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FINAL EVALUATION OF TWO SONEDE
PROJECTS IN SILIANA AND
CENTRAL TUNISIA

by

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SILIANA AND CENTRAL TUNISIA

13. SUMMARY

This evaluation, carried out in September 1983, covers two similar projects implemented in Tunisia by the Tunisian National Water Company, SONEDE. The bigger one is the Siliana Rural Centers Water Systems project (664.0318), covering ten sites in Siliana governorate. The smaller one is the Sbiba-Jedliane-Rohia Potable Water subproject (664.0312.4), covering the three towns mentioned and carried out as part of the CTRD project. Rohia is in Siliana governorate while Sbiba and Jedliane are in Kasserine governorate. Although administratively different, in practical terms these are parallel projects.

1. As we have come to expect from the SONEDE, the projects were carried out efficiently and easily, and no serious problems were encountered.

2. There are a substantial number of beneficiaries in each of the communities listed, and these include some of the poorer segments of the population.

3. The cost per connection was higher than anticipated.

4. At the end of the report, we offer some comments on the policy with regard to the public taps and the choice of areas to receive new connections under the program.

5. The only unexpected outcome is that the per household rate of consumption seems to have gone down while the number of household connections has gone up.

6. At this point, the public authorities should direct attention to expanding the network of ONAS to forestall the development of a serious waste water problem.

14. EVALUATION METHODOLOGY

The terms of reference for the technical aspect of the evaluation of the Siliana Rural Centers Water Systems project financed by USAID (664-0318) is to:

1. Determine the number of families/houses which have hooked up to new or extended piped water systems installed under the project; and
2. Determine the cost effectiveness of the project.

In preparing the evaluation of this project, SONEDE officials in Siliana and Kasserine were consulted. The evaluation team is particularly grateful to Mr. Ben Houidi and Mr. Bhourri of the SONEDE offices in Kasserine and Saliana respectively and to Mr. Mohamed Ali Hassairi of the USAID Mission in Tunisia. Messrs. Ben Houidi and Bhourri provided historical information on the total number of connections on each water system of interest for the period of 1977 through 1982 as well as total annual water consumption for the same period. Mr. Hassairi provided complete files on each of the water systems of interest. Mr. Hassairi's efforts have made the mission of the evaluation team any easy task. He has provided continuity to AID during the tenure of several AID engineers which the evaluators believe has led to the smooth performance of these projects. His work for the AID Mission is a credit to the United States

References

1. Project Documentation dated July 31, 1978, Project No. 664-0318.
2. Alimentation en Eau Potable de la Ville de Siliana, January 1981.
3. Alimentation en Eau Potable de Sidi Hamada: Note Preliminaire, January 1978.
4. Project Paper for Tunisia CTRD Rural Potable Water Project USAID 5/19/80 664-0312.7 (Cost per beneficiary shall not exceed \$125/beneficiary, \$25/large animal, and \$2.5/small animal.)
5. Project Assistance Paper Tunisia: Siliana Rural Center Water System, 5/26/78 USAID. (Consumption calculated at 80 l/c/d in small communities to 100 l/c/d in Siliana.)
6. Plan Directeur de la Ville de Siliana: undated.
7. Alimentation en Eau Potable de Kesra et Hammam Kesra, Avant Projet, August 1978.
8. Alimentation en Eau Potable du Krib, Avant Projet, January 1978.
9. Alimentation en Eau Potable du Complexe Sbiba, Jedliana, Rohia, June 1979.
10. Alimentation en Eau Potable de Siliana, Avant Projet, September 1978.
11. Alimentation en Eau Potable de la Ville de Siliana, Plan Directeur, June 1981.
12. Oral communication with Mr. Ben Houidi of the SONEDE Siliana office, September 1983.
13. Letter from J. R. Phippard to M. Ahmed Ben Arfa dated March 22, 1983.

14. Alimentation en Eau Potable de Laroussa, Avant Projet, October 1979.

15. F. Eugene McJunkin, Rural Water Supply and Sanitation Programs in Tunisia (Washington, D.C.: American Public Health Association, May 4, 1976).

16. IBRD, Village Water Supply (Washington, D.C., March 1976).

15. EXTERNAL FACTORS

The Government of Tunisia continues to support all efforts to supply potable water to all segments of the population. There are no changes in external factors.

