



ENVIRONMENTAL HEALTH PROJECT

ADDENDUM TO
ACTIVITY REPORT

No. 21

Final Monitoring Visit Regarding a Plan
to Establish a Water and Sanitation District
in Cité Soleil, Haiti

September 1997

by
Fred Rosensweig, EHP
Chris McGahey, EHP Consultant

Prepared for the USAID Mission to Haiti
under EHP Activity No. 221-CC

Environmental Health Project
Contract No. HRN-C-00-00036-11, Project No. 936-5994
is sponsored by the Bureau for Global Programs, Field Support and Research
Office of Health and Nutrition
U.S. Agency for International Development
Washington, DC 20523

CONTENTS

- 1 INTRODUCTION1
- 2 CURRENT STATUS.....3
 - 2.1 Organization/Management3
 - 2.2 Community Participation4
 - 2.3 Current Status of Technical Activities6
 - 2.3.1 CADEPA Water Supply.....6
 - 2.3.2 Solid Waste.....8
 - 2.3.3 Demonstration Projects.....10
 - 2.3.4 Site Plan11
 - 2.4 Financial Analysis.....11
- 3 SUSTAINABILITY.....21
 - 3.1 Progress Towards Indicators.....21
 - 3.2 Water Supply.....23
 - 3.3 Solid Waste.....23
 - 3.4 Latrines.....24
- 4 RECOMMENDATIONS25
 - 4.1 Recommendations for CADEPA.....25
 - 4.2 Recommendations for USAID26

TABLES

- 1 Estimated Operating Costs..... 13-14
- 2 Administrative Costs of the District..... 15-16
- 3 Water Supply O&M Costs..... 17-18
- 4 Solid Waste O&M Costs..... 19-20
- 5 Performance Indicators for the District: Planned, Actual, Projected..... 22
- 6 Gallons fo Water Sold per Day; First Six Months of System Operation 22

1

INTRODUCTION

Two consultants from the Environmental Health Project (EHP), one an institutional development specialist and the other an environmental engineer, visited Haiti September 8-12, 1997 at the request of the USAID Mission. (Both individuals had participated in this activity from the start.) This was the final planned monitoring visit in a two-year activity to establish a sustainable mechanism to provide high-quality drinking water and reduce environmental pollution in Cité Soleil. EHP assisted a large, experienced Haitian NGO, Les Centres pour le Développement et la Santé (CDS), in establishing a plan for an independent organization to manage the water supply system for Cité Soleil. This new organization was given the name CADEPA (Comité pour l'Alimentation, la Distribution d'Eau Potable et l'Assainissement). (Construction of the water-supply system was funded by UNDP through a grant to CDS. Setting up the management system was supported by a grant from USAID.)

The first EHP visit took place in October 1995, and after several other visits the plan for establishing a water supply and sanitation district was finalized in April 1996. An EHP environmental engineer made two subsequent monitoring visits, in May and November 1996, to review plans for demonstration projects and to assess overall progress in setting up the community-based organization. The district began its operations in April 1997. Thus the observations in this addendum are based on the initial five months of service.

The purposes of this monitoring visit were as follows:

- # review and document the financial and organizational operations of CADEPA
- # determine the sustainability of the system as currently configured
- # provide recommendations for improvements in CADEPA's operations
- # provide recommendations regarding future support and involvement of USAID

The consultants carried out the following activities during their visit:

- # held extensive conversations with the Director and Operations Supervisor of CADEPA
- # made several site visits to Cité Soleil
- # talked to four fountain operators
- # conducted a focus group with seven representatives of the zonal committees
- # reviewed the operations records of CADEPA
- # conducted a debriefing for USAID and CADEPA leadership

This addendum builds on the background information in EHP Activity Report No. 21, *A Plan for CDS to Establish a Water and Sanitation District in Cité Soleil, Haiti* (hereafter referred to as *the Plan*). The addendum is organized in four sections:

- # introduction
- # description of the current status of the institutional, community, financial, and technical

activities of CADEP including accomplishments
to date and issues still needing resolution
prospects for sustainability and progress made
so far toward reaching the indicators set out in
the original plan

recommendations for CADEPA and
USAID/Haiti.

2 CURRENT STATUS

2.1 Organization/Management

CADEPA has done an excellent job in getting established. Below are the significant accomplishments that CADEPA has made:

- # Located and furnished an administrative office in Cité Soleil.
- # Hired central office staff to operate the water supply system. The central office staff consists of 10 people.
- # Hired five maintenance personnel for water supply O&M.
- # Formed an extensive community management structure consisting of 41 fountain committees and seven zonal committees.
- # Trained seven zonal coordinators.
- # Trained the 65 fountain keepers identified by the fountain committees. Some fountains have more than one keeper because they are open more than eight hours per day and more than five days per week.
- # Negotiated an agreement with CAMEP, with a clear division of responsibilities between CAMEP and CADEPA. (CAMEP is a state-owned company set up under the Ministry of Public Works, Transport, and Communications. It is charged with responsibility for provision of potable water in the Port-au-Prince area.)
- # Developed and put into practice a simple and effective financial management system.
- # Provides services in six of the seven zones in Cité Soleil. Zone 7 is not receiving services

because the IDB drainage project resulted in breakage of the water pipeline.

- # Has functioned without USAID financial support since May 31. For the past three months, CADEPA has generated enough revenue to pay all salaries and O&M costs for the water supply system.
- # Has created 81 jobs to date. Virtually all of these jobs have been filled by Cité Soleil residents; the only exceptions are two or three professional positions in the central administration. In October, 43 additional jobs will be created when the solid waste teams are paid by CADEPA.

Although CADEPA is off to an excellent start, several issues will require attention.

Autonomy. CADEPA has signed a renewable three-year contract with CAMEP to operate the water supply system. The contract is between CDS and CAMEP, with CADEPA, as a branch of CDS, designated as the operating entity. The three-year period began in January 1997 and will terminate in January 2000. Although the contract has satisfactory terms, it does not offer any guarantee beyond that date. Theoretically, at the end of the contract period, CAMEP could decide to take over the management of the water supply system, given the amount of steady revenue it generates. This is clearly a long-term issue that could affect the sustainability of CADEPA if CAMEP does not renew the contract. The resolution to this issue may be affected by the current national policy discussions regarding reform of the water and sanitation sector. If the policy allows for autonomous organizations to provide services under the overall regulation of government agencies, that

would lay the groundwork for CADEPA to become a permanent entity with responsibility for water and sanitation in Cité Soleil.

Transition to a New Director. The Director of CADEPA will leave at the end of September 1997. He has done an excellent job of building a community-based organization. He has hired competent staff, created sound administrative systems, and established good relations with a wide range of stakeholders. The current Operations Supervisor will take over as Director, thus assuring a smooth transition. The incoming director has been on board since the beginning of the organizational planning; he is aware of all aspects of managing CADEPA and should be able to succeed the current director with minimal problems. The outgoing director needs to ensure that his replacement is fully briefed on all aspects of CADEPA's operations including relationships with other organizations such as USAID, CAMEP, UNDP, and IDB.

