taps is appropriate as it greatly reduces the distance that water must be carried and brings the unit price down to one the community can afford.

The system design which is done by the MOWD and reviewed by CARE/Kenya Water Staff appears to result in reliable low-cost self-help type systems that carry sufficient quantities of safe water nearer to the user such that there are perceived increases in health, hygiene, nutrition and animal husbandry benefits (approximately five to ten liters per capita per day). CARE/Kenya implements the project approach outlined in its Project Brief (see Section C of supplement) by having its staff do survey and design work when MOWD technicians are not available. While this has been the exception rather than the rule CARE/Kenya will have to consider how this will be done in the future in light of current staff levels and experience. In considering such an approach, maximum use of the other NGOs and Peace Corp Volunteers should be considered.

TABLE 4.1

SUMMARY OF DATA FROM FIELD VISITS

NAME OF SITE	DISTRICT	SOURCE	TYPE OF SYSTEM		SYSTEM DATA		COMMITTEE DATA		COMMUNITY PARTICIPATION	REMARKS
			PUMP	GRAVITY	STORAGE TANK	DISTRIBUTION	NO. OF MEMBERS	EVALUATION		
Matetani	Machakos	Spring	Diesel drive (2) to dist. tank	-	10,000 gal.	Gravity to yard taps (Not installed at time of visit)	-	Poor	Poor	System had been working but due to a simple failure at source had been out of operation for a year.
Endarasha	Nyeri	Stream Capture	-	Gravity to dist. tank	Various	Gravity to yard taps	±15	Excellent	Good (3)	Maintenance by MWD technicians. No. user fees.
Baraniki	Kiambu	Multi-spring capture	Electric to dist. tank	-	2 tanks of + 10,000	Gravity to yard taps	Large	Good	Good	This sytem is very near Nairobi and in a semi-urban area.
Merangine	Nyandarua	Stream capture	-	Gravity to dist. tank	10,000 gal.	Gravity to yard taps	Large	Very Good	Good (4)	Committee was looking to hire an operator to do maintenance.
Ngusuria	Baringo	Stream capture	-	Gravity to dist. tank	10,000 gal.	Gravity to public taps plus a few private taps	+10	Good	Good (5)	Committee had attended 2 week course organized by Water for Health (KWAOH) prior to construction.
Western Nyakach	Kisumu	Cattle pond	Infiltration gallery to well		None	hand pump to be installed	Being organized from women's groups		-	This was a project being considered for CARE financing. It was in preliminary discussion stage.

LEGEND: (1) (2) (3) (4) (5)

Photo 4.1
Typical "Community" To be served
by a self-help water supply.
(Note wide spacing of houses)

Typical community center served by self-help
water supply(Small primary school not shown)

4.2.2 Sources

It was noted that spring and stream capture were the most popular types of source. From the capture works the water was usually transported by gravity in a three-inch or four-inch pipe to a large storage tank (10,000 gallons) (see Photo 4.2).

Of the source capture works observed, all had been constructed using local materials and resources. The community had received varying degrees of technical advice from CARE staff and/or MOWD technicians.

With the exception of one spring capping that had failed, it can be said that the source capture works were appropriate to the skills and materials readily available in the community. The failure of the Matetani spring was due to a break in the dike wall--a repair that could have been made in half a day if the local water committee had not been so disorganized.

4.2.3 Storage Tanks

These tanks seem to be of a more or less standard design (block with a concrete plastering for water proofing) and size (10,000 gallons). The roof is usually a segmented prefabricated one. Construction is usually overseen by a fundi from outside the community (see Photo 4.2).

The design and materials appeared to make good use of the local materials and skills.

4.2.4 Distribution Systems

These systems are usually two-inch to three-inch gravity pipe from a storage tank that also act as a pressure regulating device. Water is distributed to users from public and/or yard taps (see Photo 4.3). Locally manufactured PVC pipe is used where pressure ratings allow. Use of galvanized iron (GI) pipe is limited because of cost, but because of some of the high pressure and rocky ground encountered GI pipe was used in several transmission and/or distribution systems (see Photo 4.3).

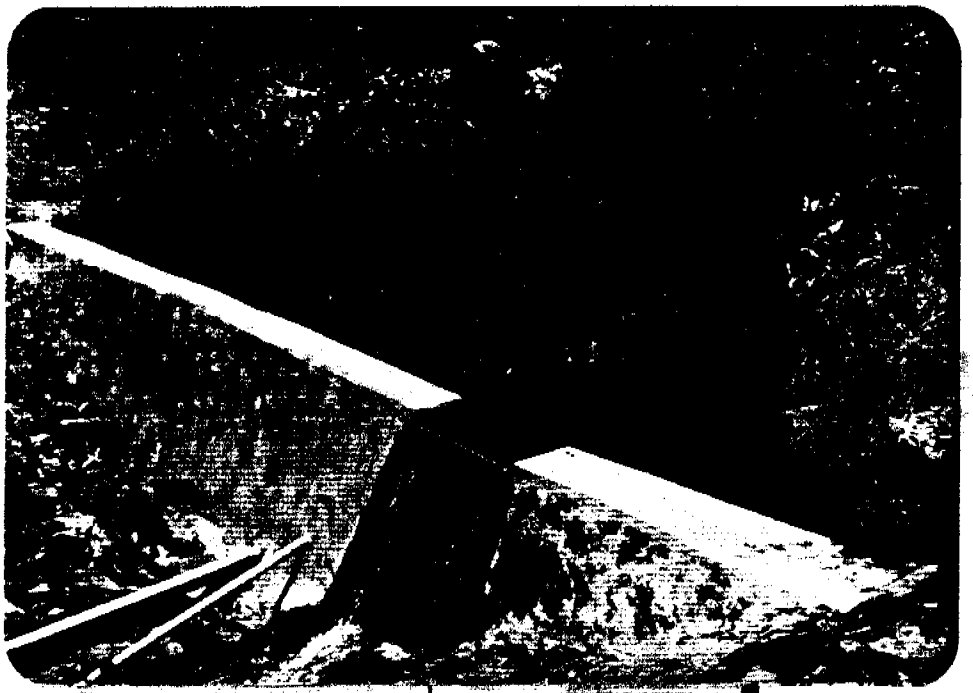
System designs are such that they can be constructed using local labor and materials, while at the same time they can be expanded (if the source is adequate) as the community acquired more funds.

4.2.5 System Management

All of the systems had a large (10 to 15 people) water committee that organized and oversaw the construction of the system by the community.

While the committees functioned well during the first two stages (project identification and construction), they were finding the operation and maintenance stages more difficult.

Photo 4.2



Typical water source for self-help scheme

Transmission main to 10,000 gallon storage tank(below)that also serves as a pressure break