16. INPUTS

Under Project 664.0318, new systems were constructed in the following communities in Siliana governorate: (1) El Kantara; (2) Sidi Hamada-Ganura; (3) Kesra and Hammam Kesra. Existing systems were expanded in (1) Siliana town, (2) Bargou, (3) Laroussa, (4) Bou Arada, (5) Le Krib, (6) Lakhouat, (7) Sidi Bou Rouis, and (8) Gaafour. All of these sites were completed at the time of evaluation except Gaafour. Gaafour was a late addition to the list in place of Makthar, which had to be dropped because there was no reliable source of water. In various combinations, these systems involved drilling new wells, capturing springs, building transmission mains and pumping stations, building or enhancing reservoirs, creating a network of distribution pipes for house connections, and installing and/or upgrading 67 public taps.

Under Project 664.0312.4, the water systems of Sbiba, Jedliane and Rohia were upgraded, using a single source of water located outside Sbiba. Again, transmission mains, distribution pipes, new reservoirs, and public taps were included in the project.

All of these communities have a municipality form of government except Kesra/Hammam Kesra, Sidi Bou Rouis, El Kantara, and Sidi Hamada/Ganura. In these communities, the Conseil du Gouvernorat is responsible for the bills and the maintenance of the public tap, whereas in the municipalities, the town council is responsible in the first instance.

17. OUTPUTS

The amount of data available for evaluation was as voluminous as it was confusing and a great deal of time was spent in trying to obtain meaningful data. Some of the difficulties were caused by:

1. Estimates of population reported for each water center were rarely identical and changed from document to document;
2. Inaccurate and inconsistent consumption rates given for persons and animals;
3. Unsubstantiated estimates of population growth for both persons and animals;
4. Inconsistent method of reporting information in AID documents;
5. Inadequate tracking of expenditures as a function of the work performed; and
6. Variation in currency exchange rates over the period of the project which made it impossible to easily determine Dinar costs when costs were expressed in U.S. Dollars and vice versa.

Overall, the evaluation has been impressed by SONEDE's:

1. High degree of competency in project planning, design, implementation, and follow through;
2. High level of professional competency among its staff;
3. Organization and systematized and complete record keeping and financial control;

The data found most useful in the analysis included:

1. Anticipated project costs from the Project Paper dated July 31, 1978;
2. The actual project completion costs based on a letter from J.R. Phippard to M. Ahmed Ben Arfa dated March 23, 1983;
3. Historical information on total number of connections per water system at the end of each year and total annual water consumption for each water system provided by SONEDE for the last five years;
4. The total population served by each water center in either 1981 or 1982 provided by SONEDE; and
5. The date of commencement and termination of construction of the various projects provided by Mr. Hassairi.

The above information has been tabulated in Table 1. Information on the total number of connections made during the project and presumably financed by the project were never located.

TABLE 1. Installed meters in listed communities provided by SONEDE.

	YEAR					
	1977	1978	1979	1980	1981	1982
EL KANTARA					3	59
S. HAMADA						113
SILIANA	1123	1297	1439	1635	1928	2134
BARGOU	308	356	363	448	481	505
ROUHIA	75	82	83	141	158	239
LAROUSA	129	134	135	145	150	232
BOU ARADA	720	781	868	919	1057	1196
LE KRIB	151	168	175	196	252	302
GAFOUR	470	526	674	797	900	1045
LAKHONET	52	53	57	60	73	79
S. BOU ROUIS	86	106	112	124	142	157
KESRA & H. KESRA					74	98
SBIBA	265	318	343	411	453	527
JEDLIANA	37	46	58	73	134	156

METER CONNECTIONS

To accommodate for the lack of information regarding the actual number of connections made during the term of the project, the number of connections made during one calendar year spanning the duration of the project was taken from SONEDE records.

Given the total cost of each project, the number of connections has been divided into project cost to arrive at the cost per connection. If it is assumed, that each connection is a home having about six inhabitants, the cost on a per person basis may be established. This number may be somewhat high because all costs expended for the construction of public fountains are added to the cost per connection. However, because only one or two public fountains were added per center, it is felt that increase in the cost per connection caused by the construction of the public fountains is small.

This analysis has assumed that all project costs whether expended for installation of mains, pumping stations, wells, otherworks, or the actual connections are attributable to those connections actually made during term of construction of the project for which funding was made. In all cases, the cost per connection exceeds \$1000 which is considerably in excess of the planned cost. These data are presented in Table 2.

A semilogarithmic plot of the total number of connections at the end of each year for each system was made. These plots are shown in Figure 1. A least squares linear regression was performed on the data for each center. This representation will be useful for evaluating the rate of growth in service for each community.

