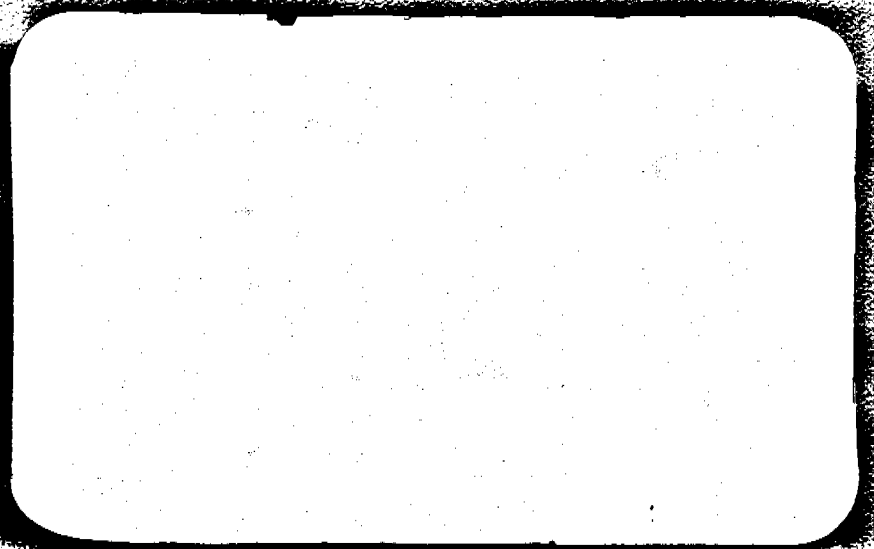


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MINISTRY OF WATER DEVELOPMENT, KENYA
MINISTRY FOR FOREIGN AFFAIRS, FINLAND

KENYA-FINLAND
WESTERN WATER SUPPLY PROGRAMME



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KAKAMEGA, KENYA

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Tel. (070) 814911 ext. 141/142

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PHASE III (1989-1992) REPORT

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ABBREVIATION AND ACRONYMS

DDC	District Development Committee
DFP	District Focus Policy
DHT-Drilling	Down -the-Hole drilling
FINNIDA	Finish International Development Agency
KANU	Kenya African National Union
KEWI	Kenya Water Institute
KFPHCP	Kenya-Finland Primary Health Care Programme
MoCSS	Ministry of Culture and Social services
MoH	Ministry of Health
MoLRRWD	Ministry of Land Reclamation, Regional and Water Development
MoWD	Ministry of Water Development
NGO	Non Governmental Organization
NMWP	National Master Water Plan
NWCPC	National Water Conservation and Pipeline Corporation
O & M	Operation and Maintenance
P.M.O	Provincial Medical Officer
WECO	Western College of Arts and Applied Sciences
W/S	Water Supply
WSDP	Water Supply Development Plan
WTP	Water Treatment Plant
PWE	Provincial Water Engineer
DWE	District Water Engineer

EXECUTIVE SUMMARY

This report covers the third implementation phase of the Kenya-Finland Western Water Supply Programme. The phase started in January 1989 and was completed in December 1992 and the Bridging Over Phase which ended in April, 1993. The programme is jointly funded by the Kenya and Finnish Governments. The Ministry of Water Development of Kenya and the Ministry of Foreign Affairs of Finland through FINNIDA employed KEFINCO to implement the phase.

During the phase the programme activities were decentralized to the districts. The decentralization moved on smoothly and monthly co-ordination meetings chaired by District Water Engineers were started in each district. Some expatriate posts were extended due to lack of experienced staff from MoWD and also some other posts were continued due to recommendation by the mid-term review mission. However the situation improved greatly towards the end of the report period and by the end of phase III, all the counterpart staff from the MoWD had been provided.

The preparation of the Water Supply Development Plan (WSDP) which was originally meant to cover the programme area was changed to cover the district administrative boundaries of Kakamega, Bungoma, and Busia districts. The change increased the plan area and additional information was needed, requiring more time to complete the plan. The plan was completed in September, 1991 and presented to the districts during October and November, 1992. The plan was well received in the districts.

The preparation of a water point register was started in 1991 by first carrying out an inventory of all the water points. The register will be a database containing all the relevant water point information. The register will continuously be updated.

The preparation of the feasibility reports was emphasized during the later part of the phase and 5 reports were completed. In addition the designs of 14 piped schemes were completed.

The field investigation teams sited a total of 492 boreholes and test pumped 440 boreholes. The number of successful boreholes has increased tremendously in the last 2 years due to improved investigation methods and experienced staff.

Field and laboratory operations in water quality testing continued smoothly. Water quality officers at district level were actively involved in water quality monitoring, inspection and consumers' training in importance of proper maintenance of water points and their environment.

Water point construction which included construction of new hand dug wells and spring protection were done from the district bases. Drilling of boreholes for hand pumps and for production wells continued by using two drilling rigs which were supervised from Kakamega. A total of 1108 water points were completed during the phase. A total of 23 new piped water schemes were completed while works on 6 schemes continued at the end of the phase. Approximately 523,000 people were covered with improved water supplies during the report period. This brings the total of 1.17 million people as from the beginning of the programme. Several buildings were constructed or rehabilitated in the districts and at the Provincial water office during the report period. The maintenance of the vehicle fleet continued smoothly while

operation of stores improved greatly due to decentralization and also computerization.

In operation and maintenance, the activities concentrated on hand pump installations, pump repairs, training of locational repairmen, changing of hand pumps, water point inspections and production of manuals. During the phase a new hand pump spare part delivery system was introduced. At the end of the phase, 6 hardware shops had been opened and the results of the pilot programme were encouraging. An inventory of existing piped water supplies was done and data on the mechanical and electrical equipment analyzed. The data was included in the water supply development plan.

In training, emphasis was laid on community training, which progressed well especially in the training of women pump attendants. Staff training was strengthened and many short courses and seminars were attended by members of MoWD and the Programme. Emphasis with staff training was on-the-job training. A number of officers attended courses overseas.

Involvement of the beneficiaries in all aspects of water development including planning, design, implementation, operation, maintenance and management continued. The involvement of the local community has contributed in the acceptance of the water supplies as their own. A total of 2,358 water points were handed over to the community.

During the phase, public meetings were organized where awareness was created concerning siting procedures, contribution in labour and material and maintenance requirements. The beneficiaries provided labour for investigations by use of the hand auger test drilling methods. The outcome was commendable.

1.0 GENERAL

1.1 BACKGROUND OF THE PROGRAMME

The Kenya-Finland Western Water Supply Programme formerly known as the Kenya-Finland Rural Water Supply Project in Western Province of Kenya is a part of technical cooperation between the Government of Kenya and the Government of Finland. The agreement dates back to 1975.

The water project was started in February, 1981, jointly funded by the Kenya and Finnish Governments. The third implementation phase began in January 1989 and ended in December 1992. The Ministry of Water Development of Kenya and the Ministry for Foreign Affairs of Finland through FINNIDA employed KEFINCO, a Finnish joint venture, to carry out the implementation of the programme up to the end of Phase III.

The Programme covers the whole of Busia district, parts of Kakamega and Bungoma districts in Western Province and two divisions from Siaya district in Nyanza Province. The total area covered by the Programme is approximately 5230 Km². The population in the programme area was estimated to be 2 million in 1992.

The economy of the programme area is largely rural and more than 90% of the population earns its living from agriculture and livestock. The income is mainly generated through the sale of farm products although a major part of the products are consumed directly in the farms. The annual per capita GDP in the programme area ranges between KES 1300 and KES 1420 in 1988, which is fairly low compared to the national average of KES 3450.

Before the implementation of the Programme started, only a few per cent (15-20%) of the population was within reach of organized water supplies. These were mainly covered through the water supplies under the Ministry of Water development and County Councils. From the time the Programme was initiated in 1981 to the end of the third phase in 1992, the Programme has constructed 3485 communal water points. In addition to this, the Programme has constructed 23 new schemes and rehabilitated or augmented 11 piped schemes. These water supplies provide safe water for about 1.17 million people. This is about 60 per cent of the total population in the programme area. The total costs of the Programme to the end of the third phase was FIM 246.2 million (approximately KES 1,170 million) while the total cost of the third phase was FIM 123.4 million (approximately KES 771.6 million).

The Programme was reviewed in January - February 1991 by an international mid-term review

team led by Mr. Han Heijnen from the International Reference Centre (IRC), the Netherlands. The findings and recommendations of the team were incorporated into the activities of the Programme during 1991 and 1992.

After Phase III, a bridging phase, starting in January, 1993, and ending in April, was implemented. The main emphases during the phase were:

- the completion of activities which were carried forward from the third phase, handing over of completed projects and project documentation.
- maintaining continuity in activities between the third and fourth phases.
- preparation for starting of fourth phase.

The report for the bridging phase is annexed as Appendix 8.

1.2 OBJECTIVES OF THE PROGRAMME

The overall objective of the Programme was to improve the water supply situation in the programme area in order to achieve improvement in general health and economic development. The more specific objective was to consolidate the existing water supply facilities and to provide 400,000 additional inhabitants with safe, sustainable water supplies. The objective was achieved by:

- updating information on water resources, water supply situation and on the requirements of the beneficiaries was available for the general planning and design of water supplies
- use of cost-effective, locally sustainable technology was maximized to the extent possible
- collapsed and unsuccessful supplies were rehabilitated whenever feasible
- sufficient number of new water supplies were constructed
- involvement of the beneficiary communities and organizations was maximized
- local capabilities and skills to properly construct, use, manage, operate and maintain water supplies was developed.

The major diversion from the third phase objectives were:

- The WSDP which was originally intended to cover only the programme area was changed to cover the district administrative boundaries of Kakamega, Vihiga, Bungoma and Busia districts.
- The number of water points recommended in programme document was reduced in line with the recommendations of the 1991 mid-term review.

- A number of consultant staff stayed longer than was indicated in project document due to non-availability of suitable replacement by Kenyan personnel. The situation improved very much towards the end of the phase.

During the third phase, the following were some of the major achievements:

- a revised water supply development plan was completed
- a water point register was prepared
- decentralization of the Programme's activities to the districts was started and progressed well up to the end of the phase
- hand pump spare part distribution system was started in several hardware and women group shops.
- demand driven approach started being implemented towards the end of phase.
- cost sharing in the water supply development was intensified and a possibility for semi-private and private water supply development was introduced for those developers who covered their share of costs.

2.0 PLANNING AND DESIGN

2.1 WATER SUPPLY DEVELOPMENT PLAN

The WSDP which covers the whole of Western Province was started and completed within the report period. A draft report was presented to the districts and the MoWD Headquarters' personnel during a seminar held in November 1990 at the Golf Hotel in Kakamega. The recommendations from the seminar which were presented to MoWD and FINNIDA were that the final version of the report was to be completed after the draft had been reviewed by the mid-term review mission in February 1991. Towards the end of 1991, the WSDP was presented to all the district authorities where discussions were held on how to integrate the report to the five year District Development Plan.

In the third quarter of 1990, the Provincial Planning Officer, one District Development Officer, two District Social Development Officers and all District Water Engineers from Western Province and three staff members of the Programme participated in a course on how to prepare a district water supply development plan conducted by TNO - Institute of Applied Geoscience, the Netherlands, in cooperation with the WRAP programme in MoWD. The course was held in Kakamega. In May, 1990 two Programme officers had been trained in a similar course by the same institute in Nyeri.

2.2 DESIGN

2.2.1 Design Guidelines

There were thirty guideline drawings available by the end of the report period. The drawings have been prepared for use in the Programme, some of which were MoWD standard drawings slightly modified to suit the needs of the Programme.

Although some drawings are standard in plan, further design and modification is necessary to fit a particular site. A spring protection is an example whereby each spring has its own unique topographical and hydrogeological conditions. In such a situation further design is necessary to suit such conditions.

2.2.2 Design of Piped Water Supplies

During the report period a total of forty eight water supplies were under feasibility and rehabilitation studies and out of these 14 were completed while two more are still in progress. Feasibility statements for five projects were completed and five are yet to be completed. Details on these water supplies are shown in Appendix 2.1.

2.3 WATER POINT INVENTORY

The water point register, an achievement of the report period, is a database containing all relevant information on water points such as the location, water quality, condition of the structure, pump information and community information. It consists of several database files among them springs, hand dug wells and boreholes database.

A water point system programme was developed to help in the analysis of the water points register information namely; input, retrieval and updating of data. The system can produce various kinds of reports such as general, spring yield and hand pump (pump list and depth), water quality, water points conditions, pumps, community participation and error checking reports.



Figure 2.1 Water points inventory exercise using the Global Positioning System (GPS)

2.4 FIELD INVESTIGATION

2.4.1 Introduction

Ground water is abundantly available at reasonable depths in most parts of the programme area. Its quality is generally good and no treatment is required, except simple iron removal in some

also for piped schemes. Surface waters, on the other hand, usually require full chemical treatment before they are acceptable as drinking water. This means high construction and O&M costs for supplies relying on surface water. Difficulties in O&M are also likely to occur.

For the above reasons, the use of ground water was meant to be maximized and surface water resorted to only when the use of ground water was not feasible.

The Field Investigation Section was charged with the responsibility of surveying proposed drilling sites and test pumping of subsequently drilled boreholes, and in addition, regular monitoring of ground water levels and spring discharges in the existing monitoring network.

During the period under review, the section acquired and/or took into use the following equipment:

Seismic refraction	-	ABEM Terraloc MK III
Electromagnetics	-	ABEM WADI
Electrical resistivity	-	ABEM SAS 300B (Borrowed as needed from the Provincial Water Engineer's office).
Test Pumping	-	Atlas Copco Aquatest TPU 2
"	-	Atlas Copco Well Monitoring Unit
Borehole logging	-	OYO Geologger

2.4.2 Geophysics

Shallow refraction seismics was the main method used for investigating sites proposed for boreholes. Also, the electromagnetic method was employed in the search for fractured zones particularly in the crystalline rocks. In addition, the resistivity method was used in areas where it was thought to give a more reliable picture of the subsurface. These were mainly in volcanic formations.

The seismic method works very well if there is a layered subsurface in which the velocities of the layers increase with depth. If this basic requirement is not met then the method may give an erroneous result. This is thought to have contributed to the drilling of many dry holes in this region in the past.

The combination of these methods has substantially improved the success rate in drilling as can be seen in Table 2.1.

Table 2.1 Decreased incidence of dry boreholes

YEAR	TOTAL BOREHOLES DRILLED	DRY BOREHOLES	
		NUMBER	% OF TOTAL
1989	189	19	10.1
1990	122	15	12.3
1991	102	1	0.98
1992	79	3	3.8

Most of the dry boreholes in 1989 (Table 2.1) occurred in the volcanic rocks of southern Busia district while those of 1990 were in the volcanics of northern Bungoma. This mostly occurred when the seismic method was used on its own. The dry borehole drilled in 1991 was re-surveyed and a successful one drilled about 200m away.

2.4.3 Test Pumping

All boreholes drilled by the programme were test pumped. Some of the old boreholes whose data was not readily available but nevertheless were supposed to be rehabilitated were also test pumped.



Figure 2.2 Test pumping at Eregi Teachers' College

The duration of test pumping depended on the yield of the borehole. Low yielding holes generally meant for hand pumps were tested for 6 hours while high yielding holes were tested for 24 hours.

In 1990 step-draw-down tests were introduced to ascertain the optimum yield of each borehole before performing the 24 hour aquifer test unlike in the past when the flushing yield (during drilling) was always used to set the discharge rate during test pumping, usually resulting in a lower recorded yield than the real potential of the borehole.

2.4.4 Ground Water Monitoring

Ground water monitoring continued in the programme area based on a network comprising of 11 observation boreholes, 37 hand dug wells and 32 springs. This network has remained unchanged most likely from phase I but does not adequately cover the programme area in that most of the observation points are concentrated in about six small regions. It was therefore felt necessary to improve this network by including more and better spaced observation points and dropping those which were close to each other or next to streams and springs.

2.5 COMPUTERIZATION

2.5.1 General

Micro-computers were utilized on a large scale. 20 systems were developed in the Programme and others bought to serve data processing. The most demanding and large computer systems developed in the Programme are the Water Supply Development Plan System, the Water Point System and the Water Treatment Plant System.

The number of micro-computers increased from five (5) to twenty two (22). This includes three (3) lap top and nineteen (19) desk top computers. The skills of employees has been upgraded and these computers are in heavy daily use in various applications in most sections.

2.5.2 Development Plan

Present situation and development needs were estimated at sub-location level. Final results are in the report: WATER SUPPLY DEVELOPMENT PLAN 1990 - 2005 IN WESTERN PROVINCE.

2.5.3 Water Point System

Data on 3,400 water points constructed by the Programme has been updated and maintained for various kind of analyses and reports.

2.5.4 Water Treatment Plant System

Technical data on equipment in 91 water treatment plants in the programme area was entered into this system to analyze machinery and to aid maintenance work in these treatment plants.

2.5.5 Word Processing

Word processing using Word Perfect 5.1 is highly utilized in all sections. Harvard graphics is used for graphics in reporting.

2.5.6 Others

In the programme area with 384 sub-locations, computerized data processing has been introduced in various fields from unutilized springs to population forecasts. Control and follow up of money and material has been computerized.

2.6 WATER QUALITY MONITORING

2.6.1 General

Water quality continued to be monitored from the water laboratory at WECO (Western College of Arts and Applied Science) until October, 1990 when the new laboratory in the Ministry of Water Development premises was put into operation.

The water quality monitoring programme had the following objectives which were achieved during the report period:-

- To act as a water quality surveillance programme.
- To be a yard stick in improvement of the water points constructed by the project in relation to traditional sources.
- To provide water quality data for preparation of the water supply development plan.
- To monitor the seasonal and long term chemical and bacteriological quality changes in different sources.
- To determine suitability of various designs of the water points.

2.6.2 Staff

A Ministry of Water Development chemist seconded to the Programme headed the Water Quality Section. There were four laboratory technologists in the laboratory and three others in the district bases (Kakamega, Busia and Bungoma) as District Water Quality Officers. Two laboratory assistants and two sample collectors inspected and sampled water points using motorcycles while two trainees from KEWI were attached to the laboratory for their field work at any one time.

2.6.3 Laboratory Equipment and Apparatus

The Programme equipped the new laboratory with new items as most of the old ones were left to WECO. The new items included:- ion selective electrode pH meter, DR 2000 spectrophotometer, refrigerator, water baths, distiller, deioniser, autoclave, incubators, microscopes, filtration apparatus and glassware. The Programme also provided the necessary chemicals for quality analysis.

2.6.4 Water Quality

The total number of samples analyzed in the laboratory during the report period was 9,843. The number tested for bacteriological quality was 7,337 out of which 4,693 (63.9%) were free from contamination. The water quality data on boreholes, hand dug wells and springs was analyzed and average values on chemical quality parameters obtained. The results showed that springs yielded the best chemical quality water followed by hand dug wells and boreholes while boreholes yielded the best bacteriological quality water followed by hand dug wells and springs.

A summary of bacteriological analyses of water quality in the period under review is presented in Appendix 2.3.

Some ground water in Samia and Sifuyo in Busia and Siaya districts respectively was found to be saline and hard while borehole water samples analyzed for heavy metals at the University of Nairobi showed minimal amounts.

Since most of the three sources (boreholes, hand dug wells and Springs), were found to have water of acceptable chemical standards, more emphasis was put on bacteriological quality except for new wells where physio-chemical tests were included. Continuous routine sampling was reduced in favour of surveillance concentrating on sanitary and structural inspection. A checklist for this work on hand pump wells and springs for use by sample collectors and locational representatives is as shown in Appendix 2.3.

In each location, all water points intended to be handed over to respective beneficiaries were inspected by the section personnel for structural and sanitary deficiencies with the appropriate

corrective measures like resiting, reconstruction or disinfection recommended for poor quality wells. The laboratory also assisted the Kenya–Finland Primary Health Care Programme in the diarrhoea diseases versus the water supply study and analysis of routine water samples submitted by the same Programme for bacteriological quality testing.

Piped schemes were routinely inspected and sampled and advice was given to chemical attendants for effective water treatment where applicable.

The laboratory personnel also participated in educating the water consumers through local seminars, on hygienic ways of handling clean water and preventive maintenance of the sources as well as conducting courses for water supply chemical attendants at WECCO.



Figure 2.3 A Laboratory Technologist analyzing water samples

3.0 PHYSICAL IMPROVEMENTS

3.1 GENERAL

The Project Document for Phase III defines (in addition to general objectives for the whole Programme) a number of specific objectives to be achieved through "Physical Improvements". The primary tasks of this sector were to be "related to increasing the number of people actively using a safe water supply". For reasons of operative management these tasks were organized under the Construction Department as well as most of the tasks of the "Implementation Support". The major part of the needed design work was done by the Planning and Design Department.

Hereunder is a summary of the major objectives and targets as outlined in the Project Document and the respective achievements.

Table 3.1 Objectives, targets and achievements

OBJECTIVE	TARGET	ACHIEVEMENT	NOTES
1. Additional consumers provided with improved water supply through construction and rehabilitation of water supplies.	400 000	523 000	The achievement figure assumes that each point source supply is used by 250 inhabitants. The presented figure excludes the rehabilitation of water points.
2. Construction of point source supplies:			
- springs (pcs)	600	333	The number was reduced following the recommendations of the Mid-Term Review, 1991.
- dug wells (pcs)	500	323	
- boreholes (pcs)	600	446	
Total (pcs)	1 700	1 102	
3. Rehabilitation of point source supplies (pcs).	900	1 960	The achievement figure exceeds the target figure due to the needs of the extensive handing over process and it includes even very minor repairs, re-deepening etc.
4. Construction, rehabilitation and augmentation of piped schemes and treatment plants.	No specific target figure was given (relates to objective No 1). "All schemes of previous phases fully operational by 1990".	33 Not realized in full.	The figure includes water supplies for both Health Centres, MoWD and communities. The O&M Department also carried out rehabilitation and maintenance works at a number of water supplies, which are not included in these figures.
5. Consolidation of existing water supplies ("handing over").	No specific target figure was given.		Handing over of piped schemes and point source supplies was done in close cooperation with other departments and MoWD. A total of 3 479 water points have been constructed since 1981. A total of 33 new or augmented schemes were completed in Phase III (see No 4).
- water points (pcs)		2 358 (68%)	
- piped schemes (pcs)		29 (86%)	

Table 3.1 (Cont.) Objectives, targets and achievements

6. Transfer of skills and knowledge.	No specific target figure was given.	See also objective No 7. Training of supervisors, contractors was arranged. Introduction of new methods in general.	Two expatriate experts were replaced by Kenyans. In general Kenyans were vested with more responsibility in the project organization. e.g. the "result oriented management system" was experimented in the Department with promising results.
7. Use of cost effective locally sustainable technologies	No specific target figure was given.	Sand sieving, block/ring making by woman and self help groups was started.	Revised designs and working methods for water points as well as contracting practices will be published in the Phase IV. Availability of local materials was developed and quality improved
8. Alternative water sources	No specific target figure was given.	Three roof catchment systems and one infiltration well were implemented.	Eregi, Kolanya, Kibabii roof catchment systems. Infiltration well for the proposed Lukolis Gravity Scheme.
9. Implementation support			
- augmentation of store and garage facilities	One	Was implemented as planned.	In addition to this the District (4) and the Provincial Water Offices were rehabilitated and augmented. In Kakamega compound the exit road and the yard area were paved, Water Quality Laboratory was constructed and Provincial Workshop renovated. The concrete foundry was later on dismantled as part of the skills transfer (see objective No 7).
- construction of a new office block	Four	"	
- construction of store and office facilities in Districts		"	
- start-up of steel and concrete product prefabrication		"	
- vehicle maintenance of 3 FINNIDA financed projects	One	Was purchased and handed over to MoWD.	
- dredging unit			
10. District Focus	No specific target figure was given.	Water point activities were decentralized to districts. DWEs were involved in all activities of the Programme.	

In July 1992 the Programme was instructed to reduce the planned activities so as to save funds for the Bridging Over Phase (January - April, 1993). As a result of this the implementation of 12 piped schemes, 4 semi-private (institutional) water supplies and 50 community water points were postponed to later phases of the Programme. Some of the mentioned piped schemes are located in areas of unrest and implementation of them would have anyway been questionable given the present situation.

3.2 CONSTRUCTION DEPARTMENT

The organization of the Construction Department was modified several times during Phase III. This was done to make it serve better the general development stage and the nature of activities and to pave way for sustainability. At the end of 1992 the Department consisted of four sections (Figure 3.1):

- Piped Schemes Section
- Mechanical Section
- Water Point Section
- Material and Transport Section

The last two sections are new as compared with the Project Document. The Water Point Section covers the activities of the Drilling and District Base Sections (see the Project Document). The Material and Transport Section is a new section responsible for material management, monitoring the use and costs of vehicles and providing transport services (transport pool).

The total number of staff in the Department varied according to needs. It was highest (230 persons) in May, 1991, while at the end of 1992 it was only 126 (See Appendix 7.1)

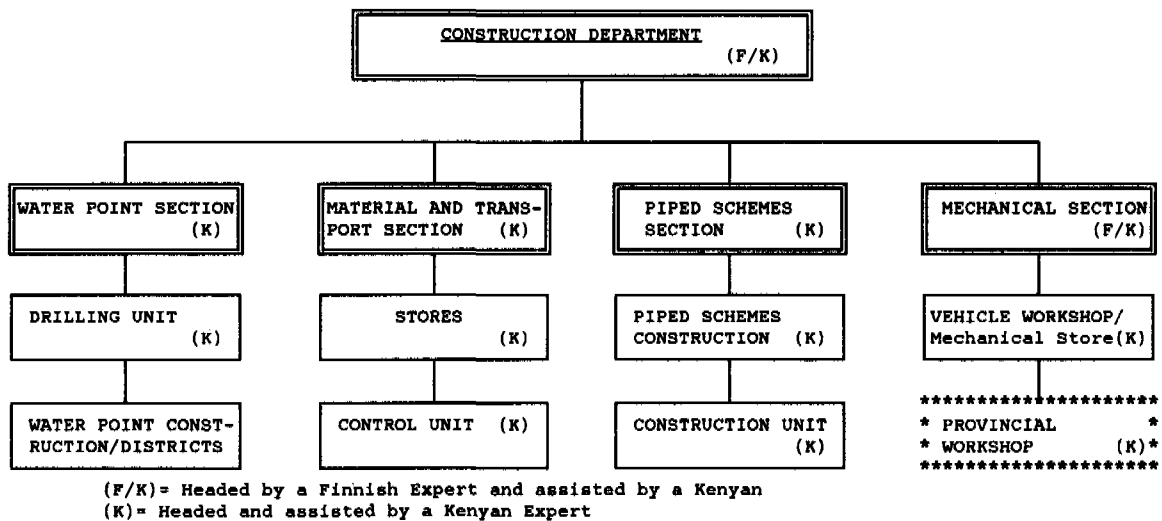


Figure 3.1 Organization chart of the construction department 31.12.1992

Along with the organizational changes the role of Kenyan officers was emphasized. At the end of 1992 the Department was still headed by a Finnish expert but assisted by a Kenyan Officer. In the beginning of Phase III all of the sections were headed by Finnish experts but at the end,

three of them were headed by Kenyans. In the Mechanical Section the Provincial Mechanical Engineer (MoWD) was nominated as the Assistant Head of the section. This is in line with plans to intensify the cooperation between the MoWD Workshop and the Programme Workshop – the ultimate goal being their merging by the end of the next phase.

As part of ensuring sustainability the directly employed Kenyans were encouraged to resign and establish their own independent enterprises. This privatization programme was a success and services such as the concrete foundry, mechanical group and the metal workshop are available on contractual basis to the Programme. These new enterprises have started marketing their services to other customers as well using the Programme as their major reference.

An experiment to adopt the 'Result Oriented Management System' (also known as 'Management by Results') in the Department was commenced by drawing up the key results and respective activity plans for each of the key personnel. The new system was well received and will be extended to cover the whole Programme in the next phase.

3.3 POINT SOURCE SUPPLIES

3.3.1 Construction of Point Source Supplies

The Project Document states a target to construct 1700 new water points during Phase III. This number was, however, later reduced from 425 pieces (Project Document) to 200 pieces per year in 1992. This is in line with the recommendations of the Mid-Term Review Mission (February, 1991) to allow more time for community development. A total of 1102 new water points were completed during the report period. It can be estimated that a total of 275,000 additional consumers were thus provided with an improved water supply. The total progress of implementation since 1981 is shown in Table 3.2 and Figure 3.3.

Construction and rehabilitation of water points continued according to practices, designs and methods established earlier. However, the need to revise and improve them became obvious. This development work was started in 1992 and the results will be published in a form of 'hand book' in the next phase.

The beneficiary communities were involved in all steps starting from site investigations up to handing over inspections. Water points were provided with cattle troughs, wash basins and bath hides wherever the community so wished.

The beneficiaries continued supplying stones and fencing materials for all types of water points. Filter sand for boreholes was purchased from a women group as part of the income generating

activities. Two women groups were also trained in block making. The staff of the former concrete foundry started producing blocks among other concrete products (concrete rings, chamber covers, 'Maji-posts' and well cover slabs) at their own foundry. This material production programme was a success and the quality of e.g. the blocks was found to be excellent.

Table 3.2 Construction of water points 1981-92

DISTRICT	SPRINGS	HAND DUG WELLS	BOREHOLES	TOTAL
Bungoma	196	217	235	648
Busia	229	329	429	987
Kakamega	601	472	475	1548
Siaya	149	165	240	554
Total	1175	1183	1379	3737

The Programme continued using local contractors (artisans) and material suppliers in the construction and rehabilitation of water points. Contracts for water points were awarded by a Water Point Committee in each of the Districts. This Committee consists of the DWE (chairman), KFWWSP Coordinators in the Districts and the Resident Engineer Assistant as members.

The water point contractors are local artisans trained and authorized by the Programme to construct and repair water points for the Programme. Their self-help group, called the United Western Civil Contractors consists of 48 artisans.