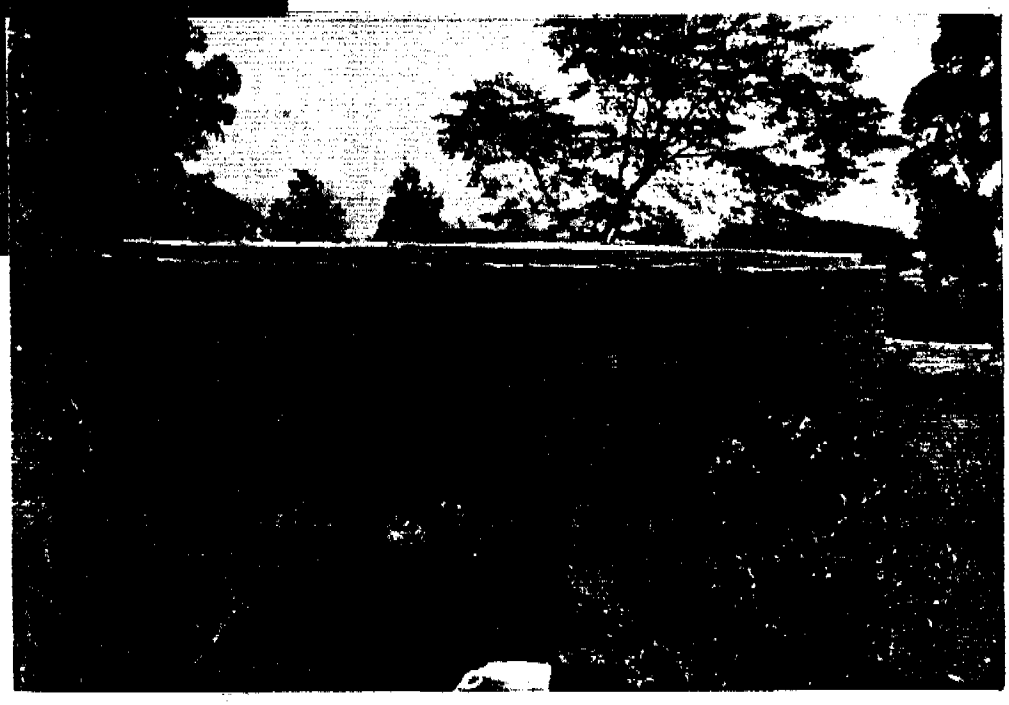
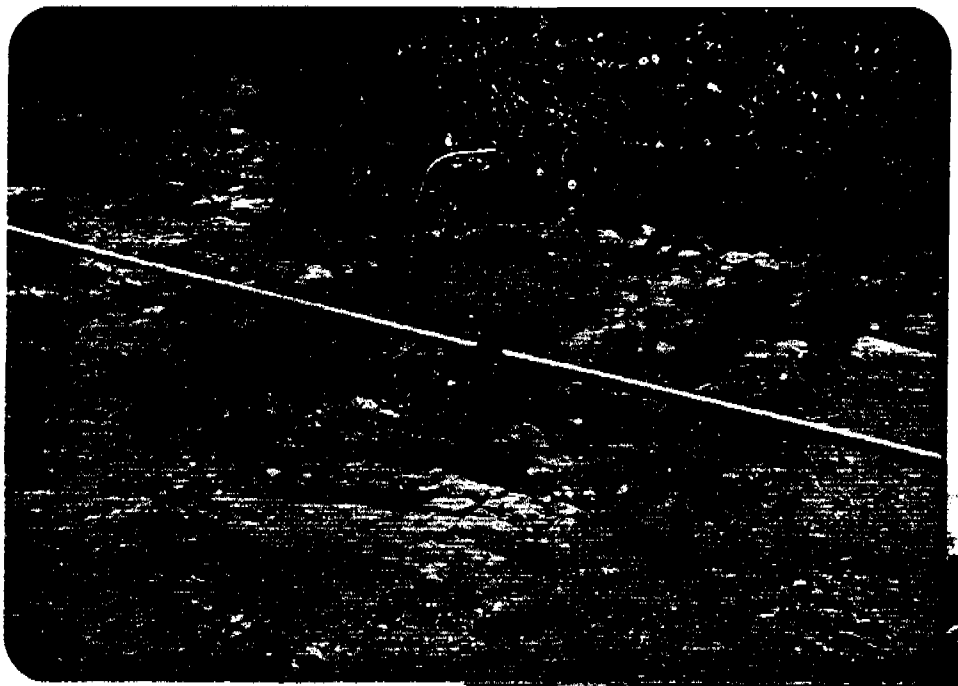


Photo 4.3

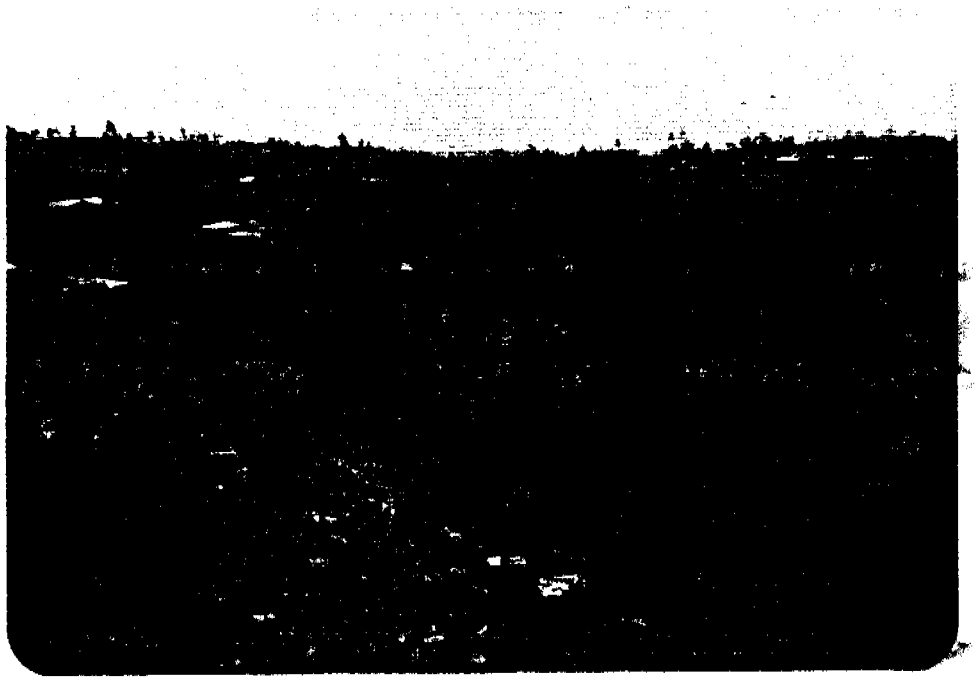


Typical public distribution point(left)and private yard taps(below)

Typical area served by low-cost gravity feed self-help water scheme

Photo 4.4

Members of typical water committee



Area served by above committee (System is multiple spring capture, an electric pump)

Photo 4.5

Cattle pond being expanded by community labor to be cleared as a drinking water source

Typical tools being used by community labor to expand a cattle pond to include storage for drinking water

With one exception, the committees had not received any management training, and on the whole they had only the most meager concept of how to manage the systems they were charged with. The one committee that had attended a two-week course sponsored by Water For Health (KWAHO) said that while they felt the course had been "useful" they had been unable to assimilate many of the ideas because they had not had enough background and/or experience to understand what they were being taught. They felt that after about a year of trying to operate their system they would now be in a much better position to understand what would be said at a similar course. Of all of the areas observed, that of system management was by far the one that needed the greatest assistance.

4.2.6 Community Participation

While in all cases the community responded with cash, materials, and/or labor for the construction of the systems, there seemed to be only limited community participation in the operation of the systems (see Photo 4.3 and 4.4). For example, while the committee members continually stressed their efforts to have the people surrounding a water tap take care of it, it sounded as if in most cases they were not too successful in their efforts. The committees also often referred to their taking turns to fix a break or leaky tap. Thus, it appears that there has not been enough user education to achieve true and effective community participation. While much more could be done by the community, the committees seem to accept willingly that they would have to do much of the work themselves. Much more work needs to be done in this area.

4.2.7 Relations With Agencies and District Assistance

Several committees had proven particularly successful in obtaining outside help and at using the water project as the base for developing other projects. For example, the Ngusuria Committee had succeeded in obtaining funding for different program elements from UNICEF, Freedom From Hunger, CARE/Kenya and MOWD. The water project success had also been instrumental in helping to attract a grinding mill, a goat project, women's group activities and a monthly visit from a mobile health clinic.

Another example is the Endarasha Committee who had obtained funds from the EEC, MOWD and CARE/Kenya. This committee was also observed to be quite effective at obtaining outside assistance. They had two full-time MOWD technicians assisting them in expansion, repairs, and systems operations.

4.3 Conclusions from Visits and Review of Documents

In order to try to determine what has worked, why it worked, and what was the impact on the community, numerous documents/reports (see Refs. 4, 5, 6, 7, and 8, in Section A of supplement to this report) were consulted in addition to the six field visits.

Table 4.2 outlines the process by which the projects that were visited had been selected, but it should be noted that with the start of the "District Focus" and CARE/Kenya's "Priority District Concept" there may be substantial

TABLE 4.2

Care Kenya Water Project Process
Prior to 1983

Step #1: Pre-feasibility and Identification of Project

1.1 Project is identified at local level by the District Development Officer (DDO) and sent to the District Development Council (DDC) for consideration. (The community often brought the project to the DDO for his consideration.)

1.2 DDCs for each District sent approved projects to IMC for consideration.

1.3 IMC assigned a limited number (approximately 30 per year) of projects to CARE/Kenya.

1.4 CARE/Kenya visited projects and accepted those that have a committee, have a design done by MOWD, and have started to mobilize to build the project (about 10 per year).

1.5 CARE/Kenya then identified the project element it would fund. This often was some combination of a pump, a pipeline for a given area, or a storage tank.

Step #2: Construction of System

2.1 CARE/Kenya identified the materials and equipment needed for that element of the project it planned to support.

2.2 CARE/Kenya ordered materials and equipment.

2.3 CARE/Kenya assured that other project elements have been completed.

2.4 CARE/Kenya purchased materials and had them delivered to the site.

2.5 CARE/Kenya visited the site during construction for inspection and technical assistance.

Step #3: System Operation

3.1 CARE/Kenya and MOWD worked with the Committee to operate and maintain the system. This is done through infrequent follow-up visits.

and significant changes in this procedure. While it is too early to tell exactly what the changes will be, several of them are explored in the following sections and a suggested project cycle (see Table 4.3) is presented as the procedure for the future.