TABLE 2. Summary of cost data for private and public metered water connections for the communities listed. Source: SONEDE.

	COSTEST 31JULY78	MAR ACT COST (\$)**	POP 1981	CONNEC 1982	PP-1980 COST/PER (\$)	MAR ACT COST/PER (\$)	ACT COST PER CONN (\$)	ACT COST PER PERS (\$)	PROJ IMP DATE	PROJ TERM DATE
EL KANTARA	239.5	79135	400***	59	325.92	197.84	1341.27	223.55	7-79	7-80
S. HAMADA	372.5	261696	1300*	167	302.83	201.30	1567.04	261.17	4-80	3-81
SILIANA	603.8	1030240	11500	196	64.08	89.59	5256.33	876.05	3-79	5-80
BARGOU	242.4	153220	2500	67	101.76	61.29	2286.87	381.14	7-80	6-82
ROUHIA	162.7	--	1400		--	--			3-82	3-83
LAROUA										
BOU ARADA	480.5	253330	6552	138	80.16	38.66	1835.72	305.95	5-80	7-81
LE KRIB	845	365848	5000	21	119.04	73.17	17421.33	2903.56	2-79	3-80
GAFOUR									12-82	5-84
LAKHONET										
S. BOU ROUIS	204.5	85690	1400	12	426	59.51	7140.83	1190.14	5-79	4-80
KESRA & H. KESRA	524.2	164970	2850	74	127.92	57.88	2229.32	371.55	6-79	3-80
SBIBA	22	368480	--	--	418.56	--			6-80	5-81
JEDLIANE										

* INCLUDES POPULATION OF EL GANNARA

** COSTS IN DINARS ADJUSTED TO USD

*** ASSUMES 6 PERSONS PER HOUSEHOLD

WATER USE

Though not specifically required as part of the evaluation, it was decided to determine

1. The per capita use of water over the five years of historical record; and
2. The rate of change of water use over the five year period.

This information will be useful in making projections of future water needs inasmuch as estimates of the growth of water use found in SONEDE reports and other documents seems to have no basis in fact other than as estimates from Peace Corps Volunteers, the Ayad report and reports of the World Bank.

The cumulative water consumption over the period of historical record provided by SONEDE has been plotted on Figure 1 as well and a least squares regression was also carried out on these data. Water consumption information is presented in Table 3.

The positive slope to the total number of connections curve or course indicates that the number of connections is increasing annually. The positive slope to the cumulative water consumption curve indicates that the water use is also increasing annually. This increase is, of course, directly related to the number of connections. The more connections, the more water is used. Certainly before connections were obtained, people may have obtained their water from public fountains which are also metered, so that overall consumption by the total population served is probably quite accurately reflected.

If the slope of the cumulative water consumption line is greater than the slope of the cumulative meter connection curve then the indication is that the total consumption per connection and per person is increasing with time.

TABLE 3 Annual consumption and cumulative consumption in cubic meters for the communities listed. Source: SONEDE.

	YEAR											
	1977		1978		1979		1980		1981		1982	
	CONS	CUM	CONS	CUM	CON	CUM	CONS	CUM	CONS	CUM	CONS	CUM
EL KANTARA									38	38	2755	2793
S. HAMADA											9710	9710
SILIANA	165828	165828	201593	367421	243363	610784	258020	868804	309724	1178528	397477	1576005
BARGOU	34437	34437	38105	72542	42646	115188	56469	171657	56292	227949	66747	294696
ROUHIA	28990	28990	31434	60424	29804	90228	37175	127403	54427	181830	49998	231828
LAROUSA	24417	24417	28482	52899	30160	83059	27426	110485	27496	137981	41086	179067
BOU ARADA	97110	97110	92712	189822	108298	298120	104793	402913	138201	541114	153201	694315
LE KRIB	35335	35335	39034	74369	37328	111697	40913	152610	73957	226567	74776	301343
GAFOUR	147759	147759	159250	307009	163216	470225	162159	632384	176236	808620	251570	1060190
LAKHONET	49103	49103	64645	113748	71317	185065	96438	281503	143225	424728	107245	531973
S. BOU ROUIS	12146	12146	14266	26412	15592	42004	19596	61600	23651	85251	28773	114024
KESRA &		0		0		0		0	3156	3156	17419	20575
H. KESRA		0		0		0		0		0		0
SBIBA	52248	52248	53753	106001	70477	176478	72323	248801	76425	325226	77000	402226
JEDLIANE	44519	44519	47251	91770	54095	145865	57064	202929	17855	220784	88061	308845

18. PURPOSE

The project purpose is given as "To improve potable water delivery, particularly to low-income families, in eleven rural and semi-urban areas in the Siliana Province of North Central Tunisia."

