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RURAL HEALTH SERVICES DETERIORATE AND
IMPROVEMENTS IN WATER AND SANITATION
DELAYED IN THE DOMINICAN REPUBLIC

Health Sector II Project (517-0120)
Audit Report No. 1-517-85-2
November 19, 1984

Although greatly enhanced under a predecessor loan, basic health services have deteriorated in the Dominican Republic since the Health Sector II project started. A 1979 AID Inspector General report and a 1980 General Accounting Office review noted the high quality rural health services had attained. However, during our field trips to rural areas we found that rural health promoters and clinics were not provided with basic medicines, family health records were either not available or kept current, health supervisors were not visiting or reviewing the work of rural health workers, and some health workers were not paid because of a lack of funds.

The Health Sector II project has made substantial contributions by providing about 175,000 rural residents with potable water and installing about 11,000 latrines; however, the project has been stalled for some time awaiting pumps, increased well drilling, and latrine construction. Also, well maintenance and latrine installation techniques need to be further institutionalized.

EXECUTIVE SUMMARY

The Dominican Republic, like most developing countries, suffers from poor health conditions resulting in high infant mortality and short life expectancy among other problems. These conditions are most serious among poor rural dwellers. A predecessor (Health Sector I) project, implemented between 1975 and 1981, established a basic health care system for rural residents. The program trained about 5,000 village residents as health auxiliaries or promoters; they give immunizations, treat diarrhea and mild infections, provide contraceptives, and teach nutrition and hygiene. The Health Sector II loan (\$8.0 million AID loan with an equivalent \$3.2 million counterpart contribution) is designed to build upon and complement the Health Sector I project by

- expanding the basic health services to 200,000 more rural inhabitants by training 400 health promoters and educators, and by upgrading 100 rural clinics, 20 small hospitals; and
- providing potable water (wells and spring water) and containers for safely transporting and storing the water, constructing sewage disposal systems (latrines), and providing health education to 160,000 rural residents.

The expansion of basic health services was completed in 1980 and turned over completely to the Government of the Dominican Republic (GODR) for operation.

As of June 30, 1984, the project had provided potable water to over 175,000 rural residents through about 1,500 wells and had installed about 11,000 latrines to improve rural hygiene. Despite these impressive gains, we identified the following deficiencies that need correction.

- Rural health services have deteriorated. Substantial gains made in rural health services under the Health Sector I and II loans have largely been lost since the GODR took over this operation. Among the problems we observed were a lack of medicines in rural areas, no new family records since 1982 and old records not being kept up, lack of supervision, and missed paychecks.
- Pumps and increased well drilling are needed to complete the potable water component. Over 200 wells await a USAID/Dominican Republic and GODR pump selection decision while well drilling is significantly below the levels achieved two years ago because of a change in institutional responsibility for drilling.

- Sanitation component needs latrines, hygiene improvements, and an evaluation of water-seal latrines. About 9,000 latrines are needed to complete the project although no more are in stock or being made because USAID/Dominican Republic and the GODR did not plan for future needs early enough and because the GODR diverted about 3,300 latrines for use outside the project area. Installed latrines often need hygienic improvements--like seat covers and buildings--to achieve full health benefits. The project has not fully tested water-seal latrines--a modern commode that flushes and seals with water--to determine their potential in the Dominican Republic.

- Well maintenance and latrine installation techniques should be institutionalized. No provision has been made to identify and retain GODR project personnel who understand well maintenance and latrine installation. Although the villagers have received some training, much of the knowledge and experience gained from this project may be lost because the villagers often rely on the technical guidance of the project personnel.

- Annual evaluations have not been made and a research plan has not been developed. Annual evaluations are required by the project agreement to measure results, identify problems, and recommend corrective adjustments. The research plan, which was proposed in the project paper, would measure and evaluate the health benefits from water and sanitation improvements. Neither has been done.

The report includes eight recommendations designed to correct the problems identified or confirmed during our review.

The objectives of this audit were to evaluate the effectiveness of the Health Sector II project, identify implementation problems and impediments, and recommend corrective action to any deficiencies we observed.