4.3.1 General Observations

In general CARE/Kenya has developed a strong water program that has resulted in low unit-cost water projects that provide safe water for semi-concentrated rural populations and some animals from public taps. These are no-frill systems that decrease the distance that water has to be carried, increase the reliability of the householders supply, and have a positive impact on the hygiene and nutrition of both people and their animals.

Per unit costs are in the range of US$10 to US$30 per capita (CARE's unit costs are often much lower because they only assist part of the project). Using a yearly income of US$160 as an average, these costs are equal to about one month's salary for construction which is acceptable for these types of systems. Recurrent costs for gravity feed systems and those with electric pumps are well within the five percent of minimum monthly wages usually used as an indicator, but when diesel pumps are used the communities have serious problems with the high recurrent and repair costs.

4.3.2 Benefit/Cost of Systems Constructed

A series of benefit/cost studies carried out in 1976 found ratios in the order of 1.5:1 to almost 3:1, with one gravity system going as high as 8.3:1 (see Table 4.4). These studies compared capital and recurrent costs versus time savings, health improvement and intangible benefits (i.e., social effects and quality of life). While limited in scope, the 22 studies provide a confirmation of the positive nature of the type of basic services project (i.e., simple capture, storage, and limited distribution to public taps) that is being assisted by CARE in Kenya.

The above mentioned studies clearly demonstrated the impact of the greatly increased recurrent costs that diesel driven pumps have over electric and/or gravity system. (An electric pump is roughly four times more expensive to operate than a gravity system, whereas a diesel pump is between 35 to 40 times more expensive.)

4.3.3 Areas of Weakness in Effort to Date

As one examines the efforts to date, the following areas of weakness become clear:

1. There has been little or no training of water committee members in the management, maintenance, and financial aspects of the system.

2. There has been very little follow-up in these same areas once the project has been made operational. Measures to correct these weaknesses are discussed in the last chapter.

TABLE 4.3

Proposed Project Cycle
for FY 84-86 Water Supply Efforts

Phase I. Project Identification

1. FO works with DDC and DDOs in their Districts to identify potential water supply projects.

2. FO visits potential sites and identifies possible CARE inputs and evaluates managerial capabilities of local water committees.

3. FO discusses potential sites and possible input with CARE Water Staff and MOWD to determine technical, financial, and managerial feasibility of project.

4. FO then suggests to CARE list of fundable projects from list of potential projects provided by DDC and/or DDO. For each FO will submit Form WS/1/83.

   In order to complete this form there must be an MOWD project design. If there is not, CARE must either obtain one from the Ministry or do the design using their own staff or that of other NGOs. In this phase, first priority will be given to projects that have an MOWD design on file and have a strong committee.

5. Once CARE/Kenya agrees to fund the project for that year the FO must then complete WS/2/83 (Water Project Baseline Data). To do this he should consider using school children as much as possible.

Phase II. Project Construction and Committee Development

1. CARE water staff will work with FOs to develop and/or check material and equipment lists.

2. CARE water staff will work with FOs in purchasing and timing of the delivery of materials to the site. Care should be exercised that materials arrive only when the community has been organized to receive and install them.

3. FO will visit the site and meet with the committee often during construction to see that: 1) work is progressing satisfactorily, 2) the "System Operation and Maintenance Person" (SOMP) is being trained; and 3) the management capability of the water committee is progressing as well as the construction. The FO will call in management and/or technical assistance from CARE/Kenya Water Staff and Community Development Technicians (CDTs) as needed.

4. Once the project is built the FO will complete Form WS/3/83 (Site Completion Report Form) and will work with Water Staff to complete WS/4/84 (Water Project Completion Technical Report).

Phase III. Project and Committee Support and Maintenance

1. Once CARE has assisted the community to construct its physical facilities, the FO will need to make periodic visits to monitor the committee's efforts to operate and maintain the present system as well as to finance future expansions and repairs. The FO should arrange for visits by CARE's Water Staff to provide managerial, technical, financial, and user education advice.

2. FO should plan to carry out at least three visits to each project in the year following its completion.

TABLE 4.4

BENEFIT/COST ANALYSIS

NAME OF PROJECT	DISTRICT	TYPE OF PROJECT		CONNECTIONS		POPULATION	PROJECT COSTS		CARE's	COSTS		BENEFIT/COST		REMARKS
		GRAVITY	PUMPED	YARD	PRIVATE	SERVED	TOTAL	UNIT $/PERSON	SHARE	INITIAL	RECURRENT	5%	7%	
Kandana	Kandana	Yes	-	Yes	?	13,000	381,706	29.36	$19,155	Self-help	$6.10pa	2.83	2.33	C=1/2 F=2 I=111 D=1/2-5
Sacho	Baringo	Yes	-	Yes	?	1,000 1 school 1 center	10,929	10.93	4,048	Self-help	$20.00pa	8.26	6.3	D=2/3 F=3 C=1 I=161
Bahati	Nakuru	-	Borehole	Yes	a few	635 2 schools 1 center	21,805	34.34	3,938 (pump)	Self-help	$417pa*	1.78	1.44	D=2/3 F=3 C=1 I=161
Chararo - Mahanga	Kakange	-	Spring (diesel)	Yes	a few	7,700	24,940	3.23	4,390 (pipe & intake)	Self-help	$2,416*	7.49	6.40	D=1/2 F=5 C=? I=?
Kikuu	Kitui	-	Borehole (diesel)	?	?	3,600 1 center	28,317	7.86	16,190 (pipe to)	-	$1,306*	2.94	2.45	D=5/7 F=2 C=1/2 I=11.54
Karas	-	-	Wein (diesel)	?	?	1,500 1 school 1 center	29,457	19.64	11,263	Self-help	$3,533*	1.46	1.2¢	D=2 F=4 C=? I=?
Sammu	Nandi	-	Wein (diesel)			2,436 1 school 1 center	30,032	12.33	6,746	Self-help	$2,330*	1.46	1.2¢	D=2 F=4 C=1 I=263
Ruini	Menu	Yes	-			5,000 2 co-ops	60,000 Phase II	12.00	13,127 (pipe)	Self-help	$4,423 8 emplys. loans	7.19	6.18	D=4/6 F=3 C=1/2 I=$37
Nyabena	Nyanza	Yes (spring)		12	-	600 2 schools	16,717 (Phase II)	27.86	$5,730 (pipe & intake)	? ?	100pa	3.87	2.99	D=? F=3 C I=$100
Nyaga	Kiambu	-	River (diesel)	2	?	7,000 1 center	76,594	10.94	8,563	?	4,55pa	2.74	2.26	D=1 F=5 C=? I=176
Karweti	Kiambu	-	River (diesel)	?	?	3,918 6 schools 2 centers	33,084	8.44	8,225	?	5,500pa	2.47	2.19	D=1 F=8 C=102 I=172

C = Average consumption (gallons/day/person)
D = Distance carry water before project (miles)
F = Number of trips
* = Replacement not included
(Exchange and = 7.109¢

TABLE 4.5

RESULTS OF MANAGEMENT TEAM VISITS
TO CARE ASSISTED WATER PROJECTS (78/79)

		PROBLEMS FOUND					
PROJECT VISITED	DISTRICT	OPERATIONAL STATUS	FINANCES	COMMITTEE FUNCTIONING	RECORDS	FOLLOW-UP REQUIRED	REMARKS
Bibironi (P)	Kiambu	Partially (1)	Poor	Lacks leadership	Poor	Yes	Left financial documents, worked with Treas.
Gitanu	Kiambu	Fully	Poor	lacks leadership	Confused	Yes	Called for better records and new committee.
Kaneveti (P)	Kiambu	Fully (Phase I) Partially (Phase II)	Good	Good	Not available	Yes	Strong well organized & knowledgeable committee
Muthiga	Kiambu	Partial (2)	Good	Weak	Not available	No comment	-
Nginduni	Kiambu	Non-operational	Poor	Poor	Poor	Yes	Left financial documents, worked with Treas.
Central Abothonguehi	Meru	Partial	No Problem	Acceptable	Not available	No comment	DDO auditing the books
Gabumbo (G)	Meru	Fully	Good	Good	Good	No	Gravity feed system
Matinya-Kinungo (G)	Meru	Partially (1)	Good	Good	Good	Yes	Strong well run committee
Marangia (G)	Meru	Not completed	Poor	Poor leadership	Poor	Yes	Committee members illiterate
Muguna-Kivimartume (G)	Meru	Fully (Phase I) Partial (Phase II)	Not observed	Good Strong leadership	Not observed	Yes	Many committee members don't live in the community
Magundu	Meru	Fully (Phase I) Partial (Phase II)	Acceptable	Well organized	Poor	Yes	Committee not available at time of visit
Libarangeki (G)	Meru	Not operational	Good	Excellent	Excellent	Yes	Need to complete 10,000 gal tank
PROJECT VISITED	DISTRICT	OPERATIONAL STATUS	FINANCES	COMMITTEE FUNCTIONING	RECORDS	FOLLOW-UP REQUIRED	REMARKS
Ruini (G)	Meru	Fully (Phase I) Partial (Phase II)	Good	Excellent	Good	Yes	Committee had borrowed 700,000/z from a bank to build the project
Lesieko Kanikee	Nyandi	Fully (Phase I) Partially (Phase II)	Good	Excellent	Excellent	-	Team found this to be a well run project with good books
Ol-Joro-Otoh West CP	"	Fully (Phase I) Partially (Phase II)	Poor	Poor/weak	Incomplete	Yes	Team recommended change in committee and new books
Kaimbaga	"	Fully (Phase I)	Poor	Poor	Good	Yes	Committee members not giving enough time
Migitine (G)	"	Partial	Poor	Poor	Poor	Yes	Needs management assistance
Rongai-Kibui	Nakunu	Fully	-	One person	Poor	Yes	Rich area. Committee depends on one person
Bahati (Pumped-electric)	Nakunu	Non-operational	Poor	-	Poor	Yes	System didn't work because power company could not provide electricity
Ikumbi (P)	Nakunu	Operational	Poor	Very poor	Poor	Yes	Teams recommended new committee and books
Nyamarnithi (P)	Nakunu	Not yet oper.	Good	Good	Good	Yes	-