1. All eleven (or ten ?) centers have water distribution networks. They are well built and functioning normally.

2. The number of public taps was reduced by agreement from 67 to 22; these have all been installed and are supplying adequate free water.

3. The quantity of water has been increased, though perhaps not to the extent specified in the logical framework. In fact, there is some evidence that the rate of household consumption has declined.

4. The number of persons benefitting from household connections has increased.

5. We have no information on the quality of the water.

19. GOAL

Under the logical framework for the Sbiba-Jedliane-Rohia project (664.0312.4), the goal is given as "Improved quality of life in the program area." The same goal was present in the Siliana project.

The logical framework suggested that certain measures could be used to gauge the impact of the SONEDE projects. These include increased school attendance, more local employment and hence less emigration, a lower birth rate, and better health conditions. The team did not think that these figures would be revealing enough to make it worthwhile to collect them. It is entirely plausible that the disappearance of a need for children to haul water might result in increased school attendance, but it would be hard to use school attendance figures alone to show that, since it would not be possible to disaggregate this cause from other possible reasons for rising school attendance. Moreover, the effects of house connections on school attendance might not really be visible (even if they could be isolated) for several years. Methodologically, there is the fact that truly relevant information is hard to collect -- and if no one establishes the parameters at the beginning of the project and collects data to serve as a baseline, then collecting data afterwards is neither useful nor revealing.

20. BENEFICIARIES

The main effect of the construction of these water systems has been to extend the coverage of the SONEDE network to new areas: (1) These include some communities that were simply not covered by SONEDE, such as Kesra, Sidi Hamada-Ganura, and El Kantara. (2) In other towns, the financial support of USAID has enabled SONEDE to lay distribution lines to new areas of settlement in these rapidly spreading rural towns.

In the first case, the main beneficiaries have been rural populations living in agglomerations large enough to meet the SONEDE guidelines. In Sidi Hamada, the existence of the SONEDE distribution lines has meant that many people now no longer have to climb up to the spring which is located above the village. In El Kantara, which is a large settlement inhabited mostly by workers in the nearby state farms and cooperatives that form the Lakhmess irrigation project, the house connections have also allowed people to cease their reliance on water supplied through the cooperative from the irrigation network. In cases such as these, people no longer have to haul water, with a considerable savings in time and effort. They appear willing to pay their bills. In El Kantara, some people are even using some of the water to irrigate small gardens of a few square meters in front of or near their house.

In Kesra, too, there are many new house connections. Here a spring that is the basis for the existence of the village has been partly captured and piped through the distribution system. One of the results of this is that the system now furnishes water to two

small settlements at the base of the hill on which Kesra is located as well as to the part of Kesra which is located between the captured spring and these settlements, i.e., the part downhill from the spring. However, approximately two-thirds of the traditional village of Kesra is located either above the level of the spring or in the opposite direction. These people have not benefitted by this work. They continue to supply themselves at another spring, captured and improved in the colonial period, in most cases using donkeys to help them carry the water higher. Here the project as conceived would have been improved by creating a reservoir further up the hill, and pumping water up to it, whence gravity flow could have been used to bring the water into the homes of a larger proportion of people's homes. However, it seems to be government policy to encourage people to move down the hill to a new site near the paved road -- the clinic, the school, and the delegate's office will all soon be down there -- so that this omission may reflect another policy imperative.

In the towns that already had a piped water supply through SONEDE, the USAID-financed project has principally had the effect of extending the geographical zones covered by the system. Most of these towns have areas of new housing on the edge of town. This reflects both a tendency in Tunisian towns to shift towards a lower density settlement pattern, and an increase in population. We have no information on the socio-economic character of the new areas served by the distribution lines in these towns. Many of those building houses in the new areas are civil servants from these towns who may serve elsewhere; some or even many of these houses will in fact be occupied by the increasing staff of civil servants, teachers

and others that are servicing the new institutions in these towns. Thus an improvement in the amenities available to these people will increase the likelihood that qualified and competent civil servants can be attracted to these small towns and so serve their populations. However, a comparison of the figures for water use (in cubic meters) and those for house connections suggests that the real increase is in the number of house connections, not in the amount of water that is used per capita. This amount appears to remain relatively low, around 30 litres per day.