Figure 3.2 Sand sieving by a women group

3.3.2 Rehabilitation of Point Source Supplies

Rehabilitation of water points constructed during earlier phases continued mainly in the locations, where new constructions were carried out. Towards the end of the report period repairing efforts were intensified in line with the needs of the extensive handing over programme.

During the report period a total of 1960 water points were rehabilitated (Appendix 3.1). This number also includes all minor repairs eg. re-screeding of the worn-out slab and repairing the fencing of the water point area.

A material recovery programme from abandoned wells and sites was started. It can be estimated that materials worth 100,000/= FIM at least were collected in 1992 alone.

Summary of rehabilitation works carried out during 1981-1992 along with new construction works is shown in Appendix 3.1.

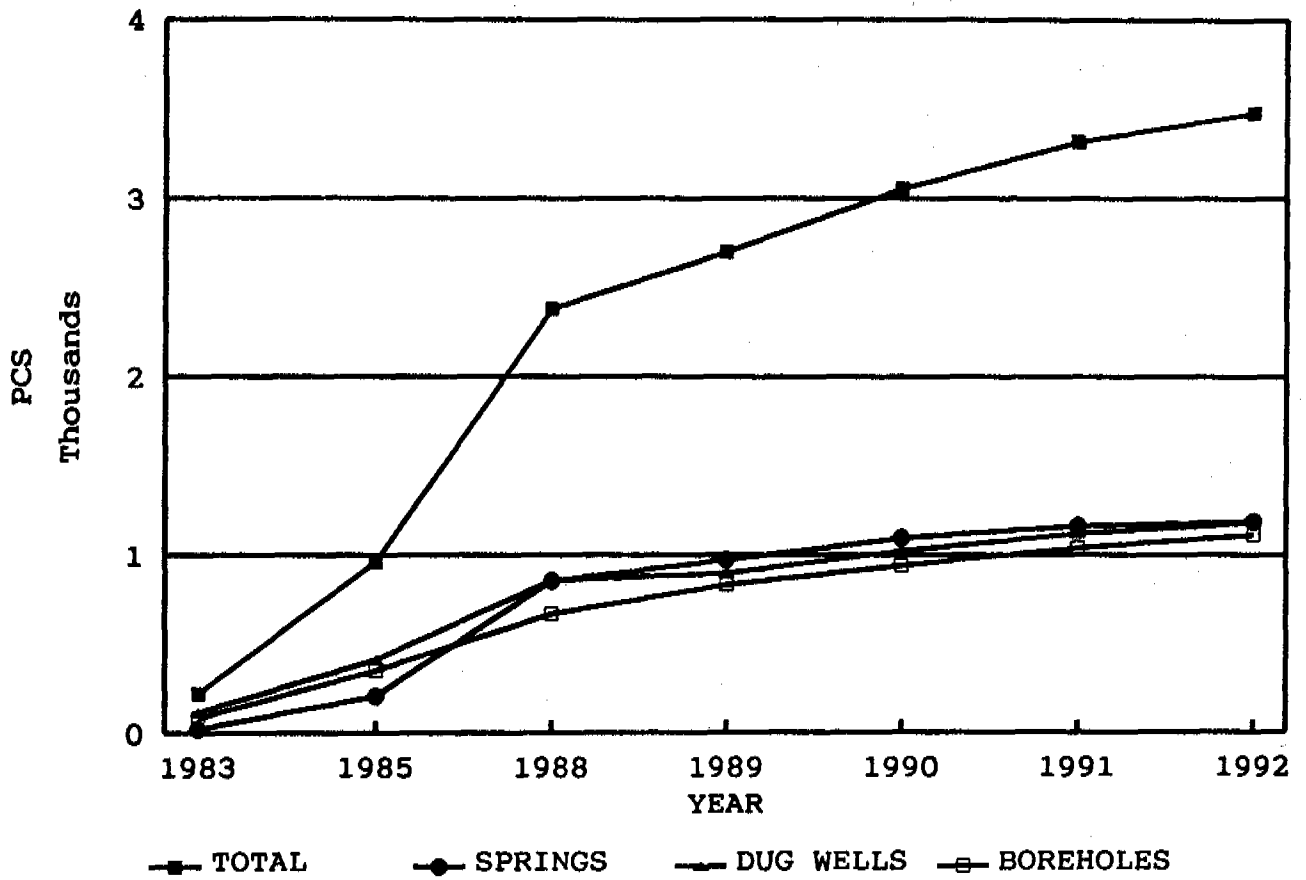


Figure 3.3 Progress of water point construction 1981-92



Figure 3.4 Reconstructed spring

3.4 PIPED SCHEMES

3.4.1 General

The target of the Project Document was to provide an additional 60,000 consumers with improved water supply by constructing, augmenting and rehabilitating piped schemes and treatment plants. This was a success as the water supply coverage improved by an estimated 248,000 people by the end of 1992. The number includes the achievements through the activities of the Construction and O&M Departments.

The construction and rehabilitation works were mainly carried out by using local contractors. Contracts were awarded on competitive bidding basis. The major aspects of the contracts being labour. The Programme itself concentrated on supplying materials and ensuring the quality of works. Wherever possible the consumers (community) were involved in the implementation too. For example, in new piped schemes, the contractor constructed tanks, chambers and the main lines while the community provided land, cleared bushes, trenched and backfilled the delivery lines and fenced the intake area. In some cases the consumers even laid the pipes.

Quality control of contractor works and materials supplied was continued by the supervisory staff of sections and by the concrete laboratory of the Programme. The laboratory is able to test the quality of aggregates, concrete and concrete blocks.



Figure 3.5 Steel pipes (G.I.) on rocky areas

3.4.2 Construction of Piped Schemes

Table 3.3 shows the construction and augmentation of water supplies completed during the report period.

The Programme continued creating water supply facilities for health centres and hospitals constructed or rehabilitated by KFPHCP. In some cases the pumping energy was produced by solar panels. Table 3.4 shows completed water supplies for health centres.

Table 3.3 Construction and augmentation of piped schemes

D I S T R I C T / Water Supply	Estimated additional population served	Notes
K A K A M E G A		
1. Butere Water Supply	6 500	MoWD Scheme.
2. Khwisero Water Supply	3 000	Community Scheme, Covers Khwisero H/C, too.
3. Maturu- Luandeti W/S	4 200	Community Scheme (Gravity).
4. Navakholo Water Supply	12 000	Community Scheme, Covers Navakholo H/C, too. Counterpart funds were made available for this scheme.
B U N G O M A		
1. Kibabii Water Supply	2 000	NWCPCo Scheme.
2. Muchi-Milo Water Supply	2 000	MoWD Scheme, Counterpart funds were made available for this scheme.
3. Kapsakwony Water Supply	2 500	Community Scheme (Gravity).
4. Kutere-Ripsabula W/S	2 000	Community Scheme (Gravity).
B U S I A		
1. Busia Town Boreholes	15 000	MoWD Scheme, Counterpart funds were made available for this scheme.
2. Butula-Muandas W/S	1 000	MoWD Scheme.
3. Funyula Nangina W/S	4 000	MoWD Scheme.
4. Nambale Water Supply	4 700	MoWD Scheme, Covers Nambale Health Centre, too.
5. Matayos Water Supply	1 000	MoWD Scheme, Covers Matayos Health Centre, too.
S I A Y A		
1. Sigomere Water Supply	4 500	Community Scheme.
2. Sira-Nyawita W/S	1 200	Community Scheme.
3. Ugunja Water Supply	5 000	MoWD Scheme.
4. Ukwala Water Supply	3 000	MoWD Scheme.
V I H I G A		
1. Eregi Water Supply	5 000	MoWD Scheme.
2. Hamisi Water Supply	3 500	MoWD Scheme, Covers Hamisi Health Centre, too.
3. Mukumu Water Supply	2 000	NWCPCo Scheme, Covers Mukumu Hospital, too.

Table 3.4 Construction of water supplies for health centres and hospitals

D I S T R I C T / Water Supply	Estimated additional population served	Notes
K A K A M E G A		
1. Ipali Health Centre W/S	350	MoH Scheme.
2. Likuyani H/C W/S	500	MoH Scheme. Solar Panels.
3. St. Mary's Hospital	500	MoH Scheme.
B U N G O M A		
1. Bungoma Hospital	1 000	NWCPCo Scheme.
2. Naitiri H/C Water Supply	500	MoH Scheme.
3. Sirisia H/C Water Supply	450	MoH Scheme.
4. Webuye Hospital	1 000	MoH Scheme.
B U S I A		
1. Khunyangu H/C W/S	500	MoH Scheme. Solar Panels.
2. Mukhobola H/C W/S	500	MoH Scheme.
3. Sio Port H/C W/S	1 500	Community Scheme.

3.4.3 Rehabilitation of Piped Schemes

Within Kakamega W/S (NWCPCo) survey and repair of the distribution network was completed. Three good yielding borehole wells were equipped and connected to the network. It can be estimated, that 20,000 additional consumers are now enjoying the improved water supply services in Kakamega town due to these improvements alone. The repair of some distribution mains within the network of Chesikaki W/S (MoWD, Bungoma) was completed. Through these repairs an estimated 5 000 additional consumers are now enjoying the improved water supply.

Renovation and augmentation of Kabuchai W/S (Bungoma) was completed (estimated 2000 additional consumers). The water supply covers the Kabuchai H/C as well and the system is operated by the community.

Rehabilitation works to be co-financed by counterpart funds were started at Soy W/S (Kakamega), Lugulu-Malanga W/S (Busia) and Chavavo-Mahanga W/S (Vihiga). Local component funds were also utilized in the neighbouring districts of Western Province, the impact of which is not included in the above figures.

3.5 WATER TREATMENT PLANTS

The rehabilitation and augmentation of water treatment plants (WTP) completed or continued during the report period is shown in Table 3.5.

Table 3.5 Rehabilitation and augmentation of water treatment plants

D I S T R I C T / Water Supply	Estimated additional population served	Notes
K A K A M E G A		
1. Kakamega WTP	20 000	NWCPCo Scheme. The treatment plant was augmented and rehabilitated.
2. Mumias WTP	10 000	MoWD Scheme. The treatment plant was rehabilitated and rising main reconstructed.
B U S I A		
1. Busia-Mundika WTP	20 000	MoWD Scheme. The treatment plant was rehabilitated and rising main reconstructed.
V I H I G A		
1. Kaimosi WTP	10 000	MoWD Scheme. The treatment plant and elevated steel tank were rehabilitated and rising main reconstructed. Counterpart funds were made available for this scheme.
2. Maseno WTP	10 000	MoWD Scheme. The treatment plant was partly rehabilitated.

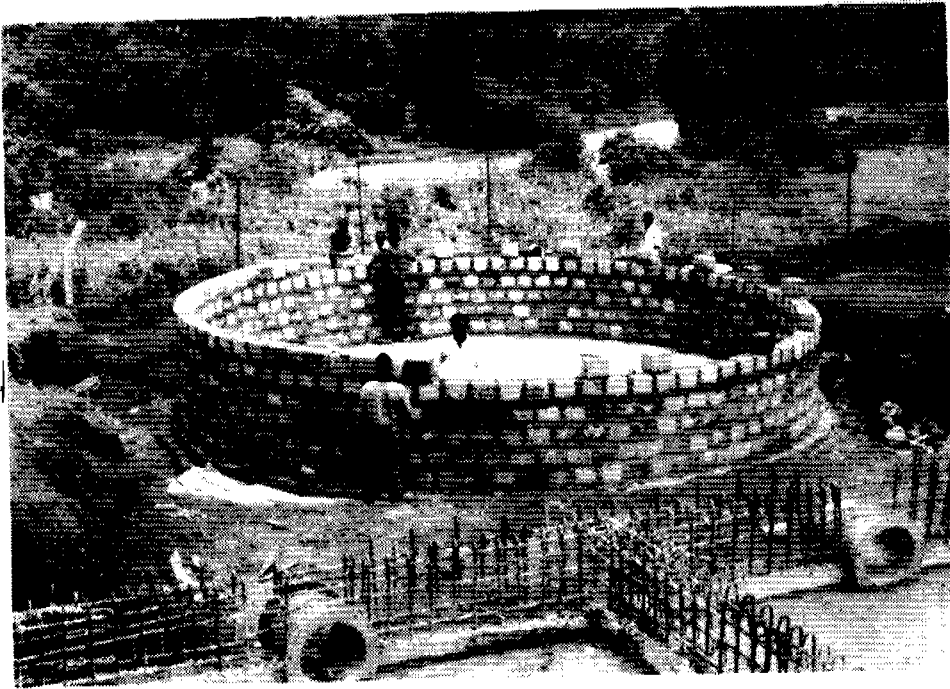


Figure 3.6 Construction of a water tank

3.6 ALTERNATIVE WATER SUPPLIES

Creating alternative water sources for institutions and communities concentrated on rain water harvesting. Three institutional systems were implemented. An experimental infiltration well was constructed for the proposed Lukolis Gravity Scheme.

3.7 BUILDING CONSTRUCTION

3.7.1 District Bases

District bases in each of the districts were constructed. The standard base consists of an office block, storage building and a service garage. The base is located in the MoWD district compound. For Siaya district, the base was constructed as part of Ugunja W/S and will be occupied by the Divisional Water Officer in future.



Figure 3.7 Participants of a meeting at Siaya district base

3.7.2 MOWD District Water Offices

Rehabilitation and augmentation of MoWD District Water Offices in Kakamega, Busia, Bungoma and Siaya Districts were completed. Repairs were also carried out in the MoWD Provincial Water Offices in Kakamega. The District Bases are a part of MoWD district water offices.

3.7.3 Provincial Workshop

Rehabilitation of the MoWD Provincial workshop was completed. The works included renovation and augmentation of buildings and paving of the yard area.

3.7.4 KFWWSP Office Block

The drawing office was completely reconstructed. Normal maintenance works were regularly carried out in the Programme offices.

The road leading to the Programme offices was paved.

3.7.5 Reinforced concrete Elevated Tank

An experimental reinforced concrete tank was constructed within the Programme compound in Kakamega. It is expected that this would form a standard design for future needs. The volume of the tank is 50 m³ and the space under it is used as an office. The offices house the National Water Conservation and Pipeline Corporation/Kakamega Scheme.

3.8 WORKSHOPS, MATERIAL MANAGEMENT AND TRANSPORT

3.8.1 Workshops

The central workshop in Kakamega continued to provide efficient maintenance services for the three FINNIDA financed programmes:

- * Kenya-Finland Western Water Supply Programme and Kenya-Finland Primary Health Care Programme operating from Kakamega and
- * Kenya-Finland Livestock Development Programme (KFLDP), which started operating from Kisumu in 1991.



Figure 3.8 Vehicle servicing at the Central Workshop

The average number of vehicles regularly serviced at the workshop was 170 at the end of the report period. Besides this the maintenance of Programme equipment such as compressors and de-watering pumps was continued. The workshop also continued repairing and overhauling pumps and equipment for a number of water treatment plants in the programme area.

Service garages in Bungoma and Busia continued providing small scale maintenance services for vehicles and equipment.

Development of the activities of the Provincial workshop was continued in close co-operation with the O&M Department and MoWD.

3.8.2 Material Management

The Programme has four central stores in Kakamega namely:

- Construction Store
- Pipe Store
- Drilling Store and
- Mechanical Store

A small store is facilitating the activities in Bungoma, Busia and Siaya Districts serving mainly the water point construction and installation and maintenance of hand pumps.

The computerized monitoring of deliveries, stored items and issues of materials was developed. The system now facilitates the proper control of material usage and provides cost reports of individual jobs.

The practice of annual stock taking was continued. The value of the stores was 7.0 MFIM at the end of the report period. The value of stores is reasonable considering that (imported) materials for water supplies, which were postponed due to saving funds for the Bridging Over Phase (see 3.1 General), had already been purchased. The list of equipment and plant is presented in Appendix 3.5.

3.8.3 Transport and Vehicle Control

The purchase value of the registered vehicle fleet is estimated roughly at 10 MFIM, while the real value could be 5 MFIM. At the end of the report period the fleet consisted of 125 vehicles including drilling rigs and trailers. The motor vehicle list is presented in Appendix 3.4.

A transport pool was established in June 1991 to facilitate a more effective utilization of

especially the heavy vehicles. A Kenyan Transport Officer was nominated to coordinate the activities. Services of the pool were made available for all departments of the Programme and for MoWD and KFPHCP.

Controlling the use and monitoring the costs of vehicles continued intensively. The tachographs, which were installed in every car and lorry, proved to be a very effective tool. It can be estimated that the annual covered mileage reduced by an average of 500,000 Km. The reports show that the operational costs of the vehicles remained at a very reasonable level throughout the whole period. The summary of costs for Programme vehicles in 1989-1992 and 1992 are presented in Appendices 3.2 and 3.3.

3.9 DREDGING UNIT

A dredging unit was purchased and operators trained as planned. After doing some work in the programme area it was handed over to MoWD for operation and maintenance.

4.0 OPERATION AND MAINTENANCE

4.1 GENERAL

4.1.1 Objectives

The objectives for O&M department described in the project document for phase III are as follows;

The development of local capability and O&M procedures/systems to adequately maintain and repair the water supply systems in each district. This involves the development of systems, active involvement and participation of local communities, suppliers and specialist training of selected individuals to carry out appropriate regular preventive maintenance and repair activities as necessary.

4.1.2 Achievements

There was need to make minor changes to the original project document to achieve reliable village level O&M and management system caused by changes of the hand pumps which did not fulfil the VLOM concept. Also hand pump installations were carried out by O&M Department from 1991.

Operators, caretakers, pump attendants and repairers were trained, following the construction or rehabilitation schedule. Operators and locational repairmen were trained by O&M Department while caretakers and pump attendants were trained by the Community and Training Department.

Establishment of appropriate O&M procedures for each type of community water supply was done. The operation and maintenance procedures are not properly recorded. The accurate evaluation of operators' performance will take place during Phase IV.

The establishment of a management committee for each water supply handed over was carried out by the Community and Training Department.

Most of the committees managed their water supplies effectively. Detailed activities of water committees are reported by the Community and Training Department.

New spare parts distribution system was established by using a pilot programme through private businessmen and women groups.

The manufacturing of fast moving components for VLOM hand pumps was started in the programme area by local artisans.

The original work programme for MoWD operated water systems described in the project document for Phase III was revised in the operative work plan. The main reason for change from the original project document was to join the efforts from various departments to maximize the efficiency of detailed activities. Also massive rehabilitation of piped water supplies and WTPs took place during the third phase.

4.1.3 Activities Below Target

4.1.3.1 Point Source Supplies

Most of the targets described in the work plan based on the project document were covered. The details of activities where O&M Department fell below target following the order of operative work plan for Phase III are as follows;

- The handing over of community operated water points did not proceed as expected. Main reasons of non-handing overs was inactive communities, inadequate quality of water and quality of superstructure.
- Rehabilitation of 20 iron removal plants instead of 40 was carried out. The involvement of the Programme was not needed because of the nature of work.
- Manuals for MK II were not distributed because the pump can not be repaired at village level.
- A separate manual for spring protection is under preparation. Instead of a spring protection manual, a 25 page document giving general aspects of spring design and construction was released together with an Operation and Maintenance Manual for Maturu Luandeti water supply.

4.1.3.2 Piped Schemes

- Improvement and rehabilitation of 22 water supplies instead of 32 was carried out due to lack of and financial resources.
- Operation and maintenance manuals for all constructed or rehabilitated schemes were produced. Schemes covered were 25 instead of the 32 targeted. Included in the manuals are specifications for daily operations; mechanical and service cards. The remaining

manuals, specifications, daily instructions and service cards will be provided later following the rehabilitation programme.

4.1.3.3 Water Treatment Plants

- Personnel and Management studies were not carried out as planned.
- Updating of plans and layouts was carried out for 9 WTPs instead of 18 reason being non-availability of resources.
- Improvement and rehabilitation for 9 WTPs instead of the targeted 12 was carried out.
- The water quality programme for individual WTPs was cancelled due to non-availability of funds.
- Flow diagrams and layouts for 7 WTPs of the targeted 18 were carried out.
- Operation and Maintenance manuals with daily instructions, service and lubrication cards for 7 completed WTPs were prepared instead of the targeted 18.
- Supply of spare part sets for Programme supplied machines and equipment was not fully completed.

4.1.4 Lessons Learned During The Phase

4.1.4.1 Point Source Supplies

- In community operated piped water supply systems the ownership of the system must be clear and the involvement of the Programme should be minimal.
- The operation, maintenance and management should fully operate according to the VLOM concept.
- The role of the Programme should remain at a certain level of support service consisting of back-up training, data collection, monitoring and assessments to follow up the development.
- Repair services, spare parts and pumps must be available at an affordable price and alternative options to fabricate key parts for pumps established.

- The system failure shortly after construction, redevelopment or hand pump replacement is the most expensive.
- Rehabilitation of existing and non-functioning wells and boreholes is a better use of capital than construction of new wells or drilling of boreholes.
- Since spare parts are the larger component of maintenance costs, these should be bought in bulk and stored so as to shield them from the effects of inflation.
- The price of water produced from a deep borehole compared to a hand dug well is three times more expensive when capital costs and inflation are taken into account.

4.1.4.2 Piped Water Supply Systems

- In MoWD water supply systems, the maintenance funds allocated for preventive maintenance and urgent repairs is inadequate.
- Revenue is not collected according to production and does not cover the direct operation and maintenance costs.
- Some of the MoWD systems are heavily over-staffed and motivation, moral and leadership need to be improved.
- Record keeping, operational control, financial control and planning and design of the operation and maintenance activities is inadequate.
- The best use of capital is to concentrate to rehabilitation of the existing water supply systems.
- The price of water produced by using diesel operated pumps or generators is extremely high and implementation of that kind of system should not continue.
- The good use of capital to add production is utilization of ground water to the existing distribution system.

4.2 COMMUNITY OPERATED WATER POINTS

4.2.1 Installations

At the inception of Phase III, the installation of hand pumps was carried out by the Construction Department. In February 1991, the Water Point Section of O&M Department took over from the Construction Department and continued with the installation of hand pumps until the end of the phase.

Installations are summarized in Table 4.1.

Table 4.1 Installations

PUMP TYPE	TARGET FOR PHASE III	NUMBER OF INSTALLATIONS		% COVERED
		BOREHOLE	HAND DUG WELL	
MK II	23	35	-	152%
AFRIDEV	190	182	-	96%
AF 85	250	113	133	98%
AF 2000	20	8	-	40%
AF 85 D	-	-	28	-

4.2.2 Maintenance

The existing maintenance system is based on the VLOM concept. The hand pumps used in the programme area are Afridev, Nira AF 85 and India MK II. Although India MK II is being phased out in a bid to enhance the VLOM concept. However, it is still being utilized in some areas where ground water is deep e.g in Samia area in Busia district.

The Programme has gone through different maintenance structures before achieving the VLOM system used presently. The first system involved the utilization of three mobile teams which went round the programme area to repair and maintain the water points. This system proved expensive, unreliable and non-sustainable.

The second step was to train locational repairmen from the community. The training took three (3) months, and at the end of training, they were provided with a tool kit and handed over back

to their respective water committees, who hired them whenever the maintenance need arose. This system was time consuming because the locational repairmen travelled long distances to effect repairs and acquired spare parts at the Head Office.

The third step was the selection and training of women caretakers of hand pumps who undertook two weeks training in all aspects of operation and maintenance of VLOM hand pumps (Nira AF 85 and Afridev pump).

The main results have been effective management and cost saving.

4.2.3 Changing of Hand Pumps

The programme for changing hand pumps to achieve VLOM continued throughout the third phase. Most predominant was from Nira AF 76 to Nira AF 85 hand pumps and from India MK II to Afridev hand pumps. The number of hand pumps changed by the mobile teams are as indicated in Table 4.2.

Table 4.2 Changing of Hand pumps 1989 - 1992

CHANGING OF HAND PUMPS				% Covered
FROM	TO	TARGET FOR PHASE III	NUMBER	
AF 76	AF 85	150	151	100%
MK II	AFRIDEV	405	375	95%
AF 76	AF 85 D	-	9	-
MK II	AF 2000	-	5	-

4.2.4 Inspection of Water Points

Inspection of hand pumps and wells was done by hand pump inspectors in liaison with the Community Development Office. A total of 2358 water points were inspected out of the target of 3000 during the last phase. The breakdown is as shown in Table 4.3.

Table 4.3 Water points inspection

DISTRICT	TOTAL NO. OF WATER POINTS INSPECTED	PERCENTAGE COVERED
Kakamega	1029	78%
Bungoma	367	69%
Busia	569	66%
Siaya	393	79%

4.2.5 Manuals and Repairs

Over 4000 manuals for Afridev and Nira AF 85 were distributed to the communities through the Community and Training Department. The manuals are supposed to be utilized by locational repairmen and women pump attendants on both corrective and preventive maintenance.

4.2.6 Spare Parts Delivery System

The spare parts delivery system has undergone different types of changes before adopting the free enterprise model of spare part distribution. At inception, the spare parts were acquired from the central store by the mobile teams and taken to various destinations in the programme area to be utilized on repairs of hand pumps. The centralized system proved to be time consuming due to long distances covered to acquire spare parts from the office. The system was unreliable and unsustainable.

The second system that followed was the decentralization of spare parts distribution to the districts. This was intended for the water consumers to easily gain access to the mobile teams in the district. However, the system was still costly and time consuming. The role of the Programme was still too central in the purchasing and distribution of the spare parts.

The third alternative has been distribution of hand pump spare parts on a free enterprise basis which was launched early 1992 on a pilot basis.

In this model, the well committees in the areas covered place their orders and payments through identified hardware shops and business oriented women groups. The shop keepers are encouraged to create direct contacts with pump manufacturers and their agents in Kenya. By the end of 1992, six hardware shops had been opened. Two in Busia District and one for Bungoma, Kakamega and Siaya Districts respectively.

4.3 PIPED SCHEMES

The detailed activities were inventory of piped scheme and plants, identification analysis and computerization of data. This task was accomplished by a mobile team centrally based in Kakamega. The targeted objective was to take inventory analysis in 32 water supplies. This task was accomplished for 83 water supplies and treatment plants (Appendix 4.3).

The objective of preparing 32 management studies was not fully accomplished. Only two management studies were produced while 40 organization charts and duties were done.

4.3.1 Assessment of Existing Situation

The assessment of existing situation in water supplies was done for water supplies under implementation. Investigation and design for MoWD operated schemes was carried out. The assessment detailed the following: location, area to be served, ultimate design population in service area, source and quality of water, storage, present production capacity and general remarks. Assessment of the existing situation gave clear indications as to what improvements were required in each water supply.

Assessment of existing situation was done for the following water supplies;

Kibabii w/s	Muchi Milo w/s	Ndalu w/s
Lwakhuna w/s	Kapsakwony w/s	Kaboywa w/s
Kimobo w/p	Nalondo/Kabuchai	Malaba-Kocholia
Bungoma Rural w/p	Little Nzoia w/s	Kaptama w/s
Shikhendu w/s	Kamukuya w/s	Kaptola w/s
Chepkwabi w/p	Mateka w/p	Lwakhakha w/p
Chepkube		

4.3.2 Improvement and Rehabilitation

The initial objective was to make suggestions for improvement and rehabilitation for 32 water supplies. Work was accomplished in 20 water supplies (see Appendix 4.4).

Malava	Hamisi	Eregi
Khwisero	Kabuchai	Ugunja
Ukwala	Funyula/Nangina	Butere
Sega	Nambale	Port Victoria
Munana	Butula	Wakhungu
Shikusa	Bokoli H/Centre	Chwele

4.3.3 Operation and Maintenance Procedures for Piped Schemes

The detailed activities were preparation of flow diagrams, specifications, instructions, manuals and mechanical service cards, monitoring systems, corrective and preventive maintenance.

Operation and maintenance procedures were to be done in 32 water supplies. 25 operation and maintenance manuals were prepared. Flow diagrams, specifications, instructions and mechanical service cards were included in O&M manuals prepared (see Appendix 4.2).

Eighteen (18) water supplies were monitored on water production, monthly fuel (diesel) usage, treatment chemical (alum, soda ash, chlorine) usage, revenue collection and general condition of water supplies. The monitored data was computerized.

4.4 WATER TREATMENT PLANTS

4.4.1 Assessment of Existing Situation

The detailed activities were assessment of existing situation, management and personnel studies, organization charts and duties, inventory of machines and equipment, data computerization and analysis.

Assessment of existing situation was done for Busia Mundika, Kakamega, Kaimosi, Mumias, Ndivisi Nakuselwa, Webuye, and Chesikaki WTPs.

Two (2) management studies were done for Busia Mundika and Maseno WTPs. Organization charts and duties were prepared for 16 WTPs.

4.4.2 Suggestions for Improvements and Rehabilitations

Plans and layouts were prepared for Kakamega, Maseno, Webuye, Mumias, Chesikaki, Busia-Mundika, Kaimosi, Bungoma, Matisi and Shitoli treatment plants. The suggestions for improvement were aimed at improving service level of water treatment plants. Old machinery plants, inadequate treatment capacity, inadequate storage/balancing tanks and under capacity piping were recommended for augmentation/rehabilitation.

4.4.3 Operation and Maintenance Procedures for Water Treatment Plants

The detailed activities were standardization of equipment, record keeping and quality control, preparation of flow diagrams, specifications, instructions, manuals, mechanical service cards, monitoring, corrective and preventive maintenance.

Operation and maintenance manuals were prepared for seven water treatment plants, i.e., Kakamega, Kaimosi, Chesikaki, Maseno, Webuye, Busia-Mundika, and Mumias WTPs (see Appendix 4.2).

Specifications, flow diagrams, instructions and mechanical service cards were included in the manuals prepared. The standards for electrical works were compiled. The standards for mechanical and civil works were not prepared. A computer program was developed for record keeping.

The objective was to carry out quality control in 18 WTPs by purchasing laboratory equipment and training of staff in the central laboratory. Laboratory equipment were not purchased because of saving for bridging over phase..