Legend:

P = pumped system
G = gravity system
(1) Partial operational due to poor management
(2) Partial operational due to system construction

Table 4.5 present an analysis of the 78/79 report of the CARE/Kenya Management team's field visits. Their visits clearly reinforce the need for management assistance and follow-up.

4.3.4 What Has Worked

The following Table shows those areas where CARE/Kenya has been successful.

TABLE 4.6

Areas of Success by CARE/Kenya Water Project

Area of Success	Degree of Success		
	High	Acceptable	Low
Identification of projects	X		
Construction of projects to standards that are in line with local resources		X	
Developing projects that can be operated and maintained locally.		X	
Developing projects that will be utilized by the community		X	
Community Participation			
- In construction	X		
- In system operation			X
- In system maintenance			X

Table 4.6 shows that while CARE has been able to develop mechanisms for identifying projects and for constructing them to standards that can be supported by local human, technical, and financial resources, it still needs to work on improving local operation and maintenance capability, as well as project utilization by the community. Recommendations for improving the last two elements will be presented in the last chapter.

4.3.5 Why Things Worked

In trying to isolate the reasons for the successes noted, one must take note of the dedication of the Water Project Staff. On numerous occasions there was a high degree of concern for and dedication to the task of bringing safe water to communities that had previously had to carry water of questionable quality for six to eight kilometers.

At the same time it was often observed that while CARE assistance was well received and highly valued, its limited nature (i.e., funding of only one or more system element, pump, tank, or a single pipe to a limited area, etc.) often did not result in the desired multiplier effect. Too often, while CARE's efforts helped make the committee aware of the need to provide service to additional areas through additional branches and taps, because of their inexperience in system management, the committee was at a loss as to how to obtain the funds for this work. Due to heavy work loads, limited staff, lack of training and experience in the management area, and the excessive amounts of time required to travel to widely scattered projects, the Water Program staff has not been able to give this element the attention they felt it needed. The CARE/Kenya Management Assistance Team developed in 1978/79 was an aborted attempt to address this need. It should be revived and refocussed as part of a "community awareness effort" that would extend CARE/Kenya's effort to include both the constructon of human as well as physical infrastructure. Then CARE/Kenya could really consider its efforts as a total development package.

4.3.6 The Impact on the Community

In nearly every site visited, both the committee and the users reported at least the following perceived benefits as a result of the water project:

- Distances that water was carried were drastically reduced.
- Personal hygiene was improved because of increased quantities of readily available water.
- Mothers had more time at home resulting in children being better taken care of and better fed.
- Cows produced more milk because they didn't have to go so far for water.

While it was not possible to obtain "hard" data to confirm the community's perceptions, from field observations comparing those areas which had had water program assistance and those that had not been assisted, (whether CARE assisted or not) one could see that the communities' heartfelt observations were reasonably justified. While CARE/Kenya cannot claim full credit for obtaining these benefits as it usually has funded only one project element, it can take credit for being a partner in helping the committee carry out an effort that brought about these perceived benefits.

In addition to assisting in obtaining the perceived benefits for the system users, CARE/Kenya efforts have helped to strengthen the community's confidence in itself. This was seen particularly in the Ngusuria project where, based on their water project experience, the community has gone on to obtain a monthly visit by a mobile MOH health clinic, a corn mill from UNICEF, and a women's goat project from CARE. Thus, in this case, the water effort resulted in the desired multiplier effect. While in many of the other communities the effect was not as pronounced, it was still there in varying degrees.

Chapter 5

PROPOSED EVALUATION PROCEDURE

5.1 General Comments

An evaluation should be considered to be a systematic way of: 1) finding out what has happened; 2) using that experience to improve future planning; and 3) taking corrective actions to improve the functioning, utilization, and/or impact of the existing projects.

To be useful, an evaluation should not just be a listing of problems but, should include recommendations for the following types of actions:

- Those needed to:
  - place non-functioning facilities in operation
  - improve existing facilities
  - improve utilization of facilities
- Complementary activities that need to be started or emphasized,
- Modifications needed in future projects,
- Those needed to ensure that lessons learned are disseminated,

In considering an evaluation it must be realized that the ultimate purpose of a water project should be to improve the health, welfare and economic status of its user (i.e., it must have a positive benefit/cost ratio). These objectives cannot be realized unless the project is fully functioning and is being utilized by the users. Thus, in trying to measure the impact of an intervention one must keep in mind the concepts of functioning and utilization becayse a system that is not functioning has no impact. The same is true of one that is not utilized.

In trying to determine the impact of a water system, evaluations have often sought to determine the improvement in health that has resulted from the presence of the supply. Usually it is assumed that because the supply was there, it was functioning and it was being used. Neither assumption is necessarily valid. In addition, measurement of health benefits is usually a difficult and time consuming procedure. Thus, from a measurement point of view the quantification of the "health" impact over the years has been difficult and generally unsatisfactory. At the same time, when one looks at the benefits from the user's point-of-view they find a number of clearly perceived impacts which are considered highly beneficial and desirable. While it is difficult to quantify these perceptions, one can gain a crude measure of the value that a community places on them by examining the lengths it will go to obtain a system and keep it functioning and by looking at their utilization of the system. After doing so, one cannot help but be impressed by the number of communities who were willing to spend long hours during three to four years to build a water supply and then invest cash, materials, labor, and more time in operating, expanding, and maintaining it. One can only arrive at the subjective conclusions that they perceive that they are receiving a positive result for their efforts.

In discussing the question of impact with the committees and the areas it quickly became apparent that they perceived that the improved water system was of value to them! It also became quickly obvious, that the measurement of the value of this improvement (i.e., impact) was not going to be an easy thing to do. It also became obvious that in trying to measure the impact of CARE/Kenya intervention, things would be even more complicated because of the fact that they only provided partial assistance to any project (i.e., a rising main, a pump, some distribution pipe, etc.).

When asking the user to explain the "impact" they perceive, the answers usually fall in the following categories:

- Convenience - "I don't have to carry water so far," or "the children have more time for school because they don't have to carry water from the spring."

- Increased Quantity Available - "I have more water to give my animals," "My house is cleaner," "I have more water for the family and the garden."

- Family Benefits - "Because I spend less time carrying water and have more time for looking to the children."

- Personal Hygiene - "I am able to wash the clothes and myself more often than when I carried the water eight kilometers from the river"

When comparing the time and effort a community spends on obtaining and operating their water system it is only fair to conclude that they perceive a positive impact for the investments of time, money, and labor. In those cases where the system had broken down and had not been repaired (for example, Matatani) one usually finds that the committee has a management problem that is beyond their limited capabilities (in this case it was a dispute with the Sub-Chief). Once a community is able to break through the initial barrier of obtaining the system and of operating it for a reasonable length of time (two to three years) they usually perceive the impact as beneficial and one they want to continue. When one finds a system that has failed after it has been in operation for a period of time, it is usually found also that the system operators have encountered a series of management problems that are beyond them. (For example, they need a spare part for the pump but don't have the funds and/or don't know where to get it.) Thus, obtaining a beneficial impact from a water system is often more related to good system management (i.e., functioning and utilization) then anything else.