Houses in all areas most commonly have a single tap, usually located in the wall that separates the courtyard from the outside. Buckets of water can be filled here, and sometimes people will use a length of hose to get the water to another part of their house. One may suppose that as long as each household only has one tap, the amount of water used and especially the way the water is used will not vary significantly from the use of the water when it had to be hauled.

People make their own adjustments. In Kesra people asked the contractor to build a separate trough for washing clothes, and at one public tap in El-Krib people had constructed a make-shift animal trough from mud. Other adjustments include blocking the tap open to ensure a continuous flow of water, which we observed on the edge of Jedliane.

The most contentious issue in these projects is the provision for public water taps. USAID insisted on including these taps in the project in order to be sure that the poorer sections of the population, who could not afford house connections, would also benefit. The agreement specified that there should be one public tap for every 250

inhabitants who were not connected directly to the water distribution system. SONEDE agreed to this stipulation though they now recognize that the effective construction and maintenance of such public taps was not entirely under their control. Normally, they respond to a request from the local public body for a public tap; in this case they had to solicit the request in order to live up to the agreement.

The number of public taps actually supplied appears to have been negotiated downwards over the life of the project. Thus in the beginning, the project documents for 664.0318 spoke of 67 public taps. In fact, 22 were constructed, and in some cases (e.g., Kesra), even this figure includes some already existing taps.

Each public tap must have a water meter and the bill for water measured by each meter is paid by a designated governmental authority. In cases where the community is organized into a municipality, the invoice is sent to the municipality; in other cases, it is sent to the Conseil du Gouvernorat. Invoices sent to the Conseil du Gouvernorat are paid from the budget of the Governor. Furthermore, although SONEDE is responsible for providing water to the public fountains, after the water passes the water meter the appropriate government authority becomes responsible for regulating water use and maintaining the public fountain.

This can create two problems: first, the government authority may not have sufficient funds to pay the SONEDE water bills (or may not want to); and, second, the government authority is responsible for the design, construction, and maintenance of the civil structures around the taps.

With regard to the civil works, the team believes the government authorities do not pay enough attention to sound design and maintenance. The public fountains are poorly maintained. Large amounts of water commonly leak on the government side of the water meter (resulting in very high water bills to the government authority), water may run continuously because of accidentally or deliberately broken valves, stagnant pools of water surround the taps, and in general drainage is poor. As best we could judge on a brief visit there is no movement among the population itself to improve matters around the public taps, nor is there concerted pressure to get the local government to do something. At the same time, in many cases the municipalities concerned are both new and small, and should not perhaps overestimate their abilities.

From an administrative point of view, there is a problem of linkages:

1. between SONEDE, the supplier of water, and the local government authorities; and
2. between the beneficiaries of the public tap and the local government authority.

As a result, there are the following problems:

1. Waste of water and concomitant high water bills to the local governing authorities; and
2. Dirty, muddy, and unsanitary conditions around the public taps.

These problems may cause the local government authority to withdraw support because the public fountains are a public nuisance and a financial drain. It is clear though that the low priority assigned by the local government authorities to public taps and their lack of attention to the details of public fountain design construction, use, and maintenance are at the heart of the problem that now

comes back to plague them. Perhaps SONEDE could be persuaded to mount a campaign against water wastage that would have some effect (after all the problems encountered here are fairly general in Tunisia). Otherwise, the only solutions to these problems may be either the redesign and reinforcement of systems or policing the systems and in extreme cases shutting them down. The latter approach was taken in El Kesra with some success: the delege told us that he had threatened to shut down the tap completely if people did not learn how to turn it off, and felt that this has worked.

21. UNPLANNED EFFECTS

None.

22. LESSONS LEARNED

1. The project is a successful one. This is due to the experience and professionalism of SONEDE, and to the relatively simple procedures followed by USAID. SONEDE should be encouraged to carry out similar projects in the future.

2. Waste water disposal is beginning to become a problem in these smaller centers. Consideration should be given to projects involving the Office National de l'Assainissement Sanitaire (ONAS). If one brings more water into a community, then the amount of waste water will also increase.

3. If socio-economic indicators are going to be used seriously in evaluation, then the methodology should be established at the beginning of the project, and base line data assembled. Wherever possible these activities should be carried out in-country, so that the figures can be supplied to the evaluation team for their interpretation.

23. SPECIAL COMMENTS OR REMARKS

None.

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