4.4.4 Programme for WTP Rehabilitations (1989 - 1992)

The programme for water treatment plant rehabilitation for 1989 - 1992 covered 9 WTPs. These are Kakamega, Mumias, Maseno, Kaimosi, Shitoli, Webuye, Chesikaki, Bungoma and Busia Mundika.

4.4.5 Training of Operators and Pump Attendants in Water Treatment Plants

The detailed activities were manpower requirements and qualifications, training of operators in co-operation with Training section and in-service training for specific duties.

Manpower requirements and qualification studies were done by Training section. Operators' training was targeted for 150 operators out of which 36 were trained. In-service training for specific duties was as follows;

1. Water Meter Readers.
2. Safety precaution (First Aid Workshop)
3. Power electronics, electrical maintenance.

Forty one (41) persons were trained by the following suppliers/ manufacturers; Hymel Meter, Holburton, Jos Hansen and Gailey and Roberts.

Seminars and excursions for operation and maintenance staff were held as follows;

1. Operation and maintenance manual workshop for 25 divisional water officers.
2. Switch gear and control workshop – 2 persons.
3. Ol-Karia Geothermal Station and Klockner Moeller excursions – 9 persons.
4. Moi's Bridge Silo Project – 12 persons.

4.5 MATERIAL SYSTEM

Assessment of the existing procurement system was done. A report on the current procurement system was compiled and distributed to the District Water Engineers.

4.6 WORKSHOP FOR O&M – FACILITIES

The detailed activities were organization, start up and development of procedures, training for special duties, training courses for district base personal, establishment of district base workshop, water meter calibrating and device repair, pump testing and repair unit.

The workshop for O&M facilities was re-organized by integration of Provincial Mechanical Engineer's staff with the Programme staff.

Start up and development procedures report was to be produced but was not achieved during the phase. This will be done in the fourth phase as part of the plan for transfer of responsibilities and duties.

The objective was to establish 4 district base workshops. These were established in Busia, Bungoma, Siaya and Kakamega districts.

5.0 TRAINING AND MANPOWER DEVELOPMENT

The main tasks given for the section in the project document for Phase III were:

- training of individuals selected by local communities to operate, maintain, repair and upgrade structures and equipment at point source supplies and piped schemes which are handed over to the communities
- training of piped scheme and water treatment plant operators employed by MoWD or some other organization to whom the schemes or water treatment plants are handed over to operate and maintain the water supplies
- giving on-the-job training to special groups
- arranging opportunities for selected individuals to participate in courses or seminars abroad
- preparation of a Training and Manpower Development Programme for approval by MoWD and FINNIDA

5.1 COMMUNITY TRAINING

5.1.1 Health Education

During training seminars arranged for water committees, the community members were invited for a film show, where the film 'Prescription for Health' was shown and all matters were discussed after the film. Every week during the four years, an average of more than 110 persons participated on these occasions. The total number was 23,500 persons trained.

Health education was also included in other training occasions arranged among the beneficiaries, and the information distributed included guidance on proper use of the provided water supply facilities.

5.1.2 Management Capability

To ensure the involvement of beneficiaries in development and management of their own water supplies, the locational leaders and water committees were trained in these aspects.

The main emphasis in training seminars arranged for the previously mentioned groups was on familiarizing participants with the Programme's objectives and convincing them on the importance of the community participation. The total number of participants in these seminars was 2411, which is 96 % of the targeted 2500.

The one week seminars arranged for these latter groups concentrated on the day to day management of a water supply, e.g. how to arrange public and committee meetings, collect revenues, keep records and operate and maintain the water points.

The target for this type of training seminars was quite clear, all the constructed water supplies should have a trained water committee. During the third phase, the executive committee members of 1544 water point committees were trained, the number of trained persons being 5006. Forty five percent of the water points have a trained water committee. Training activities in the Programme started so much later than the construction activities, that for example the water point committee training target remains to be completed during the Bridging Over Period (1.1.1993 – 30.4.1993) and during Phase IV of the Programme (1.5.1993 – 31.12.1995). The implementation speed of the committee training during the third phase has been satisfactory: every week an average 7 committees and more than 20 committee members have attended these seminars.

At the end of Phase III, the Programme had implemented 5 community managed piped schemes. Four of these piped schemes have a trained water committee, while a training seminar for the fifth committee will be organized during the bridging over period.

5.1.3 Attendant Training

The Project Document for Phase III required that each protected spring, and VLOM hand pump should have a trained and active attendant to take care of the daily maintenance and minor repairs of the supplies.

Pump attendants were trained in three week seminars. The main emphasis was on the skills needed for maintaining the pump, well and its surroundings, finding common faults in the hand pumps and repairing them and understanding the importance of the improved water supply for the health and well being of the community. In total, 2191 pump attendants from 1189 wells participated in the seminars. 44 % of the hand pump wells constructed by the Programme since the implementation started have at least one trained pump attendant. Even if an average 10 attendants have participated in the training seminars every week a lot remains to be done from January 1993 onwards to reach 100 % coverage.

Multiplier effort was strengthened by the trained pump attendants who continued on training others. This exercise was found to be successful in a way that more water points are covered, local language is utilized and the right individuals (candidates) are identified.

Water in some of the wells in the area has excess iron in it. Thus, there are hand pump wells, where iron removal plants were constructed. The pump attendants of those wells have been trained also to operate and maintain the iron removal plants.

In all, 349 spring attendants from 171 protected springs were trained in maintaining the water supply.

5.2 LOCAL CONTRACTORS' TRAINING

One of the tasks given for the Programme for Phase III was training of local contractors, the most important groups being pump repairmen and water point contractors.

Pump repairmen were trained by the operation and maintenance staff of the Programme. The training was organized mainly as on-the-job training, so that the trainees joined the mobile maintenance teams, and participated fully in repairing hand pumps. Some pump repairmen were able to attend the on-the-job training in the Programme workshop. The trained 49 pump repairmen are supposed to be used by Water committees in repairing major breakdowns of hand pumps which are beyond the skills of pump attendants.

Water point contractors form a very important target group for the training activities. Water supply development in the project area in future requires persons who are able to meet the demands for further water supply development arising from communities in the area. The total number of contractors trained during Phase III was 60. Some of the training concentrated on improving technical skills of the contractors, but a training seminar to improve their managerial skills was also arranged.

Trained contractors were not the only ones constructing water points, but other private entrepreneurs also gained from this activity. Some of the people who used to work for the Programme, who proved to be skilful and hard working, and who might in future be able to serve the water and sanitation sector, were also invited to the training seminars.

5.3 WATER SUPPLY OPERATORS' TRAINING

Water treatment plants and even gravity schemes without water treatment have several groups of employees doing different duties in order to run the water supply reliably. These groups of employees enjoyed further training given by both the Kenya Water Institute (KEWI) and the Programme.

The main part of the training was to improve technical skills of the persons running water treatment plants and/or piped schemes. The basic water supply operators course was arranged twice at Western College of Arts and Applied Sciences (WECO) in Kakamega. The course was designed for the operators, who had not attended any professional training course before, and the instructors were from the Provincial Water Engineer's office. The more experienced operators underwent three month training courses at the Kenya Water Institute (KEWI), where the training was given on three different levels, basic, intermediate and advanced.

Some pump attendants from water treatment plants underwent on-the-job training within the Programme workshops, where operation and maintenance as well as repairs of minor breakdowns of pumps were taught. A training manual for a special course for them was also under design, but it did not materialize during Phase III.

The chemical attendants course syllabus was prepared, but no course was arranged due to missing laboratory equipment, which could not be ordered due to the limited budget for the last part of Phase III.

In 1992, the Programme arranged a training course for the water meter readers and billing personnel. The two day course was also attended by some inspectors from the District Water Engineers' offices.

5.4 TRAINING OF SPECIAL GROUPS

Extension workers had an important role in the progress of field work. Some of the extension workers (sometimes referred to as locational representatives) were from the Ministry of Culture and Social Services, some of them worked for the Programme on short term contracts and some of them were directly employed by the Programme. All of them participated in the monthly meetings arranged in the districts to discuss and solve problems raised during field work and to adopt new ideas and methods used when implementing community work. Extension workers were trained in participatory training skills, and a community based health care Programme was arranged at St Mary's Hospital.

Improved water supply is supposed to create some possibilities for income generating activities. KFWWSP supported income generating groups by buying their products e.g. filter sand or concrete blocks, and also by training members of these groups in book keeping and managerial skills.

Information in the Programme is stored and processed by personal computers. Several persons were trained in the use of micro-computers e.g. Wordperfect 5.1 and Dbase IV.

Special attention was also given to improvement of supervisory and training skills of members of the Programme and ministry staff.

One special group is the trainees from different institutions, who trained on-the-job in the Programme. A total of 702 trainees were attached to the Programme for one to six months each during the third Phase.

In the third phase there was an agreement between FINNIDA and MoWD concerning exchange of young engineers in order to give them some field experience. Three Kenyan engineers worked for Tampere City Water Works in Finland for three months in 1991 and three Finnish engineers worked for KFWWSP under this agreement. Also in 1992 there were three Kenyan engineers in Finland, but due to lack of practical training possibilities, they participated in a training course on Environmental Engineering at Tampere University of Technology for three months.

Several Kenyan employees from KFWWSP and MoWD participated in training courses abroad. One of them obtained his M.Sc. degree in Engineering at University of Leeds, England and the another one his Diploma in Social Development at Coady International Institute in Canada. Scholarships to local institutions were also awarded, the Head of Water Quality section was at the University of Nairobi pursuing his M.Sc. in Public Health Engineering and was still there at the time of reporting.

Three national Provincial and District Water Engineers' Annual Conferences were arranged by KFWWSP during Phase III. The first one was funded by NORAD and the latter two by FINNIDA.



MINISTRY OF WATER DEVELOPMENT CERTIFICATE OF MERIT

This is to certify
that

FINNIDA/KENYA FINLAND WESTERN KENYA WATER SUPPLY PROJECT

this 17TH day of JULY 1992

has been awarded this Certificate

as the outstanding SPONSOR

Position TO THE PWEs/DWEs ANNUAL CONFERENCES 1990/91/92

Year 1992



H. H. Kwarang
Minister

[Signature]
Permanent Secretary

[Signature]
Director of Water Development

Figure 5.1 Certificate of merit



Figure 5.2 Participants of the 1992 Provincial and District Water Engineers' Annual Conference

5.5 TRAINING MATERIALS

A number of posters, training manuals and other training materials were produced during the third phase of the Programme.

A small library including relevant material on the sector was established in the Provincial Water Engineer's office.

5.6 TRAINING AND MANPOWER DEVELOPMENT PLAN

Training and manpower development plan, called the Human Resources Development Plan, was in draft form since May 1992. It was partly implemented from that time, but completion of the plan awaited the project document for Phase IV, which would outline the resources available for training in 1993–1995. Human Resources Development Plan will be further developed during the Bridging Over Phase, so that it can be approved and fully implemented during Phase IV of the Programme.

6.0 COMMUNITY INVOLVEMENT

6.1 GENERAL

The concept of community involvement in this context refers to actual participation of the beneficiaries in all the applicable stages of a development project right from identification, planning, design and its implementation in order to tap the community resources have the beneficiaries identify themselves with the projects. During the early years of the implementation of KFWWSP, beneficiaries were not involved in water development activities. Community involvement sector was established during Phase II out of the realisation that water facilities would not be sustainable without the beneficiaries' participation. The objectives of this sector were mainly geared towards creation of awareness in the local people on benefits of clean and safe water and to sensitize them to actively participate in all aspects pertaining to water supplies development.

A lot of progress was realised as the beneficiaries were mobilised and information related to water issues was disseminated to them in various fora which included public, local committee and siting meetings. As a result of the mobilisation process towards awareness creation, the local people developed interest and acquired skills which enabled them to replicate some of the activities related to water developments like brick and block making projects. Some of the facilities constructed by the Programme were developed further using community initiatives. Letters of applications for the construction of water facilities on either private or semi-private terms were received from communities who were willing to meet the cost of their implementation.

During the period under review all community involvement activities except socio-economic activities were decentralised in line with the Kenya Government's District Focus Strategy for close monitoring and evaluation of community activities. The detailed report on the progress made during the phase as per each component is as highlighted in the following chapters.

6.2 DECISION MAKING, PLANNING AND DESIGN

The communities played vital roles in decision making and the planning and design processes of their water development activities.

To create a good understanding of the communities for effective decision making and planning procedures, socio-economic surveys and feasibility studies were conducted on the local people and their environment. The studies were based on local cultural beliefs and practices, level and

sources of income, water use habits and demand, health status and community interests in self help activities among other factors that might have some bearing on the sustainability of water projects. During these studies there were dialogues between the Programme and the communities in which the Programme sought the community views on their needs and goals. The communities identified water as a felt need which needed development. A total of 24 socio-economic surveys and 9 feasibility studies were carried out jointly with the Planning and Design Department. This was 114% achievement of the targeted 21 socio-economic surveys and a further addition of 9 feasibility studies. This achievement came as a result of many locations and areas sending their requests wanting to start water projects and also FINNIDA wanting feasibility studies of the proposed piped water supplies to be implemented. Appendix 6.6 highlights the areas covered to determine whether the water facility was feasible or not. Community involvement work plans for phase III was drawn based on information gathered during the studies and surveys.

6.2.1 Siting

Siting of water facilities is one of the most sensitive areas of the decision making process where the communities needs and interests are very paramount. The objective of involving communities in siting activities of water points was to ensure that the beneficiaries as the users make decisions concerning the distribution, type and location of the water facility and to instil a sense of ownership and responsibility among the local people right from initial stages. Most water facilities that were sited without the consent of the communities were not properly maintained after their construction.

During siting meetings, the communities within a location discussed and agreed on how to share the water facilities allocated to that location according to their needs. After the distribution had been finalised according to sub-locations and then villages, the consumers pinpointed the actual place where construction was to take place. The local people then organised themselves and selected well committee members as the managers of that particular water point.

During the report period, siting programmes were organised in liaison with local leaders. After siting the communities were involved during investigation of sites in order to establish the suitability of the chosen sites depending on technical aspects. During these activities the local people provided labour for hand auger test drilling for hand dug wells. The participation of committees in investigation facilitated their understanding of technical factors influencing the sites and they participated in making decisions on the best alternative sites to be constructed.

The auger test drilling investigation led to the success of most hand dug wells as only the sites which were successful were constructed. After investigation the results were communicated to

communities. As for the sites whose investigation results were negative, the communities were given another chance to choose alternative sites.

During the report period, the communities' contribution towards investigations was in form of provision of labour. A total of 431 sites were investigated and this makes 86% of the targeted 500 sites for investigation. The target was not reached because some sites were directly initiated without hand auger test drilling. Generally, siting of water points was not an easy activity as it involved power sharing and bargaining in order to arrive at the required decisions. Out of the targeted 4,500 siting meetings and 1,700 sites to be selected by communities, only 1,226 meetings (i.e. 27%) and 864 site selections (i.e. 51%) were accomplished in Phase III. This was because during the first two years of the phase community development staff were few and siting activities were still centralised. Again, in the last two years of the phase when siting activities were decentralised, the number of new sites was reduced in favour of rehabilitation of the existing facilities for handing over of water points. All these factors resulted in low achievements in siting activities. Appendix 6.1 summarises siting activities undertaken during the phase.

6.2.2 Land easements

One of the factors that determined communities' decision on the acceptance of the construction of water facilities was measured through the beneficiaries' willingness to provide free land for water development. With the awareness of the benefits that accrue from construction of safe and clean water, most communities were positive in the provision of land for water point projects.

As a measure of acceptance, the area where the facilities were to be constructed had to be land eased. The land easement process is quite lengthy. It requires the land owners to sign a letter of no objection and thereafter, fill in land easement forms which are then passed on to the Divisional Land Authorities for endorsement. The forms are finally presented to the District Registrar where final scrutiny and authorization are done.

During the period under review a total of 1436 sites (i.e. 45%) of the planned 3200 were land eased. The land easement process was quite slow due to the long procedures to be followed and also because of some complications that arose in cases where the landowners had either died or migrated to urban areas or bought land and settled in other parts of the country. Facilities that were sited in public places such as churches, hospitals, schools and market centres accounted for one third of all sites which were free and needed no land easement. Appendix 6.2 gives details on land easement achievements per district.

6.3 COMMUNITY PARTICIPATION IN CONSTRUCTION ACTIVITIES

The local people were mobilized to actively participate in construction of water projects. During the report period, the beneficiaries participated in construction by providing labour and locally available materials like stones, sand, bricks and fencing poles.

The labour and materials provided by the local people during construction differed according to each type of water point being constructed as shown below:

- Hand dug wells - The communities dug pits up to water level by either hiring labour on their own account or digging themselves. However only 340 pits out of planned 500 pits i.e. (68%) were dug to water levels because there was a reduction in the total number of water points to be constructed and also some sites were unfeasible for hand dug wells and hence were changed to boreholes.

- Boreholes - Communities cleared the access routes to sites and provided manual labour on demand. Out of 1200 routes targeted for the period only 409 routes were cleared which makes 34%. This was because some routes were found already accessible.

- Springs - Communities collected hard core and assisted with the construction work. Of the planned 600 sites for stone collection only 340 sites (57%) had stones collected. The target was not achieved as some of the springs sited had low yield and could not be constructed. Some construction activities had to be carried forward to 1993.

- Gravity/piped scheme - Communities collected hard core and also dug and back filled the trenches.

Appendix 6.3 summaries the community contribution in construction while Figure 6.1 shows community members digging trenches for a piped scheme.



Figure 6.1 Community members digging trenches for a piped scheme

6.4 COMMUNITY PARTICIPATION IN OPERATION AND MAINTENANCE

The beneficiaries were sensitized to take the responsibilities of operating and maintaining water points and piped schemes. The communities nominated their representatives to be equipped with skills in operation and maintenance. The selected individuals were trained as pump attendants, pump repairmen, local contractors and spring attendants. Out of the planned 54 pump repairmen 56 members representing 104% were selected. This was over the planned number because there were two locations where the repairmen left and reselection was done. Communities selected 3956 (i.e. 79%) pump attendants against the 5000 planned for the report period. Some water points had either dried up, or were constructed in institutions or were abandoned for one reason or another hence had no pump attendants.

As for spring attendants a total of 2450 against the planned 1500 were selected i.e. 163% of the target. The achievement was higher because the target was lower than the number of available springs. The water point attendants did necessary repairs for the facilities. The consumers met operation and maintenance costs as is reported by Operation and Maintenance Department. Figure 6.2 shows pump attendants servicing a hand pump.



Figure 6.2 Pump attendants servicing a hand pump

6.5 COMMUNITY PARTICIPATION IN HEALTH EDUCATION

The activities of this component were geared towards creating awareness amongst the communities on the benefits and knowledge of safe and clean water supplies. Improvement of the health of target groups was in fact the ultimate aim of the whole Programme.

There was continued collaboration and cooperation between community involvement staff and KFPHCP on health education activities under the coordination of a technical committee as an umbrella body where modalities and logistics of cooperation between the two projects were passed. As a result of the collaboration, health education materials and services were passed on to the beneficiaries. Provision of VIP latrines for demonstration purposes were effected in some selected parts of the programme area.

The Ministry of Health through Public Health Technicians and the Ministry of Culture and Social Services played the roles of providing staff for mobilisation and follow up of communities' participation on health issues. To facilitate the local people's understanding of health issues, awareness creation campaigns were organized through various fora and channels.

Community education meetings were carried out during public 'barazas', well committee meetings and 'members' days'. In addition to meetings, community seminars and study tours were organised for water committees so as to educate them on health aspects. A total of 1,000,000 consumers were reached and this was higher than planned for the period under review.

Health and sanitation activities that were carried out in collaboration with the communities included surveys and studies on practices related to collection of water from the source to their homes. These studies were carried out in order to ensure the proper maintenance of quality of the water right from its source to its destination and eventual usage.

To promote health awareness creation campaigns, study tours were organised in conjunction with KFPHCP for 14 potters from the project area to UNICEF in Karen, Nairobi and to a SIDA funded Ferro-cement tanks and water jars project in Mwala division of Machakos district. The study tours were aimed at promoting use of water jars and Ferro-cement tanks as alternatives against the common use of jerricans for water collection as the latter are very difficult to effectively clean hence can be health hazards.

With the knowledge gained from the seminars, meetings and tours on good health and sanitation, the communities participated by fencing water facility surroundings to protect well environs from destruction by animals and children who might pollute the water. Local users also washed the water facilities according to duty rosters which they prepared.

The pump attendants were at the forefront in servicing pumps for health purposes. The communities also dug and cleared drainage systems and the surrounding bushes to maintain the water quality. However, not all water points had fences around them by the end of the phase since most of the materials used for fencing were temporary and of poor quality thus wearing out easily and forcing the well committees to re-fence.

6.6 ECONOMIC ACTIVITIES

The effective usage of water, time and energy saved as a result of bringing water closer to the communities can be used to judge the impact of water on the socio-economic development of the affected communities.

During the period under review, efforts were made towards identifying various socio-economic activities which were viable and which could be used to uplift the socio-economic status of target communities. One aim of initiating these projects was to make the water facilities implemented self sustaining. Fifty one percent(51%) achievement was recorded towards this out

of the targeted 3250 economic activities. This low achievement is partly attributed to poor co-ordination with the Ministry of Environment and Natural Resources and also to some economic activities lasting only for one year or less after being started e.g. vegetable gardens.

The monetary turnover for these economic activities varied from one activity to the other. For example, 45 block making projects earned KES 49,950, and 155 tree nursery projects were started and earned these communities only KES 4,960. For details on each economic activity per district, refer to Appendix 6.7 (a). Women having been identified as the best managers and users of community water supply systems, were encouraged and assisted in this line.



Figure 6.3 Women group using water for block making

A survey to identify training needs of women within the programme area was carried out. The study revealed that women groups played a vital role in the development of rural areas. It recommended the Programme's working closely with the women groups in order to identify and initiate viable projects which could generate income. The study also recommended the making of slabs and blocks to be used for water and sanitation projects as some of the viable income generating activities to be engaged in by women. It also recommended enhancement of the training programme on maintenance of pumps which had been started by the water Programme. A lot was done towards the implementation of these recommendations since a number of women and women groups were assisted in this respect. Mama Safi Women Group in Busia district, Mumias Muslim Women Group and Mumias Central Development Committee are but some

among the women groups which have been trained in pump repairs and the making of bricks for the construction of water supplies. Although it was proposed to start a women's credit scheme, it was not possible because provision of credit facilities was not within the scope of the Programme. However, co-operation with other organizations in Western Province working on credit schemes was encouraged.

For detailed performance and progress on these economic activities and women groups refer to Appendix 6.7 (a) and 6.7 (b).

Figure 6.3 shows a women group using water for block making to raise their level of income.

6.7 COMMUNITY PARTICIPATION IN MANAGEMENT OF THE FACILITIES

Water committees are the managers or undertakers of the facilities. They mobilise the consumers to participate in maintenance aspects. The consumers elected their water committees to run the facilities and the elected individuals were given skills in effective management in matters related to water. Out of the targeted 4500 committees, a total of 3193 which makes 71% were formed for the water points constructed since the Programme began. The target was not achieved because it was set higher than even the available water points as construction of new water points were later reduced. Also in some areas there were already existing established committees like schools or church committees who took over running of the facilities. There was also establishment of locational water committees in most of the locations to act as overall caretakers of all the water committees after handing over of the facilities. There was continuous activation of dormant committees but of the 4500 committees targeted for activation, only 2613 (58%) were activated. This was because other committees were either active or were not formed.

Most water committees were registered with MoCSS as self help groups. Out of the planned 3,000 water committees, 2,731 (91%) were registered, those that were not registered were either experiencing some structural problems with their facilities or were being managed by committees which had been registered earlier and others had some management problems.

To empower local people to effectively manage the facilities, all the community involvement activities with the exception of the socio-economic component were decentralized to the districts up to locational levels. As a result of decentralization, awareness creation was intensified and this resulted in greater achievements in community participation aspects such as funds collection, accounts opening and registration of water committees.

Effective management of facilities was also boosted by provision of backup support in terms of transport facilities and other allowances to the district and locational monitoring staff as incentives for greater efforts in community mobilisation.

There was also improvement in inter-sectoral coordination with relevant ministries, e.g., Lands and Settlement, Health and Culture and Social Services through monthly district coordination meetings where the modalities of creating a better working atmosphere were discussed.

Monitoring of water facilities was done in liaison with community extension workers e.g., CDAs, Adult Education Workers, local NGOs and locational representatives hired by the Programme. Use of CDAs for monitoring of water points was not very practical in all project areas as some communities preferred other community workers. However, in Siaya District the use of CDAs was very effective.

To facilitate follow up activities for effective management, two meetings were convened with senior staff members of Ministry of Culture and Social Services to review progress in their coordination with the Programme and make necessary recommendations. It was agreed that MoCSS be given attention in terms of provision of back up support services and also that MoCSS was to second more staff to the Programme. However the above recommendations were not properly implemented because the Phase III project document did not spell out clearly the role of MoCSS in the water sector.

For better management water committees collected funds for the water facilities. A total of KES 1,860,583 (62%) out of the planned KES 3,000,000 was collected for point sources, pumped and gravity schemes. The target could not be reached because the per capita income of consumers is low and hence not all consumers could contribute enough funds and also problematic water points killed the morale of communities in funds collection. The communities were also encouraged to open accounts for the funds. A total of 1010 accounts out of the targeted 3000, i.e. 34%, were opened. The achievement was low because most consumers are poor peasants who could only afford minimal financial contributions at a go, so it would take long before they could collect enough to open accounts. Moreover, breakdown of pumps also consumed the money collected. Again, the water facilities, being in the rural areas, some communities found it difficult to travel to post/bank offices to withdraw money whenever there was a breakdown in the facilities.

6.8 HANDING OVER OF WATER POINTS

Communities were prepared for taking over and managing their facilities. Intensive monitoring and evaluation of water committees was launched to ensure that they were ready to take over the responsibilities pertaining to their water projects. All relevant Programme departments teamed up to inspect the facilities.

However, not all the water points constructed by the Programme since its inception could be handed over by the end of Phase III as had been anticipated due to the following reasons:

1. Proper arrangement of handing over procedures and related manuals were not ready until late 1991.
2. Village level operation and maintenance systems e.g availability of spares, manuals for use and maintenance of water facilities and local skilled manpower for water facilities were not yet adequately laid down.
3. Some water points had management squabbles in relation to the committees and needed further reactivation so as to be better organized for the taking over of the responsibilities.
4. Some water points, especially those constructed during earlier phases, had structural problems, frequent drying up, poor water quality, poor maintenance or were either abandoned or under used. Such water points had poor community participation and community activities e.g., accounts opening, funds collection and registration of water committees.
5. There were also water points with land problems especially those that were constructed during the investigation phase when the beneficiaries were not involved. Such facilities had not been land eased at all.
6. Rehabilitation activities on the side of construction were not complete.
7. In areas of Bungoma district, some water committees were disorganized by tribal clashes which witnessed the displacement of some committees.
8. Some water points also had their pumps stolen and arrangements were still being made to have the community buy pumps before handing over.

All in all, by the end of the third phase, a total of 2319 water points which form 66% of the targeted 3500 had been handed over to the beneficiaries. Appendix 6.5. shows the point sources handed over per district. Apart from point sources the following community piped schemes were also handed over:

- Navakholo
- Maturu/Lwandeti
- Kabuchai
- Khwisero
- Sira Nyawita

The remaining water points were carried forward to be handed over during the Bridging Over Phase. Those water points that would not have been handed over by the end of Bridging Over Phase due to community problems would be written off and effected during Phase IV using the demand driven approach.

All in all, most of the communities were quite enthusiastic towards having the facilities officially handed over to them.

6.8.1 Lessons Learnt

1. Local capacity building is the key to transferring sustainable skills.
2. Participatory approach to planning helps ensure linkages and cooperation in implementation.
3. Training yields the best results when it employs participatory methods.
4. The community role is to own and manage the facilities constructed and to be actively involved in decision making in all phases of project development.
5. Women have a special role to play in water and sanitation projects because they are more organized and receptive to community development initiatives.

7.0 IMPLEMENTATION SUPPORT

7.1 PERSONNEL ORGANISATION

The Programme organization structure for the third phase as proposed in the project document was generally used. However, organization charts for each department were prepared and presented in annual work plans. The staff for each category at the end of each year was as shown in Table 7.1. The directly employed personnel were reduced by 170 people at the end of the third phase

Table 7.1 Staff for each category

YEAR/CATEGORY	DEPARTMENT					TOTAL
	ADMIN.	P & D	CONSTR.	O & M	C & T	
1989						
CONSULTANT	2	2	6	1	2	13
MINISTRY	4	12	4	1	3	24
KFWWSP	20	34	190	10	82	336
TOTAL	26	48	200	12	87	373
1990						
CONSULTANT	2	5	4	1	2	14
MINISTRY	5	16	3	2	17	43
KFWWSP	18	54	165	33	121	391
TOTAL	25	75	172	36	140	448
1991						
CONSULTANT	2	2	3	2	2	11
MINISTRY	4	14	7	6	5	36
KFWWSP	14	39	156	46	82	337
TOTAL	20	55	166	54	89	384
1992						
CONSULTANT	2	-	2	1	2	7
MINISTRY	4	21	11	6	22	64
KFWWSP	17	40	116	48	63	348
TOTAL	23	61	119	55	97	419

7.2 COST

The total cost for the third phase was FIM 123.4 million (KES 771.6 million). The total costs are presented in Appendices 7.2, 7.3, 7.4 and 7.5.

7.3 RESIDENT ENGINEER'S OFFICE

During the period under review, coordination between the Resident Engineer's office and various departments of the Programme, both in office and field activities continued as scheduled in the work plan (Phase III). The first half of the Programme period (third phase) saw most works concentrated on siting of new wells and consequently, construction of the same. The Resident Engineer and his assistants carried out supervision of both siting and construction of wells. Where available, Public Health Technicians were involved in the exercise at both divisional and locational levels. This involved physical checks of the structures to ensure quality of works by the Programme in the field.