From the above discussion it was concluded that impact evaluation is generally far more complex and expensive than those required for functioning and utilization. In addition, one finds that the translation of disease reduction into economic benefits is a complex, expensive and not very well understood process. In light of the above comments, a number of evaluation systems, documents and procedures were reviewed to find one which was simple and effective and required a minimum of staff. After looking at a number of evaluation procedures it was determined that with a few modifications,

WHO's recently published "Minimum Evaluation Procedure (MEP) for Water Supply and Sanitation Projects" is the most applicable for CARE/Kenya's need and resources.

Use of the MEP will have the further benefit of allowing CARE/Kenya to make comparisons between the projects it is assisting and others using the MEP.

It should be noted that in using the MEP, CARE/Kenya will be evaluating not just its input to the project but also the functioning and utilization of the entire project. While this may bring certain donor-related problems (for example, NORAD would like to know the impact of its contribution which was used to purchase a pump), WASH suggests that CARE/Kenya's position be that its contribution allowed the completion of the system (or a specific line) and, as such, was the key element in providing benefits to the user.

Therefore, in order for the proposed evaluation procedure to be valid there must be a clear CARE/Kenya policy that its contribution must result in a functioning element (i.e., pipeline, etc.) or system that can deliver water to the user. If the contribution is for only a project element, the entire element must be evaluated and CARE credited for its assistance. If the contribution results in a functioning element (C.E.A. storage tank and distribution maintenance area) that element could be evaluated as part of the whole project.

5.2 Comments on Proposed Evaluation System

The documentation for the modified MEP are given in Section G of the supplement. The following sections will provide some comments and suggestions on its adaptation to CARE/ Kenya's projects.

5.2.1 Procedure for Evaluation

Figure 5.1 shows the procedure for conducting the modified MEP. It should be noted that the goal of this evaluation is not a data collection exercise but one to use the data collected to improve system functioning utilization and/or impact. It is a dynamic process which must be carried out on a regular basis!

Of the various steps the Establishment of Terms of Reference (TOR) is one of the most critical. The TORs should define the following elements for the team:

- Study objectives
- Projects to be studied
- Study procedures (Modified MEP)
- Documentation to be used
- Organization and manpower resources needed
- Reporting Schedule
- Time schedule
- Financial requirements

In preparing for the evaluation a careful review of existing data should be done before any field work is started. Table 5.1 shows some of the aspects that should be considered in establishing the focus of the evaluation.

DECIDE TO EVALUATE

SELECT TEAM LEADER

STUDY EVALUATION PROCEDURES

ESTABLISH TERMS OF REFERENCE

CONDUCT A DESK STUDY

VISIT FIELD TO PLAN THE EVALUATION

DECIDE ON FOCUS OF EVALUATION

COLLECT DATA ON RESULTS
(Project and Programme Levels)

ASSESS THE DATA COLLECTED
(Project and Programme Levels)
AND DEVELOP ALTERNATIVE
SOLUTIONS TO PROBLEMS

PREPARE RECOMMENDATIONS AND
ESTABLISH PRIORITIES

REVIEW REPORT

INITIATE FOLLOW-UP ACTIONS

GET NON-FUNCTIONING FACILITIES
INTO OPERATION

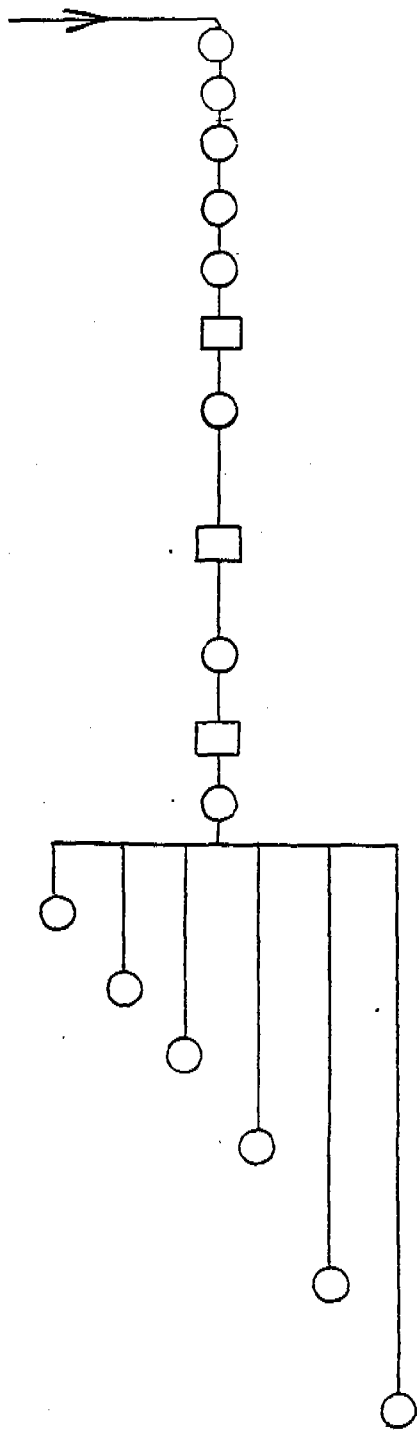
IMPROVE FUNCTIONING OF FACILITIES

IMPROVE UTILIZATION OF FACILITIES

INTRODUCE COMPLEMENTARY
ACTIVITIES FOR BENEFITS TO
MATERIALIZE OR INCREASE

MODIFY PLANNING, DESIGN,
CONSTRUCTION AND/OR OPERATION
AND MAINTENANCE OF FUTURE
PROGRAMMES AND PROJECTS

CONVEY LESSONS LEARNED TO OTHER
AGENCIES AND AREAS



LEGEND : ○ = Action

□ = Critical Review

Figure 5.1 PROCEDURE FOR EVALUATION

FROM: WHO MEP DOCUMENT(ETS/83.1 - CDD/OPR/83.1)
WITH MODIFICATIONS BY WASH

Table 5.1

Aspects to be considered in establishing the focus of the evaluation

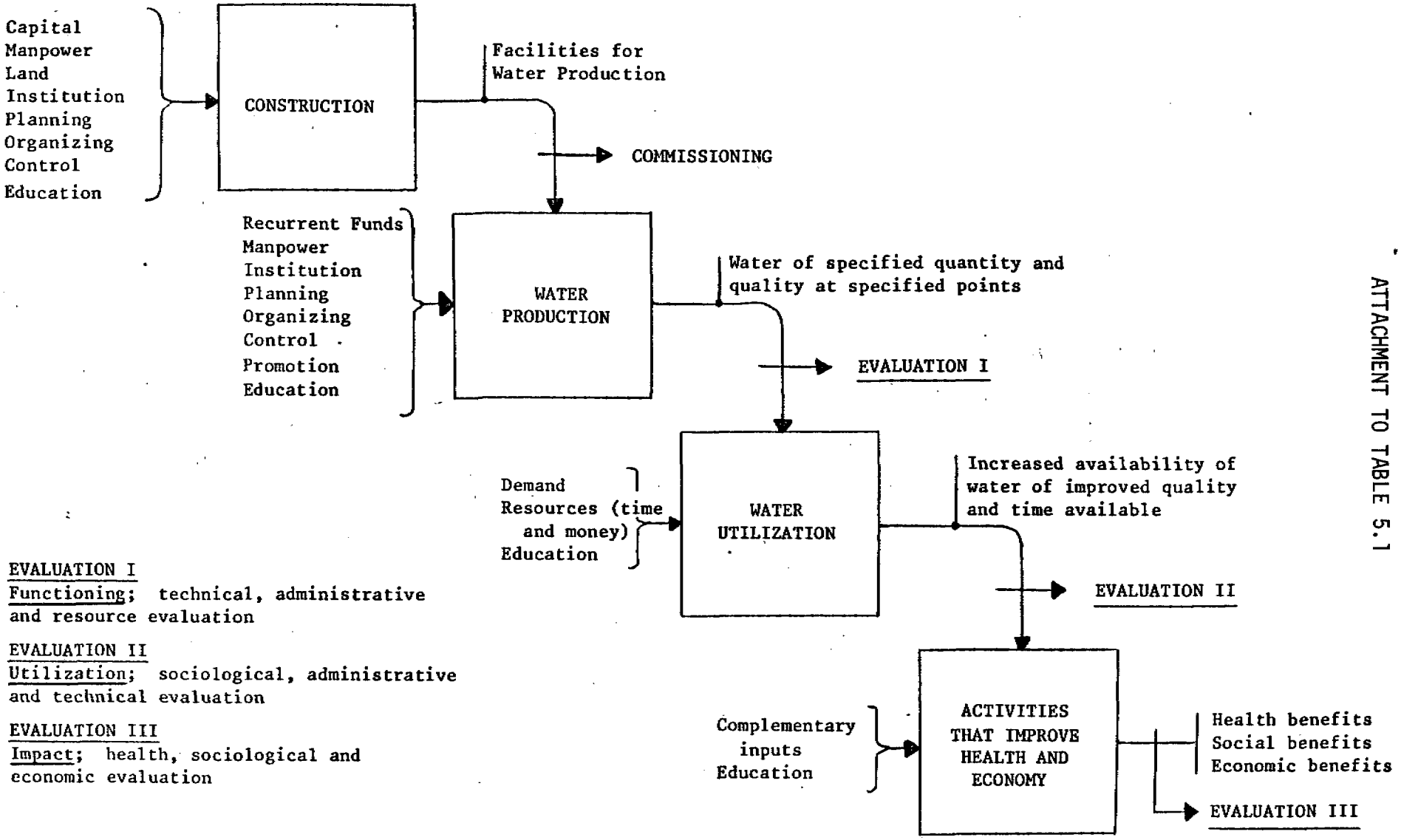
MAIN PURPOSE OF THE EVALUATION	TYPE OF EVALUATION	CRITERIA	REMARKS
To establish actions needed - to get non-functioning facilities into operation - to improve the functioning of facilities	Functioning of facilities (Evaluation I, Figure 2)	At least some of the schemes within the project should have been completed	The focus is on (1) the physical systems and their engineering aspects and (2) institutions responsible for hygiene education. Recommended actions should be checked against the views, attitudes and desires of the community as the malfunctioning could reflect sociological rather than technical problems.
To establish actions needed to increase - coverage* - water and sanitation usage**	Utilization*** of facilities (Evaluation II, Figure 2)	The facilities and the educational services under review need to be functioning fairly well.	The focus is more on sociological and administrative aspects. Recommended actions should be checked against engineering feasibility and capabilities of education institutions as they might affect functioning. Recommended actions should also be checked against potential impact on health and economy of the community to ensure that they will result in positive results.
To establish benefits from water supply and sanitation investments. To establish actions needed to optimize benefits.	Impact of the use of the facilities (Evaluation III, Figure 2)	The facilities and education services under review need to be functioning fairly well, be reliable and utilized by a high proportion of the community	Recommendations made should be checked against engineering feasibility and acceptance by the communities concerned.

