

Kenya Community Water Supply Project

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PROJECT SUMMARY

The provision of water supplies to rural populations in Kenya is hampered by insufficient maintenance of existing systems and poor initial designs. Even as new systems are being constructed, recently completed systems fall into disuse due to lack of operations funds and equipment failures. MetaMetrics Inc., a Washington, D.C. based firm specializing in planning, research and evaluation, conducted a study to determine the feasibility of a multiple component rehabilitation project for the Western Rift Valley of Kenya.

The rehabilitation project is designed to address the problem of deteriorating rural water supply systems in the Western Rift Valley. The successful utilization of community self-help resources, technical assistance, training, selected system rehabilitations, and health education has policy and program development implications that may aid the Ministry of Water Development in other rural water supply situations throughout Kenya.

PROJECT BACKGROUND

In the Western Rift Valley Districts of Kericho, Nandi, Trans Nzoia and Uasin Gishu, less than 12% of the rural population of 1.2 million persons is situated on piped rural water supply schemes. Individual family wells are rare due to the depth of water tables and the high cost of drilling. Water is largely obtained from surface streams which are located downhill at an average distance of three-quarters of a mile from households. Up to three hours a day can be required to secure a family's water for domestic use. Almost every rural family has cattle and small livestock. Livestock are herded to the same water sources twice a day.

Approximately half of the Western Rift Valley rural water supply schemes constructed in the late 1960s and early 1970s are not operational. Those that are operational work intermittently and provide inadequate amounts of water for domestic and agricultural use. The technical factors contributing to operating difficulties of the schemes are ascribable to deficiencies in design, lack of design, and improper installation. Operations and maintenance procedures have been inadequate and have contributed to scheme breakdowns.

Water practices in the Western Rift Valley are unsanitary and there is a general lack of awareness of the interrelationships among water, sanitation and health. Water sources are not protected and water containers are usually left uncovered. Ministry of Health personnel are aware of the problems, but there is a shortage of facilities, staff and transportation which hampers health education.

While the people are motivated to develop rural water supplies and Hamabee and other self-help groups have been involved in schemes, the responsibility for the continuing operation of small rural water schemes is not always clearly defined. In many areas, water fees are not collected from users and water revenues seldom meet costs of operating schemes.

The Government of Kenya has the intention of providing all citizens with adequate and safe water supplies by the year 2000. The Ministry of Water Development (MWD) has the primary responsibility for rural water development. Other ministries which have been involved in the provision or development of water supplies are the Ministry of Health, and the Ministry of Housing and Social Services. The Ministry of Water Development is constructing large scale rural water schemes and is proceeding with the takeover of small rural schemes. The Ministry, organized in 1974, has experienced rapid growth and a budget that has increased six-fold since 1975. This rapid expansion and the magnitude of rural water supply requirements has delayed the Ministry's schedule for meeting its overall objective. The Ministry's record on operations and management could be improved and more responsibility could be assumed by local communities.

PROJECT DESCRIPTION

Approximately half of the existing rural water supply schemes in the project area of Kericho, Nandi, Trans Nzoia and Uasin Gishu are not operational and most of the remaining schemes operate at less than full service. The Western Rift Valley Water Supply Rehabilitation Project will provide technical assistance, design and construction, operations and maintenance, training, equipment and evaluation to demonstrate that self-help groups can contribute to scheme rehabilitation and provide resources to successfully operate and maintain their rural community water schemes. The total project will be conducted over a five year period at an estimated cost of \$US 9,685,000.

Implementation of the rehabilitation project requires participation by MWD, MOH and USAID staff, and consultants working under contract with USAID. A four member Project Oversight Committee will be established to include one representative each from MWD, MOH, USAID, and the consulting firm. The Project Oversight Committee will participate in monitoring and evaluation activities. Allocation of funds to District Development Committees and review of priority schemes may be additional committee responsibilities.

Technical Assistance

An engineering consulting firm will be contracted to conduct the five year project. The firm will form a Technical Assistance Team consisting of two sanitary engineers, a social scientist, a training specialist, and a health education specialist. The Ministry of Water Development will provide operations and maintenance engineers and artisans. Technical assistance activities will include identifying schemes for full rehabilitation including expansion, community development, assistance to schemes requiring technical inputs (less than full rehabilitation), and training coordination.