The second half of Phase III had most works concentrated on both rehabilitation of the existing facilities (Water Supply Systems) and handing over of the constructed water points. Inspection was carried out on each facility by the Resident Engineer's office prior to handing over to beneficiaries. Beneficiaries were also allowed to nominate their representatives to be involved in water points inspection on behalf of water point committees who eventually became water undertakers after the handing over. Those supply systems found unsuitable and unacceptable due to either technical or community problems could not be handed over until the problems were finally rectified. A total of 2,319 water points were handed over in the programme area up to the end of 1992.

The Resident Engineer Assistants continued working in cooperation with other departments of the Programme in enhancing achievement of progress of the Programme by sharing available established facilities.

The Programme continuously liaised with the Resident Engineer on the on-going activities and this enabled the office to undertake continuous supervision throughout the construction stages and thereafter monitoring during and after handing over and subsequently, the guarantee period of the water supply systems.

The office also supervised construction of piped scheme water supplies. During the second half of Phase III, a number of piped scheme water supplies were commissioned. These include both motorized and gravity schemes; major ones of which were:

1. Nangina-Funyula Water Supply (motorized) – Busia district
2. Kapsakwony Water Supply (gravity) – Bungoma district
3. Ukwala Water Supply (motorized) – Siaya district
4. Navakholo Water Supply (motorized) – Kakamega district
5. Maturu Luandeti (gravity) – Kakamega district

Others were small piped schemes constructed mainly for domestic use and serving institutions and communities on a small scale.

The commissioning of satisfactorily completed water supply systems was carried out by the concerned departments of the Programme in conjunction with the Residents Engineer's office whereby the office undertook formal inspections prior to commissioning. Where works were found to be unsatisfactory, the systems were not handed over to the beneficiaries until the various rectifications were made.

The extension and rehabilitation of the District Water Engineer's offices and the Provincial Water Development Mechanical/Electrical workshop took place during the second half of the report period. Tarmacking and paving of the road leading to the yard from the main highway and also covering the main yard was undertaken.

Generally, most works (activities) targeted in the phase under review were carried out as scheduled. Consequently, through inter-sectional and inter-departmental meetings in the Programme, the office was able to supervise the Programme's field activities and advice on technical matters accordingly. Similarly, the Resident Engineer and his assistants continued overseeing legalization of the constructed communal water points in co-operation with the Ministry of Culture and Social Services which in turn enhanced proper taking over of the facilities by the relevant communities.

7.4 CO-ORDINATION

Coordination of the Programme with the Ministry of Water Development continued throughout the phase at all levels. Monthly meetings chaired by the District Water Engineers were started in 1991 and they took place in each district, attended by both Ministry and Programme staff. The Provincial Water Engineer/Resident Engineer was kept well briefed on all Programme activities including achievements, plans and targets.

The Embassy of Finland, Nairobi continued to follow the Programme activities closely. The Programme's home office coordinator and FINNIDA headquarters continued the coordination in Finland. Regular meetings of the Management Committee of the Programme were held in Nairobi during the phase. Coordination with the Primary Health Care Programme continued with several

technical committee meetings held during the report period. Coordination with other ministries such as Ministry of Health and Ministry of Culture and Social Service were undertaken at divisional level where matters on community involvement in implementation of the Programme's activities were discussed.

APPENDIX 1.1 Summary of water point construction 1981 - 1992

TYPE OF SOURCE/PHASE	KAKAMEGA	BUSIA	BUNGOMA	SIAYA	TOTAL
SPRINGS					
-INV.PHASE	16	-	5	-	21
-PHASE I	106	26	32	19	183
-PHASE II	306	148	92	103	649
-PHASE III	167	59	88	30	344
SUB-TOTAL	595	233	217	152	1197
DUG WELLS					
-INV.PHASE	39	32	27	16	114
-PHASE I	195	61	29	9	294
-PHASE II	140	134	79	97	450
-PHASE III	129	73	80	38	320
SUB-TOTAL	503	300	215	160	1178
BOREHOLES					
-INV.PHASE	36	28	10	8	82
-PHASE I	68	98	54	46	266
-PHASE II	120	99	43	56	318
-PHASE III	160	116	72	96	444
SUB-TOTAL	384	341	179	206	1110
GRAND TOTAL	1482	874	611	518	3485

APPENDIX 2.1 Summary of technical details of piped water supplies

WATER SUPPLIES & LOCATION	Year designed	Source, yield & treatment	Mode of transmission	Initial period Coverage km ² Population	Ultimate period Design (m ³ /d) Population.	Remarks
1. Mukumu Complex W/S Kakamega district	1989	Boreholes 2N ^o , 12.8m ³ /hr (Chlorination)	pumping	(1990) 2.0km ² 3,500	(2010) 362m ³ /d 7,300	Constructed (1991)
2. Butere W/S Kakamega district	1991	Boreholes 2N ^o , 9m ³ /hr (chlorination)	pumping	(1989) 2.5 km ² 6,500	(2009) 412m ³ /d 6,000	Constructed (1991)
3. Maturu-Luandeti W/S Kakamega district	1991	Springs 2N ^o 10m ³ /hr (chlorination)	gravity	(1991) 4 km ² 4,400	(2011) 236m ³ /d 9,200	Constructed (1992)
4. Navakholo W/S Kakamega district	1992	Borehole 2N ^o 40m ³ /hr (chlorination)	pumping	(1992) 25 km ² 12,000	(2012) 980m ³ /d 25,000	Constructed (1992)
5. Likuyani W/S Kakamega district	1992	Borehole 6m ³ /hr (chlorination)	pumping	(1992) 1 km ² 340	(2012) 17 m ³ /d 645	Constructed (1992)
6. Khwisero W/S Kakamega district	1992	Spring 1N ^o 8.2m ³ /hr Borehole 1 N ^o 18m ³ /hr (chlorination)	pumping	(1992) 4.2km ² 4,800	(2012) 291m ³ /d 11,400	Constructed (B/H source for future consideration) (1992)
7. Ingotse W/S Kakamega district	1992	Spring 5.6m ³ /hr (chlorination)	Hydrant	(1992) 1 km ² 500	(2012) 20m ³ /d 980	Construction on-going (1992-)
8. Kakamega W/S Treatment Plant Kakamega district	1992	-	-	-	-	Construction on-going (1992-)
9. Kambiri W/S Kakamega district	1992	Stream 1N ^o 29m ³ /hr (chlorination)	Gravity	(1992) 30km ² 7,000	(2012) 600m ³ /d 13,000	Not Constructed
10. Mukoe W/S Kakamega district	1992	Spring 9.4m ³ /hr (chlorination)	pumping	(1992) 8 km ² 4,000	(2012) 150m ³ /d 8,600	Not Constructed
11. Mumias W/S Chemical House Kakamega district	1992	-	-	-	-	Not Constructed
12. Malava tank W/S Kakamega district	1992	50m ³ Concrete Tank	-	-	-	Not Constructed
13. Soy W/S Treatment Plant Kakamega district	-	-	-	-	-	Design on-going
14. Ileho W/S Kakamega district	-	Stream 67m ³ /hr (chlorination)	Gravity	(1993) 10km ² 8,600	(2013) 691m ³ /d 16,500	Feasibility statement on- going
15. Vihiga H/C W/S Kakamega district	-	-	-	-	-	To be served by Ileho W/S

APPENDIX 2.1 (Cont.) Summary of technical details of piped water supplies

WATER SUPPLIES & LOCATION	Year Designed	Source, yield & treatment	Mode of transmission	Initial period Coverage(Km ²) Population	Ultimate period Design (m ³ /d) Population	Remarks
16. Mautuma H/C W/S Kakamega district	1989	Borehole 3m ³ /hr (chlorination)	pumping	(1989) 1km ² 400	(2009) 39m ³ /d 890	Constructed (1992)
17. Kabuchai H/C W/S Bungoma district	1989	Spring 3.6m ³ /hr (Chlorination)	pumping	(1989) 2km ² 2,000	(2009) 80m ³ /d 4,000	Constructed (1992)
18. Naitiri H/C W/S Bungoma district	1989	Borehole 1.3m ³ /hr (Chlorination)	pumping	(1990) 2km ² 300	(2010) 18m ³ /d 700	Constructed (1990)
19. Sirisia H/C W/S Bungoma district	1989	Borehole 1.5m ³ /hr (Chlorination)	pumping	(1990) 1km ² 440	(2010) 30m ³ /d 1000	Constructed (1990)
20. Kapsakwony W/S Bungoma district	1991	Spring 3N ^o 40m ³ /hr (chlorination)	gravity	(1992) 18km ² 2,200	(2012) 520m ³ /d 4,920	Constructed (1992)
21. Muchi-Milo W/S Bungoma district	1992	Boreholes	-	-	-	Constructed (1992)
22. Mateka W/S Bungoma district	1991	Springs 2N ^o 15.5m ³ /hr Borehole 1N ^o 9m ³ /hr (Chlorination)	pumping	(1991) 20km ² 11,800	(2011) 600m ³ /d 24,000	Not Constructed
23. Chepkube W/S Bungoma district	1991	River 583m ³ /hr (Chlorination)	gravity	(1990) 25km ² 17,000	(2012) 1,416m ³ /d 36,000	Not Constructed
24. Chesikaki W/S Bungoma district	-	River	gravity	-	-	Rehabilitated (1991-92)
25. Khasoko W/S Bungoma district	1992	Spring 8.3m ³ /hr (Chlorination)	Pumping	(1993) 10km ² 2,000	(2013) 190m ³ /d 3,000	Yet to be rehabilitated
26. Netima roof catchment W/S Bungoma district	1992	Rainfall average 4m ³ /hr	-	(1992) - 600	(2012) 50m ³ /d 800	Not Constructed
27. Webuye W/S Treatment Plant Bungoma district	-	-	-	-	-	Rehabilitated (1992)
28. Kutere W/S Bungoma district	-	-	gravity	-	-	Yet to be designed
29. Lwakhakha W/S Bungoma district	-	-	-	-	-	Field investigation on-going
30. Funyula Nangina W/S Busia district	1989	Spring 4.2m ³ /hr (Chlorination)	pumping	(1989) 6km ² 3,000	(2009) 230m ³ /d 6,300	Constructed (1989)

APPENDIX 2.1 (Cont.) Summary of technical details of piped water supplies

WATER SUPPLIES & LOCATION	Year designed	Source, yield & treatment	Mode of transmission	Initial period Coverage km ² Population	Ultimate period Design (m ³ /d) Population	Remarks
31. Matayos H/C W/S Busia District	1989	Borehole 3.7m ³ /hr (Chlorination)	pumping	(1989) 0.5km ² 650	(2009) 36m ³ /d 1,400	Constructed (1990)
32. Mukhobola H/C W/S Busia district	1990	Borehole 10.6m ³ /hr (Chlorination)	Pumping	(1990) 1km ² 300	(2010) 11m ³ /d 800	Constructed (1991)
33. Amukura Complex W/S Busia district	1992	Boreholes 9m ³ /hr (Chlorination)	pumping	(1992) 15km ² 5,200	(2012) 300m ³ /d 9000	Construction on-going (1992-)
34. Busia town BHs W/S Busia district	1992	Boreholes	pumping	-	-	Constructed (One borehole yet to be developed) (1992-)
35. Lukolis W/S Busia district	-	Stream & Spring 14m ³ /hr (Chlorination)	gravity	(1992) 30km ² 4,200	(2012) 360m ³ /d 8,600	Undergoing design
36. Sibirira W/S Busia district	-	-	-	-	-	Design on-going
37. Busia Hills W/S Busia district	-	Lake Victoria	pumping	(1992) 50km ² 7,600	(2012) 550m ³ /d 15,000	Feasibility statement on-going
38. Malaba border W/S Busia district	-	-	-	-	-	Field investigation
39. Sira Nyawita W/S Siaya district	1989	Borehole 15m ³ /hr	pumping	(1991) 1km ² 850	(2011) 105m ³ /d 1,700	Constructed (1989-92)
40. Ugunja W/S Siaya district	(1990)	Boreholes 2N ^o , 6m ³ /hr (Chlorinatoin)	pumping	(1990) 4km ² 2,500	(2010) 330m ³ /d 6,000	Constructed (1991)
41. Sigomere W/S Siaya district	(1991)	Spring & Borehole 7.1m ³ /hr (Chlorination)	pumping	(1991) 14km ² 4,200	(2011) 262m ³ /d 8,600	Constructed (1992)
42. Jera Siaya district	-	Borehole	Handpump	(1993) - 2,500	(2013) - 5,500	Feasibility statement on-going
43. Sifuyo W/S Siaya district	-	-	-	-	-	-
44. Ipali W/S Vihiga district	1989	Spring 1.8m ³ /hr (Chlorination)	pumping	(1990) 1km ² 360	(2010) 11m ³ /d 800	Constructed (1990)
45. Eregi T.T.C W/S Vihiga district	1990	Spring 2N ^o Borehole 2N ^o 14.7m ³ /hr (Chlorinatoin)	pumping	(1992) 1km ² 5,000	(2012) 380m ³ /d 11,000	Constructed (1990)
46. Hamisi H/C W/S Vihiga district	1990	Spring 10.3m ³ /hr (Chlorination)	pumping	(1990) 1km ² 300	(2010) 11m ³ /d 509	Constructed (1992)
47. Chavavo-Mahanga W/S Vihiga district	-	-	-	-	-	Yet to be rehabilitated

APPENDIX 2.2 Summary of computer software

COMMERCIAL PROGRAM PACKAGES USED IN THE PROGRAMME

WordPerfect 4.2 and 5.1	.....	Word processing
Lotus 1-2-3 R 3.1	.....	Tables, calculations and graphics
Harvard Graphics 3.0	.....	Graphics
dBASE IV	.....	Databases and program developing
GW BASIC	.....	Plotting program developing
GW1,...GW6	.....	Ground water analysis
Grundfos Caps	.....	Piped system calculations
GSX-86	.....	Seismic VLF operations
GSFSEISMO	.....	Analysis of refractical seismic soundings
TV-menu	.....	System menu
Sidekick	.....	System file and program writing
Norton Utilities 4.5	.....	Extension utilities to DOS
PC Tools 4.0	.....	Extension utilities to DOS
Virus Scan 8.1V85	.....	Antivirus system

APPLICATIONS CREATED IN THE PROGRAMME

Water Point Register	.....	3400 boreholes, shallow wells & springs
- water points		depth, pump, yield, location, etc.
- water quality samples		
- water committees		
Water point drafting	.....	maps of different water point aspects
Development Plan	.....	up to year 2005, sub-location level
Water Source Coverage	.....	on sub-location level, 380 sub-locations
Undeveloped Springs	.....	3300 known springs
Water Treatment Plants	.....	100 plants
- pumps		
- electrical motors		
- diesel engines		
Water Treatment Plant		
Rehabilitation Costs	.....	450 records, sub-location approach
Manpower System	.....	1300 persons
Population Forecast	.....	on sub-location level
Seismic interpretation	.....	for borehole siting
Cash Ledger	.....	for reporting and cost control
Invoice Control	.....	LPO's, invoices and payments

Cost Control	.....	budgeting and reporting
Store Control Systems	.....	6700 different items
Vehicle Cost System	.....	170 FINNIDA financed vehicles & m-bikes
Well Contractor System	.....	50 subcontractors
Payroll	.....	370 KFWWSP + 50 MoWD + 50 trainees

APPENDIX 2.3 Bacteriological water quality

Faecal col./100ml	Boreholes		Hand dug Wells		Protected Springs		Piped Schemes		P.H.C.P.		Total	
	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%
0	1904	88.4	1078	52.5	910	51.8	645	62.7	156	45.2	4693	63.9
1 - 10	187	8.7	446	21.7	461	26.2	200	19.4	63	18.3	1354	18.5
11 - 25	28	1.3	194	9.5	166	9.4	48	4.7	23	6.7	459	6.3
26 - 50	12	0.6	46	2.3	52	3.0	8	0.8	14	4.0	132	1.8
> 50	23	1.0	288	14.0	168	9.6	128	12.4	89	25.8	696	9.5
TOTAL	2154	100	2052	100	674	100	493	100	345	100	7337	100

APPENDIX 3.1 Summary of construction and rehabilitation of point source supplies

District/Year	A	B	C	D	E	F	G	H	I
Kakamega 1989	86	81	52	40	66	25	88	71	30
Kakamega 1990	43	40	57	67	32	38	38	58	28
Kakamega 1991	34	34	29	26	84	39	74	28	32
Kakamega 1992	12	12	8	9	47	25	88	11	125
Subtotal	175	167	146	142	229	127	288	168	215
Bungoma 1989	36	24	15	10	31	12	49	28	3
Bungoma 1990	19	15	20	25	17	36	22	24	9
Bungoma 1991	20	20	16	18	23	24	11	19	26
Bungoma 1992	7	7	6	4	53	9	81	5	92
Subtotal	82	66	57	57	124	81	163	76	130
Busia 1989	41	35	43	33	47	0	48	7	11
Busia 1990	46	41	37	45	35	34	15	34	21
Busia 1991	24	23	21	18	21	30	23	12	51
Busia 1992	18	19	12	10	85	19	58	6	69
Subtotal	129	118	113	106	188	83	144	59	152
Siaya 1989	25	25	23	21	41	0	26	12	17
Siaya 1990	12	12	15	8	20	17	13	6	5
Siaya 1991	25	23	25	18	15	5	16	11	18
Siaya 1992	40	40	42	36	42	10	23	1	91
Subtotal	102	100	105	83	118	32	78	30	131
Other Districts	1	1							
Total	489	451	421	388	659	323	673	333	628

KEY:

- A - BOREHOLES DRILLED
- B - BOREHOLES SUCCESSFUL
- C - SLABS CONSTRUCTED FOR BOREHOLES
- D - HAND PUMPS INSTALLED IN BOREHOLES
- E - BOREHOLE WELL SLABS REPAIRED
- F - SHALLOW WELLS CONSTRUCTED
- G - SHALLOW WELLS REHABILITATED
- H - SPRINGS PROTECTED
- I - SPRINGS REHABILITATED

APPENDIX 3.2 Summary of costs for programme vehicles 1.1.1989 - 31.12.1992

No.	Vehicle	Spare parts Ksh	Tyres and tubes Ksh	Fuel and lubr. Ksh	Licence & insur Ksh	Labour cost Ksh	Total Cost Ksh	KM driven	Averag fuel c l/100k	Cost /Km Ksh
1	L/ROVER KDV 552	470,722.50	34,888.20	161,891.50	11,120	39,016.25	717,638.45	102,644	13.03	6.99
2	L/ROVER KDV 553	508,131.30	37,199.40	203,039.85	11,120	56,894.40	816,384.95	139,947	13.66	5.83
3	L/ROVER KDW 414	452,565.10	31,018.10	221,142.65	11,030	32,283.50	748,039.35	173,825	12.25	4.30
4	L/ROVER KDW 415	538,266.20	35,710.20	150,997.75	11,120	57,390.00	793,484.15	103,831	13.69	7.64
5	L/ROVER KDW 416	640,418.35	40,544.95	239,717.60	11,120	66,334.60	998,135.50	168,673	14.08	5.92
6	L/ROVER KDW 423	585,547.85	22,673.30	155,570.15	11,120	72,063.75	846,975.05	118,635	13.41	7.14
7	L/ROVER KDW 424	490,302.25	53,522.25	295,679.10	11,120	44,126.75	894,750.35	211,332	13.22	4.23
8	L/ROVER KDW 425	663,163.55	16,830.55	218,111.45	11,120	60,418.10	969,643.65	144,410	12.92	6.71
9	L/ROVER KDW 426	342,646.75	21,004.00	329,366.95	11,030	29,382.55	733,430.25	142,697	17.55	5.14
10	L/ROVER KDW 461	197,545.50	28,386.55	163,294.40	9,500	12,932.60	411,659.05	115,294	11.64	3.57
11	L/ROVER KDW 462	128,444.55	20,880.40	197,537.90	9,500	9,703.75	366,066.60	127,115	12.40	2.88
12	L/ROVER KDW 463	308,349.70	21,832.90	188,966.90	9,500	14,516.25	543,165.75	116,507	12.92	4.66
13	L/ROVER KDW 464	320,723.65	66,790.95	230,078.70	9,500	19,698.25	646,791.55	153,244	11.77	4.22
14	L/ROVER KDW 465	264,699.85	26,944.75	199,898.40	9,500	18,112.50	519,155.50	141,432	11.04	3.67
15	L/ROVER KDW 466	79,410.75	13,812.75	138,633.55	9,500	6,211.25	247,568.30	97,895	11.18	2.53
16	L/ROVER KDW 467	284,346.10	28,337.60	255,162.35	9,500	19,201.25	596,547.30	146,648	13.44	4.07
17	L/ROVER KDW 468	220,771.05	45,255.15	204,503.00	9,500	16,278.00	496,307.20	138,425	11.67	3.59
18	L/ROVER KDW 469	388,235.15	34,225.10	242,516.60	9,500	24,505.00	698,981.85	165,420	11.76	4.23
19	L/ROVER KDW 470	296,421.85	21,148.15	213,352.95	9,500	22,400.00	562,822.95	161,080	10.42	3.49
20	L/ROVER KDW 471	238,556.70	61,535.95	261,243.55	9,500	15,999.75	586,835.95	160,346	12.92	3.66
21	L/ROVER KDW 472	215,282.35	27,683.90	301,365.60	9,500	12,862.50	566,694.35	171,078	14.47	3.31
22	L/ROVER KDW 473	191,239.65	30,732.80	169,178.60	9,500	13,911.35	414,562.40	103,789	12.72	3.99
23	L/ROVER KDW 474	246,434.35	39,861.85	214,262.50	9,500	18,832.50	528,891.20	147,548	11.85	3.58
24	L/ROVER KDW 475	184,138.65	15,340.50	176,353.30	9,500	9,076.25	394,408.70	109,209	12.60	3.61
25	L/ROVER KDW 478	403,087.95	38,320.35	257,856.90	9,500	27,412.10	736,177.30	161,570	12.93	4.56
26	L/ROVER KDW 479	260,327.05	27,001.80	200,160.70	9,500	14,516.25	511,505.80	139,649	10.89	3.66
27	L/ROVER KXU 126	595,340.15	49,308.40	219,325.40	11,030	47,144.45	922,148.40	147,716	13.74	6.24
28	L/ROVER KXU 127	563,552.60	51,507.45	227,899.35	11,030	41,825.00	895,814.40	168,744	12.47	5.31
29	L/ROVER KXU 128	629,710.65	62,228.20	226,239.90	11,120	65,636.25	994,935.00	169,622	12.72	5.87
30	L/ROVER KXU 129	375,877.55	44,958.60	200,903.55	11,030	25,570.00	658,339.70	141,033	13.27	4.67
31	L/ROVER KXU 130	459,894.35	21,155.75	209,021.45	11,030	38,202.50	739,304.05	146,273	13.71	5.05
32	L/ROVER KXU 131	903,006.40	59,151.85	216,844.15	11,120	70,692.00	1,260,814.40	140,572	13.49	8.97
33	L/ROVER KXU 132	550,741.20	27,825.40	214,778.45	11,120	50,427.80	854,892.85	169,061	12.55	5.06
34	L/ROVER KXU 133	655,551.80	36,532.20	169,177.95	11,120	60,487.00	932,868.95	153,860	13.30	6.06
35	L/ROVER KXU 134	551,773.90	61,042.00	285,120.80	11,030	55,871.50	964,838.20	175,429	13.69	5.50
36	L/ROVER KXU 135	613,371.95	42,665.35	217,974.50	11,030	43,224.50	928,266.30	154,397	13.26	6.01
37	L/ROVER KXU 136	581,516.65	34,520.65	178,567.95	11,120	42,630.75	848,356.00	137,829	13.22	6.16
38	L/ROVER KXU 138	792,882.15	47,021.35	223,508.60	11,030	109,025.35	1,183,467.45	150,257	13.01	7.88
39	L/ROVER KXU 139	595,961.00	39,479.35	207,556.00	11,030	51,397.50	905,423.85	142,527	14.06	6.35
40	L/ROVER KYG 689	271,443.75	34,355.20	126,184.70	11,030	23,978.50	466,992.15	101,635	12.11	4.59
41	L/ROVER KYG 690	763,580.60	23,951.55	227,291.90	11,120	44,528.35	1,070,472.40	141,095	14.28	7.59
42	L/ROVER KYG 691	648,808.05	25,845.25	196,971.50	11,120	59,517.50	942,262.30	148,843	12.93	6.33
43	L/ROVER KYG 692	285,853.75	56,368.70	194,335.45	11,030	34,008.75	581,596.65	128,616	13.58	4.52
44	L/ROVER KYG 697	619,243.40	48,501.60	182,795.95	11,030	51,625.00	913,195.95	135,721	12.49	6.73
45	L/ROVER KAC 133P	14,849.00		28,068.50	8,618	805.00	52,340.50	14,101	13.12	3.71
46	L/ROVER KAC 148P	27,460.80		30,947.15	6,218	367.50	64,993.45	14,969	13.86	4.34
47	L/ROVER KAC 149P	16,246.45		23,968.80	6,218	385.00	46,818.25	12,502	12.37	3.74
48	L/ROVER KAC 151P	13,409.10		22,873.95	6,218	735.00	43,236.05	12,265	12.41	3.53
49	L/ROVER KAC 152P	17,061.40		27,018.25	6,218	665.00	50,962.65	13,890	12.79	3.67
LAND ROVER TOTALS		19,377,889	1,607,901	9,314,380	460,570	1,649,872	32,410,612	6,315,473	12.94	5.13

APPENDIX 3.2 (Cont.) Summary of costs for programme vehicles 1.1.1989 - 31.12.1992

No.	Vehicle	Spare parts Ksh	Tyres and tubes Ksh	Fuel and lubr. Ksh	Licences & insur. Ksh	Labour cost Ksh	Total Cost Ksh	KM driven	Average fuel c l/100k	Cost /Km Ksh
50	TROOPER KXC 481	104,014.90	28,822.80	100,217.60	3,500	10,767.50	247,322.80	41,311	14.70	5.99
51	SUBARU KDW 441	43,799.35	6,327.30	85,583.45	11,120	4,620.00	151,450.10	52,304	11.66	2.90
52	SUBARU KDW 442	62,902.15	10,452.50	87,048.35	11,120	4,681.25	176,204.25	52,357	10.65	3.37
53	SUBARU KDW 443	49,637.30	9,074.35	82,247.40	11,120	6,081.25	158,160.30	51,554	11.70	3.07
54	SUBARU KDW 446	50,370.95	9,861.10	122,324.70	11,120	7,361.65	201,038.40	75,301	11.17	2.67
55	SUBARU KDW 447	101,867.10	8,888.00	143,010.75	11,120	4,778.50	269,664.35	85,099	11.18	3.17
56	SUBARU KDW 448	211,796.20	12,198.50	114,964.35	11,120	13,466.25	363,545.30	66,190	11.43	5.49
57	SUBARU KDW 449	81,837.10	17,833.80	116,390.95	11,120	6,833.75	234,015.60	74,277	10.70	3.15
SUBARU TOTALS		602,210.15	74,635.55	751,569.95	77,840	47,822.65	1,554,078.30	457,082	11.19	3.40
53	ISUZU NKR KXX 581	322,374.60	105,063.80	198,649.65	8,220	55,224.75	689,532.80	121,307	16.23	5.68
54	ISUZU NKR KAC 557R	2,806.70		11,623.20	7,291	315.00	22,035.90	4,954	15.50	4.45
54	SISU LORRY KUA 782	538,863.30	91,635.30	342,428.35	20,110	48,390.00	1,041,426.95	101,445	28.82	10.27
55	SISU LORRY KDV 518	1,056,107.30	204,474.25	354,675.00	20,110	51,490.00	1,686,856.55	105,193	30.95	16.04
56	SISU LORRY KDV 534	956,254.75	152,976.15	433,050.35	20,110	81,541.80	1,643,933.05	128,952	33.27	12.75
57	SISU LORRY KDV 540	1,002,627.90	190,203.00	451,937.95	20,110	64,896.25	1,729,775.10	136,358	35.70	12.69
58	SISU LORRY KDW 480	116,295.95	118,200.75	424,370.65	14,440	31,482.50	704,789.85	88,710	37.01	7.94
59	SISU LORRY KXY 043	592,271.85	163,102.85	436,960.95	20,110	63,385.25	1,275,830.90	100,371	38.41	12.71
60	M/B LORRY KDW 439	364,734.00	125,304.80	426,049.85	22,540	36,435.00	975,063.65	114,291	34.53	8.53
LORRY TOTALS		4,627,155.05	1,045,897.10	2,869,473.10	137,530	377,620.80	9,057,676.05	775,320	34.08	11.68
61	V. TRACTOR KDW 458	88,345.30	63,500.30	244,750.95	2,850	19,396.30	418,842.85			
62	V. TRACTOR KDW 459	333,783.25	154,580.35	464,323.30	2,850	21,218.75	976,755.65			
63	V. TRACTOR KDW 477	100,701.70	23,421.80	216,522.25	2,850	21,374.50	364,870.25			
64	V. TRACTOR KDW 485	112,603.85	85,420.80	267,439.80	2,850	23,747.50	492,061.95			
65	L. EXCAVATOR KUA775	189,311.95	61,841.05	90,153.60	3,559	28,715.30	373,580.65			
66	L. EXCAVATOR KDW432	482,167.55	29,167.00	319,478.15	3,559	33,116.75	867,488.20			
TRACTOR TOTALS		1,306,913.60	417,931.30	1,602,668.05	18,518	147,569.10	3,493,599.55			
68	M/B RIG KDV 545	260,052.05	87,012.60	1,291,437.05	21,750	42,653.80	1,702,905.50			
69	M/B RIG KDW 451	654,838.10	223,901.15	1,425,297.55	32,340	51,018.75	2,387,395.55			
RIG TOTALS		914,890.15	310,913.75	2,716,734.60	54,090	93,672.55	4,090,301.05			
GRAND TOTALS		27,258,254	3,591,166	17,565,317	767,559	2,382,865	51,565,159	7,715,447		