* COVERAGE = $\frac{\text{Number of people using the facility.}}{\text{Number of people living in the area the facility.}}$ $\frac{\text{Number of households who have built a latrine}}{\text{Number of households with access to the programme}}$

** USAGE refers to volume of water used per person; proportion of household members and households that use latrines that have been built; proportion of people who understand hygiene education messages.

*** UTILIZATION takes coverage as well as usage into account

FROM: WHO MEP document
ETS/83.1 - CDD/OPR/83.1



EVALUATION I
Functioning; technical, administrative and resource evaluation

EVALUATION II
Utilization; sociological, administrative and technical evaluation

EVALUATION III
Impact; health, sociological and economic evaluation

Figure 2

Evaluation of benefits from water supply investments and intermediate steps

In preparing recommendations one must be painfully aware of their financial cost and must be sure that CARE/Kenya and the community have the resources and the will to carry them out (remember, both must participate if development is to be successful over the long run). It is altogether too easy to make recommendations but realistic, financially viable, and implementable recommendations are more difficult.

5.2.2 Data Collection

A few words of caution are in line for this area. There are three types of data needs:

1. Data on the functioning of the physical facilities;

2. Data on the functioning of the user education services; and

3. Data on the utilization of the physical educational services. As there are somewhat different approaches needed to collect each of these types of data, the evaluator is referred to Section H of the supplement to this report for a discussion of data collection approaches as related to the Modified MEP.

5.2.3 Comments on Forms to be Used

To date CARE/Kenya's efforts have been concentrated on the provision of piped self-help water supplies, but considering that water supply and sanitation should always be considered as a single package the evaluation forms being suggested include a sanitation section. As in the case of the water system, there cannot be any impact if the sanitation system (i.e., latrines, etc.) is not functioning. Therefore, the first step in the evaluation must be to determine if there has been a functioning sanitation program or if the latrines have been installed haphazardly. If the latter is the case, an evaluation will be very difficult.

5.3 Proposed Evaluation Indicators

The second part of Section G of the supplement is a detailed explanation of the different indicators being proposed (six for water and four for sanitation.) For each indicator the document discusses:

- a target
- data required
- assessment of the data
- possible actions

The evaluator should study this material carefully before starting any evaluation work!

In addition to the indicator data the second part of Section G presents the procedures to be followed in the Evaluation of Functioning (Chapter 2) and the

Evaluation of Utilization (Chapter 3). This section also contains comments on the Evaluation of Impact (Chapter 4). It concludes with a series of suggestions for data gathering techniques (Chapter 5).

5.4 Suggestions for Collecting Data

To further assist the evaluator, Section H of the supplement presents a discussion of some of the advantages and disadvantages of the different methods for obtaining household information.

In regard to data collection it should be a goal of the evaluator to involve the community and the user as much as possible. Otherwise the evaluation becomes an outside exercise for which the system user sees very little reason and/or benefit. One way of involving the community in the evaluation process is to use school children of the community to collect the baseline data (see Form WS/2/83 of Section F in the supplement) and to collect the evaluation data (see Proposed Data Collection Format-Part 1 of Section G). This collaboration should be arranged through the headmaster who is often a member of the Water Committee. This use of school children should be viewed as a further linkage between CARE/Kenya's Water Program and its assistance to primary schools and/or village polytechnics.

Chapter 6

CONCLUSIONS AND RECOMMENDATIONS

Recommendation No. 1: Water Program Goals and Indicators

After reviewing the results of the interviews and field visits and studying various documents, it was felt that the above original CARE/Kenya goals (see Section 3.1, Table 3.1) would not adequately reflect the water programs achievements. It was decided to recommend Goals that more nearly reflected the proposed evaluation approaches of system functioning and system utilization. Therefore, the following goals and indicators are recommended:

Goals	Indicators
1. Improve access to safe water for 15,000 people/year.	1. Number of people served (i.e., # within 1 km. of a tap in high potential area, 2 km. in a medium potential area, and within 5 km in a low potential area).
2. Reduce by 50% time spent by women or animals in carrying water.	2. For 10 situations at least five systems divide estimated time spent by women or animals previous to the system by those now served. (See Item 1 for service area.)
3. Increase quantities of water used by 50 percent.	3. For 10 cases in at least five systems divide estimated quantities of water carried prior to the system by these estimated quantities drawn after system installation. (This indicator is valid up to 30 liters/capita/day.)
4. Increase reliability of water source.	4. For 10 cases show that user has had water available for at least 75% of the time through the year.
5. Increase linkages to other CARE/Kenya. program areas.	5. Show that the water program had a linkage to at least one other area for 50% of its projects (i.e., Roof catchment in a school program, water tap at health clinic, etc.)

Goals	Indicators
6. Increase community participation.	6. Show that community participation provided at least ten percent of the funding for construction of each system. (This includes labor, materials and/or equipment.)
7. Increase women's participation in water activities.	7. Show a 15% increase in the number of women serving on water committees within one year of the system entry into operation.

Recommendation No. 2: Types of Water Projects to be Assisted by CARE/Kenya

Because of limited funds available in those communities that will be served by self-help water projects, CARE/Kenya should only be considering those systems which will provide water at a unit cost for the system of about 10 percent of the average annual salary of the area (for example, if annual income is US$170, maximum unit cost is US$17/capita). In addition, because of the usually limited managerial capability of the water committees, CARE/Kenya should avoid systems with high recurrent costs such as diesel pumped systems.

CARE/Kenya should continue to fund simple low-cost water systems. (i.e., capture works, transmission of 10,000 gallon storage tank, limited distribution systems to public and school taps). In so doing they should consider the following:

- Gravity feed opportunities such as upland stream capture, infiltration galleries, or upland springs.
- Spring capping with minor pumping and gravity feed distribution (electric to be given priority over diesel).
- Stream capture or infiltration galleries with minor pumping and gravity feed distribution. (Electric to be given priority over diesel.)
- Protected wells (handpumps on large diameter dug wells over diesel pumping from dug wells).
- While rainwater catchment systems have been considered as an individual rather than a community supply, it should be considered as an element in every CARE school project.

Recommendation No. 3: Site Selection

Because of the changes that will result as the GOK adapts to its "District Focus" and CARE/Kenya adapts to their "Priority District Concept" it will be necessary to modify the proposed "Selection Criteria for CARE/Kenya Water Projects (FY'84/86)" (see Section E of the supplement).

Only Item One of Section E should be modified to reflect the procedures adopted by the individual DDCs. Until new procedures are finalized CARE/Kenya will need to be in close contact with the DDCs of its Priority Districts. The Project Cycle of Table 4.3 should be used as a guide in modifying Item One.