At the outset of the project, an inventory will be conducted to identify potential candidate schemes for rehabilitation. The inventory will also serve the MWD as an aid to management of water development activities in the Western Rift Valley. Service areas of newly planned and initiated water schemes will be noted to avoid rehabilitating schemes that may be covered under new water service.

The list of candidate schemes will be contacted and informed of the rehabilitation project. Assistance in organizing local water committees will be provided. Technical factors will be reviewed and assistance will be provided in developing an application for scheme rehabilitation. District Development Committees will rank applications in accordance with criteria that include need for assistance, organization factors, operation and maintenance arrangements, technical feasibility and local contributions.

Technical assistance on operations and maintenance to all existing rural water schemes will be provided on request by the Technical Assistance Team and MWD assigned personnel. This technical assistance will be rendered on site and will include explicit recommendations. Assistance will be provided in implementing recommendations.

Design and Construction of Rehabilitation

According to cost estimates for extensive rehabilitation of typical systems, between six and ten schemes will be selected for rehabilitation. The number of schemes to be rehabilitated may be greater if specific schemes require rehabilitation at a lesser level than that estimated for the determination of feasibility. The average scheme will serve approximately 85 families and will provide enough water for the livestock. Water treatment can be provided so that the project can meet water quality standards of the World Health Organization. Treatment of water will increase construction, operations and maintenance costs.

Design of rehabilitation schemes will consider consumer preferences, water quality requirements, adequacy of the source, population served, appropriate technology, and MWD guidelines and criteria. The service area will be established and water demand will be projected. Water sources, requirements for water treatment, energy sources, water storage, pipeline and costs will be considered in developing plans and specifications. Existing components that are usable or salvageable will be incorporated into the design.

A construction manager will be assigned to manage each scheme rehabilitation. The construction manager will acquire equipment and material, hire skilled and unskilled labor, and supervise construction. The local communities will contribute funds and labor for the construction phase. The local water committees will identify persons for contributed labor.

Operations and Maintenance

The local water committee will be responsible for managing, operating and maintaining the rehabilitated water scheme. All costs associated with the operating scheme will be borne by the committee and fees will be collected from the water consumers. Meters are recommended to measure water usage and to set water fees.

The local water committee will hire or designate a manager and clerk and will hire full-time operations and maintenance personnel. Training will be provided by the rehabilitation project to management, operations and maintenance personnel. Assistance will be provided by the Technical Assistance Team for estimating costs and establishing water fees.

Training, Community Development and Health Education

The consultant training specialist will coordinate all training activities of the rehabilitation project.

Operations and Maintenance

The scheme managers and clerks will be given courses in system operations and maintenance management. They will receive an orientation of technical requirements and training in budgeting, financial records, and appropriate management practices.

Local operators will be trained at the Rift Valley Institute of Science and Technology. Course topics will include pumps, engines, pipe work, water treatment, and record keeping. On-the-job training will continue after completion of the basic course. A refresher course will be provided six months after the basic course.

Mechanics and pipe fitters from the Ministry of Water Development and County Councils will be provided training courses. Mechanics will receive instruction on engines, pumps and operations and maintenance procedures. Pipe fitters will receive instruction on galvanized and PVC pipe, pipe fittings, valves and water meters.

A middle management training program will be provided to MWD district water officers, inspectors, water bailiffs, planners and accountants. Topics will include operations and maintenance management, personnel management, support services, and technical writing.

Several key MWD officials from the ministry, provincial and district levels will receive out-of-country training. The training will provide different perspectives on solutions to operations and maintenance problems of rural water schemes.

Community Development

"Harambee" or self-help is a tradition in rural Kenya. Thousands of agricultural and educational projects have been accomplished through community raising of funds and locally contributed labor. Water projects are emerging as a high Harambee priority as primary and secondary education needs are met.

Many of the candidates for rehabilitation are erstwhile county council schemes or cooperative society schemes which do not have an already existing Harambee group. Harambee initiative will be developed where water schemes have been identified for rehabilitation through a program directed and coordinated by the consulting social scientist (Community Program Coordinator). The coordinator will work closely with the Ministry of Housing and Social Services and with local community development staff. The Community Development Assistants at location level will form the cadre of facilitators to work with the Harambee groups.