Community Relations Staff. CADEPA currently has no community relations staff. Using USAID funds, CDS hired three consultants to put in place the community structure, including organizing and training the fountain committees. CADEPA felt that these consultants did not have the right skills to provide ongoing support to the committees, so they were not hired for permanent positions. Although they did an excellent job of setting up the system, they had neither the desire nor the field orientation to spend time in the community working with the committees once they were up and running. CADEPA plans to hire two community relations staff by the end of September who have the field orientation that will be required in the future. Hiring these staff is important to maintaining the community structure that has been established.

2.2 Community Participation

CADEPA has succeeded in establishing a community-based institution. This may be the most important aspect of the project's success to date,

since its long-range prospects depend on the degree to which the community supports CADEPA. The community-level structures that have been created consist of the following:

- # Forty-one fountain committees have been formed. They operate 62 fountains. The interest and commitment of these committees is all the more impressive considering they function without any financial support from CADEPA. The original plan was for committees, which hire and supervise the fountain operator(s), to receive a salary plus 50% for discretionary spending. Although CADEPA plans to begin paying this 50% above the salary in October, it has not yet done so out of concern that it would not have sufficient money to meet other essential expenses during start-up. The committees were all elected democratically in open meetings organized by CADEPA. A typical five-person committee has two women representatives. The 41 fountain committees employ 65 fountain keepers.
- # Each of the seven zones has formed a zonal committee, which is composed of one representative from each fountain committee and five at-large community leaders. Each zonal committee has in turn elected a three-person management committee which is responsible for implementation of zonal sanitation activities such as solid waste collection and management of communal latrines. The management committees represent a locus of responsibility and provide a point of contact for CADEPA. The zonal committees currently do not have women representatives.
- # After much discussion, the decision was made for customers to use cash rather than tokens to purchase water. The zonal coordinators collect the cash from the fountain operators in their zone every day and bring it to CADEPA headquarters where it is counted and checked

by the cashier. The zonal coordinators report their meter readings and check them against the cash receipts. Every few days, the cash is deposited in the bank. The financial system is simple, and the record-keeping forms that have been developed are easy to fill out and allow very easy monitoring of how each fountain is doing.

- # Each zonal committee has selected a zonal coordinator, who is responsible for collecting receipts from the fountain keepers and reporting problems to CADEPA. The zonal coordinator is the only one of these representatives who collects a salary from CADEPA.

The committees appear to be working well. Most importantly, these elected committees have been given responsibility for an important local service, and the result has been a high degree of community ownership of the water supply system. CADEPA (and its representatives/the committees) is viewed as a Cité Soleil-based organization responsible for providing local water and sanitation services.

Below are issues which have arisen relating to community management.

Private Water Sellers. One of the ongoing community-level concerns is the fate of the private water sellers. EHP estimated that there were approximately 133 private water sellers when the plan was being developed, although this estimate may have been high. Approximately 20 private vendors, all of whom were served by an abandoned CAMEP pipeline, complained to CADEPA when CAMEP closed the pipeline due to the poor quality of water and the existence of the new water supply system. Three community meetings have been held between CADEPA and the private water vendors whose businesses have been disturbed by the new water system. CADEPA proposed the following criteria for connecting a water vendor to the new system: (1) the water vendor will pay for connection and metering costs, (2) water storage tanks must be

kept in a condition satisfactory to CADEPA, and (3) water must be sold to customers at the prevailing CADEPA price. If these criteria are met, then CADEPA will connect the private water vendor to the distribution system. EHP believes that this solution will not provide sufficient financial incentives to the private sellers. In the focus group, zonal committee members thought that CADEPA should charge the sellers one gourde for seven gallons, like all other consumers, and let them charge whatever the market will bear. The consumers would then decide whether the price was justified. Although the issue needs more negotiation, this solution might be workable.

What is surprising is the small number of vendors who have complained about the drop in their business. Although the consultants did not have time during the monitoring visit to do a complete study of the issue, it appears that some of the vendors have simply closed their businesses. It is also possible that some private vendors continue to obtain water from water delivery trucks and sell most of the water when the fountains are closed.

During a focus group meeting conducted during this visit, Zone 5 committee members said there are no private vendors in their zone any longer. Committee members from Zone 1 said there were only three sellers left. Many people reported that there are fewer water trucks in Cité Soleil, which is possible evidence that the private market is eroding.

Ongoing support to the committees. The committees will continue to need support from CADEPA. Although the community participation consultants did a very good job in forming the committees, the job is not finished. It can be expected that over time, some committees will not display the same enthusiasm as in the beginning. Some committee members will move; others will no longer want to serve; and problems will arise leading to disputes. The two community relations staff (to be hired) will have the responsibility of providing ongoing support to ensure that the organizational backbone of CADEPA's community structures remains solid.

Consultative Board. CADEPA plans to form a consultative board that would meet monthly or bimonthly. This board would consist of the seven presidents of the zonal management committees, senior staff of CADEPA, and representatives from CDS and CAMEP. On occasion, representatives from donor organizations might want to attend to discuss potential project ideas of mutual interest. The role of the consultative board is discussed in the Plan (see Section 2.6 and Table 2). To date such a board has not been set up. Now that the zonal management committees have been formed, the consultative board should be convened. The first meeting should take place before the current director departs at the end of September.

2.3 Current Status of Technical Activities

2.3.1 CADEPA Water Supply

Seventy-six communal water fountains have been constructed for CADEPA's use. Currently, 62 of them are in operation. This lack of full operation is explained by the following points:

- # Six fountains in Zone 7 of Cité Soleil are not in operation due to supply line breakage by the drainage project contractors at the abandoned railway line north of the central market
- # Six fountains in Zone 2 of Cité Soleil are not in operation due to supply line breakage by the drainage project contractors on National Route 1
- # One fountain in Zone 5 and one fountain in Zone 6 are not in operation due to limited water sales at adjacent fountains

Unfortunately, it was not clear at the time of this writing how quickly repairs would be made to

facilitate the opening of the fountains in Zones 2 and 7. CADEPA submitted a letter to the drainage contractor requesting repair of the break affecting Zone 2, but after one month, no response had been received from the contractor. Repairing the breaks affecting Zone 7 is expected to take even longer as repairs are contingent upon drainage construction and phase two of the new national highway which is proposed for construction through Cité Soleil.

Other relevant data obtained during this assignment are listed below:

- # 108,000 gallons of water were sold by CADEPA per day (24 operating days) in August 1997
- # CADEPA paid 5.3 gourdes for each cubic meter of water obtained from CAMEP (volume sold is gauged by a water meter on the water tank)
- # Unaccounted-for-water has been averaging 32% since the system opened for operation in March 1997 (in August, unaccounted-for-water was only 19%, quite acceptable by international standards)
- # The flow rate at one faucet that was sampled was 28 gallons per minute (gpm). This flow rate is significantly higher than the 3 gpm rating of the faucets. The higher observed flow rate is likely the result of high pressure in the system due to the closing of both Zones 2 and 7.