We discussed our findings at an exit conference with USAID/Dominican Republic officials, and we submitted a draft audit report for the Mission's review and comment. The Mission generally agrees with our findings, conclusions, and recommendations and we have incorporated their views in this report when

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ACRONYMS

SBS	Basic Health Service (Servicios Basicos de Salud)
SESPAS	Secretariat of Health (Secretaria de Estado de Salud Publica y Asistencia Social)
GODR	Government of the Dominican Republic
INAPA	Institute for Potable Water and Sanitation (Instituto Nacional de Agua Potable y Alcantarillado)

BACKGROUND

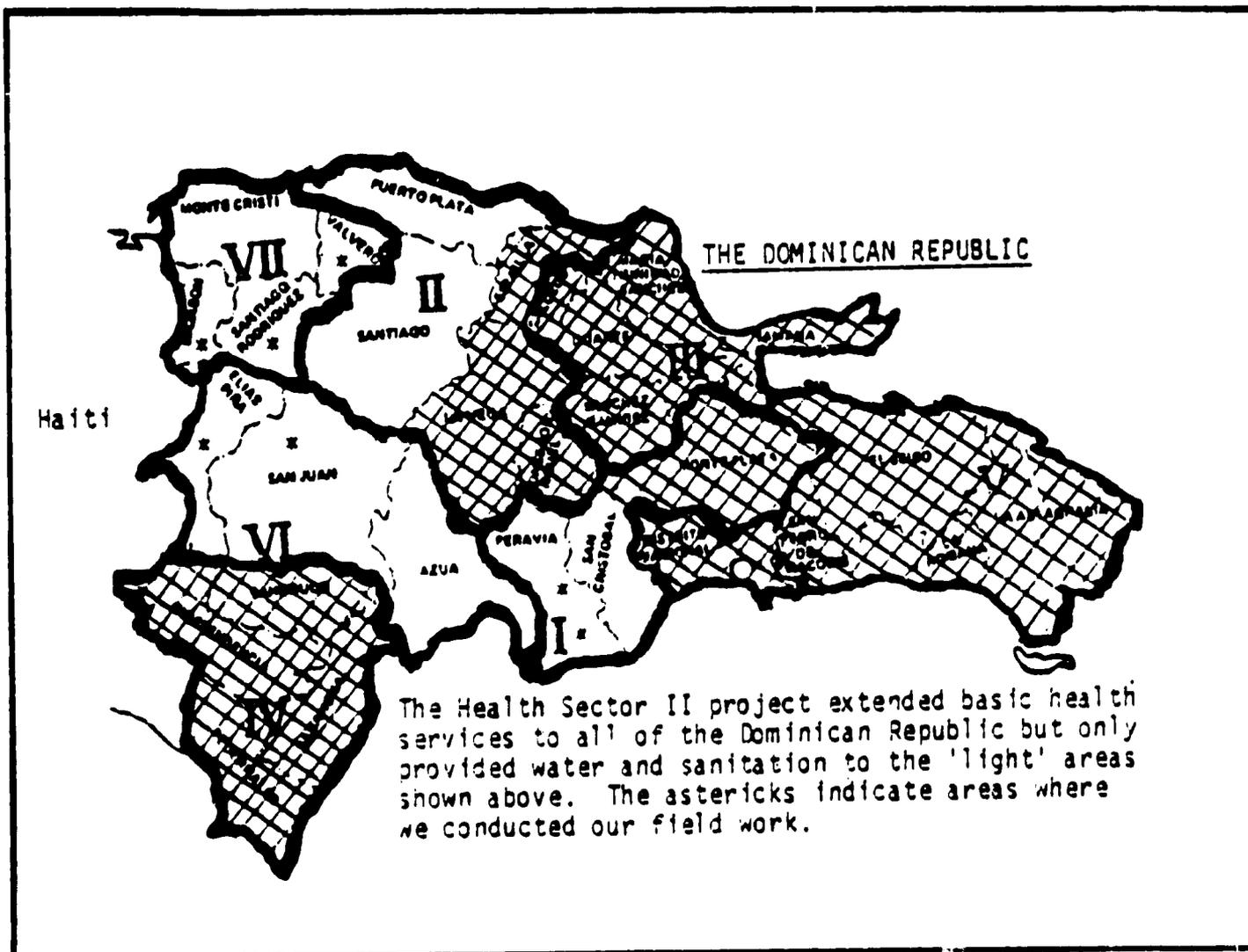
The Dominican Republic, like most developing countries, suffers from poor health conditions. These conditions result in a high infant mortality rate (103.8 per thousand live births in 1974 or six times higher than the United States) and a short life expectancy (60.3 years compared to 72.9 in the United States). These problems are most serious among rural residents in the Dominican Republic. For example, the infant mortality rate in rural areas in 1974 was 127.9 per thousand live births compared to 73.9 in urban areas.