The Community Development Assistants (CDA's) in the four districts will be trained to facilitate the community development process to rehabilitate water schemes. Working with Harambee groups is the CDA's normal primary responsibility and the program will introduce them to additional community development methods. The CDAs will be trained through the DELTA training program of the Christian Development Education Service of Kenya or similar training center.

The CDA's will identify communities to be served by rehabilitated water schemes and hold meetings to explain the purpose of the rehabilitation project. Committees will be formed and assistance will be provided to identify water problems, define needs and expectations with respect to water supply and determine necessary repairs, extensions or other scheme improvements. The committee will determine the ability of the community to raise financial contributions. The committee will organize fund raising activities, monitor progress of the application, and be involved in related activities. The committee will subsequently take responsibility for managing, operating and maintaining the rehabilitated scheme.

Health Education Program

The provision of a rehabilitated water supply system alone will not necessarily result in improvements in health. Individuals and groups can address issues of water and health through a program of health education. Health education will supply the water users with correct information about disease and the required preventive measures. As people become informed of the value of health, they will adopt the necessary preventive measures. A program of continuous education over a period of time will develop a population that is ready to make their own decisions to improve their health status and their environment.

A community health education program will be initiated and coordinated by the health education specialist (Health Program Coordinator) as each water scheme is selected, using the local people themselves as a resource for health education activities. A community-organized team of volunteer "Health Educators" will be developed as an extension of the existing health and other

development personnel working at the community level. This cadre of volunteers will address villagers' fundamental outlook and understanding of environmental sanitation through informally advising their neighbors and relatives about health problems relating to water and sanitation and encouraging community action.

Women will constitute the target population for health education. They have the major responsibility for the health and home environment of their families and for inculcating good habits of hygiene and sanitation in their children. Women and women's organizations will provide the means for providing health education. The women of Kenya have already proved their worth as workers and volunteers in national development.

The Technical Assistance Team will employ an Assistant Health Program Coordinator from one of the national women's groups to assist the Health Program Coordinator and provide program continuity over the five year project period. The Health Program Coordinator will negotiate the contribution of women's groups to the program. The Ministry of Health will provide a full-time Public Health Educator and selected district level personnel to provide training to community volunteers.

The basic program for health education consists of periodic one-to-one sessions of the community volunteer with neighboring women on the rehabilitated schemes. Monthly seminars for volunteers will provide material for the one-to-one sessions. Annual conferences will provide additional training to the community volunteers.

The Health Program Coordinator and Ministry of Health district resource personnel will provide additional public information programs. Transportation and audio-visual equipment will be provided for community sessions.

Equipment

Transportation is required for the successful implementation of the rehabilitation project. Depending upon the number of schemes selected for rehabilitation, between nine and 11 vehicles will be required. Maintenance of the vehicles will be provided by the Ministry of Water Development.

Monitoring and Evaluation

Monitoring and evaluation will be a major component of the proposed rehabilitation program. The objective of the program is to demonstrate cost-effective ways to manage water development and operations and maintenance activities. The demonstration will utilize the rehabilitation of between six and ten rural water schemes. Local water consumers will be involved in the development and operation of their water schemes.

The Ministries of Water Development and Health will play important roles in the project. To achieve maximum benefit from the project, a monitoring and evaluation program is proposed to focus attention on lessons to be derived from the project experience.

A consulting evaluation team, under separate contract or as a subcontractor to the project consulting firm, will conduct the evaluation program over the five year project period. The team will meet on a scheduled basis with the Project Oversight Committee to review evaluation activities and present relevant findings and recommendations.

PROJECT ANALYSIS

The rural water supply schemes are owned by county councils, settlement farm cooperatives and self-help groups. There are several Ministry of Health systems. Of the County Councils, only Kipsigis (Kericho District) has sufficient water revenues and previously accumulated surpluses to meet current operating and maintenance costs. Meters are not used on any of the rural systems.

The rural water supply schemes requiring rehabilitation are basically of three types: trading centers, large settlement farms, and small self-help farm groups. Trading centers are typically county council schemes that serve approximately 10 shops, with standpipes provided for community use. Settlement farms have up to 350 members and have a cooperative to manage the water scheme. The small Harambee projects are mostly inoperational except where groups of farmers cooperate in obtaining fuel in order to water their cattle herds.