Recommendation No. 4: Viable Community Based Maintenance System

While the types of system being funded by CARE/Kenya are basically simple they must be maintained. Given the realities of the number of systems and the distances involved it is reasonable to expect that the maintenance can be done by a local operator who will have had a minimum of training. In view of the usually poor management skill found within water committees, it is reasonable to expect that there will be little back-up assistance to the local operator from the community and only limited funds available for recurrent costs (spares, fuel, etc.).

In order to have a viable local maintenance system CARE/Kenya will need to revive and expand its former Water Management Assistance Team (WMAT). As a condition of its assistance CARE/Kenya should insist that each committee appoint a "System Operation and Maintenance Person (SOMP)." CARE/Kenya should fund that person to visit a nearby successful project or the District MOWD office for a few days to observe maintenance practices. During each WMAT visit special attention should be given to reviewing maintenance achievements and to providing short in-service training sessions.

To provide in-service training and back-up to the WMATs CARE/Kenya will need to upgrade its maintenance capability by: 1) Expanding its Water Program Staff to include a number of Community Development Technicians (CDT) (see Section J of the supplement for a proposed job description and task analysis); 2) Training FOs in simple maintenance techniques; 3) Develop written maintenance materials to be delivered via the local committee; and/or 4) hold yearly training sessions for the SOMPs of all projects assisted that year. (Section K of the supplement presents some ideas regarding the selecting and evaluation of maintenance training facilities.)

Recommendation No. 5: Baseline Data Collection

For most of the work being done by CARE/Kenya the data collection exercises should be focused on the desired results, and be linked to available staff time and should be simple enough to be managed by persons having only a meager knowledge of formal evaluation procedures and practices.

In addition, the date collection exercise must be seen as having to produce practical and realistic answers to real problems facing program managers. CARE/Kenya does not need to collect masses of "none-to-know" data. Its efforts must provide information that will allow the managers to: 1) Respond to donors concerns (How and where was my money spent) and 2) ensure program goals are being met.

Sections G and H of the supplement provide a simple evaluation procedure (MEP) that fits CARE/Kenya's need and is responsive to its staff limitations. The proposed procedure coupled with Form WS/2/83 (which is attached to "Suggested

Guidelines to Field Officers for CARE/Kenya Assistance to Water Project Assistance" (see Section F) will provide CARE/Kenya with a simple manageable and useable data base for evaluation and program management. The Project Cycle of Table 4.3 provides the framework for implementing the proposed program and evaluation.

Recommendation No. 6: Use of School Children to Collect Data

In view of the need to maximize community participation in the planning, construction and operation of the system, CARE/Kenya should seek every opportunity to find new ways to involve different elements in the community in its water system efforts. At the same time it should seek linkages with other CARE/Kenya Program.

As one often finds the school teacher as a member of the local water community, whenever possible thought should be given to having the school children of the community be the one who collect the baseline data and who would conduct the household survey. Both of these efforts would be done as a school project under the supervision of the teacher and CARE/Kenya water staff.

CARE/Kenya should consider organizing the local school children to collect the Baseline Data required for each project as a school project at the time of system construction. In addition, the school children should be organized to assist in conducting the household survey that should be done at least one year after system completion.

Recommendation No. 7: Goal of CARE Projects Must be Delivery of Water

In view of the need to maximize its limited human and financial resources CARE/Kenya should ensure that its participation (be it a pump, pipe or materials) will be carried out in such a manner as to result in water being delivered to a user in the nearest future possible.

CARE/Kenya should establish the policy that its contribution to any system must be such that it will result in the provision of water to system users within a nine month period.

Recommendation No. 8: Orientation of Local Water Committees

Water systems are often realizing less than their full potential because the committee does not have the know-how for the long-term management and maintenance of the system.

To assist the local committee to strengthen their managerial capability CARE/Kenya should:

1. Establish a policy of requiring visits to nearby successful projects by committee members prior, during and after construction so that they can observe what it is they are about to do.

2. Establish a yearly short course to be conducted by CARE Staff for a limited number of key system committee members to upgrade their skills and give them new knowledge in the management and maintenance areas.

3. Link the above efforts to CARE/Kenya's Village Polytechnic effort.

Recommendation No. 9: Linking Water and Sanitation

To date the program has concentrated on providing water systems. But, maximum health benefit are derived when water and sanitation are developed as a coordinated package.

CARE/Kenya should examine the possiblity of incorporating sanitation measures into the projects it has already helped. This could be done by having the water team work closely with the Primary Health Care expert to develop and use "user" education and "community awareness" materials.

Recommendation No. 10: Focal Point for Kenya Water Activities

There are numerous national and international agencies and institutions working in the water sector (there are 30 registered NGOs) but there does not appear to be any forum in which they can exchange experiences, data and/or information on the successes and failures of their efforts in a less than formal exchange between agencies.

CARE/Kenya should take the lead in organizing an informal "Rural Water" luncheon among the NGOs on a quarterly basis as a mechanism for sharing view/ experiences in an informal mechanism.

Recommendation No. 11: Bacteriological Water Sampling and Sanitary Surveys

In reviewing the procedures used for identifying projects for CARE funding it was noted that no water quality checks were performed. On checking with the Ministry of Health the author was advised that while Kenya was developing its own water standards it was using WHO guidelines.

While most systems obtained their water from known sources and in places where one would expect minimal amount of bacterial contamination, the practice of depending on appearance rather than chemical and bacteriological test is highly risky.

Each system funded by CARE/Kenya should be tested at the time of the prefeasibility study to see that it can be considered safe from a chemical and bacteriological point-of-view and a sanitary survey should be conducted by the CARE/Water staff after one year of operation. At that time the SMOP of Recommendation No. 4 should be trained to conduct such surveys. (See WHO's Surveillance of Drinking Water and Section L of the supplement).

Recommendation No. 12: CARE's Total Package Approach

As one examines CARE/Kenya's effort to date they find that there has been relatively little cross-linkages between various programs. This has resulted in the various programs working in relative isolation from one another and losing many beneficial effects. (For example: if the village school program were closer linked to the water program CARE/Kenya could require each school assisted to have a water tap or a rainwater catchment scheme.)

CARE/Kenya should institute a policy that each project should be designed to include at least one other program area. This policy should be thought of as the first step in the intergration of all programs into a "total package" approach to each community vs. the present independent program approach.

Recommendation No. 13: Community Awareness Effort

In the past CARE/Kenya had developed a Management Assistance Team. For reasons that are unclear, this commendable incentive was allowed to die.

CARE/Kenya should establish a "Project Assistance" Team with the following functions:

- Provide management assistance to water and other committees.
- Provide in-service training to project committees on how to develop the human resources for operating and maintaining their system.
- Serve as a monitoring mechanism to help the committees identify problems and potential needs at the earliest possible time.

This team should be closely linked to the Primary Health Care's User Education efforts as part of a total "community awareness effort."

Recommendation No. 14: Need for Providing Staff Training

A number of changes have been proposed that will result in significant changes in the type, number and location of Water Program staff as well as the type of solutions to be used in future projects.

For example, the Project Identification Brief calls for making greater use of CARE/Kenya staff in project survey and design when MOWD staff is not available (see item 3.1 and Table 3.1). Depending on the extent of this it could mean extensive amount of travel, equipment and staff time. This change would come at a time when the change-over to the "District Priority Concept" CARE's 10 Priority Districts is being implemented and, at the same time, the two Water Technicans of the program have been reassigned as Field Officers with extensive responsibilities outside the water sector. These changes come at a time when water committees need more technical and managerial assistance.

In order to better assist the local committees and the system users, CARE/Kenya should:

1. CARE/Kenya should consider replacing the two water technicians who have been deployed as FOs with Community Development Technicians (see Section J of the supplement for Task analysis and proposed job description).

2. CARE/Kenya should consider funding refresher, updating and new courses of training in hydraulics, management and financing of small water systems for its present staff.

3. CARE/Kenya should consider developing a series of short courses for redeployed MOWD and CARE staff. This effort willh elp them to be knowledgeable in water system design, construction, operation, maintenance and management so that they will be able to advise those serving on the DDCs Special Purpose (Water) Sub-committees.

Recommendation No. 15: Linkages with Other NGOs

It has been reported that there are about 30 NGO working in Kenya. Many of these have a water and/or sanitation program. Among them are CARE African Medical and Research Organization & Water for Health, etc.

In order to prevent duplications of effort, which wastes limited resources, CARE/Kenya should try to build one and/or take advantage of on-going or proposed effort by other NGOs. A good example of such a potential linkage could be the Water for Health Organization's proposal for "Training Women from Rural and Deprived Urban Communities in the Development, Maintenance and Use of Simple Water Supply Systems."

CARE/Kenya should contact the Water for Health Organization and discuss:

- Possible inputs to the above mentioned project
- Possibilities for using the women trained in the program for CARE/Kenya projects.