Many issues have arisen during the first months of operation, CADEPA is currently addressing them, as discussed in the following paragraphs.

Competing water suppliers. Since April 1997, water has been entering Cité Soleil in four ways: (1) through an old CAMEP pipeline network, (2) from the Salesian Fathers in Soleil 4 and Soleil 17, (3) from private vendors of trucked water, and (4) from CADEPA. CAMEP no longer supplies water to Cité Soleil other than through CADEPA. As

mentioned above, the monitoring team learned from CADEPA staff and focus group discussions that the number of private vendors in Cité Soleil has dropped significantly since the opening of the CADEPA system. The Salesian Fathers have recently increased the volume of water they provide free of charge to Cité Soleil. CADEPA's service pool of clients has increased 33% each month on average since May 1997.

- # *CAMEP*: The CAMEP pipeline network into Cité Soleil was completely closed in August 1997.
- # *Salesian Fathers*: It is estimated from information provided by supervisors that the Salesian Fathers currently provide 248,000 gallons of water free of charge to residents of Cité Soleil through their distribution points on Soleil 4 and Soleil 17. The EHP team suggests that CADEPA conduct a truck count, similar to one conducted in 1995, to accurately assess the volume of water being trucked into Cité Soleil by both the Salesian Fathers and independent truckers. This study should be conducted over four consecutive non-rainy days, including one Sunday.
- # *Displaced vendors*: This issue is discussed in Section 2.2.

Quality of system hardware. Poor workmanship is evident throughout the CADEPA system. Unfortunately, the contractor who installed the fountain fixtures has been released from his one-year insurance responsibility of maintaining the quality of the system. PVC pipes leak at joints, ON/OFF valves in fountains break and leak regularly, 20% of the water meters are currently not functioning, and hinges on fountain doors are breaking at the welds. The system has been in operation for only five months and is at risk of rapid deterioration. The greatest immediate threat is not destruction by external forces, as was initially feared, but rather from rapid deterioration due to low-quality materials and workmanship. The

unexpectedly high pressure in the system due to the closure of Zones 2 and 7 may also be contributing to leaky pipes and water meter damage.

Illegal connections. An encouraging aspect of the operation of the water supply system has been the community's actions regarding detected illegal connections to the distribution network. On two recent occasions, fountain committee members have taken the initiative to identify to CADEPA newly installed illegal connections. These actions clearly demonstrate the ownership felt by the community members over the water system. Upon notification, CADEPA has been able to promptly identify owners of such connections and has physically disconnected them. Frequently, however, individuals reconnect to the system. CADEPA knows of at least four instances where this has occurred and where neither CADEPA nor the community can exercise sufficient leverage to bring about a permanent disconnection. In such cases, police support is the sole alternative, but CADEPA has not received enforcement support from these authorities in these particular instances. The magnitude of the impact of illegal connections is not known but is reflected in the unaccounted-for-water value. Therefore, close attention must be paid to this number at all times by CADEPA.

Negative pressure in system. Water distribution systems are designed to work under constant positive pressure to avoid contamination of the system from outside the pipe network. Because so much of the CADEPA pipeline is laid in polluted soil, it is particularly important that positive pressure be maintained. Unfortunately, it is not. Two factors contribute to this condition: (1) CAMEP is not providing sufficient water to the system to keep positive pressure--the system regularly becomes empty during normal operating hours, and (2) CADEPA purposely closes the system off from the water tank at 6 p.m. each evening to ensure that the tank is not drained overnight from a faucet being inadvertently left open. The first factor must be addressed as a problem to resolve. The second factor is arguably an acceptable management

practice, although the negative impacts would be minimized by reducing leaks within the distribution system.

Water quality. CAMEP is responsible for water quality and chlorination. CAMEP does not closely monitor the quality and is not currently using the automatic chlorinator on the water tower. Powdered chlorine is being added to the tank manually.

Turbidity measurements by CAMEP are currently noted in the range of 2 to 3 NTU; the acceptable limit for turbidity is 1 NTU. A determination that water has a high turbidity indicates the presence of particulate materials in the water and is a cause for concern. When high turbidities are observed in drinking water, particular attention needs to be given to the chlorine demand of the water and to the disinfection process. U.S. standards for drinking water recommend not more than 1 NTU in more than 5% of samples taken each month.®

Bulk water supply. CADEPA is currently not receiving all the water it could sell on multiple days during the week because the water tank is allowed to empty. This problem is only likely to increase as CAMEP expands its distribution of water from the water tank to establishments outside of Cité Soleil. According to CADEPA, CAMEP provides water for Cité Soleil until the afternoon, after which time it provides water to some industrial customers (e.g. Haiti Electricity, Shodecosa industrial complex, and a nearby hospital). In addition, because only one of the pumps is working, the reservoir is not being refilled as quickly as it could be. Community members report that two or three days a week there is no water after 4 p.m. CADEPA's plumber also reports that CAMEP staff end their working hours, leave at 4 p.m. and close the system. This situation will negatively impact (1) the financial viability of CADEPA by continuing to restrict its water supply and (2) the quality of water in the system by allowing back-siphoning of polluted water into the

empty distribution system. CAMEP is obligated under contract to provide CADEPA with 250,000 gallons of water per day. They should be held to this agreement by TPTC or through negotiation directly between the two parties.

2.3.2 Solid Waste

No solid waste collection teams are currently mobilized by CADEPA in Cité Soleil. CADEPA plans to begin collection in October 1997, using revenues from water sales to cover costs. During June and July 1997, solid waste collection teams were mobilized by CADEPA and Zone Committees in Zones 1 through 6 as demonstration Projects. This work was abandoned after two months because USAID's support for the demonstration effort was finished. In the demonstration, six workers were mobilized in each zone. Records show that all together, they collected approximately 8 m³ of solid waste per day or 48 m³ of waste per week. This amounts to 1 1/3 m³ per worker per week, an astoundingly small amount of waste collection. Each worker should be expected to collect about 1 1/3 m³ of waste in a full day of work. It is EHP's opinion that mistakes were made by CADEPA in planning and implementing this demonstration project. As described in the Plan, the demonstration was to be implemented with a full crew of 20 workers in one zone in order to establish working procedures including personnel management and solid waste removal. CADEPA administrators opted to mobilize six workers in each of the seven zones instead. As a result of this equitable but diluted effort and inadequate supervision, amounts of waste collected in each area were too small to make a significant impact on the problem.

Another item of note is that during the demonstration period, none of the collected waste was transported out of Cité Soleil unless one of the

irregular municipal collections happened to coincide. Consequently, CADEPA has not yet fully modeled a solid waste program involving collection, transportation, and final disposal.