The Health Sector I project, implemented between 1975 and 1981, established the basic health care system for rural residents in the Dominican Republic. Prior to this loan, rural areas received little medical care even though they had far greater medical needs than better served urban areas.

The program trained about 5,000 village residents as health promoters to give immunizations, treat diarrhea and mild infections, provide contraceptives, and teach nutrition and hygiene. Evaluations in 1980 and 1983 showed that reductions had been achieved in infant mortality and birth rates for the rural residents served by this program.

The Health Sector II loan (\$8.0 million AID loan with an equivalent \$3.2 million counterpart contribution) is designed to build upon and complement the Health Sector I project by

- expanding basic health services to 200,000 more rural inhabitants by training 400 health promoters and educators, and by upgrading 100 rural clinics and 20 small hospitals, and
- providing potable water (wells and piped spring water), water containers for safely transporting and storing water, sewage disposal systems (latrines), and health education to 160,000 rural residents located in 11 provinces.



The Health Sector II loan agreement was signed November 23, 1978 with an originally planned completion date of November 23, 1983. The Mission later extended the completion date to November 23, 1985 because of a lack of progress in well drilling and latrine installation. As of June 30, 1984, 76 percent of the funds were disbursed with 80 percent of the time expended and the following accomplishments had been made toward the project's goals.

<u>Project Component</u>	<u>Amount Budgeted</u>	<u>Amount Disbursed</u>	<u>Percent of Budget Disbursed</u>	<u>Accomplished</u>	<u>Project Goals</u>	<u>Percent of Goals Achieved</u>
<u>Expansion of Basic Health Services</u>	\$747,000	\$618,000	83			
Residents served				200,000	200,000	Completed
Promoters trained				326	400	Completed
Supervisors trained				6	20	Completed
Nurses trained				43	120	Completed
Doctors trained				23	20	Completed
Clinics upgraded				99	100	Completed
Hospitals upgraded				20	20	Completed
<u>Potable Water, Sewage, Disposal, and Health Education Services</u>	7,062,000	5,305,000	75			
Rural residents provided water				175,512	160,000	110
Communities provided water				471	500	94
Total wells drilled				2,042	2,600	79
Wells with water				1,492	None	N/A
5-gallon containers distributed <u>a/</u>				0	20,000	0
20-gallon containers distributed <u>b/</u>				12,339	20,000 <u>d/</u>	61
Latrines installed				10,802	20,000 <u>e/</u>	54
Water-seal latrines tested				12	150	8
Community organizers trained <u>c/</u>				43	84	51
Field supervisors trained <u>c/</u>				4	6	67
<u>GODR Administration</u>	191,000	159,000	83			
<u>Total</u>	<u>\$8,000,000</u>	<u>\$6,082,000</u>	76			

a/ The project provides specially designed 5-gallon containers to rural residents to collect and transport water from the wells to their homes without contamination. Contractor protests over the bid procedures slowed the production of the containers; however, the containers are now being manufactured and should be distributed this year.

b/ The project provides specially designed 20-gallon containers to rural residents for storing water in their homes without contamination.

c/ The number of community organizers and field supervisors trained by the project represents the actual needs of the project which was less than the originally estimated goal.

d/ Although the project agreement called for 26,000 20-gallon containers, the GODR and USAID/Dominican Republic now estimate the actual need is 20,000.

e/ Although the project agreement called for 26,500 latrines, the GODR and USAID/Dominican Republic now estimate that the actual need is 20,000.

When completed, the water and sanitation component of the Health Sector II loan will meet some of the most basic needs of about 200,000 rural residents in the Dominican Republic. Virtually all of the rural residents interviewed at the 40 well sites we visited noted that diarrhea and intestinal problems had disappeared since they began using potable well water. Prior to using well water, the residents had used water from a variety of sources including rivers, streams, and irrigation ditches which were often contaminated with human and animal wastes. The project's sanitation component is designed to safely dispose of human wastes.