APPENDIX 3.3 Summary of costs for programme vehicles 1.1.1992 - 31.12.1992

No.	Vehicle	Spare parts Ksh	Tyres and tubes Ksh	Fuel and lubr. Ksh	Licences & insur. Ksh	Labour cost Ksh	Total Cost Ksh	KM driven	Averag fuel c l/100k	Cost /Km Ksh
1	L/ROVER KDV 552	227,751.55	10,352.70	58,988.50	3,500	10,220.00	310,812.75	24,035	12.39	12.93
2	L/ROVER KDV 553	132,855.65	15,625.80	81,230.50	3,500	8,347.50	241,559.45	40,033	13.99	6.03
3	L/ROVER KDW 414	111,861.25	15,441.40	75,188.90	3,500	4,278.75	210,270.30	47,719	12.30	4.41
4	L/ROVER KDW 415	160,070.35	1,628.90	50,055.40	3,500	6,632.50	221,887.15	26,090	12.94	8.50
5	L/ROVER KDW 416	161,556.70	11,945.60	66,117.80	3,500	8,916.25	252,036.35	30,973	15.12	8.14
6	L/ROVER KDW 423	106,750.55	2,806.10	52,132.40	3,500	4,025.00	169,214.05	28,595	12.69	5.92
7	L/ROVER KDW 424	176,046.70	15,191.70	100,549.50	3,500	8,023.75	303,311.65	54,385	14.27	5.58
8	L/ROVER KDW 425	298,131.50	12,967.60	108,093.40	3,500	31,053.15	453,745.65	50,876	12.27	8.92
9	L/ROVER KDW 426	182,849.45	14,365.70	96,896.70	3,500	8,496.25	306,108.10	28,624	19.42	10.69
10	L/ROVER KDW 461	98,749.15	2,177.60	72,070.35	3,500	4,777.50	181,274.60	44,372	11.31	4.09
11	L/ROVER KDW 462	71,661.50	10,527.00	95,340.50	3,500	3,211.25	184,240.25	51,781	12.70	3.56
12	L/ROVER KDW 463	123,886.60	891.30	100,474.50	3,500	6,072.50	234,824.90	53,808	12.92	4.36
13	L/ROVER KDW 464	199,859.05	42,507.40	108,892.90	3,500	6,842.50	361,601.85	63,704	11.87	5.68
14	L/ROVER KDW 465	138,668.75	13,117.00	91,643.90	3,500	5,145.00	252,074.65	57,218	11.06	4.41
15	L/ROVER KDW 466	32,845.60		71,809.45	3,500	1,767.50	109,922.55	44,885	11.11	2.45
16	L/ROVER KDW 467	127,839.15	15,110.00	94,627.40	3,500	4,812.50	245,889.05	50,077	13.32	4.91
17	L/ROVER KDW 468	153,318.40	27,678.00	94,360.55	3,500	4,331.25	283,188.20	57,736	11.57	4.90
18	L/ROVER KDW 469	235,109.70	19,991.80	100,593.10	3,500	8,478.75	367,673.35	57,383	12.14	6.41
19	L/ROVER KDW 470	147,811.80	20,836.60	90,828.00	3,500	7,253.75	270,230.15	60,092	10.50	4.50
20	L/ROVER KDW 471	146,452.55	40,711.60	104,261.95	3,500	6,238.75	301,164.85	56,647	12.78	5.32
21	L/ROVER KDW 472	108,632.45	14,456.30	139,699.40	3,500	4,777.50	271,065.65	64,383	15.34	4.21
22	L/ROVER KDW 473	117,083.85	17,072.50	78,258.85	3,500	4,777.50	220,692.70	40,465	13.38	5.45
23	L/ROVER KDW 474	115,783.00	26,108.40	88,618.00	3,500	5,501.25	239,510.65	55,803	11.76	4.29
24	L/ROVER KDW 475	91,228.20	5,051.00	92,805.60	3,500	3,955.00	196,539.80	50,147	12.85	3.92
25	L/ROVER KDW 478	222,750.75	24,876.40	103,925.95	3,500	10,307.50	365,360.60	58,678	12.45	6.23
26	L/ROVER KDW 479	82,819.45	6,429.00	95,598.75	3,500	3,438.75	191,785.95	61,498	10.72	3.12
27	L/ROVER KXU 126	203,884.10	13,382.10	60,389.55	3,500	9,459.95	290,615.70	30,928	13.35	9.40
28	L/ROVER KXU 127	149,077.30	8,741.00	82,441.10	3,500	7,402.50	251,161.90	47,431	11.95	5.30
29	L/ROVER KXU 128	167,554.35	18,133.00	72,462.50	3,500	9,922.50	271,572.35	41,372	12.26	6.56
30	L/ROVER KXU 129	106,217.35	28,780.00	68,280.35	3,500	3,797.50	210,575.20	32,665	13.70	6.45
31	L/ROVER KXU 130	109,203.25	2,902.90	60,436.90	3,500	5,810.00	181,853.05	32,232	13.13	5.64
32	L/ROVER KXU 131	349,539.20	26,799.60	42,738.90	3,500	9,627.50	432,205.20	19,507	14.33	22.16
33	L/ROVER KXU 132	138,494.95		72,760.05	3,500	7,700.00	222,455.00	46,619	11.05	4.77
34	L/ROVER KXU 133	198,324.30	23,115.30	48,507.95	3,500	11,703.75	285,151.30	54,520	13.39	5.23
35	L/ROVER KXU 134	196,514.85	24,841.40	113,497.30	3,500	10,097.50	348,451.05	51,622	15.85	6.75
36	L/ROVER KXU 135	234,415.45	25,113.00	74,472.75	3,500	5,967.50	343,468.70	29,739	14.89	11.55
37	L/ROVER KXU 136	37,357.20	368.80	20,782.65	3,500	3,780.00	158,246.25	12,426	11.99	32.38
38	L/ROVER KXU 138	222,047.95	22,552.90	79,936.70	3,500	9,098.25	337,135.80	41,457	12.97	8.13
39	L/ROVER KXU 139	175,835.95	22,492.30	67,699.00	3,500	9,126.25	278,653.50	34,142	14.75	8.16
40	L/ROVER KYG 689	74,956.65	10,470.80	42,916.10	3,500	2,957.50	134,801.05	25,739	11.48	5.24
41	L/ROVER KYG 690	340,351.25	14,365.70	56,838.30	3,500	4,103.75	849,504.00	27,035	14.04	31.42
42	L/ROVER KYG 691	189,661.05	522.50	65,110.55	3,500	11,585.00	270,379.10	36,209	11.97	7.47
43	L/ROVER KYG 692	162,907.35	32,221.00	84,322.65	3,500	7,393.75	290,344.75	39,840	14.69	7.29
44	L/ROVER KYG 697	105,557.40	12,122.00	54,628.20	3,500	8,618.75	184,426.35	30,519	12.02	6.04
45	L/ROVER KAC 133P	14,849.00		28,068.50	8,618	805.00	52,340.50	14,101	13.12	3.71
46	L/ROVER KAC 148P	27,460.80		30,947.15	6,218	367.50	64,993.45	14,969	13.86	4.34
47	L/ROVER KAC 149P	16,246.45		23,968.80	6,218	385.00	46,818.25	12,502	12.37	3.74
48	L/ROVER KAC 151P	13,409.10		22,873.95	6,218	735.00	43,236.05	12,265	12.41	3.53
49	L/ROVER KAC 152P	17,061.40		27,018.25	6,218	665.00	50,962.65	13,890	12.79	3.67
LAND ROVER TOTALS		7,023,300.30	674,791.70	3,614,160.40	187,490	322,791.35	11,822,533.75	1,961,736	12.79	6.03

APPENDIX 3.3 (Cont.) Summary of costs for programme vehicles 1.1.1992 - 31.12.1992

No.	Vehicle	Spare parts Ksh	Tyres and tubes Ksh	Fuel and lubr. Ksh	Licences & insur. Ksh	Labour cost Ksh	Total Cost Ksh	KM driven	Averag fuel c l/100k	Cost /Km Ksh
50	TROOPER KXC 481	68,759.85	13,783.60	57,070.90		5,062.50	144,676.85	21,240	15.01	6.81
51	SUBARU KDW 441	33,205.25	1,360.35	28,434.55	3,500	1,505.00	68,005.15	13,685	11.43	4.97
52	SUBARU KDW 442	24,272.50	6,014.65	28,105.40	3,500	1,575.00	63,467.55	14,488	11.27	4.38
53	SUBARU KDW 443	21,392.10	1,580.30	19,767.40	3,500	700.00	46,939.80	9,898	11.30	4.74
54	SUBARU KDW 446	11,917.95	5,211.35	36,823.85	3,500	840.00	58,293.15	18,517	11.02	3.15
55	SUBARU KDW 447	69,443.55	3,590.95	51,822.85	3,500	1,470.00	129,827.35	26,331	10.97	4.93
56	SUBARU KDW 448	29,381.15	4,033.20	49,100.30	3,500	2,213.75	88,228.40	24,197	11.30	3.65
57	SUBARU KDW 449	28,410.25	10,971.20	37,197.55	3,500	1,898.75	81,977.75	19,989	10.17	4.10
SUBARU TOTALS		218,022.75	32,762.00	251,251.90	24,500	10,202.50	536,739.15	127,105	11.02	4.22
58	ISUZU NKR KXX 581	1,449.80	18,961.60	25,502.35		910.00	46,823.75	12,340	15.80	3.79
59	ISUZU NKR KAC 557R	2,806.70		11,623.20	7,291	315.00	22,035.90	4,954	15.50	4.45
60	SISU LORRY KUA 782	142,466.05	31,345.80	105,054.50	5,320	7,035.00	291,221.35	23,337	31.22	12.48
61	SISU LORRY KDV 518	406,520.80	88,582.80	93,113.90	5,320	8,102.50	601,640.00	21,421	30.71	28.09
62	SISU LORRY KDV 534	252,856.75	6,808.20	118,903.00	5,320	11,103.75	394,991.70	27,744	30.08	14.24
63	SISU LORRY KDV 540	566,217.85	78,055.35	187,383.20	5,320	15,662.50	852,638.90	34,170	38.31	24.95
64	SISU LORRY KDW 480	40,357.50	45,750.50	186,691.05	5,320	4,795.00	282,914.05	34,326	35.05	8.24
65	SISU LORRY KXY 043	263,883.65	65,516.65	160,541.60	5,320	8,636.25	503,898.15	23,375	42.97	21.56
66	M/B LORRY KDW 439	175,290.30	38,189.05	151,130.85	5,320	7,297.50	377,227.70	27,845	38.52	13.55
LORRY TOTALS		1,847,592.90	354,248.35	1,002,818.10	37,240	62,632.50	3,304,531.85	192,218	35.43	17.19
67	V. TRACTOR KDW 458	45,041.75		117,016.20	1,050	5,267.50	168,375.45			
68	V. TRACTOR KDW 459	45,161.60	82,418.35	171,548.30	1,050	3,867.50	304,045.75			
69	V. TRACTOR KDW 477	80,592.05	20,899.05	104,585.20	1,050	11,425.75	218,552.05			
70	V. TRACTOR KDW 485	55,122.05	85,420.80	114,885.10	1,050	7,787.50	264,265.45			
71	L. EXCAVATOR KUA775	42,524.10	1,100.00	25,661.85	1,050	2,240.00	72,575.95			
72	L. EXCAVATOR KDW432	132,231.85	1,905.15	81,311.45	1,050	8,312.50	224,810.95			
TRACTOR TOTALS		400,673.40	191,743.35	615,008.10	6,300	38,900.75	1,252,625.60			
73	M/B RIG KDV 545	102,594.80		809,797.50	8,400	12,810.00	933,602.30			
74	M/B RIG KDW 451	226,137.65	62,965.65	542,643.25	14,000	14,560.00	860,306.55			
RIG TOTALS		328,732.45	62,965.65	1,352,440.75	22,400	27,370.00	1,793,908.85			
GRAND TOTALS		9,891,338	1,349,256	6,929,876	285,221	468,185	18,923,876	2,319,593		

APPENDIX 3.3 (Cont.) Summary of costs for programme motor bikes 1.1. - 31.12.1992

No.	Motorbike	Spare parts Ksh	Tyres & tubes Ksh	Fuel & lubr. Ksh	Licen. & insur. Ksh	Labour Cost Ksh	Total Cost Ksh
4	SUZUKI KWK 727	10,287.40	673.00	17,975.60	700.00	2,187.50	31,823.50
5	SUZUKI KWK 728				700.00		700.00
6	SUZUKI KWK 730				700.00		700.00
7	SUZUKI KWK 731				700.00		700.00
8	SUZUKI KWX 707	475.60			700.00	280.00	1,455.60
9	SUZUKI KWX 708	19,138.70	1,416.50	21,200.45	700.00	1,540.00	43,995.65
10	SUZUKI KWX 709	11,299.30		7,206.65	700.00	595.00	19,800.95
11	SUZUKI KWX 710	18,267.30		6,680.70	700.00	927.50	26,575.50
12	SUZUKI KWX 711	7,140.00	166.50		700.00	280.00	8,286.50
13	SUZUKI KWX 712				700.00		700.00
14	SUZUKI KWX 713				700.00		700.00
15	SUZUKI KWX 714				700.00		700.00
16	SUZUKI KWX 715	4,950.60		19,981.50	700.00	262.50	25,894.60
17	SUZUKI KKV 778	34,486.80	3,196.50	40,843.95	700.00	2,065.00	81,292.25
18	SUZUKI KKV 779	59,646.00	3,450.70	19,756.30	700.00	2,267.50	85,820.50
19	SUZUKI KKV 780	7,891.55		15,239.55	700.00	1,015.00	24,846.10
20	SUZUKI KKV 781	4,335.00			700.00	245.00	5,280.00
21	SUZUKI KKV 782	4,150.00	680.00	10,001.15	700.00	770.00	16,301.15
22	SUZUKI KKV 783	17,959.97	1,440.00	18,713.70	700.00	1,004.50	39,818.17
23	SUZUKI KKV 787	12,850.55	1,946.50	15,108.55	700.00	997.50	31,603.10
24	SUZUKI KKV 788	8,800.00		5,832.10	700.00	927.50	16,259.60
25	SUZUKI KKV 789	12,971.40	1,780.00	4,771.50	700.00	1,680.00	21,902.90
26	SUZUKI KKV 790	18,705.30	3,363.00	38,035.40	700.00	1,872.50	62,676.20
27	SUZUKI KKV 791	34,552.25	1,859.50	51,705.80	700.00	2,450.00	91,267.55
28	SUZUKI KKV 792	10,501.30	1,440.00	28,527.30	700.00	980.00	42,148.60
29	SUZUKI KAA 729E	36,874.05		5,423.15	700.00	1,435.00	44,432.20
30	SUZUKI KAA 730E	15,551.65	1,590.00	17,006.55	700.00	1,592.50	36,440.70
31	SUZUKI KAA 762E	28,644.10	506.50	13,685.50	700.00	2,537.50	46,073.60
32	SUZUKI KAA 763E	21,350.20	1,763.60	20,309.45	700.00	1,636.25	45,759.50
33	SUZUKI KAA 764E	28,039.65	2,460.00	13,341.20	700.00	1,347.50	45,888.35
34	SUZUKI KAA 765E	16,671.60	2,443.60	22,691.90	700.00	1,495.00	44,002.10
35	SUZUKI KAA 767E	21,814.65	2,453.00	16,514.55	700.00	1,645.00	43,127.20
36	SUZUKI KAA 768E	27,225.80	1,780.00	11,029.65	700.00	1,522.50	42,257.95
37	SUZUKI KAA 789F	37,836.55	2,743.00	14,349.50	700.00	1,461.25	57,090.30
38	SUZUKI KAA 714X	15,784.50	4,026.60	45,918.40	700.00	1,680.00	68,109.50
39	SUZUKI KAA 715X	17,815.05	3,116.50	21,737.70	700.00	1,732.50	45,101.75
40	SUZUKI KAA 716X	20,382.30		8,147.90	700.00	1,067.50	30,297.70
41	SUZUKI KAA 717X	31,782.10	2,260.70	21,365.15	700.00	1,750.00	57,857.95
42	SUZUKI KAA 718X	26,777.55	4,620.10	25,853.35	700.00	2,047.50	59,998.50
43	SUZUKI KAA 719X	14,398.15	1,606.50	43,752.10	700.00	1,120.00	61,576.75
44	SUZUKI KAA 720X	37,310.85	1,400.00	9,675.45	700.00	918.75	50,005.05
45	SUZUKI KAA 721X	29,096.85	3,196.50	17,330.00	700.00	2,870.00	53,193.35
46	SUZUKI KAA 722X	15,651.30	2,856.50	8,476.90	700.00	577.50	28,262.20
47	SUZUKI KAA 723X	22,893.95	1,440.00	13,852.30	700.00	577.50	39,463.75
48	SUZUKI KAC 768N	2,232.30		3,578.20	1,473.60	52.50	7,336.60
49	SUZUKI KAC 769N			4,992.55	1,473.60	210.00	6,676.15
50	SUZUKI KAC 770N	5,253.80	157.10	7,331.05	1,473.60	105.00	14,320.55
51	SUZUKI KAC 771N			7,698.60	1,473.60	122.50	9,294.70
52	SUZUKI KAC 772N	300.00		11,184.45	1,473.60	52.50	13,010.55
53	SUZUKI KAC 773N			5,979.80	1,473.60	175.00	7,628.40
54	SUZUKI KAC 774N	3,930.55		6,082.30	1,473.60	455.00	11,941.45
55	SUZUKI KAC 775N	1,872.90		9,125.40	1,473.60	297.50	12,769.40
56	SUZUKI KAC 776N			6,508.15	1,473.60	350.00	8,331.75
57	SUZUKI KAC 778N	3.30		6,194.25	1,473.60	140.00	7,811.15
	TOTAL	777,902.72	61,832.40	740,715.65	45,536.00	53,320.75	1,679,307.52

APPENDIX 3.4 Vehicle list 31.12.92

Private vehicles

No.	Make	Reg.No.	C.C.	Year of Manufacture
01.	LAND ROVER	KDW 414	2,499	1985
02.	SUBARU	KDW 441	1,725	1989
03.	SUBARU	KDW 442	1,725	1989
04.	SUBARU	KDW 443	1,725	1989
05.	SUBARU	KDW 446	1,725	1989
06.	SUBARU	KDW 447	1,725	1989
07.	SUBARU	KDW 448	1,725	1989
08.	SUBARU	KDW 449	1,725	1989
09.	LAND ROVER	KDW 424	2,455	1989
10.	LAND ROVER	KDW 426	2,500	1989
11.	LAND ROVER	KDW 462	2,500	1989
12.	LAND ROVER	KDW 463	2,500	1989
13.	LAND ROVER	KDW 464	2,500	1989
14.	LAND ROVER	KDW 465	2,500	1989
15.	LAND ROVER	KDW 466	2,500	1989
16.	LAND ROVER	KDW 471	2,500	1989
17.	LAND ROVER	KDW 472	2,500	1989
18.	LAND ROVER	KDW 474	2,500	1989
19.	LAND ROVER	KDW 479	2,500	1989
20.	LAND ROVER	KXU 127	2,500	1986
21.	LAND ROVER	KXU 129	2,500	1986
22.	LAND ROVER	KXU 130	2,500	1986
23.	LAND ROVER	KXU 139	2,500	1986
24.	LAND ROVER	KYG 689	2,500	1986
25.	LAND ROVER	KYG 692	2,500	1986
26.	LAND ROVER	KYG 697	2,500	1986
27.	LAND ROVER	KAC 133P	2,500	1992

Commercial vehicles

No.	MAKE	REG. No.	C.C.	YEAR OF MANUFACTURE
01.	SISU LORRY	KUA 782	6,540	1981
02.	SISU LORRY	KDV 518	6,600	1982
03.	SISU LORRY	KDV 534	6,600	1984
04.	SISU LORRY	KDV 540	6,600	1984
05.	M/BENZ RIG	KDV 545	18,273	1972
06.	M/BENZ LORRY	KDW 439	5,675	1989
07.	M/BENZ RIG	KDW 451	14,618	1988
08.	LAND ROVER	KDW 461	2,500	1989
09.	LAND ROVER	KDW 467	2,500	1989
10.	LAND ROVER	KDW 468	2,500	1989
11.	LAND ROVER	KDW 469	2,500	1989
12.	LAND ROVER	KDW 470	2,500	1989

APPENDIX 3.4 (Cont.) Vehicle list 31.12.92

Commercial vehicles (Cont.)

No.	MAKE	REG. No.	C.C.	YEAR OF MANUFACTURE
13.	LAND ROVER	KDW 473	2,500	1989
14.	LAND ROVER	KDW 475	2,500	1989
15.	LAND ROVER	KDW 478	2,500	1989
16.	LAND ROVER	KXU 132	2,500	1986
17.	LAND ROVER	KXU 133	2,500	1986
18.	LAND ROVER	KAC 148P	2,500	1992
19.	LAND ROVER	KAC 149P	2,500	1992
20.	LAND ROVER	KAC 151P	2,500	1992
21.	LAND ROVER	KAC 152P	2,500	1992
22.	SISU LORRY	KDW 480	12,200	1989
23.	ISUZU LORRY 3.6	KAC 557R	3,636	1992
24.	SISU LORRY	KXY 043	6,600	1986
25.	LANNEN EXCAVATOR	KUA 775	4,400	1981
26.	LANNEN EXCAVATOR	KDW 432	4,400	1989
27.	VALMET TRACTOR	KDW 458	4,400	1989
28.	VALMET TRACTOR	KDW 459	4,400	1989
29.	VALMET TRACTOR	KDW 477	4,400	1989
30.	VALMET TRACTOR	KDW 485	4,400	1989
31.	TANK TRAILER	ZA 7942	-	1982
32.	TANK TRAILER	ZA 9255	-	1984
33.	TRAILER	ZA 7943	-	1982
34.	TRAILER	ZB 1294	-	1988
35.	TRAILER	ZB 1297	-	1988
36.	TRAILER	ZB 1298	-	1988
37.	TRAILER	ZB 1299	-	1988
38.	TRAILER	ZB 2229	-	1989
39.	TRAILER	ZB 2254	-	1989
40.	TRAILER	ZB 2255	-	1989
41.	TRAILER	ZB 2256	-	1989
42.	TRAILER	ZB 2267	-	1989
43.	HOLMAN COMP.	ZB 3603	-	1992
44.	TEST PUMPING UNIT (TRAILER)	ZB 3604	-	1992

APPENDIX 3.4 (Cont.) Vehicle list 31.12.92

Motor cycles

No.	MAKE	REG.No.	C.C.	YEAR OF MANUFACTURE
01.	SUZUKI	KWK 727	124	1984
02.	SUZUKI	KWX 708	125	1985
03.	SUZUKI	KWX 709	125	1985
04.	SUZUKI	KWX 710	125	1985
05.	SUZUKI	KWX 711	125	1985
06.	SUZUKI	KWX 715	125	1985
07.	SUZUKI	KXV 779	125	1986
08.	SUZUKI	KXV 780	125	1986
09.	SUZUKI	KXV 781	125	1986
10.	SUZUKI	KXV 782	125	1986
11.	SUZUKI	KXV 783	125	1986
12.	SUZUKI	KXV 787	125	1986
13.	SUZUKI	KXV 788	125	1986
14.	SUZUKI	KXV 789	125	1986
15.	SUZUKI	KXV 790	125	1986
16.	SUZUKI	KXV 791	125	1986
17.	SUZUKI	KXV 792	125	1986
18.	SUZUKI	KAA 729E	125	1989
19.	SUZUKI	KAA 730E	125	1989
20.	SUZUKI	KAA 762E	125	1989
21.	SUZUKI	KAA 764E	125	1989
22.	SUZUKI	KAA 765E	125	1989
23.	SUZUKI	KAA 767E	125	1989
24.	SUZUKI	KAA 768E	125	1989
25.	SUZUKI	KAA 769F	125	1989
26.	SUZUKI	KAA 714X	125	1990
27.	SUZUKI	KAA 715X	125	1990
28.	SUZUKI	KAA 716X	125	1990
29.	SUZUKI	KAA 717X	125	1990
30.	SUZUKI	KAA 718X	125	1990
31.	SUZUKI	KAA 719X	125	1990
32.	SUZUKI	KAA 720X	125	1990
33.	SUZUKI	KAA 721X	125	1990
34.	SUZUKI	KAA 722X	125	1990
35.	SUZUKI	KAA 723X	125	1990
36.	SUZUKI	KAC 768N	125	1992
37.	SUZUKI	KAC 769N	125	1992
38.	SUZUKI	KAC 770N	125	1992
39.	SUZUKI	KAC 771N	125	1992
40.	SUZUKI	KAC 772N	125	1992
41.	SUZUKI	KAC 773N	125	1992
42.	SUZUKI	KAC 775N	125	1992
43.	SUZUKI	KAC 776N	125	1992
44.	SUZUKI	KAC 778N	125	1992

APPENDIX 4.1 Hand pump repairs and cost recovery (1989-1992)

ACTIVITY DISTRICT	KAKAMEGA	BUNGOMA	BUSIA	SIAYA	TOTAL
H.P.REP. AF76	166	86	125	124	401
H.P.REP. MKII	232	223	340	227	1022
H.P.REP. AF85	153	44	35	21	253
H.P.REP. AFRIDEV	98	48	113	51	310
H.P.REP. INVOICED (KSH)	178284.80	74308.00	115742.00	61048.00	429,382.90
H.P.REP. PAID (KSH)	127911.60	39234.90	73159.50	40498.00	280,804.00
% PAID FOR REPAIRS	72%	53%	63%	66%	65%

APPENDIX 4.2 List for operation and maintenance manuals for piped water supply systems

NO	DISTRICT	NAME OF WATER SUPPLY	INST.CAP.m ³ /d	PAGES
1. KA-01	KAKAMEGA	Butere Water Supply	240	75
2. KA-03	- " -	Eregi Teachers College W/S	310	85
3. KA-04	- " -	Mumias Water Treatment Plant	1440	255
4. KA-04	- " -	Mumias Hospital Water Supply	150	28
5. KA-05	- " -	Maturu Luandeti Water Supply	336	120
6. KA-07	- " -	Kakamega Water Treatment Plant	7000	462
7. KA-08	- " -	Malava Water Supply	330	160
8. KA-13	- " -	Mukumu Water Supply	192	95
9. KA-14	- " -	Navakholo Water Supply	550	140
10. KA-15	- " -	Ingotse Sec. School W/S	96	31
11. VI-02	VIHIGA	Kaimosi Water Treatment Plant	1440	220
12. VI-03	- " -	Maseno Water Treatment Plant	1800	260
13. VI-04	- " -	Hamisi	135	85
14. BN-01	BUNGOMA	Chesikaki Water Treatment Plant	2000	180
15. BN-02	- " -	Chewele	110	140
16. BN-07	- " -	Webuye Water Treatment Plant	2880	260
17. BN-03	- " -	Kabuchai	110	245
18. BN-11	- " -	Bungoma Hospital/Kibabi W/S	220	80
19. BN-26	- " -	Bokoli Kibichori	24	32
20. -	- " -	Sang'alo College Water Supply	100	180
21. -	- " -	Mabanga F.T.C. Water Supply	70	85
22. BS-01	BUSIA	Butula Muandas Water Supply	336	110
23. BS-02	- " -	Nambale Water Supply	380	180
24. BS-03	- " -	Funyula Nangina Water Supply	280	85
25. BS-04	- " -	Sio Port Water Supply	75	110
26. BS-05	- " -	Busia Mundika Water Treatment Pla.	2900	65
27. BS-08	- " -	Busia Town Water Supply	1152	285
28. BS-24	- " -	Bumala "B" Water Supply	50	155
29. SI-01	SLAYA	Ukwala Water Supply	384	35
30. SI-02	- " -	Sega Water Supply	194	140
31. SI-03	- " -	Ugunja Water Supply	200	75
32. SI-04	- " -	Sira Nyawita	100	70

APPENDIX 4.3 Water supplies and water treatment plants

NAME OF SUPPLY	W/S CODE	SOU.	MAIN.AG EN.	AREA SER. KM ²	POP. SER.	INST. CAP. M ³ /DAY	REMARKS
MUNANA	BS-14	RIVER	MOWD	10	3500	168	-
AMAGORO	BS-18	RIVER	MOWD	0.4	900	14.4	-
BUTULA	BS-01	BH	MOWD	6	1800	300	REHAB.
LUGULU	BS-29	SP	INST.	2.5	900	192	-
BUKHALALIRE	BS-16	SP	INST.	2.5	1300	72	-
BUKHUYI	BS-31	SP	INST.	4.0	1500	120	-
KHUNYANGU	BS-26	RIVER	MOH	2.0	500	180	REHAB.
BUMALA'B/H/C	BS-30	BH	MOH	1.0	600	144	CONST.
PORT VICTORIA	BS-09	LAKE	MOWD	30	5000	396	-
OSIEKO	SI-07	LAKE	MOWD	2.0	600	158	-
KHAINGA	BS-35	RIVER	MOH	1.5	600	144	NOT OPER.
NAMBALE	BS-02	BH	MOWD	5.0	2500	324	REHAB.
MATAYOS H/C	BS-38	BH	-	0.5	650	36	CONST.
KISOKO	BS-28	SP	INST.	1.5	1000	180	-
KHASOKO	BN-18	RIVER	INST.	4.0	2000	-	-
CHWELE	BN-02	BH	MOWD	0.5	2800	53	REHAB.
OLD KIBICHORI	BN-15	RIVER	MOWD	40	40000	576	-
NAMWELA	BN-06	SP	COM.	-	1000	-	-
KUTERE KAPSAKULE	BN-05	SP	COM.	-	1600	-	-
NALONDO	BN-20	SP	COM.	-	300	-	-
MALABA BORDER	BN-24	BH	INST.	-	700	-	-
KABOYWO	BN-22	SP	COM.	-	5000	-	-
FUNYULA NAGINA	BS-03	SP	MOWD	4.0	10000	360	REHAB.
WAKHUNGU	BS-15	RIVER	MOWD	15	5500	216	-
SIO PORT	BS-04	LAKE	MOWD	3	2900	96	-
BUSIA HILLS	BS-11	LAKE	MOWD	50	6000	288	-
SIO PORT H/C	BS-04	BH	COM.	-	-	-	CONST.BY KEFINCO
MALAVA	KA-08	SP	MOWD	1.5	1400	-	REHAB.
SHIKUSA	KA-02	BH	INST.	0.3	3500	-	REHAB.
HAMISI	VI-04	SP	MOWD	6	2000	216	REHAB.
SOSIAN(KIBOSWA)	VI-09	SP	MOWD	18	5000	432	-
VIHIGA	VI-08	SP	MOWD	20	8000	516	-
CHAVAV MAHANGA	VI-07	SP	INST.	-	10000	-	-
LITTLE NZOIA	BN-23	RIVER	MOWD	250	40000	-	-
BUMBO SHAMAKHO-KHO	VI-11	SP	MOWD	-	20000	-	-
SHIBUYE	KA-16	SP	COM.	-	10000	-	-
SHIKUNGA	KA-31	SP	COM.	-	5000	-	-
EBUNAGWE	VI-14	SP	COM.	-	6000	-	-
EREGI	KA-03	BH	INST.	-	3000	-	REHAB.
JEPROK	VI-15	SP	COM.	-	10000	-	-
NAMASOLI	KA-18	SP	COM.	-	3000	-	-
ANGURAI	BS-20	RIVER	INST.	2.0	700	180	-
ABOLOI	BS-32	RIVER	L/AUTH.	1.0	500	180	-