To develop the rehabilitation project two basic options were considered. Option 1 was rehabilitation to provide water of the quality for which the scheme was originally designed. An estimated 10 scheme rehabilitations can be completed under Option 1. Option 2 was rehabilitation to World Health Organization water quality standards. Water treatment costs would result in an estimated six scheme rehabilitations under Option 2. Three levels of rehabilitation were considered and included trading centers with the original service population, trading centers with expansion to additional families and farms, and large cooperative settlement farms.

At the relatively small scale of the existing rural water supply schemes, the cost of rehabilitation will be approximately 15% to 25% below the cost of all new construction. The current large scale rural schemes currently being implemented by the Ministry of Water Development are being constructed at a lower cost per quantity of water provided than the rehabilitated schemes. Clearly, all other things being equal, the large scale systems are more cost effective.

The potential advantage of rehabilitation lies with mobilization of local resources to construct and maintain systems. The existence of these schemes indicates an historical community interest in providing piped water. Placing the responsibility of operations of the schemes on the communities may assure faster responses to operations and maintenance problems. With the communities responsible for financing the operations, additional revenues in support of operations may be forthcoming.

Technical Feasibility

The technical feasibility of the Rehabilitation Project is dependent on the need for water quality improvement, operation and maintenance requirements of rehabilitated schemes, alternative technologies, and the comparison of rehabilitation with replacement at the original scale or incorporation into the large scale MWD rural water supply projects.

There is a definite need for improvement in the service being provided by existing rural water schemes. Service from new MWD rural schemes will not be available in the near future in most of the project area of the Western Rift Valley. Meanwhile, rural people consume water that is damaging to health and difficult to obtain.

Technology Requirements

Almost all of the water schemes in the project area involve a diesel powered piston pump delivering water to an elevated storage tank with gravity flow to consumers. The exception is the occasional hydraulic ram. The diesel pumping sets, while basic and common to the entire community, can be limiting factors with respect to successful operation and maintenance. There are local operators who lack the technical ability to keep the equipment operating. Training of operators is an important component of the rehabilitation project and will address the lack of technical ability. Many of the inoperative rural water schemes failed because of poor design. The design procedure for the Rehabilitation Project will assure the installation of adequately engineered schemes that will be superior to the original systems.

In general, the Rehabilitation Project design criteria are based on the need to keep water scheme physical plants as simple as possible. If such simplicity is maintained in view of the quality of water sources available and selected standards of quality for delivered water, and if the training and operation and maintenance support programs prescribed for this project are implemented, it is technically feasible to rehabilitate the existing rural water schemes in the project area, and to expect continued operation and maintenance.

Alternative Methods

The results of water sample analyses indicate that turbidity might be low enough in some sources to allow for simple chlorine disinfection. There will be cases where disinfected water simply cannot be produced without some level of treatment and a higher level of technology will be required. The design procedure is structured to develop the desired level of water quality and take into consideration the existing levels of expertise in the project area. The Rehabilitation Project will provide training in the new technology to increase the probability of successful operations and management of the rehabilitation schemes.

Wind power and solar pumps for pumping water were examined and rejected as feasible alternatives to diesel power. The cost of installing, maintaining and operating dual power systems is high and extensive technical expertise is required to maintain the systems. Submersible pumps, operated by electricity, are a feasible alternative where electric power is in the vicinity of a scheme for rehabilitation. Electric power is currently less expensive than diesel power and the determining factor would be the cost of transmission lines to the water source.

Water meters are in use in the larger communities of the Western Rift Valley and are recommended for individual connections for rehabilitation schemes. Maintenance of the meters requires no unusual expertise. The repair records indicate that the meters are compatible with the proposed rehabilitation designs.

Rehabilitation Options

There are an estimated 100 rural water schemes in the Western Rift Valley in need of rehabilitation at some level. Most of these schemes will not be incorporated into planned MWD new projects. Complete replacement of these schemes at the originally designed scale would cost from 15% to 25% more than rehabilitation and rehabilitation is preferred to new construction of the same scale. The larger rural schemes of the type currently being built by the MWD can be constructed at a lower cost. Successful operation and maintenance of such schemes, however, depends on there being a technically and administratively competent entity to assist local people on a continuing basis.