In addition, CARE/Kenya should seek out similar opportunities where in conjunction with other NGO's, Peace Corps, etc., it would do follow-on projects and/or ones that make use of joint staff efforts.

APPENDIX

Documents that Describe
Rural Water Activities in Kenya

This section summarizes a few of the reports the consultant was able to locate on rural water activity in Kenya. While the list is far from complete, it gives the reader a taste of the rich history of activity by a wide range of agencies and non-governmental organizations.

1. "The Condition of UNICEF - Assisted Demonstration Rural Water Supplies in Kenya," Robert E. Wignot (December 1974).

   This document traces the Ministry of Health (MOH) and UNICEF's rural water efforts between 1960 and 1972. During this period they assisted 561 demonstration schemes that were estimated to serve 664,000 people. UNICEF's contribution consisted of mechanical water pumps and diesel engines to power them, hydrams, handpumps, piping and related materials such as roofing sheets for schools. The program involved the District Health Officer in the following phases: planning, design and equipment, supply, construction, and operation and maintenance. The report describes the result of the author's visit to 62 schemes in 11 districts.

   The author analyzed 197 of the 561 schemes and found the following:

	#	Mech. Pumps	Handpumps	Gravity	Hydrams
Total Units	197	90	55	28	24
Units Not Working	93	35	46	6	6
Units Working	104	55	9	22	18
% Not Working	47%	39%	83%	21%	25%

   The reasons for the failures in the 93 non-working schemes was as follows:

Reason	# of failures	% of total
Failure of source (inadequate yield)	16	17%
Equipment failure (mechanical fault) mainly handpumps	42	45%
Project not started	11	12%
Project under construction	11	12%
Covered by larger WD supply schemes	8	9%
Other (theft of parts, sabotage, etc.)	5	5%
	93	100%

The author categorized the 62 schemes he visited as follows:

<u>Source of Water</u>		
Rivers and streams	21	(34%)
Springs	15	(24%)
Wells and boreholes	23	(37%)
Roof catchments	3	(5%)
<u>Method of Delivery</u>		
Mechanical pump	24	(39%)
Handpump	21	(34%)
Hydram	9	(15%)
Gravity	7	(10%)
Windmill	1	(2%)
<u>Reason Not Working</u>		
Technical problem in design and/or equipment	3	
Source dried up or inadequate	7	
Equipment failure (mechanical pump)	1	
Equipment failure (handpump)	18	
Equipment failure (windmill)	1	
Theft of fittings	1	
Area now serviced by WD	1	

The author found that operation and maintenance problems had been encountered for the following reasons:

- Lack of funds
- Lack of transport
- Lack of standard procedures
- Failure of source
- Inadequate yield
- Lack of interest in water quality

- Inadequate revenue collections
- Distance between schemes
- Low priority for maintenance

The report includes 20 recommendations which cover the areas of community participation, inter-ministerial co-operation, maintenance of schemes, transportation, skilled artisans on MOH payroll, gravity supplies and hydrams priority, protection of sources, MOH developing sanitary engineers, training programs, seminars for DOs and DHOs, and formation of a mobile service unit.

2. "Environmental Health among the Masai of Southern Kenya: The Effects of Water Supply Changes," Roy Shaffer, D. Najai, and P. Kabuleeta.

In this paper the authors made a number of preliminary conclusions: Masai use less than 5 liters of water per person per day. The water is used for cooking maize meal when milk runs short. They appear to have little idea of quality. Health complaints were headache (49%), cough (32%), eye problems (7%), and diarrhea (7%).

3. "Evaluation of Rural Water Supplies in Eastern and Southern Africa," L. Rosenhall and L. Hensen.

Since the mid-1960s Swedish International Development Authority (SIDA) has been assisting the development of water supplies in Africa. While the evaluations in Botswana, Ethiopia, Kenya, and Tanzania were conducted by different agencies at different times using different methodologies SIDA was able to draw some conclusions in the following areas:

Water quality: Providing safe water is not generally a priority; health (i.e., user) education is necessary.

Technology: In Kenya they found that rivers were the most common water sources; consumption was 15/30 liters per person per day at communal water points and 50/70 at individual connections. The maximum walking distance to a communal water point should be 400 meters. PVC pipes are being widely used. More emphasis should be placed on using ground water supplies.

Operation and Maintenance: This has proved to be the weakest element. Lack of trained staff is serious. Spare parts and stores are lacking. Funding for recurrent costs is inadequate (in Kenya it was 2% of the accumulated investment). Revenue recovery is inadequate to meet costs.

Training: Not enough trained personnel are available. No long-range schemes for human resource development have been implemented.

4. "Kenya Rural Water Supply: Programs, Progress, Prospects," Daniel Dworkin (USAID Project Impact Evaluation No. 5, May 1980).

This report is based on a look at 22 communities in five provinces. The author found that the typical Kenyan water system is large and provides water to individual families through private connections. There are three long distribution lines to serve the dispersed populations. Problems in

design, construction, maintenance, funding, and system reliability were identified. It was noted that the government discourages communal facilities. The author stated that while CARE Kenya self-help systems had problems of reliability they usually served the entire community.

The study identified the following needs: Adequate funding for operation of the systems should be ensured, technologies to be used should be selected from the fullest range possible, and the community should be involved in the process of providing the supplies.

The author pointed out that self-help schemes were providing water to about 18% of all those served by rural water systems and that the government was shifting the emphasis from "regular" rural water projects to self-help ones.

In 1975 CARE/Kenya started a self-help program with assistance from the Ministry of Water Development (MWD). This called for 30 projects per year to serve 300,000 people. Actual production has been about 10 projects per year. Of the three CARE/Kenya projects visited only one was providing a reliable source of supply. Two of the systems were seen as poorly designed. One system completed in 1975 (Riuri) was still not in operation.

Reported impacts from the reliable systems were improved health, increased income, increased agricultural production, time saved by women and animals, more leisure, and improved classroom performance by children.

The lessons learned from the survey were:

- There is a shortage of Kenyan engineers.
- Capital costs are high (US$ 80 to 100).
- Most MWD engineers are expatriates.
- Operational and maintenance funding is inadequate.
- In many schemes there is not enough community participation.
- Systems are often very large and complex and serve many thousands of people. This makes operation and maintenance difficult.
- Only 17% of the water was derived from wells.
- The Government of Kenya provides only a quarter of the funds needed to support the installed systems.

5. "Water, Health and the Community in Kibwezi," Ayuka Oendo (African Medical and Research Foundation, April 1983).

This report looks at the collection, transportation, storage, and use of water by the people in Kibwezi and how those factors affect the health of the area. It was found that water was most often collected by the women in 20 liter containers and carried up to four kilometers. For greater amounts and/or distances the men used carts or bicycles.

In the home water was used for drinking, cooking, and washing household utensils. Bathing and laundry took place at the water source.

The report concludes that water pollution was due to the unsanitary state of the sources, indiscriminate use of the sources for bathing, etc., unhygienic handling of water at the sources, unhygienic storage and handling of water in the home, and a lack of knowledge about clean and unclean water and disease.

The report considers three possible interventions for the African Medical and Research Foundation (AMREF): increase the quantity of safe water to reduce human expenditure of energy to collect and transport water (many wells in the area are 15 to 50 feet deep); increase health (user) education on handling and storing water; and mobilize community development efforts.

6. "World Bank Efforts in the Development and Implementation of Low-Cost Sanitation Investment Projects," Technical Assistance Group Mission Reports for 1983.

   From these documents it can be seen that the World Bank's Technical Assistance Group is becoming very active in assisting the MOH and MWD to carry out the following activities:

   - Demonstration rural sanitation projects
   - Western Province rural sanitation projects
   - Sanitation policy paper
   - Collection of data on levels of service in rural areas
   - Future training of MOH cadres in low-cost sanitation
   - Study tours
   - Incorporating low-cost sanitation as an element of the Five-Year Development Plan of the MWD
   - Kisumu on-site sanitation demonstration project
   - Training in organization and management of sewage treatment plants
   - Field testing of low-volume flushing systems
   - Local manufacture of low-cost sanitation units
   - Technical support for women's water and sanitation activities

7. "Peace Corps. Efforts in Water Projects. (1979 Project Plan)," Craig Hafner.

   This document outlines an action plan for placing Peace Corp volunteers in the Department of Community Development in the Ministry of Housing and Social Development. These community development technicians would work closely with, train, and help to motivate the Locational Community Development Assistant (LCDA); serve as the liaison between MWD, MOH, Ministry of Agriculture, Ministry of Works, and CARE/Kenya field officers and DOs' and, serve as technical and resource advisors to village self-help communitees.

Other reports and/or documents that should be referred to in any work on rural water supply in Kenya are:

8. Drawers of Water, by Gilbert White, David Bradley and Anne White (University of Chicago Press, 1972).