APPENDIX 4.3 (Cont.) Water supplies and water treatment plants

NAME OF W/S	W/S CODE	SOU.	MAIN. AGEN.	AREA SER.	POP. SER.	INST CAP. M ³ /DAY	REMA.
KOTUR	BS-40	SP	L/AUTH.	1.0	200	180	-
MODING	BS-34	SP	L/AUTH.	1.5	500	180	REHAB.
KOLANYA	BS-33	BH	INST.	2.5	1000	72	-
KOCHOLIA S.	BS-27	SP	INST.INS	1.0	900	12	-
SC.AMUKURA H. SC.	BS-22	SP	T.	1.0	1500	180	-
AMUKURA W/S	BS-22	SP	L/AUTH.	2.0	1400	180	-
BISHOP SULUMETI	BS-23	SP	INST.	1.5	500	180	-
ALUPE	BS-13	DAM	KEFRI/ KEMRI	2.0	2000	240	-
LUKOLIS	BS-24	RIVER	L/AUTH.	1.0	1000	192	-
APEGEI	BS-19	SP	L/AUTH.	1.0	1000	192	-
OUYUNYUR	BS-37	SP	COM.	2.5	1500	120	-
CHAKOL	BS-12	SP	INST.	1.0	1500	120	-
BUTERE	KA-01	BH	MOWD	1.5	5000	192	REHAB.
NAVAKHOLO	KA-26	BH	COM.	2.5	12000	980	CONST.
KHWISERO	KA-27	SP	COM.	4.2	4800	4.2	REHAB.
BUSIA BOREHOLE	BS-42	BH	MOWD	-	-	-	CONST.
KEVEYE	VI-18	BH	INST.	-	-	-	CONST.
MATURU LUANDETI	KA-29	SP	COM.	4.0	4,400	236	CONST.
KABUCHAI	BN-29	SP	COM.	2.0	2,000	80	REHAB.
UGUNJA	SI-03	BH	MOWD	4.0	2,500	330	CONST.
UKWALA	SI-01	BH	MOWD	-	-	-	CONST.
SIRA NYAWITA	SI-04	BH	COM.	1.0	850	105	CONST.
MUCHI MILO	BN-30	BH	MOWD	-	-	-	CONST.
LIKUYANI	KA-28	BH	INST.	1.0	340	17	CONST.
KIBABII	BN-31	BH	MOWD	-	-	-	CONST.
MUKUMU COMPLEX	KA-30	BH	NWCPC	2.0	3,500	362	CONST.
SIGOMERE	SI-05	BH	COM.	14	4,200	262	CONST.
BUSIA PRISON B/H		BH	MOWD.	1.4	-	192	CONST.
AMUKURA	BS-07	BH	MOWD	15	5,200	300	-
BUNGOMA MATISI	BN-27	RIVER	NWCPC	127.5	67000	6000	REHAB.
NDIVI NAKUSELWA	BN-16	RIVER	MOWD	264	67000	2880	-
WEBUYE	BN-07	RIVER	MOWD	10	67000	5952	-
NZOLA SUGAR BUSIA	BN-19	RIVER	INST.	-	30000	4800	REHAB.
MUNDIKA	BS-05	RIVER	MOWD	192	1500	1920	-
FUNYULA BUMALA	BS-39	RIVER	MOWD	155	35000	1800	REHAB.
KAIMOSI	VI-02	DAM	MOWD	40	27700	816	-
MASENO	VI-03	RIVER	MOWD	38	23000	1584	REHAB.
SHITOLI	KA-12	RIVER	NWCPC	60	50000	2040	REHAB.
KAKAMEGA	KA-07	RIVER	NWCPC	3	55000	4848	REHAB.
MUMIAS	KA-04	RIVER	MOWD	10	72000	-	REHAB.
LUMAKANDA	KA-20	RIVER	MOWD	3	34000	-	-
BUKURU	KA-19	DAM	INST.	2	2000	-	-
MBALE	VI-01	RIVER	-	50	2100	-	-
MUMIAS NUCLEAR	KA-25	RIVER	INST.	25	40000	-	-
MALINDI SIRULO	VI-13	RIVER	MOWD	-	8000	-	-
KIBICHORI	BN-26	RIVER	MOWD	-	18000	-	-

APPENDIX 4.4 Rehabilitation of piped water supplies

NAME	AREA SERVED	CAPACITY	WORK DONE
LOCATION	POPULATION	STORAGE	
1. Malava W/S	1.5km ² 5,000	9m ³ /h 12m ²	<ul style="list-style-type: none"> - Installation of generators - Installation of 2 No. highlift pump - Laying of new rising main. - Repairing the protected springs. - Building new staff quarters. - Fencing the compound. - Installing meters - Electrical wiring in the pump house - Erection of 10m³ elevated tank
2. Hamisi W/S Banja		135m ³ /d	<ul style="list-style-type: none"> - Spring protection. - Building clear water sump. - Installation of 2 No. high lift pumps. - Erection of 30m³ elevated tank - Fencing the pump house compound. - Laying new risin main. - Installation of master meter. - Installation of automatic control.
3. Funyula - Nangina	50km ²	280m ³ /d	<ul style="list-style-type: none"> - Construction of masonry tank. - Building clear water sump. - Installation of 2 No. highlift pumps. - Building of pump house. - Spring protection. - Fencing the compound. - Laying of rising and distribution mains. - Electrification of system. - Installation of chlorination tanks. - Building of staff quarters.
4. Mukumu Complex W.Idakho	0.5km ² 1,000	8m ³ /h	<ul style="list-style-type: none"> - Installation of borehole pump - Building of valve chambers. - Installation of borehole water level protection device - Repair of electrical switch board.
5. Shikusa W/S	0.3km ² 1,000	8m ³ /h 113	<ul style="list-style-type: none"> - Overhauled the engine - Installed new borehole pump and electrical panel. - Installed new generator set

APPENDIX 4.4 (Cont.) Rehabilitation of piped water supplies

6. Eregi W/S		1.0km ² 3,000		<ul style="list-style-type: none"> - Building 100m³ masonry tank. - Installation of borehole pumps. - Repair of distribution main. - Installation of inspection ladder.
7. Nambale		5.0km ² 4,700	150m ³ /d 115m ³	<ul style="list-style-type: none"> - Electrification of the system. - Installation of borehole pump (2 No.) - Repair of tanks (2 No.) - Installation of electrical panel - Fencing the compound - Installation of meters
8. Kabuchai W/S Nalondo		2.2km ²	110m ³ /d	<ul style="list-style-type: none"> - Installed Generator - Installed new submersible pump - Building clear water sump. - Repaired elevated tank.
9. Butula W/S		6.0km ²	140m ³	<ul style="list-style-type: none"> - Replace electrical feeder cable for submersible pump.
10. C.Marachi W/S		1,800	100m ³	<ul style="list-style-type: none"> - Installed one submersible pump - Laying Raising Main for 2nd Borehole. - Building of chambers.
10. Port Victoria W/S		30Km ² 2,800	150m ³ /d 150m ³	<ul style="list-style-type: none"> - Installed steel door and window grills. - Modification of electrical wiring. - Installed new electrical panel. - Servicing and installation of generator set.
11. Sio Port W/S		2Km ²	75m ³ /d 75m ³	<ul style="list-style-type: none"> - Lister engine overhauled. - Installed submersible pump. - Installed switchboard.
12. Chwele		2.5Km ²	110m ³ /d	<ul style="list-style-type: none"> - Installed submersible pumps. - Repaired masonry tank. - Building of valve chamber. - Repaired solar panels.
13. Bokoli H/C W/S		1.0Km ² 500	7m ³ /h	<ul style="list-style-type: none"> - Repair of solar system.
14. Segal W/S		5.0Km ² 3,000	194m ³ /d	<ul style="list-style-type: none"> - Repair borehole.

APPENDIX 4.4 (Cont.) Rehabilitation of piped water supplies

NAME	AREA SERVED	CAPACITY	WORK DONE
LOCATION	POPULATION	STORAGE	
15. Ukwala W/S	1.2Km ²	348m ³ /d	- Repair borehole.
16. Khwisero W/S	1 Km ²		- Installed new highlift. - Installed diesel engine. - Repaired elevated tank. - Laying of new rising and distribution mains.
17. Butere		240m ³ /d	- Repair of elevated tank. - Installed submersible pumps. - Laying new rising and distribution mains.
18. Ugunja		200m ³ /d	- Installed submersible pump. - Build one new tank and renovated 2 old tanks. - electrification of system. - Installed switchboard. - laying new rising main and distribution mains.
19. Munana Water Supply	10 Km ² 3,500	40m ³ /d 100m ³	Serviced
20. Wakhungu Water Supply	15km ² 5,500	100m ³ /d 200m ³	Overhauled the Engine

APPENDIX 4.5 Rehabilitation of water treatment plants

NAME LOCATION	AREA POPULATION	CAPACITY STORAGE	WORK DONE
1) Kaka.WTP W.Isukha	28km ² 72,000	202m ³ /h 1800	<ul style="list-style-type: none"> - Rehabilitation of elevated tank (backwash) - Installation of ducts to electrical power house. - Replacement of water meter and pressure gauge. - Rehabilitation of storage tanks at Milimani tank. - Installation of lowlift pumps. - Installation of Struja pumps. - Building new chemical house. - building additional full Treatment Plant. - Construction of shade on coagulation basin. - Laying new rising main. - Installation of high lift pumps. - Rehabilitation of filters. - Installation of flocculators.
2) Mumias WTP C.Wanga	10km ² 34,000	60m ³ /h 530m ³	<ul style="list-style-type: none"> - Rehabilitation of coagulation basin - Fixing of lamps and security light in the pump house. - Repair of leakages on clear water sump and drainage system. - Installation of high lift pumps. - Laying new rising main. - Installation of master meter. - Building of valve chambers.
2) Mumias WTP C.Wanga			<ul style="list-style-type: none"> - Installation of compressors - Installation of chemical pump - Servicing of valve. - Rehabilitation of filters
3) Maseno WTP S.Bunyore	38 40,000	70m ³ /h 1900m ³	<ul style="list-style-type: none"> - Rehabilitation of filters. - Installation of new high lift pump. - Repair of Struja - Modification of piping in the high lift pump. - Repair of backwash pumps
4) Kaimosi Shamakhokho	40km ² 23,000	60m ³ /h 466m ³	<ul style="list-style-type: none"> - Installation of new high lift pump. - Laying new rising main. - Installation of master meter. - Repair of masonry tank - Building shade for solution tank. - Murraming feeder road in the treatment compound. - Modification of piping in the treatment works compound. - Servicing of valves. - Renovation of office cum store. - Fencing the compound. - Installation of hand rails on filters. - Installation of steel doors and window grills. - Installation of F.R.O. dosers and solution tank.

APPENDIX 4.5 (Cont.) Rehabilitation of water treatment plants

5) Shitoli WTP E.Isukha	60km ² 55,000	85m ³ /h 925m ³	<ul style="list-style-type: none"> - Rehabilitation of filters. - Rehabilitation of electrical panel. - Installation of steel doors and window grills.
6) Webuye	27km ² 30,000		<ul style="list-style-type: none"> - Renovation of pump house. - Rehabilitation of filter. - Installation of compressor. - Building chlorination room. - Repair of Struja. - Installation of new high lift pumps. - Building of chambers. - Painting pump house, treatment plant. - Installation of master meter. - Installation of steel doors and window grill.
7) Chesikaki Cheptais	115km ² 23,000	117m ³ /h 610m ³	<ul style="list-style-type: none"> - Serviced air valves. - Repair and servicing of backwash engines and pumps. - Installation of meters. - Rehabilitation of filters (2 No.) - Building of valve chambers. - Replacement of master meter.
8) Bungoma	13km ²	113m ³ /h	<ul style="list-style-type: none"> - Rehabilitation of lowlift pumping station. - Installation of new electrical panel. - Installation of automatic level control. - Modification of electrical works at intake pumping station and chemical pumping station switch board. - Installation of 3 No. chemical dosing pumps. - Repair and installation of chemical mixers. - Installation of flocculation.
9) Busia Mundika		120m ³ /h	<ul style="list-style-type: none"> - Rehabilitation of 3 No. filters. - Installation of 3 No. low lift pump. - Painting of low lift pump house. - Installation of raw water master meter. - Installation of steel doors and window grills. - Installation of 2 No. compressor. - Laying new rising main. - Installation of clear water master meter. - Painting high lift pump house. - Building of chambers. - Installation of dosers (F.R.V) - Modification of chemical pipings - Servicing of valves. - Installation of hand rails on sedimentation basin. - Installation of level gauge on back-wash tank.

APPENDIX 5.1 Locational leaders seminar (Jan 1989 - Dec 1992)

District	Location	Venue	No.of Part.	Date
Kakamega	N.Marama			
"	N.Idakho	Bukura FTC	30	1-3/3/89
"	S.Kabras	Shamberere Sch	22	19-21/4/89
"	C.Kabras	Tande Sch.	22	5-7/6/89
"	C.Marama	Mutoma P.Sch.	44	7-9/6/89
"	S.E.Marama	Shiatsala Chr.	50	28-30/6/89
"	Chevaywa	Matete S.A.Chr	45	19-21/7/89
"	N.Marama	Lunza P.Sch.	64	20-22/9/89
Busia	E.Bunyala	Sirimba Mission	33	25-27/10/89
"	S.Bunyala	Makunda Sec.Sch	47	6-8/12/89
Kakamega	W.Kabras	Malava G.H.	39	14-16/12/89
Busia	W.Bukhayo	Matayo H.Centre	51	10-12/1/90
"	N.Teso	Moding H.Centre	40	17-19/1/90
Bungoma	N.Bukusu	Nalondo H.C.	37	14-16/2/90
Kakamega	E.Isukha	Shamberere S.S.	40	21-23/2/90
Bungoma	Sirisia	Sirisia Y.P.Tec	37	7/9/3/90
Kakamega	N.Butso	Ingotse S.S.	45	14-10/3/90
Bungoma	Namubira	Namubira Mkt	62	3-5/4/90
Kakamega	S.Butso	Eshisiru S.S.	42	18-20/4/90
Bungoma	Lwandanyi	Lwandanyi S.S:	52	8-11/5/90
Siaya	S.Ugenya	Simenya Chr.	52	22-26/5/90
Bungoma	Malakisi	Butonge CPK Chr	50	5-8/6/90
Busia	C.Marachi	Bukhalalire S.S	45	10-13/7/90
Kakamega	W.Wanga	Koyonzo P.Sch.	35	6-10/8/90
Busia	W.Teso	Chakol G.H.Sch	36	21-24/8/90
Kakamega	N.Wanga	Matungu P.Sch.	36	4-7/9/90
Busia	N.Samia	Nangina Mission	47	18-21/9/90
Kakamega	N.Idakho	Isulu Luth.Chr.	49	2-5/10/90
"	S.Wanga	Bukaya Sec.Sch.	45	6-9/11/90
Bungoma	Bumula	Mabusi P.Sch.	46	20-23/11/90
"	Musikoma	Samuya P.Sch.	44	4-7/12/90
Kakamega	N.Marama	Lunza Sec.Sch.	60	18-21/12/90
Busia	C.Marachi	Bukhalalire S.S	45	10-13/7/90
Kakamega	W.Wanga	Koyonzo P.Sch.	35	6-10/8/90
Busia	W.Teso	Chakol H.Sch.	36	21-24/8/90
Kakamega	N.Wanga	Matungu P.Sch.	36	4-7/9/90
Busia	N.Samia	Nangina Mission	47	18-21/9/90
Kakamega	N.Idakho	Isulu Luth.Chr.	49	2-5/10/90
"	S.Wanga	Bukaya Sec.Sch.	45	6-9/11/90

APPENDIX 5.1 (Cont.) Locational leaders training

Bungoma	Bumula	Mabusi P.Sch.	46	20-23/11/90
"	Musikoma	Samuya P.Sch.	44	4-7/12/90
Kakamega	N.Marama	Lunza Sec.Sch.	60	18-21/12/90
Busia	E.Teso	Amagoro Y.Poly	65	12-15/2/91
Bungoma	Chwele	Busakala S.Sch.	40	26/2-1/3/91
"	Cheptais	Cheptais S.A.Ch	53	19-22/3/11 9-
Siaya	N.Ugenya	Kagonya P.Sch.	45	12/3/91
Kakamega	Bunyala	Navakholo H.C.	53	29/4-3/5/91
Busia	W.Marachi	Bukinda P.Sch	52	28-31/5/91
Bungoma	Kopsiro	Kopsiro Y.Poly	42	18-21/6/91
"	Sirisia	Namwela	50	27-30/8/91
"	S.Bukusu	Kabula Y Poly	55	26-29/11/91
Siaya	Uholo	Sigomere	54	9-13/12/91
"	E.Ugenya	Chogo Church	46	19-22/8/92
"	W.Ugenya	Hafumbire Chr.	66	11-19/6/92
		Total	2411	

APPENDIX 5.2 Well committee seminars

District	Location	Venue	Female	Male	Total	No.of Wpts.	Date
Busia	W.Teso	Adungos C.Chr.	4	8	12	4	5-8/9/89
"	W.Bunyala	Port. Victoria C	13	20	33	11	12-15/9/89
"	S.Teso	Amukura Y.Poly	10	17	27	9	16-19/9/89
"	E.Bunyala	Sirimba M.Chr.	14	24	38	13	7-10/11/89
"	Elgo/Kapt	Kabuk C.Chr.	10	26	36	12	11-13/7/89
Kakamega	C.Mumias	Urban C.Hall	10	27	37	13	23-26/1/90
Kakamega	Bunyala	Health Centre	19	20	39	13	20-23/3/90
Bungoma	Chwele	Busakala S.S.	14	40	54	18	24-27/4/90
Kakamega	Chevoywa	Nambirima P.S	11	40	51	17	15-18/5/90
"	E.Isukha	Kambiri Church	18	30	48	16	19-22/6/90
Bungoma	Sirisia	Binyanya P.S.	20	31	51	17	12-15/6/90
Siaya	S.Ugenya	Ambira H.Sch.	18	21	39	13	13-17/8/90
Busia	S.Samia	Nangina H.Sch.	20	31	51	17	27-31/8/90
"	C.Marachi	Bukhalalire S.	20	26	46	15	10-14/9/90
"	E.Bukhayo	Igara P.Sch.	20	32	52	17	24-28/9/90
"	S.Samia	Ageng'a FTC	25	25	50	17	16-19/10/"
Kakamega	W.Wanga	Mamboleo	21	20	41	14	23-26/10/"
Bungoma	Kanduyi	Kibabii Church	26	22	48	16	13-16/11/"
"	Kopsiro	Chelebei P.S.	32	25	57	19	27-30/11/"
"	Musikoma	Siritanyi P.S.	20	20	40	13	
"	S.Bukusu	Kabula Poly	13	20	33	11	
"	W.Bukusu	Siboti P.Sch.	16	30	46	15	
Kakamega	N.Marama	Lunza P.Sch.	10	22	32	11	
Busia	W.Bukhayo	Mundika M.	15	15	30	10	
Siaya	W.Ugenya		14	22	36	12	
Kakamega	S.Marama		20	22	42	14	
Busia	S.Teso		22	25	47	16	
Bungoma	Cheptais	Chebkube SA.Ch	24	23	47	16	23-26/7/91
"	W.Bukusu	Kimaiti S.S.	33	24	57	19	24-27/9/91
"	Kapsokwon	Kapsokwony H.S	32	20	52	17	1-4/10/91
Busia	S.Teso		28	21	49	16	
"	N.Teso		27	22	49	16	
"	C.Marachi		17	26	53	18	
"	S.Bunyala		30	25	55	18	
Kakamega	N.Wanga	Msamba Mkt	20	20	40	13	9-12/7/91
"	E.Marama	Muyundi Parish	30	21	51	17	6-9/8/91
Busia	C.Marachi	Kingandole P.S	24	30	54	17	6-9/11/91
Siaya	N.Ugenya	Kagonyo P.Sch.	20	32	52	17	4-7/12/91
"	S.Ugenya	Simenya S.Sch.	19	36	55	18	17-20/12/"
Kakamega	S.Kabras	Kimang'eti P.S	35	15	50	17	19-22/11/"
"	C.Marama	Ibokolo P.Sch.	30	25	55	18	16-19/12/"
Bungoma	S.Bukusu		20	25	45	15	3-6/13/91

APPENDIX 5.2 (Cont.) Well committee seminars

Location	Date	Venue	Female	Males	Total	No. of Wpts.
E.Wanga	7-10/4/92	Bumini P.S.	20	29	49	17
Bunyala A	13-16/4/92	Shamoli P.S.	26	22	48	16
Bunyala A	19-22/5/92	Navakholo HC	31	21	52	18
Musikoma	7-10/4/92	Samoya P.S.	40	29	69	23
Kanduyi	13-16/4/92	Kanduyi CTC	45	20	65	17
N.Bukusu	12-15/5/92	Mukhueyu P.	45	25	70	24
Uholo	21-24/4/92	Rambula Sch.	16	31	47	16
Uholo	27-30/4/92	Nyasanda Sch	21	29	50	17
W.Ugenya	19-22/5/92	Hafubre Ch	18	32	50	17
W.Ugenya	26-29/5/92	Sirima Ch.	23	27	50	17
E.Ugenya	2-5/6/92	Yogo Ch.	31	19	50	17
E.Marachi	1-4/4/92	Butunyi Sch.	22	31	53	18
S.Teso	21-24/4/92	St.Mary's Amukura	29	59	88	30
C.Bukhayo	12-15/5/92	Kisoko M	24	28	52	18
E.Bukhayo	3-6/6/92	Madende	27	25	52	18
Chevaywa	15-18/5/92	Vihiga P.S.	35	15	50	17
W.Wanga	16-19/6/92	Lunganyiro S	34	24	58	20
N.Marama	23-26/6/92	B.Sec.Sch.	40	15	55	19
N.Bukusu	2-5/6/92	Sirare P.S.	40	19	59	20
Sirisia	9-12/6/92	Sibumba P.S.	26	34	60	20
N.Ugenya	7-10/7/92	Nyalenya S.	20	38	58	19
Sihay	21-24/7/92	Sihay Chr.	26	30	58	19
S.Ugenya	28-31/7/92	Umina Sch.	21	33	54	18
Ukwala	11-14/8/92	Yenga Sch.	18	34	52	17
Uholo	15-18/9/92	Madungu Sch.	20	30	52	17
Sirisia	7-10/7/92	Sibumba Sch.	37	27	54	21
Lwandanyi	4-7/8/92	Korosandet S	37	29	61	22
Bumula	15-18/8/92	Mebuel P.S.	35	25	59	20
Bumula	29/9- 2/10/92	Kimatuni Ch	24	25	50	16
N.Marachi	21-24/7/92	Darira Sch	23	27	50	16
C.Teso	22-25/9/92	Ikapolok S.	29	16	45	15
C.Teso	11-14/8/92	Amagoro Sch.	34	12	46	15
W.Bukhayo	25-28/8/92	Matayo H.C.	18	33	51	16
C.Mumias	21-24/7/92	Chiefs C.	34	23	62	20
E.Isukha	11-14/8/92	Lubao	31	25	56	18
E.Marachi	18-21/8/92	Shianda	39	19	58	19
NE Ugenya	14-16/10"	Got Nanga C.	30	24	54	18
Bumula	29/-2/10"	Kimatuni Ch.	26	14	40	13

APPENDIX 5.2 (Cont.) Well committee seminars

District	Location	Date	Participants			No. of Water Points
			Female	Male	Total	
Kakamega	C.Kabras	11-14/2/92	16	20	36	12
"	W.Kabras	10-13/3/92	17	33	50	17
"	S.Butsotso	16-19/3/92	20	28	48	16
"	N.Idakho	23-26/3/92	16	32	48	16
Bungoma	Malakisi	4-7/2/92	19	21	50	17
"	S.Bukusu	11-14/2/92	27	37	64	21
"	Chwele	10-13/3/92	20	41	61	20
Busia	E.Bukhayo	28-31/1/92	20	35	55	17
"	W.Teso	5-8/2/92	30	17	47	16
"	E.Bunyala	26-29/2/92	30	23	53	17
Siaya	Sihay	4-7/2/92	22	28	50	16
"	Ukwala	3-6/3/92	18	39	57	19
"	Uholo	17-20/3/92	27	29	56	17
TOTAL			2223	2783	4642	1544

APPENDIX 5.3 Film shows

District	Location	Venue	No. of Viewers	Date
Kakamega	E. Wanga	Shianda Market	800	2/2/89
"	E. Wanga	Mwitoti Market	1000	5/2/89
"	N. Idakho	Bukura FTC	36	3/3/89
"	S. Butsotso	Eshisiru Mkt	450	8/3/89
"	"	"	40	20/4/89
"	S. Kabras	Shamberere C.C.	40	20/4/89
"	E. Wanga	Shianda	200	9/5/89
"	C. Marama	Mutuma Sch.	150	9/5/89
Busia	S. Bunyala	Mukhweyo Mkt.	800	8/3/89
"	W. Bunyala	Lugare Market	1000	"
"	"	Maumau	1500	10/3/89
"	"	Trailers Inn	120	14/3/89
"	"	Port Victoria	800	15/3/89
"	"	Bulemia	800	17/3/89
"	"	Sisenya	800	"
Kakamega	Chevaywa	Matete S.A. Chr.	60	19 21/7/89
Busia	W. Teso	Adungosi H.C.	50	8-10/8/89
"	W. Bunyala	Port Victoria C	45	12-15/9/89
Kakamega	N. Marama	Lunza Pr. Sch.	220	20-22/9/89
Busia	S. Teso	Amukura Poly	45	16-19/10/89
"	E. Bunyala	Sirimba M. Ch.	38	25-28/10/89
"	"	- " -	40	7-17/11/89
"	S. Bunyala	Makunda Sec. Sch	55	6-8/12/89
Kakamega	W. Kabras	Malava G.H. Sch	40	14-16/12/89
Bungoma	Kaptama	Kabuk M. Chr	42	11-13/7/89
Busia	W. Bukhayo	Matayos H.C.	76	10-12/1/90
"	N. Teso	Adungos H.C.	55	17-19/1/90
Kakamega	C. Mumias	Urban Coun. Hall	50	23-26/1/90
Bungoma	N. Bukusu	Nalondo Sec. Sch	90	14-16/2/90
Kakamega	E. Isukha	Shamberere S.S.	150	21-23/2/90
Bungoma	Sirisia	Sirisia Y. Poly	50	7-9/3/90
Kakamega	N. Butsotso	Ingotse S. Sch.	330	14-16/3/90
"	Bunyala	Health C. Hall	70	23-26/3/90
Bungoma	Namubira	Namubira Mkt.	70	2-5/4/90
Kakamega	S. Butsotso	Shisiru S.S.	80	18-20/4/90
Bungoma	Chwele	Busakala S.S.	101	24-27/4/90
"	Lwandanyi	Lwandanyi S.S.	-	8-11/5/90
Kakamega	Chevaywa	Nambirima P.S.	58	15-18/5/90
Siaya	S. Ugenya	Simennya S.A.C.	50	22-26/5/90
Bungoma	Malakisi	Butonge CPK Ch.	55	5-8/6/90
Kakamega	E. Isukha	Kambiri C. Chr.	69	19-22/6/90
Bungoma	Sirisia	- " -	120	12-15/6/90
Around	Programme	area total	300	July-Sep. 90
Busia	S. Samia	Agenga FTC	50	17/10/90
Kakamega	N. Idakho	Isulu Church	50	3/10/90
"	S. Wanga	Bukaya S. Sch.	255	7/11/90
Bungoma	Bumula	Nabusi Pr. Sch.	150	21/11/90
"	Musikoma	Samoya P. Sch.	80	5/12/90