The technical, operation and maintenance factors that influence feasibility considerations in the project area may or may not be similar in other parts of Kenya. The large rural water supply schemes are feasible only when consumers are of sufficient density to support large piped distribution systems. The types of water resources available will determine whether or not large extractions can be made from one point at which treatment and pumping facilities can be centralized. Technical engineering judgments are difficult to generalize without specific knowledge of physical conditions in the areas of proposed application. The technical feasibility arguments presented here can be extended to the rest of the country where the terrain, existing water systems, and water requirements are similar.

Social Feasibility

The Rehabilitation Project provides for a process of community facilitation to assist the formation and organization of Harambee groups and provides continuing support and guidance. The project also includes an extensive technical and management training program for all levels of personnel to be involved and a health education program directed to the water consumers of the rehabilitated schemes. The social feasibility of the project is evaluated using the following criteria for assessing the potential for success of Harambee projects.

Water Needs

The project will satisfy a strongly felt, well-articulated need. The greatest demand for improved water supplies is for watering dairy cattle. For those schemes serving a farming population, it is clear that there is a definite desire for water services to each small holding. The need for water in the trading centers, largely for domestic use, is not well defined, and the willingness and ability to pay are questionable.

Project Support

The leadership of each rehabilitation scheme will be broad-based and committed to group goals rather than individual interests. In the case of the Harambee projects visited during the conduct of the feasibility study, the impetus came mainly from the more wealthy farmers with the resources to pay to assure water for their livestock. The community facilitation approach will encourage the participation of a strong, democratic and committed leadership.

Local Resource Limitations

The community program coordination process will assess local resources limitations in relation to the contribution to be requested. Consideration of the best means of resource mobilization will be encouraged. The schemes will reflect the nature and limitations of local resources. Over burdening local contributors will be avoided, particularly in the case concerning the cost to each family for operation and maintenance. The problem is more severe for low income residents of the trading centers and the less affluent farmers.

Project Time Frame and Community Interest

Projects will be planned and completed within the shortest possible time to maintain community interest. Construction will be completed over a one year period and the time between application and work being commenced is to be filled with water project related activities including fund raising. The community program coordination process is designed to help unsuccessful applicants by encouraging utilization of Harambee funds for more limited water scheme improvements with the help of the O&M technical assistance program, application for other forms of assistance and transfer of funds to other projects.

The Harambee group will have a continuing function after project construction is completed. The Rehabilitation Project will provide supportive activities to maintain group involvement and interest in day-to-day management. The management training for committee members will include management subjects along with group dynamics and leadership subjects.

Project Coordination

The Technical Assistance Team will coordinate community and technical requirements in assisting communities to address their rehabilitation needs. Project initiative strategies will utilize open discussions and formal and informal consultations with individual leaders and the water committee. The technical assistance is proposed to be materially supportive and will not impose solutions on the community. The impetus for the projects will come from within the local community rather than from outside. Projects where local support is lacking or half-hearted will not be pursued.

Summary

On balance the rehabilitation project will be successful where most of the above criteria are met. A key issue is the degree of community motivation that can be expected given the projected contribution for construction and operation and maintenance.

The replicability of the rehabilitation project is dependent upon the similarity of social conditions in other parts of Kenya. Wherever the criteria applied above are satisfied, it is likely that a similar program will be successful in social terms.

Economic Feasibility

The Technical Assistance Team in cooperation with designated MWD personnel will provide technical assistance to rehabilitate and maintain rural water supply systems throughout the Western Rift Valley. Up to 200 systems may be assisted within the five year project period. Technical assistance will be provided to inoperative systems and to systems that are marginally operational. These latter cases could include systems with barely adequate sources of water, equipment that is outdated yet functioning, improper utilization of water storage facilities and similar situations where technical assistance can increase availability of water to beneficiaries and decrease operations costs. Total beneficiaries of the technical assistance can reach 100,000.