When completed, project wells and latrines will serve only about 8 percent of the 2.2 million rural residents and only 6 percent of the 8,100 rural communities that need potable water and sanitation. Despite this need, there are no plans for any future water and sanitation projects in the Dominican Republic after this one is completed in November 1985. The Mission believes the purpose of the project was to demonstrate the effectiveness of potable water and proper sanitation and that this purpose has been achieved. The Mission also believes that AID's limited health resources should now be used to strengthen the management of the Dominican Republic's health services.

Although the project now serves 175,512 rural residents with water or about 10 percent more than the originally planned 160,000, ^{1/} other project goals in the water and sanitation components remain incomplete. This report discusses the major impediments to project implementation and makes recommendations to accelerate the project's completion.

The Mission and Ministry of Health (SESPAS) completed the component that extended basic health services in 1980 and the Ministry's Basic Health Service (SBS) is now completely responsible for providing these services to rural residents. According to the USAID project manager, the original goals exceeded needs and actual accomplishments met those needs. Hence, the Mission is now transferring the funds remaining in this component to the water and sanitation component. This report discusses the current status of these basic health services.

^{1/} The GODR loan coordinator believes that the goal of 160,000 rural residents was the best available estimate at the time the project was designed. He now believes reaching 200,000 rural residents with potable water is achievable by the end of the project.

The GODR loan coordinator, who works directly for the Minister of Health, manages the water and latrine project with a headquarters staff, provincial supervisors, field supervisors, and community organizers. The Institute for Potable Water and Sanitation (INAPA), an autonomous GODR agency, drills the wells and supervises contractors who also drill wells.

OBJECTIVES, SCOPE, AND METHODOLOGY

The objectives of this audit were to evaluate the effectiveness of the Health Sector II project (an \$8.0 million AID loan with \$6.0 million in expenditures through June 30, 1984) 1/, identify implementation problems and impediments, and to make recommendations to correct any deficiencies that we observed.

Utilizing Mission and Latin America Bureau files, we reviewed: the project agreement, project paper, project identification document, implementation letters, quarterly reports from January 1979 to June 1984, correspondence, a 1979 and 1983 AID impact evaluation of basic health services, AID Inspector General and General Accounting Office reports on Health Sector I, status of AID loan funds, controller financial reviews, and other background information on the project. To evaluate the effectiveness of the project and to identify implementation problems, we interviewed the following USAID/Dominican Republic and GODR officials.

<u>Location</u>	<u>USAID/Dominican Republic</u>	<u>Government of the Dominican Republic</u>		
		<u>Project Office</u>	<u>Basic Health Services</u>	<u>Institute for Potable Water & Sanitation</u>
Santo Domingo	Director Deputy Director Project Development Officer Health Development Officer Controller Head Accountant Engineer	Loan Coordinator	Director, Clinic Supervision Administrative Assistant Director, Dept. of Supervision	Deputy Director Hydrologist
Rural Communities		3 Provincial Supervisors 3 Supervisors 3 Community Organizers	1 Regional Director 2 Regional Supervisors 4 Health Supervisors 7 Clinic Doctors 10 Promoters	1 Field Supervisor

1/ For more details on funded activities and expenditures, see page 3.

We also interviewed two of the five owners of well-drilling companies contracted under this project to determine why drilling had fallen off in the last two years. At the 40 well sites visited, we interviewed members of community health committees and over 100 rural residents to gauge the impact of the wells.

To better understand the project's goals and implementation, we visited five project communities close to the Mission in Santo Domingo to interview field staff and observe the condition of the wells, latrines, and upgraded clinics. We later conducted a detailed review in seven communities, located in five rural provinces, of five upgraded clinics, 31 wells, and 11 latrines (five of the seven communities had no latrines because the project had no more in stock), and conducted in-depth interviews with promoters, supervisors, community organizers, rural residents, doctors, health committees, and regional SBS officials. The communities were randomly selected from a project universe of upgraded clinics which were near project wells and latrines so we could examine all of the project's components during the same site visit.

We also reviewed the Mission Controller's procedures for verification of payments and reimbursements under the project and noted that two financial reviews had been performed recently. We did not reverify the vouchers examined by the Controller's office because the procedures used to review these transactions appeared adequate to provide satisfactory internal controls over the project's expenditures.

We conducted this audit between June 4 and August 21, 1984; it covered project activities from November 23, 1978 to June 30, 1984. The project had not been audited before. We discussed our findings at an exit conference with USAID/Dominican Republic officials, and we submitted a draft audit report for the Mission's review and comment. The Mission generally agrees with our findings, conclusions, and recommendations and we have incorporated their views into this report. We made our review in accordance with the Comptroller General's Standards for Audit of Governmental Organizations, Programs, Activities, and Functions.