Little was accomplished during this demonstration project but significant lessons were learned. It is very important for CADEPA to acknowledge the lessons learned from this effort when teams are remobilized with CADEPA funding in October 1997:

- # CADEPA must make it clear to the teams that as full-time employees of the organization, they are expected to be productive. They must work a full day to earn a full day's wage, and to show this, each individual should be required to collect a minimum of 1 m³ of solid waste.
- # CADEPA must see that all collected solid waste is removed from Cité Soleil by municipal operations or private contractors.
- # Residents must be encouraged to assist the solid waste program by disposing of their waste in locations indicated by the solid waste teams. A successful demonstration of cooperation by residents was made in Zone 1 during the demonstration project.
- # The model developed by the residents of Zone 1 during the demonstration effort should be used and expanded upon in other zones.
- # Workers from Zone 1 should be encouraged to demonstrate to workers from other zones the benefits of their model.
- # Municipal solid waste collection can be mobilized in Cité Soleil, but such environmental improvement should not be dependent upon limited and stressed governmental services.

The set of steps listed below should lead CADEPA to more successful efforts in their solid waste collection program:

- # First, expectations of workers must be made clear with regard to hours of work and volume of waste to be collected. CADEPA should

expect 8 hours of work (e.g., from 6 a.m. to 2 p.m.) and collection of at least 1 m³ of solid waste per worker per day.

- # Second, CADEPA must find a method to reduce the monthly cost of equipment for solid waste collection. In July, a significant amount of money, US\$540, was needed to replace broken or stolen equipment. One approach would be to set a regular allowance for equipment for each team (e.g., one new wheelbarrow each six months). CADEPA has been quite innovative in overseeing the secure and cost-effective construction of communal latrines and should use the same ingenuity to reduce the recurrent costs of solid waste teams.
- # Third, CADEPA must set up a system for regular cartage of collected solid waste out of Cité Soleil. Little if any environmental improvement will be realized if solid waste is merely moved from one location to another within Cité Soleil. Cartage can be handled by a municipal authority or by private contractors using large trucks or small pick-up trucks, depending upon the volume collected and its location. CADEPA staff are encouraged to access municipal collection as often as possible but should emphasize creative approaches to mobilizing private contractors and perhaps Cité Soleil residents who own vehicles to cart waste to the municipal landfill. CADEPA should be able to hire private contractors to cart the waste to the landfill. Such costs are included in Table 4 in Section 2.4.
- # Fourth, after cartage is reliable, CADEPA should look at ways to support the work of the collection teams by urging residents to use central neighborhood collection points and reduce random littering, in order to make solid waste teams' efforts more efficient and effective. CADEPA should ask for specialized technical assistance to develop a formal organizational system involving householders, centralized collection points, linkages between

zone committees and private contractors to facilitate waste removal, and timely payment of contractors for their services.

2.3.3 Demonstration Projects

Latrine construction and management. Seven latrines are being constructed using the demonstration project funds—two in Zone 3, one in Zone 4, one in Zone 5, one in Zone 6, and two in Zone 7. Details of the latrines follow:

- # Each of the seven is located as specified on the site plan developed during the project.
- # The average cost of one unit is 97,000 gourdes (\$6,258).
- # Each unit consists of eight stalls constructed over a 36 m³ vault.
- # CADEPA plans to ensure that the latrines are pumped out when they are two-thirds full.
- # Responsibility for management and pumping lies with the zone committees.
- # CADEPA currently plans to open the facilities for use on 20 September 1997.

The latrines will be under the direct management of the zone committees, with ultimate responsibility for their proper operation and maintenance remaining with CADEPA. The management committees attached to each zone committee will have complete responsibility for collecting fees and meeting expenses. CADEPA will not have financial responsibility for the latrines. No provision has been made in the budget for CADEPA financial support. Users will be expected to pay 0.20 gourdes for each use. Money will be given to a full-time manager who will be responsible for collecting fees, transferring them to the zone coordinator, and ensuring the cleanliness of the facility. It is anticipated that the latrines will need to

be pumped out once every year and that revenues will cover (1) pumping costs, (2) manager's salary, and (3) supplies required for operation and maintenance. In a report prepared by CADEPA (*Gestion de l'Eau Potable et de l'Assainissement a Cité Soleil: Rapport d'encadrement social*, 1997) the following projections for each unit were presented:

- # 250 uses per day (7,500 per month, 90,000 per year).
- # Revenues of 50 gourdes per day (1,500 per month, 18,000 per year).
- # Salary for manager of 750 gourdes per month (9,000 per year).
- # Material costs estimated at 480 gourdes per month (5,760 per year).
- # Emptying costs at 2,000 gourdes each time (one time per year).
- # A net income (revenue - cost) of 1,240 gourdes per year.

The monitoring team suggests that as a one-time trial, CADEPA forestall any problems by pumping out two of the latrines when they are each approximately half full. This would serve as a test (1) of whether revenues actually cover pumping costs and (2) to see how quickly pump trucks can be mobilized from the governmental authority to empty the latrines. If the latrine pits are allowed to fill up completely before investigating the true steps required for pumping, CADEPA might find that revenues are insufficient to cover pumping costs or that substantial time was required to mobilize a pump truck. Either situation would be significantly dangerous if left for too long.

Hooking an existing water vendor to the CADEPA system. Due to the closing of CADEPA's old, uncontrolled pipeline network in Cité Soleil, hooking up a private vendor has moved from being a demonstration project to becoming a significant element in the profitability and survival of

CADEPA. CADEPA has not yet decided how to bring existing vendors into the management system of CADEPA although, as described earlier, efforts have been made in this direction.

Communal Laundry Facilities. Laundry facilities have not been built and will not be built under the agreement between CADEPA and USAID. The zone committee in Zone 5 has, on its own initiative and with its own discretionary funds and labor, started to build a communal laundry facility adjacent to fountains 5-08 and 5-09. Funds originally dedicated to this project should be reallocated to further latrine construction and management.

Upgrade of existing latrine. This work has not been undertaken, nor are there plans to do so. The physical condition of the latrine has deteriorated to the point that CADEPA chooses not to improve it. If the zone committee decides to take on responsibility for management of the facility, then CADEPA is prepared to support the activity. Funds allocated for this demonstration project should be directed toward one of two priority demonstrations: (1) supporting water vendor connections or (2) reanimation and marketing of CADEPA with community members.

2.3.4 Site Plan

The following information was gathered which was missing from the Plan:

- # Identification number of each fountain;
- # Location of all communal latrines;
- # Final location of all roadways within Cité Soleil; and
- # Identification of all fountains currently not in operation.

Multiple copies of the finalized site plan will be presented to CADEPA and USAID/Haiti in October 1997.