APPENDIX 5.3 (Cont.) Film shows

District	Location	Venue	No.of Viewers	Date
Kakamega	N.Marama	Lunza S.Sch.	100	15/12/90
"	S.Wanga	Mumia Church	109	8/12/90
"	"	Bukaya Church	141	8/12/90
"	"	Musanda Market	268	8/12/90
Kakamega	N.Wanga	Bulimbo P.Sch.	140	9/12/90
"	C.Mumias	Elukoye Village	190	- " -
Busia	S.Teso	Unyunyuri P.S.	73	10/12/90
"	"	Kamarinyang	108	- " -
"	N.Samia	Wakhungu P.S.	93	11/12/90
"	"	Buradi P.Sch.	141	- " -
"	"	Luchululo P.Sch.	118	- " -
"	S.Bunyala	Busangwa	65	14/12/90
"	"	Makunda S.Sch.	72	- " -
"	"	Musoma P.Sch.	171	- " -
"	E.Bunyala	Budalangi P.Sch.	50	15/12/90
"	"	Sibuka P.Sch.	93	- " -
"	W.Bukhayo	Matayos H.C.	2000	16/12/90
"	"	Busibwabo Chr.	309	"
"	"	Muturu P.Sch.	225	"
"	W.Marachi	Ikonzo P.Sch.	140	28/12/90
"	"	Bujuma P.Sch.	85	"
"	"	Busiri P.Sch.	125	"
"	C.Bukhayo	Mwirale P.Sch.	180	29/12/90
"	"	Malanga P.Sch.	116	"
"	S. Samia	Sio Port Chr.	260	30/12/90
"	"	Agenga AFCTC	60	"
"	"	Ageng'a FLTC	60	"
Siaya	N.Ugenya	Kagonya P.Sch.	90	12/4/91
Bungoma	Musikoma	Siritanyi P.Sch.	150	
"	S.Bukusu	Kabula Poly	40	
"	Sirisia	Namwela Church	70	30/8/91
"	Cheptais	Chepkube S.A.Chr	120	26/7/91
"	W.Bukusu	Kimaiti Sec.Sch.	230	27/9/91
Busia	N.Teso		49	
"	C.Marachi		53	
Bungoma	S.Bukusu	Kabula Y.Poly	106	16/11/91
"	Kapsokwony	Kapsokwony Y.P.	80	4/10/91
Busia	W.Bukhayo	Mandika Mission	30	
Kakamega	N.Butso	Eburenga Sch.	200	28/1/92
	E.Isukha	Handiti P.Sch.	500	29/1/92
Busia	W.Teso	Asinge Pri.Sch.	213	5/2/92

APPENDIX 5.3 (Cont.) Film shows

District	Venue	Date	Males	Females	Total
Busia	Buyofu Sch.	27/6/92	173	253	416
"	Bunayenga	28/6/92	85	166	521
Bungoma	Busakala Sec	27/5/92	250	150	400
"	Namasanda	20/5/92	300	200	500
"	Samoya Pri	31/2/92	130	170	300
"	Sirare Pri.	2/6/92			89
Kakamega	Shamoni Pri	15/4/92			580
"	Vihiga Pri.	14/5/92			400
"	Bukaya	April	80	120	200
"	Lureko	May	350	250	600
"	Chevaywa Chr.	June	80	220	300
Siaya		June			288
"	Sihay Church	24/7/92	103	212	315
"	Umina P.Sch.	28/7/92	700	400	1105
Busia	Ikapolok	25/9/92	33	21	54
"	Lwavikha Sch.	2/10/92	27	52	77
"	Agenga	9/10/92	80	6	86
"	Lwamikha Sch.	2/10/92	88	58	88
Kakamega	Lubao	14/8/92	50	150	200
Busia	-	2/10/92	52	107	165
"	-	14/10/92	200	185	385
Kakamega	-	18/10/92	112	28	140
Siaya	-	13/11/92	30	20	50
Bungoma	-	18/11/92	200	50	250
				TOTAL	26462

APPENDIX 5.4 Pump/Spring attendants training

District	Location	No.of Sp.Att	No.of P.Att	No of Wpts	Dates Trained
Kakamega	E.Isukha		31	18	16/2-23/2/89
"	N.Wanga		27	18	7/3-20/3/89
"	W.Wanga		15	11	30/3-19/4/89
Busia	E.Bunyala		41	16	25-27/4/89
"	S.Bunyala		31	21	4-9/5/89
"	W.Bunyala		15	11	6-16/5/89
"	E.Bunyala		28	25	9-24/5/89
Kakamega	W.Wanga		37	26	3-17/6/89
"	Bunyala		13	7	13-24/6/89
"	E.Isukha		15	8	19/7-6/8/90
Siaya	Uholo		50	31	10-23/7/90
"	N.W.Ugenya		34	19	19-26/8/90
"	S.Ugenya		23	12	14/7-3/8/90
Bungoma	S.Bukusu		46	25	17-28/10/90
Kakamega	Bunyala	50	-	28	13/11-2/12/90
"	S.Wanga		50	26	13-29/12/90
Busia	C.W.Marachi		44	27	6-22/2/91
"	C.W.Marachi		36	18	17/4-4/5/91
Kakamega	C&N.Marama		43	18	11-28/3/91
"	N.Wanga		50	39	23/4-6/5/91
"	S.Wanga		44	25	13-29/6/91
"	W.Kabras		39	22	21/5-6/6/91
"	S.Kabras		50	29	5-28/6/91
Bungoma	Lwandanyi		24	12	11-27/6/91
Busia	C.Marachi		43	23	26/6-13/7/91
Bungoma	Misikoma		33	18	3-19/7/91
Kakamega	W.Wanga		20	12	26/7-2/8/91
Busia	N.Teso		46	15	29/7-14/8/91
Bungoma	Bumula		45	24	5-20/9/91
Kakamega	C.Kabras		42	19	26/9-15/10/91
Busia	N.Samia		28	11	16-31/11/91
	Sub-total	50	1043	614	

Key: No. Number,
 Sp - Spring,
 Att - Attendant,
 Wpts - Water Points

APPENDIX 5.4 (Cont.) Pump/Spring attendants training

District	Location	No.of Sp Att	No.of P.Att	No.of Wpts	Dates Trained
Busia	W.Teso	-	43	18	6-22/1/92
Bungoma	W.Bukusu	-	46	28	7-24/1/92
Kakamega	C.Mumias	-	45	23	14-31/1/92
Bungoma	Bumula	32	-	15	28-31/1/92
Siaya	W.Ugenya	-	37	20	5-20/2/92
Kakamega	E.Wanga	58	-	31	17-20/2/92
Bungoma	Kanduyi	-	41	22	18/2-6/3/92
Busia	C.Marachi	51	-	30	9-13/3/92
Kakamega	N.Butso	-	44	26	16/3-1/4/92
Busia	C.Marachi	-	45	21	- " -
Siaya	E.Ugenya	-	40	19	- " -
Bungoma	S.Bukusu	-	35	17	17/3-8/4/92
Busia	S.Samia	-	26	15	8-22/4/92
Kakamega	S.Wanga	-	44	25	21/4-6/5/92
Siaya	Sihay	-	52	29	23/4-8/5/92
Bungoma	N.Bukusu	-	41	20	28/4-15/5/92
"	Chwele	-	25	14	13-28/5/92
Siaya	N.Ugenya	-	38	15	14/5-3/6/92
Busia	W.Bukhayo	-	36	13	18/5-5/6/92
"	C.Marachi	-	30	14	19/5-5/6/92
Kakamega	Cheveywa	-	46	29	26/5-11/6/92
Bungoma	N.Bukusu	-	44	21	26/5-12/6/92
"	Malakisi	-	16	8	9/6-26/6/92
Siaya	E.Ugenya	40	-	20	10-16/6/92
Bungoma	Sirisia	-	21	15	21/7-8/8/92
"	Bumula	-	23	16	17/8-7/9/92
"	S.Bukusu	40	-	20	14-18/7/92
"	W.Bukusu	40	-	20	25-28/8/92
Kakamega	S.Marama	-	45	25	30/6-15/7/92
"	N.C.Marama	-	46	22	18/8-2/9/92
Kakamega	N.W.Wanga	-	46	23	22/9-7/10/92
Busia	S.Samia	-	37	20	23/6-9/7/92
Busia	E.Bukhayo	38	-	19	28/9-2/10/92
Siaya	Ukwala	-	50	17	3-19/8/92
Kakamega	S.Bustotso	-	-	-	27/10-11/11/92
"	N.Idakho	-	40	20	17/11-3/12/92
Busia	S.Bunyala	-	27	19	16/11-2/12/92
"	C.Teso	-	39	17	
Total		349	2152	1323	

APPENDIX 5.5 Trainees on attachment to KFWWSP (Jan 1989 - Dec 1992)

College/Institute	No.of Students	No.of Training Months
KEWI - Kenya Institute of Water	282	615
WECO-Western College of App.Science	103	172
KTTI-Kitale Train.Tech. Institute	12	14
Mombasa Polytechnic	3	7
Kenya Polytechnic	18	44
UoN - University of Nairobi	15	41
Keveye	6	8
Kaimosi	5	7
Moi Institute	2	2
Garisa	2	2
Sang'alo	10	16
Shamberere	18	25
Kabete Technical Institute	3	5
Bumbe Tech. Train. Institute	7	13
Kilifi Youth Polytechnic	5	7
RVIST-Rift Valley Inst.of Sci.	7	13
CITC-Christian Industrial Train.Col.	5	4
RIAT-Ramogi Inst.of Adv.Tech.	7	16
KTTI-Kaiboi Tech.Train.Inst.	4	9
Sigalagala Tech.Institute	13	21½
Maseno Youth Polytechnic	5	10
Mumias	2	4
Cheptarit Youth Polytechnic		
National,industrial,vocational training Centre	1	3
Kisum Tec. Train. Institute	6	7
Egerton University	127	301
Kenyatta University	2	2
Moi University	9	19
Baraton University	5	15
Homabay Tech.Coll.	2	4
Nyanza Tech. College	1	3
Sam Tech. - Kisumu	4	7
Eldoret polytechnic	2	7
Imani	2	2
Machakos Tech. Institute	1	3
Odiado Rehabilitation Centre	1	3
KCITI	1	3
	2	3
Total	700	1437½

APPENDIX 5.6 Material development

The Type of Material Developed	Purpose for the Material	No.of Copies	Date
1. Locational leaders training syllabus	Facilitators reference/guide	10	1990
2. Pump attendants training syllabus	"	10	"
3. Well committees training syllabus	"	10	"
4. Posters on hygiene education	To be used during seminar	Enough for all water committees	1991
5. Spring attendants training syllabus	Facilitators reference & guide	10	"
6. Water committee guide booklet	To guide the committees	Enough for water committees	"
7. Nira AF 85 hand pump manual	To guide for proper use & maintenance	"	"
8. Water point committee management guide	To guide on management skills	"	"
9. Pump attendants training guide	Guiding trained pump attendants	"	1990
10. Pump performance monitoring forms	To evaluate the performance of the pump and pump attendants	Enough for all pump attendants	1992
11. Water and sanitation training manual.	To assist in training on water and hygiene	10	1991
12. One seminar was held for government extension officers on how to use the developed materials.			
13. A library in Provincial Water Engineers' office was founded			

APPENDIX 5.7 Training and manpower development

			ACHIEVED /TARGET
(a) LOCAL COMMUNITY TRAINING	<p><u>Health Education</u></p> <p>Film shows organized in connection with well committee and locational leader seminars. The film used is "Prescription for Health" prepared by International Development & Research Centre - Canada.</p> <p><u>Management Capability</u></p> <p>Locational leaders of 54 locations were trained to familiarize them with the programme objectives and to ensure communities fully participation in the activities.</p> <p>Executive members of 1544 water points were trained to strengthen their management and administrative skills.</p> <p><u>Training of Attendants</u></p> <p>Pump attendants (2191) for 1189 wells and spring attendants (349) for 171 springs were trained in maintaining community water supplies.</p>	<p>23427 Viewers</p> <p>2411 persons</p> <p>1544 committees</p> <p>1189 wells 171 springs</p>	<p>-</p> <p>96%</p> <p>45%</p> <p>53% 15%</p>
(b) LOCAL CONTRACTORS	<p><u>Contractors</u></p> <p>60 local contractors were trained in construction skills at various levels.</p> <p><u>Local Pump Repairmen</u></p> <p>49 locational pump repairmen were trained to carry out major maintenance of all types of hand pump.</p>	<p>60 persons</p> <p>49 persons</p>	<p>-</p> <p>91%</p>
(c) WATER SUPPLY OPERATORS' TRAINING	<p>In total 142 water supply operators were trained to run MoWD piped schemes and 12 others were trained to run community piped schemes.</p>	<p>154 operators</p>	<p>-</p>
(d) TRAINING OF SPECIAL GROUPS	<p><u>Women Groups</u></p> <p>536 women from different income generating groups undertook training in various management skills and matters related to water and hygiene.</p> <p><u>Staff Training</u></p> <p>422 staff members from both MoWD and the Programme participated in various seminars and courses to upgrade and update their skills.</p> <p><u>Computer Training</u></p> <p>28 Programme and MoWD staff members participated in computer courses.</p> <p><u>Study Tours and Excursions</u></p> <p>100 Programme and community members have gone on study tours in various areas.</p> <p><u>Community Extension Workers</u></p> <p>Extension workers attended various seminars and courses to upgrade their skills. Out of these 17 attended a special course on Community Based Health Care, where participatory training methods were introduced.</p>	<p>536 women</p> <p>422 persons</p> <p>28 persons</p> <p>100 persons</p> <p>37 ext. workers</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>

APPENDIX 5.7 (Cont.) Training and manpower development

	A total of 702 students were attached to the programme for field and industrial training	702 students	-
(e) TRAINING ABROAD	<p><u>Training abroad</u></p> <p>21 Programme and MoWD staff undertook training courses abroad.</p>	21 persons	-
(f) MATERIAL DEVELOPMENT	<p><u>Training materials</u></p> <p>Nearly half the training material needed has been developed. These materials have been now being tested in the field.</p> <p>One seminar was held for Government extension workers on how they can use the developed materials.</p> <p>Library in Provincial Water Engineer's office was founded.</p>		

APPENDIX 6.1 Siting of water points (1989-1992)

DISTRICT	NO. OF SITING MEETINGS	SITING MEETINGS ATTENDENCE		SITES INVESTIGATED	SITES SELECTED BY COMMUNITIES
		WOMEN	TOTAL		
Kakamega	471	7544	23847	156	365
Busia	364	4882	17315	136	187
Bungoma	264	5252	12668	90	221
Siaya	127	4002	8083	50	91
Total	1226	21680	61913	432	864

APPENDIX 6.2 Registration of land easements (1989 - 1992)

DISTRICTS	NUMBER OF LAND EASEMENTS REGISTERED
Kakamega	481
Busia	383
Bungoma	280
Siaya	292
Total	1436

APPENDIX 6.3 Summary of community participation in construction of water points and piped schemes (1989 - 1992)

ACTIVITY	DISTRICT	QUANTITY DONE	TOTALS
Routes cleared	Kakamega Busia Bungoma Siaya	108 sites 109 sites 94 sites 98 sites	409 sites
Sites stones collected.	Kakamega Busia Bungoma Siaya	86 sites 112 sites 88 sites 98 sites	340 sites
Pits dug to water level.	Kakamega Busia Bungoma Siaya	79 sites 80 sites 83 sites 93 sites	340 sites
Trenches dug for piped/gravity schemes	Navakholo Kabuchai Kapsokwony Siranyawita Sigomere	13km 3km 10km 3km 8km	37km

APPENDIX 6.4 Summary of achievements in community development activities (1989 - 1992)

District	Reg. MoCSS	A/C Opened	L/Eased	Meetings Held	Funds Coll.	Committees		Consumers Reached	Duty Rosters	Sites Selected			Meetings Held	Attendance		Routes Cleared	Sites Stones Coll.	Pits Dug to W/level	W/Points Handed over
						Formed	Activ.			Bh	Dw	Sp		Women	Total				
Kakamega	1123	403	481	5752	702796	1319	1097	417498	520	132	96	132	471	7544	23847	108	86	79	1029
Busia	719	307	383	2968	352923	848	654	222910	380	68	81	38	364	4882	17315	109	112	80	569
Bungoma	447	144	280	2691	256374	532	436	216896	178	64	94	63	264	5252	12668	94	88	88	367
Siaya	442	156	292	2524	363990	494	426	118206	385	42	28	21	127	4002	8083	98	98	93	393
Total	2731	1010	1436	13935	1676083	3193	2613	975510	1463	306	299	260	1226	21680	61913	409	340	340	2358

APPENDIX 6.4 (Cont.) Summary of achievements in community development activities (1989 - 1992)

DISTRICT	SITES INVESTIGATED	P.A SELECTED	S.A SELECTED	SELECTED PUMP REPAIRMEN	AMOUNT INVOICED ON REPAIRWORK	AMOUNT COLLECTED (PAID)
Kakamega	156	1220	612	17	178284.80	127911.60
Bungoma	90	950	602	14	74308.00	39234.90
Busia	136	980	640	15	115742.00	73159.50
Siaya	50	806	596	10	61048.00	40498.00
Total	432	3956	2450	56	429382.90	280804.00

APPENDIX 6.5 Handing over of waterpoints (1989-1992)

DISTRICT	TOTAL NO. OF WATER POINTS	WATER POINTS HANDED OVER
Kakamega	1415	994
Bungoma	500	360
Busia	830	578
Siaya	472	387
Total	3217	2319

APPENDIX 6.6 Socio-economic surveys and feasibility studies

DISTRICT	LOCATION/AREAS	DATES	
		1989	DECEMBER 1992
Kakamega	Bunyala	January	1989
	North Idakho	January	1989
	South Marama	February-March	1989
	East Wanga	February-March	1989
	Chevaywa	April-May	1989
	South Kabras	May	1989
	Navakholo	August	1991
	Kambiri	September	1991
Bungoma	Cheptais-Chepkube	July	1989
	North Bukusu	July	1989
	Kopsiro	November	1989
	Chebkube	February	1991
	Kabuchai	August	1991
	Mateka	August	1991
Busia	West Teso	August	1989
	South Teso	September	1989
	Central Marachi	October	1989
	East Marachi	December	1989
	North Teso	January	1990
	West Bukhayo/Busia Town	February	1990
	Central Bukhayo	April	1990
	Amagoro	May	1990
	FEASIBILITY STUDIES		
Siaya	Ugunja	September	1990
	Sigomere	October	1991
	Mukoe	August	1992
	Soy	July	1992
	Kambiri	November	1992
	Ileho	July	1992
	Mateka	July	1992
	Chepkube	July	1992
	Khasoko	October	1992
	Lukolis	July	1992
	Busia Hills	August	1992
Jera	August	1992	

APPENDIX 6.7 (a) Economic activities initiated

DISTRICT	TYPE OF ACTIVITY			
	BLK.MAKING	VEG. GARDEN	TR. NURSERY	FISH POND
Kakamega	26	519	52	22
Busia	06	326	32	05
Bungoma	09	214	33	11
Siaya	04	343	38	29
Totals	45	1402	155	67

APPENDIX 6.7 (b) Detailed performance and progress of women group activities

Women Group	Income generating activities	Year	Amount(Kes)
Mama Safi Women Group Busia	Filter sand	1991	128,810
	Block making	1992	362,720
		1992	25,720
Mumias Central Development Committee	Block making	1992	79,950
Mumias Muslim Women Group	Sale of spare-parts	1992	40,625.50
Totals		Upto Dec 1992	647,105.50

KENYA-FINLAND WESTERN WATER SUPPLY PROGRAMME
COST CONTROL SHEET 1989

ITEM		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	TOTAL	BUDGET	%
ADMINISTRATION	FIN	68,244.94	19,472.15	53,952.20	37,625.19	177,078.27	37,173.25	393,546.00	783,000.00	50%
	KES	212,601.06	86,159.96	239,043.86	175,818.64	816,405.12	178,803.51	1,708,832.15	3,445,200.00	50%
PLANNING AND DESIGN	FIN	96,407.18	55,892.86	47,423.53	96,069.53	65,312.23	125,768.74	486,874.07	1,154,000.00	42%
	KES	300,333.89	247,313.54	210,117.55	448,923.04	301,116.78	604,948.24	2,112,753.04	5,077,600.00	42%
CONSTRUCTION	FIN	189,627.24	213,182.64	387,012.03	1,456,586.39	1,196,233.98	2,728,618.58	6,171,260.86	9,523,000.00	65%
	KES	590,739.07	943,286.02	1,714,718.79	6,806,478.46	5,515,140.53	13,124,668.49	28,695,031.35	41,901,200.00	68%
OPERATION AND MAINTENANCE	FIN	52,802.30	20,239.47	5,883.01	56,356.02	59,883.25	663,037.50	858,201.55	1,323,000.00	65%
	KES	164,493.15	89,555.18	26,065.62	263,345.89	276,086.91	3,189,213.56	4,008,760.30	5,821,200.00	69%
COMMUNITY AND TRAINING	FIN	111,422.29	52,096.93	31,981.01	77,680.94	71,587.31	71,610.43	416,378.91	1,171,000.00	36%
	KES	347,109.94	230,517.39	141,696.99	362,995.05	330,047.53	344,446.51	1,756,813.41	5,152,400.00	34%
INVESTMENTS	FIN	18,996.90	127,434.23	457,690.47	64,338.67	220,857.16	688,914.57	1,578,232.00	1,700,000.00	93%
	KES	59,180.37	563,868.27	2,027,870.93	300,647.99	1,018,244.17	3,313,682.40	7,283,494.14	7,480,000.00	97%
INDIRECT COSTS	FIN	67,355.31	176,306.31	123,925.88	46,783.81	54,783.86	246,416.86	715,572.03	2,181,000.00	33%
	KES	209,829.63	780,116.42	549,073.46	218,615.93	252,576.58	1,185,266.28	3,195,478.30	2,596,400.00	33%
TECHNICAL ASSISTANCE	FIN	464,032.29	486,142.87	441,451.68	570,204.20	504,548.32	681,038.37	3,147,417.73	8,165,000.00	39%
	KES	1,445,583.46	2,151,074.65	1,955,922.37	2,664,505.61	2,326,179.44	3,275,797.84	13,819,063.36	35,926,000.00	38%
EQUIPMENT AND VEHICLES	FIN	0.00	436,300.00	(17,381.66)	179,700.00			598,618.34	7,133,000.00	8%
	KES	0.00	1,930,530.97	(77,012.23)	839,719.63	0.00	0.00	2,693,238.37	31,385,200.00	9%
MONITORING AND EVALUATION	FIN	0.00						0.00	200,000.00	0%
	KES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	880,000.00	0%
OTHERS	FIN	0.00						0.00	0.00	ERR
	KES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ERR
TOTAL	FIN	1,068,888.45	1,587,067.46	1,531,938.15	2,585,344.75	2,350,284.38	5,242,578.30	14,366,101.49	33,333,000.00	43%
	KES	3,329,870.56	7,022,422.39	6,787,497.34	12,081,050.29	10,835,797.05	25,216,826.84	65,273,464.41	146,665,200.00	45%
RATE FIN/KES		0.321	0.226	0.226	0.214	0.217	0.208	0.235	4.400	
FINNIDA INVOICED	FIN	1,068,888.45	1,587,067.46	1,531,938.15	2,585,344.75	2,350,284.38	5,242,578.30	14,366,101.49	30,000,000.00	48%

KENYA-FINLAND WESTERN WATER SUPPLY PROGRAMME
COST CONTROL SHEET 1989

ITEM		JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
ADMINISTRATION	FIM	93,754	50,038	53,294	129,706	82,995	39,425	449,212
	KES	453,576	242,902	265,146	648,532	425,614	203,221	2,238,991
PLANNING AND DESIGN	FIM	86,966	127,729	83,181	144,801	157,492	89,634	689,802
	KES	420,734	620,046	413,833	724,003	807,649	462,032	3,448,297
CONSTRUCTION	FIM	1,101,429	2,003,735	1,143,591	1,036,555	1,095,882	795,144	7,176,335
	KES	5,328,635	9,726,867	5,689,509	5,182,774	5,619,909	4,098,678	35,646,372
OPERATION AND MAINTENANCE	FIM	27,614	68,594	45,409	50,814	30,242	37,708	260,380
	KES	133,593	332,980	225,915	254,068	155,088	194,369	1,296,012
COMMUNITY AND TRAINING	FIM	74,306	96,432	85,042	91,337	105,681	77,238	530,036
	KES	359,488	468,118	423,094	456,684	541,953	398,134	2,647,471
INVESTMENTS	FIM	212,400	182,868	120,851	406,486	199,977	36,739	1,159,321
	KES	1,027,576	887,709	601,251	2,032,431	1,025,522	189,376	5,763,865
INDIRECT COSTS	FIM	78,622	172,210	137,797	89,903	207,687	187,075	873,295
	KES	380,366	835,973	685,558	449,515	1,065,064	964,305	4,380,780
TECHNICAL ASSISTANCE	FIM	533,085	454,221	511,310	603,593	642,579	717,054	3,461,842
	KES	2,579,030	2,204,957	2,543,832	3,017,963	3,295,276	3,696,153	17,337,211
EQUIPMENT AND VEHICLES	FIM	940,153	587,219	303,524	1,357,621	629,678	1,738,066	5,556,261
	KES	4,548,393	2,850,576	1,510,070	6,788,107	3,229,116	8,959,104	27,885,366
MONITORING AND EVALUATION	FIM	7,754	1,050		5,765	875	28,179	43,624
	KES	37,514	5,097	0	28,827	4,487	145,253	221,178
TOTAL	FIM	3,156,083	3,744,096	2,484,000	3,916,581	3,153,087	3,746,261	20,200,108
	KES	15,268,904	18,175,224	12,358,208	19,582,904	16,169,678	19,310,625	100,865,544
RATE		0.207	0.206	0.201	0.200	0.195	0.194	

	FIM rate:	JAN-JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN-DEC	% USED TO DATE	TOTAL LEFT
01 ADMINISTRATION	budget	424,200	68,200	73,200	68,200	73,200	68,200	73,200	848,400		
B: 848,400	actual	370,954	33,085	86,090	122,881	24,237	55,954	76,066	769,267	90.7 %	79,133
02 PLANNING & DESIGN	budget	540,200	106,700	66,700	66,700	66,700	86,700	66,700	1,000,400		
B: 1,000,400	actual	612,290	73,782	89,647	69,880	63,523	111,775	47,951	1,068,846	106.8 %	-68,446
03 CONSTRUCTION	budget	7,561,800	1,344,800	834,800	871,800	836,800	932,800	784,900	13,167,700		
B: 13,167,700	actual	7,156,080	616,719	1,721,428	992,481	727,297	897,405	1,193,686	13,305,098	101.0 %	-137,398
04 OPERATION & MAINTENANCE	budget	1,033,000	157,500	185,500	153,500	174,500	157,500	185,500	2,047,000		
B: 2,047,000	actual	1,106,043	325,690	303,434	224,806	188,139	160,899	167,846	2,476,858	121.0 %	-429,858
05 COMMUNITY PARTICIPATION	budget	888,000	164,000	144,000	147,000	143,000	164,000	149,000	1,799,000		
B: 1,799,000	actual	560,944	142,203	113,369	90,436	99,853	181,643	213,679	1,402,126	77.9 %	396,874
06 INVESTMENTS	budget	170,000	0	0	0	0	0	0	170,000		
B: 170,000	actual	156,446	3,160	11,813	2,570	5,770	17,237	129	197,124	116.0 %	-27,124
07 INDIRECT COSTS	budget	436,000	36,000	36,000	36,000	51,000	36,000	46,000	677,000		
B: 677,000	actual	447,005	13,471	52,821	25,060	35,061	39,622	25,182	638,222	94.3 %	38,778
08 TECHNICAL ASSISTANCE	budget	3,738,000	467,000	475,500	565,500	565,500	565,500	565,500	6,942,500		
B: 6,942,500	actual	3,886,205	644,465	550,632	585,478	583,178	573,237	577,805	7,401,000	106.6 %	-458,500
09 EQUIPMENT & VEHICLES	budget	1,120,000	0	0	100,000	350,000	0	0	1,570,000		
B: 1,570,000	actual	599,979	18,702	134,151	2,320	207,194	0	190,945	1,153,291	73.5 %	416,709
10 MONITORING & EVALUATION	budget	300,000	0	0	0	0	50,000	0	350,000		
B: 350,000	actual	8,040	0	100	0	0	0	0	8,141	2.3 %	341,859
11 PURCHASES SPECIFIED LATER	budget	460,000	141,000	216,000	206,000	160,000	195,000	50,000	1,428,000		
B: 1,428,000	actual	102,659	28,534	44,221	14,916	25,491	60,371	15,467	291,659	20.4 %	1,136,341
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
30,000,000	budget	16,671,200	2,485,200	2,031,700	2,214,700	2,420,700	2,255,700	1,920,800	30,000,000		
	actual	15,006,645	1,899,812	3,107,706	2,130,827	1,959,743	2,098,143	2,508,755	28,711,631	95.7 %	1,288,369

KFWSP

1991 COST REPORT, IN FIM

		FIM rate:	JAN-JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN-DEC	% USED TO DATE	TOTAL LEFT
01	ADMINISTRATION	budget	546,000	86,500	45,500	86,500	50,500	86,500	45,500	947,000		
	B: 947,000	actual	349,183	79,112	63,614	47,862	82,505	80,372	39,327	741,976	78.4 %	205,024
02	PLANNING & DESIGN	budget	598,400	100,100	115,100	75,100	94,100	85,100	99,100	1,167,000		
	B: 1,167,000	actual	503,185	76,591	101,568	64,769	81,250	71,918	119,011	1,018,292	87.3 %	148,708
03	CONSTRUCTION	budget	6,877,000	1,085,000	1,105,000	1,230,000	977,000	1,127,000	987,000	13,388,000		
	B: 13,388,000	actual	6,008,461	882,163	1,002,408	1,820,728	982,382	2,236,597	1,468,883	14,401,623	107.6 %	-1,013,623
04	OPERATION & MAINTENANCE	budget	1,743,200	225,300	174,300	179,300	189,300	371,800	139,800	3,023,000		
	B: 3,023,000	actual	1,232,740	246,897	62,358	224,240	188,932	309,355	731,832	2,996,355	99.1 %	26,645
05	COMMUNITY PARTICIPATION	budget	928,000	225,000	197,500	182,500	184,000	190,500	162,500	2,070,000		
	B: 2,070,000	actual	552,813	205,322	66,480	144,756	116,209	107,712	171,492	1,364,784	65.9 %	705,216
07	INDIRECT COSTS	budget	399,000	29,000	144,000	29,000	29,000	29,000	29,000	688,000		
	B: 688,000	actual	195,990	7,986	35,196	38,267	63,007	83,779	184,957	609,183	88.5 %	78,817
08	TECHNICAL ASSISTANCE	budget	3,533,000	604,000	531,000	600,000	641,000	585,000	479,000	6,973,000		
	B: 6,973,000	actual	3,502,667	549,396	502,474	632,358	626,320	579,260	649,814	7,042,290	101.0 %	-69,290
09	EQUIPMENT & VEHICLES	budget	585,000	200,000	0	0	0	0	0	785,000		
	B: 785,000	actual	323,550	2,087	27,172	58,801	24,458	102,120	183,534	721,721	91.9 %	63,279
10	MONITORING & EVALUATION	budget	420,000	0	0	30,000	0	0	20,000	470,000		
	B: 470,000	actual	16,117	0	0	6,187	427	0	1,593	24,324	5.2 %	445,676
11	PURCHASES SPECIFIED LATER	budget	425,000	0	1,000	2,000	37,000	24,000	0	489,000		
	B: 489,000	actual	684,195	25,548	105,140	12,935	0	0	1,898	829,716	169.7 %	-340,716
	30,000,000	budget	16,054,600	2,554,900	2,313,400	2,414,400	2,201,900	2,498,900	1,961,900	30,000,000		
		actual	13,368,902	2,075,103	1,966,411	3,050,903	2,165,491	3,571,113	3,552,342	29,750,264	99.2 %	249,736
	EQUIVALENT IN KES	actual	90,282,079	13,917,523	13,358,769	20,726,244	15,028,740	24,321,410	23,413,799	201,048,564		