AUDIT FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Although the Health Sector I and II loans established basic health services for rural areas in the Dominican Republic, these services have deteriorated significantly in recent years from the levels envisioned and established under these projects. In addition, the water and sanitation components of the Health Sector II loan require more pumps, well drilling, latrines, hygienic improvements, and institutional permanence in order to achieve a timely and successful completion of the project.

RURAL HEALTH SERVICES HAVE DETERIORATED

Basic health services for rural areas of the Dominican Republic have significantly deteriorated since this component was completed in 1980 and turned over to the GODR largely because the GODR lacks the funds to pay for the services. In contrast to a 1979 audit by the then AID Auditor General and a 1980 review by the General Accounting Office, both of which reported a strong program for basic rural health services in the Dominican Republic, we observed the following weaknesses in the current program.

- No Medicines Basic medicines--aspirin, cough syrup, antiparasite, antidiarrhea, and iron pills--provided to the promoters under the Health Sector I and II loans are no longer available for the promoters to distribute. Rural clinics are supposed to provide these services now, but the five clinics we visited had neither these nor any antibiotics. Doctors at the clinic told us that the budget for the medicines is insufficient to meet needs.
- No More Family Records Under the Health Sector I and II loans, promoters were to keep a medical record and history (births, deaths, immunizations, weights, sickness, visits, etc.) for each family in their community. New record forms have not been available since 1982 because of funding restrictions, according to an official in the Basic Health Service. All 20 of the promoters we interviewed lacked medical record forms.
- Lack of Supervision Supervisors often do not oversee the work of the promoters. During our field visits, this was most evident with the records of the promoters which were generally not up to date. A major responsibility of the supervisors is to ensure that promoters make visits, give immunizations, weigh babies, etc., and the promoters' records are the control to measure the work of the

promoters. According to the GODR loan coordinator and AID project officer, part of the problem lies with the appointment of supervisors for political reasons who have little interest in health work. Another reason is the lack of motorcycles for supervisors to reach their promoters. Only about 175 supervisors out of 400 have motorcycles.

--Missed Paychecks Promoters in GODR Health Region VI and supervisors in Region VII did not receive paychecks in May 1984 because the GODR reportedly lacked the funds to pay them.

These problems indicate that the Dominican Republic may not have the absorptive capacity to handle the range of services that were planned under the Health Sector I and II loans. Perhaps the biggest shortcoming of these projects in terms of primary health care was the absence of a funding mechanism to finance the recurring costs of the rural health services. The effect has been to initially provide a fairly high level of health services during the project period, and then observe the quality of services deteriorate. The water and sanitation components of the Health Sector II loan have a self-funding mechanism whereby rural communities collect a monthly fee for pump maintenance and repair. Hence, this change should be more permanent than that provided by the basic health care services.

The revitalization and restoration of these services in the Dominican Republic are critical, not only to lowering mortality (especially among infants, young children, and child-bearing women), but also to reducing the toll of serious communicable diseases that decrease the productivity of large numbers of rural workers.

The agreement for the next USAID/Dominican Republic health project, Health Systems Management, requires, as a special covenant, a study of alternative financing methods. The results of this study could lead to restoring the effectiveness of basic rural health services in the Dominican Republic.

Conclusion

Basic health services in the Dominican Republic are operating at a fraction of their previous effectiveness and the impressive health improvements made during the late 1970s, as reported in a 1980 AID impact evaluation, may no longer be present because of deteriorating health services. AID health efforts are aimed at encouraging and assisting developing country governments to develop and implement workable basic health care programs.

We have not included a recommendation in this section because USAID/Dominican Republic has reported the extent of health service deterioration to the GODR after receiving our draft report. The GODR has appointed a new Director for Basic Health Services; planned an in-depth evaluation of one health region to correct deficiencies and apply remedies to other regions; and planned for training to upgrade the health care in rural areas. USAID/Dominican Republic should report to us the status of these efforts within six months of the issuance of this report.

PUMPS AND INCREASED WELL DRILLING REQUIRED FOR POTABLE WATER COMPONENT

In order to complete the potable water component in a timely manner, the project will need over 700 more pumps (none are currently available) and increased well drilling which has fallen off dramatically in the last two years.