The Rehabilitation Project will emphasize community involvement in rehabilitating systems and community responsibility for continuing operations, maintenance and management. This involvement will be promoted and facilitated by activities of the Technical Assistance Team Community Program Coordinator and the Community Development Assistants. A total of 10 schemes will be rehabilitated with construction funds of the Rehabilitation Project under Option 1 and approximately 7,000 persons will be affected.

Training will be provided to management, and operations and maintenance personnel of systems selected for rehabilitation construction. Training will also be provided to selected MWD personnel, Health Education Volunteers, and Community Development Assistants. Primary beneficiaries (approximately 230) would be those individuals who receive training. Secondary beneficiaries are persons whose water supplies and health are affected by the trained personnel.

The Rehabilitation Project has the potential of reallocating GOK resources away from operations and maintenance towards construction as local communities assume responsibility for operations and maintenance. Newly completed systems and planned water systems can be affected.

The total number of beneficiaries of the Rehabilitation Project within the Western Rift Valley may exceed 100,000. A successful demonstration of the Rehabilitation Project has the potential of affecting millions of rural water supply users throughout the nation.

Scheme Rehabilitation Benefits - Costs

The benefits to be derived from the six to ten rehabilitations are both direct and indirect. Direct benefits include value of water for domestic use, health benefits and livestock production benefits. Indirect benefits include short-term employment and income, long-term production, redistribution of income and national benefits. Under Option 1, livestock production benefits constituted approximately half of total benefits. Only direct benefits were assigned values for the purpose of benefits-costs analysis. For Option 1 using only direct benefits and direct rehabilitation construction, operations and maintenance costs, the internal rate of return is 17.8%. The rate reflects a return on project investment. For Option 2, six rehabilitations, the internal rate of return is slightly lower at 16.5%.

Financial Analysis

A total Rehabilitation Project expenditure over the five year project period will be \$US 9,685,000. Of this amount, approximately 25% will be borne by the Ministry of Water Development, Ministry of Health, Ministry of Housing and Social Services, county councils, and the rural communities to be served by the rehabilitated schemes. Approximately half of the project expenditures will be for technical assistance, training, equipment, and evaluation in support of project construction and operations and maintenance.

The contributions of the Ministry of Water Development, Ministry of Health, county councils and Ministry of Housing and Social Services will support the rehabilitation project technical assistance. Training and equipment maintenance will also be provided. Rural water supply schemes other than those rehabilitated will receive technical assistance.

A critical financial aspect of the rehabilitation project is the contribution of the local communities towards project construction and 10% of construction costs is the proportion proposed. This 10% is equivalent to the estimated cost of unskilled construction labor. An average cash contribution of 1,250 KSh. per family would be required for Option 1. Historically, families have contributed between 200 and 500 KSh. for Harambee efforts. For some of the families, 1,250 KSh. is the total annual family income. The average family income is estimated to be approximately 4,000 KSh. in the rehabilitation project area.

Lowering the local construction contribution to 5%, or permitting the use of Harambee labor for some families, would lessen the burden on participating communities. A definite minimum contribution should be retained, however, and can serve as an indicator of community interest and desire for the rehabilitation.

The small scheme rehabilitation and rehabilitation plus expansion projects will be for schemes located at trading centers and the surrounding service areas. The operation and maintenance costs for small scheme rehabilitation projects are estimated at 44 KSh. per family for Option 1 and approximately 50 KSh. for Option 2. The cost per family of the water for domestic use is approximately 11 KSh. per month for both Options. The remaining average cost of approximately 36 KSh. per month is the cost for watering livestock. To cover the costs of operations and maintenance, a fee structure would have to call for a minimum monthly charge of 12 KSh. and average monthly collections of approximately 47 KSh. per family. Meters will be required except for standposts that can provide squatters and low income families with water for domestic use only. The farmers surrounding the trading center will have most of the livestock and will have a greater need for a large quantity of water. Their potential for increased income from milk and meat production will be sufficient to cover the higher monthly cost for their water.

Comparative Construction Costs

The cost effectiveness of the Rehabilitation Project can be determined by analyzing the cost of achieving the same purposes by alternative means. The estimated cost for a new project for the same service population and the same project specifications would be up to 25% higher than rehabilitation. There is no differential for operations and maintenance costs and rehabilitation is the cost effective alternative.

