

MEMORANDUM

1

PD-AAZ-049

DATE: 6/6/88  
TO: Lois Richards, DIR  
FROM: Winston M. McPhie, PDS  
THRU: Thomas D. Lofgren, PDS  
SUBJ: Comprehensive Groundwater Development Project 649-0104  
Project Assistance Completion Report

len=60500

SUMMARY DATA

Administrative:

Implementing Agency -	Ministry of Minerals and Water Resources (MMWR), Water Development Agency(WDA)
Technical Assistance Contractors (Amounts) -	Louis Berger International/Roscoe Moss (\$9,404,200); United Nations Development Program (\$692,339); Douglas Tsitouris, PSC (\$75,000)
Final evaluation -	6/86

Financial (\$000):

Date of Authorization -	9/21/79
Authorized LOP (original) -	\$13,000
(amended, 8/29/84) -	\$18,800
PACD (original) -	9/30/84
(amended) -	9/30/88
Date of Initial Obligation -	9/30/79
Cumulative Obligations -	\$18,500 <sup>1</sup>
Cumulative Commitments -	\$18,320 <sup>2</sup>
Cumulative Accrued Expenditures -	\$17,099 <sup>2</sup>

<sup>1</sup> \$300,000 was deobligated on 7/20/86 and reobligated to the Livestock Marketing and Health Project (649-0109)

<sup>2</sup> As of 5/8/88

Planned AID Inputs:

Technical Assistance	\$10,481,000
Training	\$477,000
Construction	\$155,000
Commodities	\$7,217,000
Other Costs	\$170,000

NB: all project funds have been accounted for, but accountability by line items has differed from those used above in original planning. These differences have been a result of contract budgets being written different than planned (e.g., Louis Berger's TA contract included funding for training, commodities and construction).

Planned Outputs:

WDA and private sector wells  
 Increased opportunities for private sector drilling operators  
 Establishment of WDA Planning Unit and MMWR National Water Center  
 Improved WDA operations  
 Trained WDA personnel

PROJECT DESCRIPTION/PURPOSE

The Comprehensive Groundwater Development (CGWD) Project was designed to strengthen the management capability of the Water Development Agency (WDA) and assist it with the establishment of an on-going water development program which provides potable and livestock water in rural areas. The project was subdivided into the following components:

Institutional Support - Provision of technical assistance and training for data collection and analysis, logistical supply, and equipment management systems. It encouraged the liberalization of policies affecting private sector drilling operations and promoted initial efforts to strengthen private Somali drilling enterprises.

Data Collection and Utilization - Establishment of WDA Planning Unit and the MMWR National Water Center.

Exploitation (drilling) - Establishment of 92-100 rural borehole water production systems in the Bay Region and Central Rangelands over the life-of-project.

Studies - Conducting of a series of short-term water resource development studies.

END OF PROJECT STATUS

Technical Assistance:

Institutional support covered a number of activities provided principally through Louis Berger International/Roscoe Moss (LBII/RM) from 8/81 - 6/86 aimed at strengthening the ability of WDA to construct, operate, and maintain rural water supply systems.

(1) Well Site Maintenance - Well site maintenance and maintenance of pump and distribution systems by project (WDA) personnel are minimal to non-existent (LBII/RM).

(2) Community Participation - Community participation was an important element in twelve communities in which water committees were established. They proved very effective when developed prior to well construction and when provided with adequate and timely support by WDA (LBII/RM).

(3) Water Quality Lab - This laboratory was provided with equipment and supplies; personnel were trained, and standards were established for proper analysis of water samples (LBII/RM).