2.4 Financial Analysis

The EHP monitoring team provided specific technical assistance during its visit, updating the

financial information first presented in the 1996 Plan. Tables 1 through 4 contain a number of scenarios meant to assist CADEPA in projecting anticipated revenues and expenditures under a number of conditions. Scenarios include:

- # Actual revenues and expenditures in August 1997;
- # Projected revenues and expenditures for October 1997, with a revised staffing structure proposed by CADEPA;
- # Projected revenues and costs when CADEPA is meeting the second year USAID indicators of success which were presented in the Plan. Two projections are made assuming 175,000 gallons of water sold per day and two different staffing scenarios related to number of fountains and solid waste collection. Projection 1 presents data if six teams of six workers each are employed. Projection 2 presents how many solid waste workers could be mobilized while CADEPA sells 175,000 gallons of water per day, replaces all ON/OFF valves in fountains, and replaces 25% of the water meters in the system.
- # Projected revenues and costs when CADEPA is meeting the third year indicators presented in the Plan. This scenario is presented assuming all 76 fountains operating, 200,000 gallons of water sold per day, and seven solid waste teams of 20 workers each.

The following assumptions are made:

- # There are 24 work days per month for water fountain operators, waste collectors, and staff.
- # No capital recovery investments will be made.
- # Revenues will increase 10% in September 1997 over those actually realized in August 1997.
- # Revenues will increase 10% in October 1997 over those estimated for September 1997.

Table 1 is a summary of all operating costs for administration, water supply O&M, and solid waste O&M. To be able to support six solid waste crews of six people each, CADEPA will have to sell over 151,000 gallons of water per day at 1 gourde/7 gallons ([519,664 gourdes x 7 gallons] divided by 24 days/mo.) and more than 242,000 gallons to support seven crews of 20 people ([832,385 gourdes x 7 gallons] divided by 24 days/mo.). Based on a planned target of 175,000 gallons per day, CADEPA could support seven teams of eight persons for solid waste collection. EHP believes that 175,000 gallons/day is a realistic target for 1998. Selling 242,000 gallons/day will be difficult and unrealistic if the Salesian Fathers continue to provide water free of charge (see discussion below).

Table 2 shows the administrative costs for CADEPA under several scenarios. The actual costs of running the organization (August 1997) are significantly less than projected, \$6,678 instead of \$11,912. In general, the salaries paid are lower than projected in the 1996 Plan, and several positions have not been filled. The other important observation is that CADEPA's costs for administration will not rise very much as it sells more water.

Table 3 shows the water supply O&M costs. The actual costs are less than the Plan estimated, primarily because CAMEP is responsible for water production and pumping. Thus, CADEPA has less employees than anticipated in water supply O&M, but must purchase the water from CAMEP. Also, the fountain committees have not been paid their overhead portion, as of August.

Table 4 shows the planned and projected solid waste O&M costs. These costs will rise significantly if the solid waste crews are expanded and CADEPA begins to pay hauling fees to a private contractor, as shown in the projections.

EHP recommends that initially CADEPA aim to operate under the Projection 1 scenario until revenue is established to cover costs and the solid waste program is fully developed and operating effectively. After the approach of Projection 1 is met, then CADEPA should move aggressively toward expanding solid waste removal and implementing the crucial system repairs to valves and meters.

In summary, as of now, CADEPA is off to an excellent start financially. In July and August 1997, enough water was sold to pay for its core administrative and water supply O&M costs. This is a major accomplishment after five months of operation. Careful management of expenses and USAID support has resulted in a net balance of 260,000 gourdes or \$16,250. This will provide an excellent cushion as CADEPA begins to fund the solid waste and maintenance activities from its own funds. Priority areas toward which any balance should be directed are as follows:

- # support of two community relations staff members until CADEPA generates enough revenue.
- # purchase, stockpiling, and replacement of fountain ON/OFF valves.
- # purchase, stockpiling, and replacement of water meters.
- # support for the solid waste removal program until CADEPA generates enough revenue to pay for it.

Table 1
Estimated Operating Costs
(per month)

1 US\$ = 15.5 Gourdes

	1996 EHP Report		Actual Aug. 1997		Projected Oct. 1997	
	G per mo.	\$ per mo.	G per mo.	\$ per mo.	G per mo.	\$ per mo.
Administration	184,636	11,912	103,540	6678	124,540	8033
Water Supply O&M	420,720	27,142	142,750	9213	190,982	12,324
Solid Waste O&M	402,053	25,938	0	0	114,607	7394
O&M Contingencies (10%)	82,277	5308	14,275	921	30,559	1972
Capital Recovery for Investment	117,800	7600	0 ¹	0 ¹	0 ¹	0 ¹
Management Fee to CDS (8% of staff salaries)	0	0	6163	398	7643	493
National Insurance Contribution (est. 9% of staff and zone coordinator salaries)	0	0	8284	534	9949	642
National Taxes (est. 8.2% of staff and zone coordinator salaries)	0	0	7547	487	9064	585
TOTAL COST	1,207,483	77,900	282,559	18,231	487,344	31,443
gallons sold per day (24 days)			108,500		131,285	
TOTAL REVENUE			372,000	24,000	450,120	29,040
TOTAL INCOME (REVENUE - COST)			89,441	5769	-37,224	-2403

¹Capital recovery payment should begin as soon as positive values of total income are achieved by CADEPA.

**Table 1 (cont.)
Estimated Operating Costs
(per month)**

1 US\$ = 15.5 Gourdes

	Projection 1 175,000gpd/36 waste		Projection 2 175,000gpd/ 56 waste ²		Projection 3 200,000gpd/140 waste	
	G per mo.	\$ per mo.	G per mo.	\$ per mo.	G per mo.	\$ per mo.
Administration	124,540	8033	129,809	8384	128,040	8259
Water Supply O&M	220,364	14,220	229,124	14,774	253,523	16,358
Solid Waste O&M	114,607	7394	173,699	11,207	362,167	23,366
O&M Contingencies (10%)	33,497	2161	40,282	2598	61,569	3972
Capital Recovery for Investment	0 ¹	0 ¹	0 ¹	0 ¹	0 ¹	0 ¹
Management Fee to CDS (8% of staff salaries)	7643	493	7643	493	7643	493
National Insurance Contribution (est. 9% of staff and zone coordinator salaries)	9949	642	10,174	656	10,174	656
National Taxes (est. 8.2% of staff and zone coordinator salaries)	9064	585	9269	598	9269	598
TOTAL COST	519,664	33,528	600,000	38,710	832,385	53,702
TOTAL REVENUE	600,000	38,710	600,000	38,710	685,714	44,240
TOTAL INCOME (REVENUE - COST)	80,336	5182	0	0	-146,671	-9462

¹ Capital recovery payment should begin as soon as positive values of total income are achieved by CADEPA.

² Projection 2 would allow for 7 solid waste teams of 8 persons. 175,000 gallons per day is the planned target for water sales for 1998.