The cost of providing water through large scale rural water schemes of the type built by the MWD is lower per population equivalent than rehabilitating existing rural water supply schemes assuming water quality improvement is required. Ministry of Water Development construction funds are better utilized for large scale schemes when contrasted with small scheme rehabilitation.

Summary

The Ministry of Water Development cannot immediately assume responsibility for all existing rural water schemes. Ministry technical assistance to schemes may encourage continuing local operations at a lower cost than the assumption of the schemes by the MWD or new construction. Local operations of rural water supply schemes have had mixed success and approximately half are not operational. Assistance in organization, management and technical training may aid local communities to successfully rehabilitate and operate their own schemes. The Rehabilitation Project would demonstrate the feasibility of this approach.

Trading centers with large indigenous populations may not be feasible for rehabilitation with respect to the local share of construction costs and the ability of families to support the required operations and maintenance costs. If combined with nearby farms, trading center rehabilitations may be feasible. Subsidies for operations and maintenance would be required otherwise.

Settlement farms and communities with livestock herds would receive cash income benefits from the rehabilitation of existing schemes. This increment in farm income can be greater than the operations and maintenance costs. A progressive rate structure could generate sufficient water revenues to provide water to low income families and cover operations and maintenance costs.

The candidate communities for rehabilitation should be reviewed for willingness and ability to support the local share of construction and operations and maintenance costs. Final determination on rehabilitations should be decided by the Project Oversight Committee. Adjustments could be made on the required local share of construction costs.

The project experience in the Western Rift Valley may be relevant to other small trading centers and large cooperative settlement farms. The demonstration of local involvement in rehabilitation and operations and maintenance may be indicative of local capabilities in other parts of Kenya. The Rehabilitation Project would make a contribution toward reaching the national goal of water service to all citizens by the year 2000. The emphasis of the project on local initiative may demonstrate a means to increase the national capacity to provide water.

Administrative Feasibility

Due to its vast responsibilities in water development, increasing budgets and scarcity of trained and qualified personnel the MWD has a substantial administrative and management burden. The addition of significant, unassisted administrative responsibilities for the Rehabilitation Project could be a disservice to the Ministry and would diminish prospects that project activities would be carried out as scheduled. The major responsibility for project administration is placed on an engineering consulting firm, with USAID administering the consulting contract. This relieves the MWD of carrying out the time consuming and burdensome tasks of negotiating and processing a contract, monitoring consulting activities, and managing project procedures. It is proposed that all project purchases be made by the consultants, either acting as purchasing agents for USAID, or using advance payments from USAID to make direct purchases.

All consulting activities will be carried out in the MWD environment, with MWD counterparts, except for those activities calling for counterparts in the MOH. MWD office space is to be made available as has been successfully done in previous projects. Obtaining MWD support services such as secretarial services, telephones, and vehicle maintenance may be more difficult. With the MWD and MOH enthusiastic about the project, the support services should be forthcoming.

The essential responsibility of the Ministries is to commit staff to the project as counterparts to the consultants. Discussions with District staff reveal that there are officials generally available in the numbers required for the Rehabilitation Project. One exception may be the two assistant engineers required to oversee the operation and maintenance technical assistance activities in Kericho and Eldoret. New positions may have to be established.

One problem may be turnover among the people assigned as counterparts. There is a high rate of turnover among MWD staff, especially in professional positions. If high turnover, or frequent vacancies, are experienced in the counterpart positions, the worth of the program to the government ministries will be diminished. The level of commitment of the ministries to the project will be crucial to the stability of the counterpart positions.

An administrative anomaly in the program is the County Councils. The primary responsibility for managing the rehabilitated water schemes should rest with the local consumers, preferably represented by a Harambee committee. All water fees collected from local consumers are to go to the local management groups to pay direct operation and maintenance expenses. The MWD is expected to provide technical assistance without payment from individual schemes. The county councils would be welcome to participate in the program and help provide technical assistance. There is, however, little incentive for the councils to do so if they receive no income from the schemes.

In summary, the rehabilitation program has been designed to avoid making unrealistic administrative demands on any government agencies. Some of the administrative procedures that are included, such as purchasing of materials under USAID procedures, and having staff support services provided by government ministries, may present some difficulties. The administrative mechanisms selected are the best choices under existing circumstances to assure project success.