- (4) Electronics and Geophysical Lab - An electronics and geophysical laboratory was established and located within the WDA compound to provide repair and maintenance service to mobile radios, geophysical equipment, hydrogeological field equipment, and laboratory instruments. No full time counterpart staff was ever provided and, as a consequence, after the prime contractor's departure, a technician from the U.S. has twice visited Mogadishu to repair equipment and provide some limited training to whoever was available (LBII/RM).
- (5) Monitoring and Evaluation - A monitoring and evaluation program was planned to integrate socioeconomic with technological considerations. A Monitoring and Evaluation System (MES) was designed and tested by the prime contractor. However, as a result of the lack of qualified Somalis, this program could not be institutionalized (LBII/RM).
- (6) Cost Analysis - Cost analysis models were developed, based on data from the project, and intended as a management tool for use by WDA (LBII/RM).
- (7) Socioeconomic Analysis - Background information was collected on the socioeconomic conditions prior to testing the MES, referred to in (e) above. It was discovered that a lack of sufficient water points during the dry season caused increases of morbidity and mortality of humans and animals that often resulted in mass migrations. Evidence exists that this situation has been considerably minimized at sites where wells have been constructed. Populations at well site villages appear to have substantially increased in most cases (LBII/RM).
- (8) Private Sector - A special study was conducted to evaluate the potential of the water development industry in Somalia. That study, completed in April 1986, concluded that an adequate number of private sector industries exist that are capable of making a significant contribution to the developemnt of water resources in Somalia (LBII/RM).
- (9) WDA's Future Role - As a result of the experience of the Comprehensive Groundwater Development project, an evaluation by the project was made of WDA's role as sole provider of the nations's deep groundwater resources. Based on the present water needs and the increased water demands that are required to improve the socioeconomic conditions of Somalia, WDA cannot adequately be the sole provider of groundwater (LBII/RM).
- (10) Planning Unit - The establishment of a planning unit, which was to precede a WDA planning department, was marginally successful. The lack of qualified personnel available within WDA and the lack of financial incentives were the primary limiting factors (LBII/RM).

(11) National Water Center - The UNDP and USAID have provided assistance for the establishment of a National Water Center (NWC) which is presently located at the WDA. Both donors have provided foreign exchange to assist this Center to gather, compile, and place in easily retrievable or useable formats the large quantity of geological and hydrological information scattered among GSDR repositories, private agencies and assistance organizations. Implementation on this activity only began in earnest in April 1987, too late to develop its planned interface with the WDA Planning Unit during the life of this project. USAID assistance to the NWC ended on 9/30/87, but assistance will continue to be provided by the UNDP through 1990. The Center is now relatively well established. It has a library of more than 200 volumes of water-related publications, stores various sets of maps, and offers technical information and data to a wide range of users. In addition, a start has been made with the computerization of data (UNDP/FAO).

(12) Vehicle/ Equipement Maintenance - After LBII's departure, a number of employers left and new ones were hired as replacements for WDA's work shops. Over the final two years of the project, therefore, USAID provided the services of a PSC to the WDA. The first year's contract was a result of the WDA's desire to bring the management and skills of the staffs of its maintenance work shops to an acceptable level of performance. For the second year, the PSC's services were retained in order to effectively warehouse and control the issuance of spare parts ordered by the mission (refer to "Commodities" section below).

#### Training:

Training was provided in the form of "on-the-job training", classroom instruction, and short term and university degree programs in the U.S. About one hundred and thirty-two individuals received one or more levels of training for a total of over \$474,000. Manuals covering eight topics were prepared to support the training, including six in both English and Somali.

#### Construction:

According to mission Controller financial records, \$155,077 was expended for construction over the life of the project. The Baidoa housing compound, which LBII's expatriate advisors shared with members of at least one other project team (BRADP:649-0113), is the only construction activity that can be identified in the CGWD project files. However, in the project files only one expenditure (\$23,137) for electrification of the compound was authenticated; one other piece of documentation seems to suggest that some of the construction was CIPL(DDD) funded with local currency. Therefore, it is not entirely clear from the project files how all construction funds were spent.

Commodities:

Over \$6.7 million worth of equipment and materials, including three Ingersoll Rand rotary drill rigs, two pump rigs and numerous medium and light-duty support vehicles and equipment and spare parts, were provided through LBII. In addition in the project's penultimate year almost \$1/2 million worth of spare parts were ordered directly by USAID/Mogadishu.

Other Costs (Studies):

Seven studies and a number of reports were funded under this project. These ranged from the potential environmental impacts of the project to the socioeconomic influence of well development in two regions (Bay and Central Rangelands) of Somalia and a look at irrigation water-pumping/water-lifting issues in the Lower Shebelli Region.