Table 2
Administrative Costs of the District
(per month)

1 US\$ = 15.5 Gourdes

	1996 EHP Report			Actual Aug. 1997			Projected Oct. 1997		
	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.
SALARIES									
General Manager	1	38,750	2500	1	25,000	1612	1	25,000	1612
Community Relations	2	23,250	1500	0	0	0	2	15,000	968
Operations Supervisor	1	15,500	1000	1	20,000	1290	0	0	0
Solid Waste Supervisor	1	15,500	1000	1	7500	484	1	7500	484
Administrator	0	0	0	0	0	0	1	12,500	806
Accountant	1	15,500	1000	1	6000	387	2	14,000	903
Cashier	2	12,400	800	2	7000	451	2	8000	516
Secretary	2	15,500	1000	1	6000	387	1	6000	387
Driver	1	2480	160	1	2500	161	1	2500	161
Messenger	1	2480	160	0	0	0	1	2000	129
Guard	1	3100	200	1	1540	99	1	1540	99
Cleaner	1	1550	100	1	1500	97	1	1500	97
SUB-TOTAL	14	146,010	9420	10	77,040	4968	14	95,540	6162
ZONE SALARIES									
Zonal Coordinator	7	14,000	903	6	15,000	968	6	15,000	968
Zonal Clerks	7	5255	339	0	0	0	0	0	0
SUB-TOTAL	14	19,255	1242	6	15,000	968	6	15,000	968
OPERATIONS									
Utilities & Supplies		15,500	1000		5000	323		7000	451
Transport		3875	250		4000	258		4000	258
Petty Cash		0	0		2500	161		3000	194
SUB-TOTAL		19,375	1250		11,500	742		14,000	873
TOTAL		184,640	11,912		103,540	6678		124,540	8033

**Table 2 (cont.)
Administrative Costs of the District
(per month)**

1 US\$ = 15.5 Gourdes

	Projection 1 175,000gpd/ 36 solid waste			Projection 2 175,000gpd/ 0 income			Project 3 200,000gpd/ 140 solid waste		
	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.
SALARIES									
General Manager	1	25,000	1612	1	25,000	1612	1	25,000	1612
Community Relations	2	15,000	968	2	15,000	968	2	15,000	968
Operations Supervisor	0	0	0	0	0	0	0	0	0
Solid Waste Supervisor	1	7500	484	1	7500	484	1	7500	484
Administrator	1	12,500	806	1	12,500	806	1	12,500	806
Accountant	2	14,000	903	2	14,000	903	2	14,000	903
Cashier	2	8000	516	2	8000	516	2	8000	516
Secretary	1	6000	387	1	6000	387	1	6000	387
Driver	1	2500	161	1	2500	161	1	2500	161
Messenger	1	2000	129	1	2000	129	1	2000	129
Guard	1	1540	99	1	1540	99	1	1540	99
Cleaner	1	1500	97	1	1500	97	1	1500	97
SUB-TOTAL	14	95,540	6162	14	95,540	6162	14	95,540	6162
ZONE SALARIES									
Zonal Coordinator	6	15,000	968	7	17,500	1129	7	17,500	1129
Zonal Clerks	0	0	0	0	0	0	0	0	0
SUB-TOTAL	6	15,000	968	7	17,500	1129	7	17,500	1129
OPERATIONS									
Utilities & Supplies		7000	451		7000	451		7000	451
Transport		4000	258		4000	258		4000	258
Petty Cash		3000	194		5769	384		4000	258
SUB-TOTAL		14,000	903		16,769	1081		15,000	968
TOTAL		124,540	8033		129,809	8384		128,040	8259

Table 3
Water Supply O&M Costs
(per month)

1 US\$ = 15.5 Gourdes

	1996 EHP Report			Actual Aug. 1997			Projected Oct. 1997		
	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.
SALARIES									
Operators	2	5625	363	0	0	0	0	0	0
Guards	3	4125	266	0	0	0	0	0	0
Maintenance	1	2813	181	2	3250	210	2	3250	210
Laborer	1	1375	89	3	3000	194	3	3000	194
Fountain Keepers	70	105,000	6774	65	65,000	4194	65	65,000	4194
SUB-TOTAL	76	118,938	7673	70	71,250	4598	81	71,250	4598
OTHER									
Community Overhead (50% of keeper salaries)		52,500	3387		0	0		32,500	2097
Distribution Systems Repairs		2325	150		1500	97		2000	129
Pumping Charges and Chemicals		115,619	7459		0	0		0	0
Transport		4650	300		1000	65		1000	65
Private Contractors		7750	500		2000	130		2000	130
Global Estimator (100% of salaries)		118,938	7673		0	0		0	0
SUB-TOTAL		301,782	19,469		4500	292		37,500	2421
Payment to CAMEP for water		0	0		67,000	4323		82,232	5305
TOTAL		420,720	27,142		142,750	9213		190,982	12,324

**Table 3 (cont.)
Water Supply O&M Costs
(per month)**

1 US\$ = 15.5 Gourdes

	Projection 1 175,000gpd/ 36 solid waste			Projection 2 175,000gpd/ 0 income			Projection 3 200,000gpd/ 140 solid waste		
	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.
SALARIES									
Operators	0	0	0	0	0	0	0	0	0
Guards	0	0	0	0	0	0	0	0	0
Maintenance	2	3250	210	2	3250	210	2	3250	210
Laborer	3	3000	194	3	3000	194	3	3000	194
Fountain Keepers	65	65,000	4194	70	70,000	4506	76	76,000	4903
SUB-TOTAL	70	71,250	4598	75	76,250	4910	81	82,250	5307
OTHER									
Community Overhead (50% of keeper salaries)		32,500	2097		35,000	2258		38,000	2452
Distribution Systems Repairs		3000	194		4260 ¹	275 ¹		4000	258
Pumping Charges and Chemicals		0	0		0	0		0	0
Transport		1000	65		1000	65		1000	65
Private Contractors		3000	194		3000	194		3000	194
Global Estimator (100% of salaries)		0	0		0	0		0	0
SUB-TOTAL		39,500	2550		43,260	2792		46,000	2969
Payment to CAMEP for water		109,61 4	7072		109,61 4	7072		125,27 3	8082
TOTAL		220,36 4	14,220		229,12 4	14,774		253,52 3	16,358

¹ Replace 4 valves on each of 76 fountains @ 130 Gourdes/valve = 39,520 G (\$2550)
 Replace 25% of water meters (19 meters) @ \$90 per meter = \$1710
 Total cost = \$4260

Table 4
Solid Waste O&M Costs
(per month)

1 US\$ = 15.5 Gourdes

	1996 EHP Report			Actual Aug. 1997 ¹			Projected Oct. 1997		
	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.
SALARIES									
Cleaners	140	131,040	8454	36	31,104	2007	36	31,104	2007
Leaders	7	8190	528	6	6480	418	6	6480	418
Supervisors	1	2340	151	1	2160	139	1	2160	139
SUB-TOTAL	148	141,570	9133	0	39,744	2564	43	39,744	2564
OTHER									
Community Overhead (10% of salaries)		14,157	913		0	0		3974	256
Handtool Replacement		4526	292		8429	544		8429	544
Hauling Fees		241,800	15,600		0	0		57,660	3720
Handtools		0	0		0	0		4800	310
SUB-TOTAL		260,483	16,805		8429	544		74,863	4830
TOTAL		402,053	25,938		48,173	5672		114,607	7394