KFWWSP

1992 COST REPORT, IN FIM

		FIM rate:	JAN-JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN-DEC	% USED TO DATE	TOTAL LEFT
01	ADMINISTRATION	budget	475,000	88,500	73,500	73,500	63,500	58,500	58,500	891,000		
	B: 891,000	actual	388,397	134,921	35,096	41,288	50,234	21,696	138,216	809,848	90.9 %	81,152
02	PLANNING & DESIGN	budget	733,500	112,000	92,500	97,000	89,000	77,000	89,000	1,290,000		
	B: 1,290,000	actual	463,525	77,413	84,218	147,899	78,460	45,959	122,376	1,019,850	79.1 %	270,150
03	CONSTRUCTION	budget	7,402,000	1,314,500	1,297,500	1,159,500	1,091,500	858,000	780,000	13,903,000		
	B: 13,903,000	actual	10,231,600	599,309	1,972,195	504,604	742,888	912,034	-341,994	14,620,637	105.2 %	-717,637
04	OPERATION & MAINTENANCE	budget	2,610,600	123,100	207,100	547,100	210,100	163,600	151,600	4,013,200		
	B: 4,013,200	actual	1,485,901	763,507	103,629	305,537	64,685	66,205	748,626	3,538,091	88.2 %	475,109
05	COMMUNITY PARTICIPATION	budget	1,083,000	284,000	169,000	169,000	169,000	169,000	169,000	2,212,000		
	B: 2,212,000	actual	841,743	177,375	148,807	172,853	88,969	52,485	151,296	1,633,528	73.8 %	578,472
07	INDIRECT COSTS	budget	258,000	43,000	43,000	43,000	43,000	43,000	43,000	516,000		
	B: 516,000	actual	227,965	18,129	70,197	28,001	14,419	24,164	9,121	391,995	76.0 %	124,005
08	TECHNICAL ASSISTANCE	budget	3,930,080	634,200	614,200	614,200	614,200	614,200	914,200	7,935,280		
	B: 7,935,280	actual	3,441,537	588,160	572,257	577,089	552,625	521,875	489,063	6,742,606	85.0 %	1,192,674
09	EQUIPMENT & VEHICLES	budget	1,350,000	0	0	0	0	0	0	1,350,000		
	B: 1,350,000	actual	801,761	498,509	63,390	84,702	-5,454	0	878	1,443,787	106.9 %	-93,787
10	MONITORING & EVALUATION	budget	0	0	0	0	150,000	150,000	150,000	450,000		
	B: 450,000	actual	4,544	0	0	0	0	0	0	4,544	1.0 %	445,456
11	PURCHASES SPECIFIED LATER	budget	240,000	0	0	0	0	0	0	240,000		
	B: 240,000	actual	130,049	18,615	0	0	0	0	0	148,663	61.9 %	91,337
	=====											
	32,800,480	budget	18,082,180	2,599,300	2,496,800	2,703,300	2,430,300	2,133,300	2,355,300	32,800,480		
		actual	18,017,022	2,875,938	3,049,789	1,861,973	1,586,827	1,644,419	1,317,582	30,353,549	92.5 %	2,446,931
		actual	133,805,087	26,728,046	26,382,254	27,462,724	17,044,329	16,526,828	12,879,591	260,828,859		

EQUIVALENT IN KES

APPENDIX 8.0 Bridging Over Phase report

1.0 GENERAL

The Bridging Over Phase started in January 1993 and was completed at the end of April, 1993. The main emphases during the phase were:

- Completion of activities which were carried forward from the third phase, handing over of completed projects and project documentation.
- Maintaining continuity in activities between the third and fourth phases.
- Preparation for starting of fourth phase.

2.0 POINT WATER SUPPLIES

2.1 Water Point Register

Checking and updating of the water point register continued during the phase and will be completed early in the fourth phase. Work in compiling and checking the total number of water points continued.

2.2 Decision Making, Planning and Design

Siting of water points was not accomplished as had been planned due to rehabilitation and repair works which dominated the activities carried out by the Programme during the report period. Communities continued to request for technical advice from hand auger drill teams, who provided services to the beneficiaries on contractual basis. On land easement, the target was realized because of better collaboration between the MoCSS, extension workers, MoLRRWD together with the Lands Office on the processing of land registration forms.

2.3 Site Investigation and Test Pumping of Boreholes

8 borehole sites were investigated while 13 boreholes were test pumped. The numbers are less than planned due to fewer requests for borehole drilling than were anticipated.

2.4 Construction

Very few construction activities took place during the period under review. In water point construction, full contracts were tried out in Busia, Siaya and Kakamega districts. The experiences were quite promising and there was a lot of interest among the local contractors although the projects were small, involving rehabilitation works only. There were seven institutional water points constructed on full cost recovery.

The communities participated during rehabilitation and repair of facilities as this was a priority. Out of the 20 targeted sites only 6 were dug up to the water level.

2.5 Rehabilitation

Lack of funds had an effect on the number of completed community water points. Out of the 120 water points targeted in the work plan, 61 were completed in 1992.

2.6 Operation and Maintenance Manuals

Operation and maintenance manuals for India MK II pump, were prepared and distributed to 40 caretakers in the programme area.

2.7 Spare parts Distribution System

It was not possible to identify any additional potential businessmen and/or women groups for the spare parts distribution. This was partly due to the widespread misconception of the venture by the communities in view of the ongoing shift of greater responsibilities to the beneficiaries, and also doubts concerning the long term availability of certain spare parts locally. However educative and corrective measures have been undertaken, and it is hoped that more hardware shops will start acting as spare part distributors in future.

2.8 Operation and Maintenance Competence

No new water point attendants or committees were selected during the report period. Emphasis was laid on activation of the existing ones, who were mobilized to collect operation and maintenance funds and encouraged to open bank/postal accounts.

2.9 Management of Facilities

Effort was dedicated to strengthening of water committees/ associations through meetings and training sessions which resulted in higher standards of cleanliness at well surroundings. In addition, water committees registered themselves with the MoCSS as self help groups. As part of management of water facilities, water committees took over the responsibility of managing the water facilities. During the report period a total 183 water points were handed over to the water committees, leaving a balance of 636.

3.0 PIPED WATER SUPPLIES

3.1 Feasibility Studies

The feasibility study for Ileho water supply was completed. The other two reports in the work plan will be completed in early may 1993.

3.2 Designs

Designs for Soy and Lukolis water supplies were completed during the report period.

3.3 Construction

Five water supplies on full cost recovery were planned but none was implemented during the report period. This was one of the reasons

for community contribution being less than planned.

Completion of three MoLRRWD water supplies using local component funds were started but the works was not completed.

3.4 Maintenance

Preventive maintenance was carried out for 12 water supplies and 5 water treatment plants against the target of 40 and 10 for each respectively. Regular service for engine driven pumps and generators was least accomplished largely due to the fact that the district water engineers who were supposed to provide material for service did not have funds to purchase these materials.

3.5 Updating of Data from Water Supplies

Updating of data from water supplies continued during the report period. Organization charts and duties were updated for 27 instead of 18 targeted water supplies. Suggestions for improvement and rehabilitation for one water supply and one treatment plant were completed. Assessment of existing situation for Mbale and Ndivisi-Nakuselwa water treatment plants was accomplished.

3.6 Management of Facilities

On piped schemes, although the establishment of 4 water associations had been targeted, only one was established. This was due to the fact that no new community water supplies were constructed during the report period. For old associations, 'members days' proved useful, officials and members being given a chance to exchange views on how best to manage their schemes.

4.0 TRAINING ACTIVITIES

Training activities were implemented according to the work plan. The major differences were:

- Training course for extension workers in participatory training skills could not be implemented because St. Mary's Hospital did not arrange the course as scheduled.
- Training of trainers course for MoLRRWD personnel was arranged in the first week of May instead of February due to non-availability of instructors.
- The number of water point attendants and well committees trained was less than planned because of the saving from the above two activities.

Forty three water committees and eight pump attendants were trained and the cost covered by the respective water committees. Some water committees have realized the need for training in running water supplies. Two committees for community managed piped water supplies each sent two operators for the Water Treatment Plant Course and covered a half of the training cost.

4.1 Training of Operators and Meter Readers

Training of operators and meter readers was carried out as scheduled. Eighteen water supply operators and seventeen meter readers were trained out of the targeted twenty for each group. On-the-job training by mobile teams lagged behind because they were used mainly for preventive maintenance tasks in support of the District Water Engineers and community operated water supplies. Thus, on-the-job training during the report period was carried out for only 15 days out of the targeted 30. Manufacturers and suppliers were invited to hold refresher courses in various fields but there was no response from them. Instead, in-house practical training was organized on dismantling and assembly of Grundfoss submersible pumps.

4.2 Training of Locational Repairmen

On the job training for locational repairmen was organized during the report period at the workshop in Kakamega. This was to enable them fabricate fast wearing hand pump parts. It was scheduled that 40 repairmen would be trained but only 31 responded positively. The achievement was therefore 77%.

4.3 Health Education

Extension workers intensified health education campaigns during their daily meetings with the consumers. In response, the consumers fenced well sites, cleaned drainages and prepared duty rosters for involvement of all consumers in operation and maintenance of the wells. During the campaigns, simple hygiene practices such as use of latrines, washing of hands and covering of water containers were taught to the beneficiaries. Creation of awareness on benefits accrued from safe and clean water planned for women groups was behind schedule as indicated in appendix 1.5. This was as a result of shortage of staff within the socio-economic section.

5.0 STUDIES/PROGRAMMES

5.1 Management and Personnel Studies

Management and personnel studies were carried out for Kaimosi water supply during the report period.

5.2 Iron Removal Study

The Iron removal study continued during the report period. The study is being carried out by an M.Sc. student at Nairobi University.

5.3 Handbook of Point Source Water Supply

The Programme is in the process of preparing a handbook of point source water supply development. This will be continued in Phase IV and will be expected to contain all lessons and experiences gained in the implementation of point water sources. During the report period, a technical proposal for revision of current design of point water supply was made.

5.4 Information Packages

During the report period, preparation of information packages was started and will be completed early in Phase IV. The purpose of the packages is as follows:

- To promote the present approach in water development i.e., the "demand driven approach" where the local people are expected to be well versed with water development issues so that they articulate the ideas and develop interest and initiatives in demanding for the development of water supply.
- To enlighten the various parties e.g., government departments, communities and NGOs who will be in charge of continuity and further development of the existing projects implemented by the Programme, monitoring and coordinating water development issues when the donor winds up.
- The information will also act as reference source to donors and local groups like contractors and other individuals who will in future wish to emulate the Programme's strategies in development of new water projects.
- The information would be used as a tool for educating the consumers on all water related aspects including the different parties involved, their specific roles, available development options and their logistics.

6.0 MONITORING

6.1 Water Quality

During the report period, 286 communal water points not previously analyzed, were sampled and analyzed for chemical quality. 118 new or rehabilitated water points were also sampled and analyzed for chemical and bacteriological quality.

The following were the reasons for not achieving the targeted figures:

- Delay in exchange of the old motorbikes for new ones
- The iron removal study inspection of reported poor water quality in point and piped water supplies.

6.2 Community Water Supplies

Assessment of nine community piped schemes was carried out to determine their technical and financial status. All except Ingotse water supply had good technical performance. Most of the schemes were not financially sound due to poor revenue collection, high diesel/electricity bills, and in some cases inefficient water committees. Only Sigomere Water Supply was found to be on good financial standing. Monitoring and feed back was accomplished for nine WTPs out of the targeted ten. These were Mbale, Māseno, Chesikaki, Matisi, Kaimosi, Shitoli, old Kibichori, Kibichori- Bokoli and Busia Mundika.

6.3 Hand Pumps

Inspections of hand pumps during the bridging phase were done above the targeted number of 1850 and the data obtained continued to be computerized.

6.4 Spare Parts

The monitoring of spare parts distribution indicated that there was poor sales during the review period in most of the existing hardware shops. There were only a few sales in Mayanja and Omena shops and no sales at all in Nasianda and Simon Ekeya retail shops. Good sales was only achieved in Heshima Holdings Ltd in Siaya District. The poor sales may have been as a result of local inflation that has drastically raised spare part prices.

7.0 INDICATORS OF SUSTAINABILITY

Communities continued to replicate what they had been taught by initiating their own water facilities. During the report period the community contribution towards private, communal and institutional water points was KES 2,400,000. In addition, KES 8,800 was paid towards participation in training sessions. The Programme continued to receive applications for water points (33 private, 34 semi-private/institutional and 30 community requests were received).

8.0 PERSONNEL

	Consultant	MoWD	MoCSS	KFWWSP	Total
Administration	2	5	-	9	16
Planning & Design	-	20	-	15	35
Construction	1	10	-	98	109
Operation & Maintenance	1	8	-	27	36
Community & Training	1+1	6	2	26	36
R.E.'s Office	-	6	-	-	6
Total	6	55	2	175	238

9.0 BUDGET

The use of funds was according to the work plan. Up to the end of April, FIM 2,583,405 had been spent. The community contribution was KES 2.4 Million which comprised construction of water supplies on cost recovery. The sale of 11 boarded vehicles approved in the management meeting was completed. Approximately KES 1.8 Million was realized.

APPENDIX 8.1 Planning & Design Department

COMPONENT	KEY RESULT	DETAILED ACTIVITIES	TARGET	ACHIEVEMENT	JAN	FEB	MARCH	APRIL
1. Point Source Supplies.	Chemical Data obtained for 300 water points.	Determination of chemical quality for communal water point previously not done.	300	286	75	75	75	75
	Chemical and Bacteriological data available for new rehabilitated WPTS.	Chemical and Bacteriological water quality determination for new or rehabilitated WPTS.	130	118	32	33	32	33
	Borehole sites available.	Site investigation for Boreholes.	30	8	7	8	8	7
	Well characteristic obtained.	Test pumping of boreholes.	30	13	7	8	8	7
2. Piped Scheme	Feasibility reports with recommendations ready.	Preparation of feasibility reports.	3	2			1	2
	Design documents ready.	Design of schemes started in 1992 completed.	3	2				3
3. Monitoring	An updating water points register is available. Key personnel and DWE's are aware of its content.	Checking and updating water point register.		Continued	█	█	█	█
	An expanded and improved ground-water observation net work is in place.	Ground water monitoring system will be set, expanded and improved.		In place	█	█	█	█
	Advice given where and when necessary.	Routine water quality monitoring will continue and necessary advice given.		Continued	█	█	█	█
	Model available	General monitoring model to be prepared.		To be included in phase IV	█	█	█	█

APPENDIX 8.2 Construction Department

COMPONENT	OUTPUT	DETAILED ACTIVITIES	TARGET	ACHIEVEMENT	JAN	FEB	MARCH	APRIL
1. WATER POINTS	120 Water Points Rehabilitated.	25 in Kakamega 15 in Bungoma 30 in Busia 40 in Siaya The work included approximately 80 water points started in 1992.	120	61	30	30	30	30
	10 Water points for Institution Communities	The water points will be constructed on full cost recovery.	10	7	2	3	3	2
	More cost effective structures and working method developed.	Full contract system developed, tasted and taken to use.		Implemented	■	■	■	■
		Present standard design for community water point will be revised.		Implemented	■	■	■	■
		A one family shallow well model will be developed	1	Design ready				1
		Past experience documented in a form of water point manual.	1	1				1
	Collection of left over materials.	Collection of left over material from site and removal of rings from abandoned wells will continue. Target being material worthy Kshs. 500,000	Kshs. 500,000	Kshs. 1,348,000	125,000	125,000	125,000	125,000

APPENDIX 8.2 (Cont.) Construction Department

COMPONENT	OUTPUT	DETAILED ACTIVITIES	TARGET	ACHIEVEMENT	JAN	FEB	MARCH	APRIL
2. PIPED SCHEMES.	Completion of Construction rehabilitation started in 1992.	Completion of construction work started in 1992 in 6 water supplies will be completed.	6	6	1	2	2	1
	Construction of 5 water supplies.	Construction of 5 water supplies for institutions will be done on full cost recovery.	5	0	1	1	2	1
	Handing over of water supplies.	Handing of approximately 6 water supplies to institution will be undertaken.	10	9	2	2	3	3
	Construction of 3 water supplies.	Construction of 3 water supplies will continue part funds (GoK) will be completed.	3	0		1	1	1
IMPLEMENTATION SUPPORT.	Sustainability plan.	The draft sustainability plan in workshop will be completed.		Ready	█	█	█	█
	Maintenance programme vehicles.	The routine maintenance of programme vehicles will continue.		Continued	█	█	█	█

APPENDIX 8.3 Operation and Maintenance

COMPONENT	OUTPUT	DETAILED ACTIVITIES	ACHIEVEMENT	TOTAL TARGET	JAN	FEB	MARCH	APRIL
1. POINT WATER SUPPLIES	1. Sufficient number of trained pump repairmen for every location.	1. Locational repairmen to be trained on fabrication on hand pump components.	21	40	-	10	20	10
	2. Reliable village level O&M system achieve.	2. Inspection of hand pumps to determine their function and breakages.	217	1850	450	450	500	500
	3. Water point in an acceptable condition for final handing over.	3. Inspection of hand pumps and wells before handing over to the community.	75	150	25	50	25	50
	4. Operation and maintenance procedures approximate O&M manuals prepared for each type of point source supplies.	4. Manuals for hand pumps. Indian mark II.	40	40	10	10	10	10
		5. To identify for potential businessmen & community oriented women groups.	0	4	1	1	1	1
		6. Monitoring of on going pilot programme of the distribution of spare parts.	6	6			6	
2. PIPEL WATER SUPPLIES	1. Existing data available and analyzed.	1. Organisation charts and duties.	27	18 W/S	2	5	6	5
	2. Design	Suggestions for improvement and rehabilitation.	1	1 W/S	-	-	-	1
	3. Operation & Maintenance procedures.	1. Manuals as built documents	7	4 W/S	1	1	1	1
		2. Mechanical and service cards.	7	4 W/S	1	1	1	1
		3. Monitoring of community water supplies.	0	5 W/S		2	1	2
	4. Training.	4. Monitoring of other water supplies.	20	40 W/S	10	10	10	10
		1. Operators training for construction or rehabilitation piped scheme.						
		- Water meter readers	17	20 persons		20		
- Operators.	18	20 persons				20		

APPENDIX 8.3 (Cont.) Operation and Maintenance

COMPONENT	OUTPUT	DETAILED ACTIVITIES	ACHIEVEMENT	TOTAL TARGET	JAN	FEB	MARCH	APRIL
		2. On job training during service period.	10	30 days		10	10	10
	5. Preventive maintenance.	Regular service						
		1. Electric & mechanical system	40	40 W/S	10	10	10	10
		2. Regular service for engine pumps and generators.	1	40 W/S	10	10	10	10
3. WATER TREATMENT PLANTS (WTP)	1. Existing data collected identified and computerized.	1. Assessment of existing situation.	1	2 WTP	-	1	1	-
		2. Management and personnel studies.	1	1 WTP	-	-	-	1
		3. Organization charts and duties monitoring.	6	10 WTP	-	3	4	3
		4. Inventory of machines and equipments.	0	10 WTP	3	2	2	3
		5. Continuous computerization of available data.	8	10 WTP	2	3	3	2
	2. Inventory	1. Updating the plans and layouts.	1	2 WTP	-	-	1	1
		2. Suggestions for improvement and rehabilitation.	1	1 WTP	-	-	-	1
		3. Monitoring and feed back.	10	10 WTP	2	2	3	3
		4. Pump testing and repairing.	7	28	5	8	8	7
		5. Metal and machining workshop.	Continuing	X	XXXXX	XXXXX	XXXXX	XXXXXX
	3. Operation and maintenance procedures.	Establishing mobile teams for regular and preventive maintenance of W/S and WTP.	2	2 districts	1	-	-	1
		Standardization record keeping.	0	2 WTP	-	-	1	1
		Quality control specification						
		Instructions service lubrication cards and monitoring.						

APPENDIX 8.3 (Cont.) Operation and Maintenance

COMPONENT	OUTPUT	DETAILED ACTIVITIES	ACHIEVEMENT	TOTAL TARGET	JAN	FEB	MARCH	APRIL
4. WORKSHOP	4. Training of operators, meter readers and pump attendants.	1. In-service training for specific duties.	0	20 Days	5	5	5	5
		2. Refresher courses held by supplies of manufacturers.	0	20 persons	-	5	20	-
	5. Preventive maintenance	1. Regular service	-	10 WTP	5	5	5	5
		2. Supply of tool boxes	-	-	-	-	-	-
	6. Material system	Purchasing of laboratory equipment for WTP.	-	-	-	-	-	-
	7. Emergency repair and service.	Mobile teams operation.	9	18 WTP	XXXXXX	XXXXXX	XXXXXX	-
	8. Workshop for O&M facilities.	1. Water meter	-	-	-	-	-	-
		2. Calibrating and repairing.	240	200 days	50	50	50	50

APPENDIX 8.4 Community Development Section

COMPONENT	OUTPUT	DETAILED ACTIVITIES	TARGET	ACHIEVEMENT	JAN	FEB	MARCH	APRIL	
1.DECISION MAKING PLANNING AND DESIGN	Formulation of Community participation strategies and actively involving the beneficiaries in locating, designing and rehabilitation of water facilities.	Resiting meetings	25 meetings	18	6	6	6	7	
		Selecting new sites	5 sites	5	1	1	1	2	
		Resited sites	40 sites	17	10	10	10	10	
		Land easement registered	80 sites	50	20	20	20	20	
		Investigation of hand dug wells.	20 wells	22	5	5	5	5	
2.CONSTRUCTION	Active involvement of communities in construction activities of water facilities.	Digging of pits to water level (hand dug wells)	20 sites	5	5	5	5	5	
		Collection of stones for spring sites.	10 sites	4	2	2	3	3	
		Clearing of routes	15 sites	3	4	4	4	3	
3.OPERATION & MAINTENANCE COMPETENCE	Mobilization of Communities to select their representative for operation and maintenance.	Pump attendants selected	40		10	10	10	10	
		Spring attendants selected	30		7	8	8	7	
4.MANAGEMENT OF FACILITY PLANNING AND DESIGN	Establishment of strong water management base and provision of extension services for follow up.	Formation of water committees.	60		15	15	15	15	
		Activation of old and weak water committees.	100	90	25	25	25	25	
		Recruitment of extension workers.	15	8	4	4	4	3	
	Establishing affordability for sustainability.	Collection of operation and maintenance funds.	30,000	95,961	7,500	7,500	7,500	7,500	
		Opening of bank/postal accounts.	50	45	12	12	12	14	
	Collection and storage of community development activities	Field follow ups for collection and evaluation of community involvement aspects.	80 follow up visits	50		20	20	20	20
		Handing over of water points to the users.	150	83		37	37	38	38
5.HEALTH	Creation of awareness on health and sanitation benefits to the communities.	Fencing of well surroundings	50 sites	43	12	12	13	13	
		Preparation & use of duty roasters for cleaning well sites	50 duty roasters	39	12	13	13	12	
		Organise site visits & meetings for public campaigns on health and sanitation aspects.	30 forums	123	7	8	8	7	

APPENDIX 8.5 SOCIO - ECONOMIC SECTION

COMPONENT	OUTPUT	DETAILED ACTIVITIES	TARGET	ACHIEVEMENTS	JAN	FEB	MARCH	APRIL
STUDIES AND PLANNING MEETINGS	Incorporation of Community and economic aspects in the planning and management of water points	1.Feasibility studies on the identified water supplies.	2	2		1		1
		2.Hold meetings involving the beneficiaries.	30	19	7	7	8	8
ECONOMIC ACTIVITIES	Monitoring,evaluate and support already initiated community projects.	1.Continued assessment of the economic viability of initiated income-generating activities e.g						
		1. Vegetable gardens	200	53	50	50	50	50
		2. Tree nurseries	10	30	3	3	2	3
		3. Fish ponds	05	14	1	1	1	2
		4. Block making	04	41	1	1	1	1
WOMEN INVOLVEMENT IN WATER AND SANITATION ACTIVITIES	Creation of awareness on benefits of safe water and sanitation.	Community education during women groups meetings.	5 meetings	2	1	1	1	2
		Study tours and through Hygiene education, good sanitary habits and promotion of storage facilities.	4 tours	2	1	1	1	1
MANAGEMENT OF FACILITY	Facility managed and supervised by representatives of the local community as agreed with the community.	- Establish water association for the management of the facility.	4 water association	1	1	1	1	1
		- Train management committees in book keeping, management skills.	3 management trainings	1	1	1	1	
		- Organise study tours to other community managed projects.	6 study tours	2	1	1	2	2
		- Hold members day with consumer communities.	5 members days	4	1	1	1	2

APPENDIX 8.6 TRAINING SECTION

COMPONENT	OUTPUT	DETAILED ACTIVITIES	TARGET	ACHIEVEMENT	JAN	FEB	MARCH	APRIL
Training of pump attendants	Equipping the community with skills of knowledge in O&M of water points.	To train 2 pump attendants per water point on 3 weeks training seminars	180	194	45	45	45	45
	Measuring demand in training of attendants	Beneficiaries organize training of attendants at water point, training supervised by KFWWSP staff.		8				
Training of Well Committees	Involvement of beneficiary community in management of water points.	To train 3 executive members of a committee, land owner and village elder per one water point on one week training seminar.	200	450	50	50	50	50
	Measuring demand in committee training	Beneficiaries organize training at water point, supervised by KFWWSP.		43				
Training of extension workers	Giving extension workers more skills & tools in participatory training.	3 weeks training course in St. Mary's Hospital.	20	-			20	
Training of Water treatment plant operators	Improving the skills of operators to ensure better performance of water supplies.	3 weeks training course for untrained WTPOs at WECO.	20	18				20
Training of Meter readers	Getting more revenue through selling water.	2 day training courses in the districts.	30	17	30			
TOT training	Improving training capabilities of MoWD staff.	One week tailor-made training course in Kakamega.	20	-		20		
On the job training	Improving the skills of pump repairmen and persons in-charge of meter repairs etc.	Inviting the trainees to programme workshop under guidance.	30	12		10	10	10
Preparing job descriptions	Creating clear job description for the key personnel.	Each department to start preparing job descriptions.	40	Preparation on-going	10	10	10	10
Evaluation & monitoring	Developing evaluation and monitoring systems to help planning of future activities	Testing and developing evaluation and monitoring systems in co-operation with other departments and sections.		Implemented	█	█	█	█

KFWSP

1993 COST REPORT, IN FIM

		FIM rate:	JAN 0.1023	FEB 0.1067	MAR 0.1008	APR 0.0800	MAY	JUN	JAN-APR	% USED TO DATE	TOTAL LEFT
01	ADMINISTRATION	budget:	41,500	42,500	42,000	41,500	0	0	167,500		
	B: 167,500	actual:	8,768	8,764	86,828	26,639			130,999	78.2 %	36,501
02	PLANNING & DESIGN	budget:	23,430	32,930	37,630	23,430	0	0	117,420		
	B: 117,420	actual:	18,738	21,178	27,734	30,067			97,716	83.2 %	19,704
03	CONSTRUCTION	budget:	-12,000	331,600	-16,207	231,321	0	0	534,714		
	B: 534,714	actual:	23,442	255,455	178,533	122,073			579,504	108.4 %	-44,790
04	OPERATION & MAINTENANCE	budget:	61,400	51,050	59,750	54,650	0	0	226,850		
	B: 226,850	actual:	16,902	37,195	45,762	31,241			131,100	57.8 %	95,750
05	COMMUNITY PARTICIPATION	budget:	41,900	34,300	53,700	41,000	0	0	170,900		
	B: 170,900	actual:	19,359	41,289	47,459	31,879			139,985	81.9 %	30,915
07	INDIRECT COSTS	budget:	2,000	7,000	9,000	9,000	0	0	27,000		
	B: 27,000	actual:	10,943	2,984	3,124	16			17,066	63.2 %	9,934
08	TECHNICAL ASSISTANCE	budget:	390,697	396,897	344,220	181,580	0	0	1,313,394		
	B: 1,313,394	actual:	364,207	353,406	463,113	306,307			1,487,033	113.2 %	-173,639
09	EQUIPMENT & VEHICLES	budget:	0	0	0	0	0	0	0		
	B: 0	actual:	0	0	0	0			0		0
10	MONITORING & EVALUATION	budget:	0	0	0	0	0	0	0		
	B: 0	actual:	0	0	0	0			0		0
	=====										
	2,557,778	budget	548,927	896,277	530,093	582,481	0	0	2,557,778		
		actual	462,359	720,271	852,553	548,221			2,583,405	101.0 %	-25,627
	EQUIVALENT IN KES	actual	4,519,635	6,750,432	8,457,871	6,852,768			26,580,705		

APPENDIX 8.7 Cost report (Jan. 1993-April 1993)