For a more comprehensive review the reader can refer to the following studies:

1. Pape, M.B., 1982  
Preliminary Analysis of the Potential Environmental Impacts of the Comprehensive Groundwater Development Project; Louis Berger International, Inc.
2. Pape, M.B., 1982  
Preliminary Economic Analysis of the Comprehensive Groundwater Development Project; Louis Berger International, Inc.
3. Roark, Paula D., 1982  
Phase I, Socioeconomic Report
4. Brandon, C., 1984  
Economic Evaluation of the Comprehensive Groundwater Development Project; Louis Berger International, Inc.
5. McGowan, R., Johnston, L., Waldstein, A.S., Tillman, G., and Speed, J., 1986  
Irrigation Water-Lifting in the Shebelli Water Management Project; Associates in Rural Development, Inc.
6. Lerner, H., and Coolidge, J., 1986  
Study of Private Sector Participation in Somalia's Water Resource Development Industry. Four Volumes. Louis Berger International, Inc.
7. Impact of Well Development on Socioeconomic Conditions in the Bay Region and Central Rangelands; International Group for Financing and Consulting (1987).

SUMMARY OF NON-U.S. CONTRIBUTIONSSomali Government (GSDR) Inputs:

WDA Staff - Somali personnel for the project was provided by the GSDR, primarily from the WDA's staff. In some cases it was necessary to recruit qualified people from outside the WDA. WDA personnel were selected on the basis of past experience (particularly with rotary rigs). Neither USAID nor the prime contractor had any control over this selection process. Many of the project staff were quite competent, but some unqualified people and others who performed unsatisfactorily were also nominated to the project.

Support Facilities - The WDA provided the CGWD project with office space, yard and warehouse areas, in addition to some housing accommodations for expatriate project staff.

Local Currency - All local currency funding came from counterpart funds generated by CIP and PL 480. These funds were included in the GSDR's development budget for each calendar year and were allocated in accordance with a local currency budget process that began with requests prepared each year by Somali and USAID project managers for the Ministry of Finance's Domestic Development Department (DDD). These requests were used to make up the Annual Program Budget Plan (APBP), prepared by USAID's program office and the DDD, and signed by the Minister of Finance and the USAID Mission Director. Releases under the budget were then approved by the USAID/GSDR Generated Shillings Proceeds (GSP) Committee and advances were usually scheduled to be made on a quarterly basis.

This budget was used primarily for providing allowances (incentives) in addition to salaries for WDA staff assigned to the project, per diems, office supplies, and vehicle maintenance and fuel. While money was budgeted for fuel (both diesel oil and gasoline), the problem of actually getting fuel for the project, and then making sure that it was not diverted, proved to be the biggest problem for the prime contractor's staff. Often an allocation of 40,000 liters would be requested from the GSDR's Petroleum Agency and only 4-5,000 liters would be delivered, which was not enough to mobilize the drilling rigs.

Other Donor Inputs:

The CGWD project did not directly receive any inputs from other donors, but did relate to the following projects which were funded by other donors.

Integrated Rural Development Projects - The CGWD project has provided support and been closely linked to the Bay Region Agricultural Development (649-0113) and Central Rangelands Development (649-0108) projects. Both of these projects have received the major share of their funding from the IBRD. USAID has also provided substantial support to both; GTZ also has funded certain project activities.

Small Urban Water Supply Systems - GTZ provided technical assistance to the WDA from 1980 - 1987, including some advisory services on administrative systems. As part of this project, GTZ also funded a review of WDA's capacity to operate, maintain and repair water wells and distribution systems in small urban centers and rural areas. A major finding of that review, completed in 1986, was that the WDA has little capacity for (or interest in) operation, maintenance and repair.

#### ACCOMPLISHMENTS VERSUS PLANNED OUTPUTS

##### Institutional Support:

1. More opportunities and plans for private sector drilling operations expansion - The project called for the start up of two private sector firms and drilling and production plans devised for four private wells. There are at least two bonafide private Somali water drilling firms- Horn of Africa and MAM Brothers- currently in operation in Somalia. However, these firms were not started as a result of the project. In 1987, the WDA put out a tender to the private sector for the production of four wells. The Horn of Africa company successfully completed those wells later that same year. Since that time, however, the private sector has not been publicly invited to produce additional wells for the WDA because of its lack of local currency operating funds. Thus, project objectives regarding the private sector technically have been met though institutionalization of private sector involvement seems unlikely.
2. Trained WDA personnel - In order for this output to assist in the attainment of the project's purpose, Berger was tasked contractually with the responsibility of providing training for 4 long-term and 10 short-term technicians and administrators in the United States plus on-the-job training for all project staff. OJT appears to have been one of the major benefits of the CGWD project. The classroom training program, however, was described as highly ambitious by the final evaluation team. The completed participant program included (1) a U.S Geological Survey two-month course for eight participants and (2) degree programs for two hydrogeologists and two hydrogeochemists. Many, including Louis Berger, the evaluation team and GTZ, believe that continued inadequate pay (and for a period in 1987 actually no pay) will cause many more of the project trainees to leave the WDA for more lucrative employment.