¹ Funded by USAID demonstration project money not by CADEPA revenues

**Table 4 (cont.)
Solid Waste O&M Costs
(per month)**

1 US\$ = 15.5 Gourdes

	Projection 1 175,000gpd/ 36 solid waste			Projection 2 175,000gpd/ 0 income			Projection 3 200,000gpd/ 140 solid waste		
	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.	#	G per mo.	\$ per mo.
SALARIES									
Cleaners	36	31,104	2007	56	48,384	3122	140	120,960	7804
Leaders	6	6480	418	7	7560	488	7	7560	488
Supervisors	1	2160	139	1	2160	139	1	2160	139
SUB-TOTAL	43	39,744	2564	64	58,104	3749	148	130,680	8431
OTHER									
Community Overhead (10% of salaries)		3974	256		5810	375		13,068	843
Handtool Replacement		8429	544		13,065	843		32,779	2115
Hauling Fees		57,660	3720		89,280	5760		167,400	10,800
Handtools		4800	310		7440	480		18,240	1177
SUB-TOTAL		74,863	4830		115,595	7458		231,487	14,935
TOTAL		114,607	7394		173,699	11,207		362,167	23,366

3 SUSTAINABILITY

3.1 Progress Towards Indicators

The original Plan proposed nine performance indicators for CADEPA. Table 5 compares the targets set for 1996 (anticipated to be the last six months of 1996) to the five months that CADEPA has actually been in operation. In the Plan, the initial six-month start-up period was anticipated to be July-December 1996. In actuality, operations began in April 1997. The monitoring visit reviewed the first five months, or start-up period, of April-August 1997. In addition, Table 5 also sets targets for the next 12 months, from October 1, 1997 to September 30, 1998. After progress is assessed for the next 12 months, it will be reasonable to set targets for the following two to three years. For the moment, too many uncertainties exist to set targets beyond the first 18 months of operation. The targets for the next 12 months are what CADEPA can be expected to aim for by October 1998, not an average of what is achieved over the 12-month period.

Access to improved waste management services. Even though the pilot solid waste activity did not fully meet expectations, the planned target (population served) was met. The solid waste crews collected an average of 8m³ per day, which represents 7.5% of the estimated solid waste produced daily in Cité Soleil. Although there is no way to know the precise number of people with access to improved services, 7.5% of the population would equal 15,000 and 2,500 would be slightly more than 1% of the population of Cité Soleil.

Consumption of high-quality drinking water. The average amount of water sold for the five following months of operation was 63,000 gallons

per day. However, as can be seen in Table 6, a clear upward trend in sales has been observed.

Operating costs recovered through user fees. The average costs recovered through user fees for the five months was 70%. The 30% balance was covered by USAID support during the start-up period. It is important to note, however, that in July and August, after USAID support ended, CADEPA's revenues exceeded its costs. CADEPA is currently showing a net profit of \$16,300. A cautionary note: the expenses for the first five months do not include any solid waste costs (they were USAID-funded) nor any capital investment recovery or fountain committee overhead payments. Nevertheless, it shows that CADEPA is already self-sufficient in its core water supply operations.

Amount of CADEPA revenue used to finance waste disposal services. Because of delays in getting started, CADEPA was not able to initiate the USAID-funded solid waste demonstration project until July 1997. Thus, the April-August period being monitored did not include any expenditures on the part of CADEPA to finance waste disposal services. (Even so, in this period, CADEPA did not yet have sufficient revenues from water sales to fund solid waste services.)

Average amount of solid waste hauled to landfill daily. During July and August the municipality hauled garbage to the landfill. Since CADEPA did not pay for these services, there is no way to know how much was hauled to the landfill daily.

Meters working. This target has not been met because of the poor quality of meters used by the construction contractor. This problem was discussed in Section 2.4. The 90% target

Table 5
Performance Indicators for the District: Planned, Actual, Projected

Indicator	Unit	Planned initial 6-month	Actual: April-Aug 1997	Next 12 months (Oct 97-Sept 98)
Access to improved waste management services	number of people	2,500	2,500-15,000	70,000
Consumption of high quality drinking water from CADEPA	gallons per day	65,000	63,000	175,000
Operating costs recovered through user fees	Percentage	80%	70%	100%
Amount of CADEPA revenue used to finance waste disposal services	\$ per year	\$17,000	0	\$44,640
Average amount of solid waste hauled to landfill daily	cubic meters	15 m ³	8m ³ (July/ Aug) ¹	40 m ³
Meters working	Percentage	90%	80%	90%
Unaccounted-for-water	Percentage	30%	30%	30%
Water quality	percentage of samples with an acceptable chlorine concentration	95%	unknown	95%
District staffing	ratio of CADEPA employees to gallons of water sold per day	1/13,000	1/5,166	1/7,000

¹ There is no way to verify how much solid waste is actually hauled to the landfill daily since CADEPA has not paid for any haulage to date.

Table 6
Gallons of Water Sold per Day
First Six Months of System Operation

Month	Gallons Sold per Day	Percent Change from Previous Month
March 1997	17,985	n/a
April 1997	57,593	+220
May 1997	45,735	-21
June 1997	57,628	+26
July 1997	83,921	+46
August 1997	108,500	+29

for the next 12 months is based on the expectation that meters will be replaced as they fail.

Unaccounted-for water. The average amount of unaccounted-for water for the initial five months of operation was 30%. However, for the last two months the amount was about 20%, a very low figure for a system in an area like Cité Soleil. Nonetheless, the usual figure of 30% is retained as a target, as more frequently the norm.

Water quality. At the time the Plan was written (Spring 1996), it was assumed that CADEPA would be responsible for monitoring chlorination and water quality. Since both of these responsibilities are assigned to CAMEP in the terms of the agreement, CADEPA can no longer be held accountable for this indicator.

District staffing. The target of 1/13,000 was set in the Plan, based on a much higher volume of water sales than is currently the case. The target for the next 12 months has been adjusted to reflect a realistic amount of water that can be sold and the actual number of staff required to operate the water system. As in all organizations, there are certain fixed costs and required personnel, whose work is not based on units of volume of sales.

3.2 Water Supply

Prospects for the financial sustainability of the water supply operations are excellent. After only five months of operation, CADEPA is meeting its basic operating costs for water supply. CADEPA has developed simple and effective management systems that allow it to monitor its own operations. The community-based structures are working well and CADEPA appears to be accepted as an integral service organization by the community. With a modest increase in revenues, CADEPA will be in a position to apply its excess revenues toward

organizational investments including funding capital recovery of the initial investment.

Three issues have the potential to undermine the sustainability of the water supply system. First, CADEPA is dependent on CAMEP to provide high-quality water. CAMEP must maintain the water supply production system and provide to CADEPA the volume of water agreed to in the CDS/CAMEP operational contract. Given CAMEP's past track record, nothing can be taken for granted. This includes providing 250,000 gallons per day to CADEPA as stipulated in the contract with CAMEP. Second, CADEPA does not have the right to operate the water supply system beyond the expiration of its contract in January 2000. If CADEPA continues to be successful, it may become an enticing target for CAMEP to take over. If that occurs, the community-based organizational structure would surely weaken over time, and with it, the condition of the infrastructure would deteriorate. Third, delay in repairing the distribution pipes broken during drainage construction has a direct negative impact on CADEPA's revenue stream. Inoperable fountains generate zero income.