### Data Collection and Utilization:

Hydrogeologic and year round water source maps produced and WDA and MMWR producing and updating pertinent data for water sector analysis and planning starting from adequate data base - In order to assist in achieving the project's purpose, a WDA Planning Department and MMWR Water Data Center were to be established prior to the end of the project. Since the establishment of the former requires a Presidential decree which was never published, Louis Berger instead assisted the WDA with the establishment of a Planning Unit. As discussed in the previous "End of Project Status" section, only marginal success was achieved during Berger's tenure and substantially less has occurred after that contractor's departure. The unit is currently still understaffed and has not been able to fully carry out its mandate. On the other hand, after much delay the Water Center was established in late 1987. For all practical intent and purpose, the center only began to gear up in April 1987. It will be sometime, therefore, before its success or failure can be objectively determined.

### Exploitation:

1. WDA capable of implementing its share of water resource development program with reduced technical assistance - In order to attain this output, the WDA should be capable of independently drilling 50 boreholes per year. At the height of the project's operation (i.e., the first 7 years) an average of only 15 production wells per year were drilled (i.e., 30% of the 50 planned following the end of the project). As mentioned in the discussion of the achievements under the first output in this section, only 20 wells were commissioned by the WDA from 7/86 to 3/88 (i.e., an average of one/month or twelve/year). It is very unlikely, without the more timely and consistent financial support of the GSDR, that the WDA will ever come close to this projected rate.

2. WDA and private contractor production wells - It was estimated in the revised PP (8/84) that the production of between 60 and 65 rural borehole water systems (down from 92-100 in the original design) would assist in signaling the achievement of the project's purpose. As of March 1988, over the almost nine years of the project, approximately 142 borehole water production systems had been completed. However, from Louis Berger's (prime contractor) departure in June 1986 until March 1988, the WDA had only been responsible for the completion of about 20 of those wells. Thus, the project has exceeded its stated objectives in exploitation, but the institutional capabilities to carry on are not present.

Studies:

The reader should turn to the "End of Project Status" section under "Other Costs" for a more detailed discussion of studies undertaken.

Other Factors:

It is unclear from the project files whether or not the following Special Covenants included in ProAg Amendment No. 6 have ever been completely satisfied and if so, to what extent:

- (i) Review water user fee levels, their allocation, and use, and implement appropriate changes to the fee collection and use system that more equitably distribute system costs among users to increase the longevity and efficiency of rural water systems.
- (ii) Pursue solutions to the problems of hiring and retaining qualified individuals in key positions in the Water Development Agency.
- (iii) Promote and facilitate community participation in rural water system design, operation, and maintenance, to increase the longevity and efficiency of these systems.
- (iv) Strictly enforce policies agreed to by AID and the WDA concerning Project vehicle use and maintenance.
- (v) A commitment that drilling equipment rehabilitated with Project funds will be used solely in furtherance of Project objectives.

It should be clear from discussions throughout this report that apparent failure to address at least some of these issues has adversely affected the implementation of this project (e.g., continued availability of qualified project staff).

POST PROJECT MONITORING

Implementation start up on the National Water Center (NWC) partially funded by USAID was delayed for almost fourteen months. As a consequence of the late start, an assessment of the true impact of the NWC is not realistic at this juncture. In view of this and the fact that the major donor, UNDP/FAO, now proposes to continue supporting this activity through 1990, USAID/Mogadishu should continue monitoring the NWC in order to determine the following:

- (a) The extent to which its planned activities have been successfully executed;
- (b) The extent to which the immediate objectives and outputs have been achieved; and
- (c) Recommendations for follow-up activities, if necessary.

These questions were included as part of USAID's grant agreement with UNDP but because of the delay in start-up they could not be adequately answered. The mission will have to elicit the NWC's Chief Technical Advisor's assistance in this regard, by requesting him to continue forwarding copies of his periodic progress reports. Briefings can then be arranged at mutually agreed stages in the implementation of the activity.

LESSONS LEARNED

The following summarizes the lessons learned over the life of the CGWD project. These are presented as considerations in the design of future similar (or other) projects. The implications of these lessons ought also to be evaluated in terms of the continuing issue of project versus non-project assistance in Somalia:

(1) The design of future projects should more actively involve long-term USAID Somali and American staff members familiar with specific local conditions and aware of the larger mission picture as a support to any short-term consultant team members in order to ensure adequate consideration of local conditions and requirements. Arrangements should be made to excuse full-time staffers from their regular responsibilities during design work, if future projects are to address real needs in a realistic fashion (i.e., in particular taking into account time and resource constraints).

(2) It would make sense in the future to work more closely with other donors in order to specifically address the issues of standardization of vehicles and equipment and the maintenance of these locally. For example, for the CGWD project support vehicles, it would have been wiser to have permitted standardization on Japanese or Italian vehicles already widely in use in Somalia. Although not necessarily guaranteeing the successful continuation of the project, it certainly would have ensured, instead of the already growing number of "dead line" vehicles, the continued use of project vehicles for sometime in the future. Waivers in this case could have been included in original project paper.

(3) Future groundwater projects should consider not only quantitative needs and a "groundwater development program" to satisfy those needs but also, as part of the design, compare alternative approaches to well drilling in terms of planned project objectives, the types of equipment best suited to each approach and the impact of each approach on settlement patterns, future maintenance needs and organizational structure. In other words, technological solutions should be appropriately scaled back to meet the skills, educational and comprehension levels of a project's intended beneficiaries, a lesson that has been documented many times by AID and other donors.

(4) The idea of involving individual communities in the development and operation of wells should be included in all future rural groundwater development projects. The concept should be incorporated in the design from the outset and the contractor directed to explore the alternative of local control and operation of wells and what it could require in the way of centralized Government support functions.

(5) Particularly in light of OJT and circumstances such as described in lesson (4) above, ideally long-term TA advisors should speak the local language and/or at the very least be assigned a technical counterpart who speaks and reads English.

(6) A prerequisite for project success is the ability of those responsible for implementation to have the authority necessary to exercise control over all aspects of the project. When this function is divided and sub-divided, the chances of successful implementation are reduced substantially.

#### CONCLUSIONS AND RECOMMENDATIONS

##### Conclusions:

The project's final evaluation report<sup>3</sup>, which covered the period 1979-1986 (i.e., period of Louis Berger's contract), describes the project during those seven years "as modestly successful, in terms of the achievement of its objectives. A number of producing wells were completed; more than 100,000 rural dwellers, plus their livestock, have benefited from the Project; and about 130 staff members of the Somali Water Development Agency (WDA) have received some form of training. The requirements of [Louis Berger's] contract Terms of Reference have been largely carried out in a sound and professional manner." From the period immediately following this report up to 1988 a few more people were trained, some more wells were drilled and a substantial amount (\$424,500) of spare parts were ordered and received. Approximately \$102,000 presently remains in the project, which was retained to cover possible spare parts price increases.

Also during this final period, the WDA staff did not receive salaries for a period of over 8 months during 1987. In addition, the WDA made a number of requests to USAID to provide funds for its operating expenses. These could be indications of the GSDR's lack of support for the WDA and a not so subtle hint that even the modest success of the project described above is not destined to survive much beyond the 9/30/88 PACD.

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<sup>3</sup>The final evaluation was undertaken (6/86) two years prior to the eventual project completion (9/88) because the project was then due to terminate on 9/30/86 and work on the prime contract was due to end on 6/86 also.

Recommendations:

In view of the preceding discussion it is recommended that:

(1) After careful reconciliation among the USAID CGWD Project Officer and Controller, FM in AID/W and the GSDR, any remaining undisbursed funds should be deobligated and returned to the US Treasury;

(2) The USAID PDS/ENG office should be assigned the responsibility of continuing to periodically monitor and report on the National Water Center activity;

(3) The "Lessons Learned" should be incorporated into the mission's project design policy; and

(4) A review of the Status of the Covenants (described under "Other Factors" in the "Accomplishments Versus Planned Outputs" section) should be undertaken prior to any further consideration of assistance to WDA or involvement in Somalia groundwater projects in general.

Approved \_\_\_\_\_

Disapproved \_\_\_\_\_

Date \_\_\_\_\_

Clearance:

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Drafter:Winston McPhie:SMD:Doc#1337P:6/21/88.