3.3 Solid Waste

The solid waste system has had only a trial run; its full operation and sustainability cannot yet be assessed. CADEPA has not fully thought through the solid waste management system. Understandably, it has focused its attention on selling water. In the long run, the key to the financial sustainability of the solid waste services is the ability of CADEPA to sell enough water. If CADEPA can sell between 151,000 and 175,000 gallons per day, then it will be able to afford at least seven solid waste crews of eight persons each. Seven such crews will be able to collect about a half

of the solid waste generated each day. Seven crews of 20 workers each would require revenues from the sale of an estimated 250,000 gallons per day.

In addition to the revenues needed to fund solid waste collection and disposal, a system has not been fully defined to assess its acceptability to the community. The zonal committee structure should prove to be a major asset in managing solid waste collection at the neighborhood level.

3.4 Latrines

The prospects for the sustainability of the latrines are uncertain. Since the latrines have

not yet been put into use (they should be opened on 20 September 1997), it is too soon to determine the effectiveness of the management system. The system that CADEPA has developed appears to be workable and financially sustainable. The zonal committee will be the community-level organization to monitor latrine management. Since the latrines have not yet been used, it is too soon to make any determination of long range sustainability.

4

RECOMMENDATIONS

This section summarizes the recommendations for CADEPA and USAID.

4.1 Recommendations for CADEPA

Organization and Management

- # Ensure a smooth transition from the current director to the new one. This should involve informing the appropriate community leaders and making sure that the new director is up to speed on all the issues.
- # Hire the two permanent community relations staff as soon as possible.
- # Develop a simple business plan so that spending and investment priorities will be in place if water revenues increase. Competing priorities include replacing the fountain meters and valves, expanding the solid waste program, paying the planned 50% overhead to the fountain committees, beginning investment in capital recovery, and marketing CADEPA. All of these are worthy and recommended activities, but if revenues are not sufficient to pay for all of them, CADEPA must decide which ones have the highest priority.

Community

- # Come to a final solution on whether and how to hook up the private sellers. CADEPA should not make this decision alone, but rather in concert with the zonal management committees. This could be an agenda item for the first meeting of the consultative board.

- # Begin paying the 50% overhead to the community (fountain committees) to maintain their motivation.

Technical Activities

- # As an urgent priority, replace the existing meters and on/off valves in the fountains. CADEPA may need assistance in locating a source of replacement water meters. It is likely that these will be procured from overseas. Every meter in the system should be replaced immediately upon failure; otherwise CADEPA will lose revenue by not being able to monitor exact sales from each fountain. Good-quality valves are available locally for 130 gourdes each, and CADEPA should begin purchasing these crucial items and replacing failed valves. Not replacing them will lead to an increase in unaccounted-for water and environmental deterioration around the fountains.
- # Begin permanent operation of the solid waste management program with six teams of six workers each (suggestions are given in Section 3.3.2 on setting up the program). CADEPA must also monitor its water sales closely to make sure it is selling enough water to pay for the solid waste activities. EHP estimates that 142,000 gallons per day will generate enough revenues to break even for all of CADEPA's activities in October 1997, including the solid waste program with six crews.
- # Monitor the implementation of the latrine management program closely. The communities themselves have primary responsibility for this program, which is scheduled to begin September 20. CADEPA must monitor the latrines for cleanliness, the number of users per day, pumping-out schedule, and the amount of revenues generated.

- # Stockpile spare parts for the operation of the water supply system.
- # Regularly test both chlorine concentration and pH level of the water in order to have a reasonable understanding of prevailing quality. Even though this is CAMEP's responsibility, CADEPA should do some limited testing. It is CADEPA's understanding that the World Health Organization (OMS) provides testing kits at no charge. A request should be made to OMS for two testing kits, and CADEPA should test water at selected points in the distribution system once each day. CAMEP should also be required to explain why the turbidity of the water supplied to CADEPA is slowly increasing.

Financial

- # CADEPA needs to do everything possible to increase water sales. These efforts should consist of the following specific actions:
 - \$ Continue efforts to publicize CADEPA, such as hanging a sign on the central office building and in other high visibility spots in Cité Soleil or revitalizing the successful community animation efforts accomplished with USAID demonstration project funds.
 - \$ Hook up existing private vendors to increase sales. (The terms of hooking them up must be advantageous to CADEPA as well as providing sufficient financial incentive to the sellers.)
 - \$ Refigure the market size by determining the volume of water being trucked into Cité Soleil by the Salesian Fathers and private vendors.
 - \$ Expand the use of fountains by doing everything possible to accelerate the reconnection of the pipelines damaged by the drainage canal contractor.

4.2 Recommendations for USAID

- # Provide periodic overall monitoring of CADEPA over the next two years. This should occur every six months and will require approximately one week of one consultant's time. Although CADEPA has made remarkable progress in a short time, it is unrealistic to think that no further assistance will be required. The monitoring should focus on the same areas as this report: organization/management, technical activities, community management, and finance.
- # Provide support in the development of the solid waste program. A solid waste management system must be developed, including how to get garbage from the individual household to collection points, work schedules, location and construction of collection points, contract terms for a private hauler, and a communications program to change individual behaviors regarding solid waste. EHP believes that CADEPA would benefit from outside assistance in developing this program.
- # Participate in the national-level discussions on the reform of the water and sanitation sector to assist in laying the policy or legal basis for organizations like CADEPA to become permanent operating entities. This is an issue in which USAID support and leverage could make a real difference.
- # Assist CADEPA in pressuring CAMEP and the electric company (EDH) to begin using the second well designed to provide water to the reservoir. This pump is fully installed but currently lacks an electrical connection.
- # Ensure that the design currently being prepared by the World Bank for Phase Two of the road construction project, along the abandoned HASCO railway line, takes full account of the location of CADEPA and CAMEP pipelines. Any PVC pipe along the road right-of-way will need to be replaced.

- # Provide support to CADEPA in its efforts to get the IDB-funded drainage canal contractor to relay the pipeline so that 12 additional fountains can be placed in operation.
- # Provide support to CDS and CADEPA in ensuring that CAMEP provides 250,000 gallons per day to Cité Soleil before selling water to industrial customers.

By most measures, the USAID effort has been a success. Only the most optimistic would have predicted that CADEPA would be as well established as it is at this early stage. However, it is far too soon to declare the organization

safely on its feet. Any fledgling organization such as CADEPA cannot be expected to be firmly established in five months, especially in an area like Cité Soleil where the conditions are very demanding. As this report has detailed, there are a number of issues which need to be addressed and which could become major problems, if ignored. Nevertheless, the foundation has been laid for ongoing success. Ongoing monitoring and targeted assistance to CADEPA will help to protect USAID's investment and, most importantly, increase the chances that residents of Cité Soleil receive improved water and environmental sanitation services.