Wells Await Pump Decision

A long delayed decision as to whether to adopt a recently introduced, more powerful, and less expensive well pump developed for AID by Georgia Tech has resulted in over 200 wells awaiting pumps.

In the provinces of Monte Cristi, Dajabon, Valverde, Santiago Rodriguez, and Puerto Plata, 279 wells needed pumps as of the end of June 1984. Although 47 pumps will soon be provided when spare parts arrive to restore pumps that were cannibalized to repair broken pumps, the remaining 232 wells must await an AID and Ministry of Health decision on which pump to manufacture and the subsequent manufacturing, delivery, and installation of the pumps. The community organizer in Dajabon and Monte Cristi told us that the 39 wells in that area had been in need of pumps since about January 1984. Based on recent experience, about 30 additional wells will need pumps each month.

To meet the need for more pumps, the Mission and Ministry must choose between the standard AID 'Battelle' pump, a modified 'Battelle' pump, or a new steel pump designed by Georgia Tech. Sixteen of the new steel pumps are now being used in the Dominican Republic to test their effectiveness, as well as the ability of the manufacturers in the country to build them. Georgia Tech introduced four of the pumps and three Dominican machine shops built four each. Four of the pumps were installed in December 1983 and the remainder in February 1984. According to the Mission Engineer, the steel pump is superior to the Battelle pumps because the steel pump:

- can operate at greater depths. The steel pump has been tested to a depth of 185 feet while the limit on the Battelle pump is 120 feet. This greatly increases the likelihood of finding water.
- is less expensive to manufacture than the Battelle pump.
- is easier to operate because the handle is longer, providing more leverage to the user. The handle can also be extended with an additional pipe to provide even more leverage for the user. This can be important because women and children pump and carry most of the water.
- has tighter fitting parts making for less unnecessary movement and thereby reducing pump maintenance and repair.
- is quicker and easier to repair. For example, the entire Battelle pump must be dismantled from the base to replace a seal. The Battelle pump weighs 115 pounds and is connected to the base with about 10 bolts. However, the steel pump only requires simple disassembly at the top of the pump with a small key.
- cannot be primed thus avoiding contamination of the well water.
- is easier to build since it is made from common parts that are readily available and the pump can be assembled by a machine shop rather than cast by a foundry.
- is less prone to vandalism because it's harder for children to foul it with sticks or small stones.
- has a small orifice, which means that less water is wasted because the residents often use narrow neck bottles to carry the water.
- uses commonly found ball bearings instead of bushings which should result in longer life and easier manufacturing. A major problem with the Battelle pump in this project was the inability of the local manufacturers to produce bushings to the hardness needed for the pumps.
- would leave a better technology in the country once the project was completed.

The Mission engineer field inspected the test pumps and recommended on June 12, 1984 that the steel pump be used to complete the project based on a need for 600 more pumps. He later noted that if only a small number of pumps were to be built, it may be better just to stay with the Battelle pump since the start-up time and effort may not be worth a small purchase. This concern was shared by the project officer and the loan coordinator.

Based on the following information at least 751 more pumps are needed.

Planned number of wells	2600
Number drilled as of July 30, 1984	<u>2042</u>
Wells to be drilled	558
Average number of wells drilled that have water	<u>x.75</u>
Pumps needed for remaining wells	419
Wells needing pumps now	232
Approximate number of dry and seasonally dry wells that could be redrilled to a greater depth for water	<u>+100</u>
Total number of pumps needed	<u>751</u>

This is probably a conservative estimate since the percentage of wells with water should increase substantially over past experience because the steel pump can operate at a substantially greater depth. In our opinion, the fact that over 700 pumps are needed to complete the project justifies the start-up time and trouble involved in switching to a new pump.

A successful wide-scale use of the steel pump in the Dominican Republic could also have a significantly positive effect on similar AID projects around the world. We believe that further delaying the decision as to which pump to build will not likely result in any new information on which to base a decision, while a delayed decision will postpone the use of completed wells and the project's own completion.

Conclusion

The Georgia Tech steel pump offers a potentially better technology that could result in fewer dry wells (nearly 25 percent are dry), less maintenance, and less expense than the project is currently experiencing. Although any new technology offers some potentially new problems, the steel pump has been built and tested in the Dominican Republic with successful results.

Recommendation No. 1

USAID/Dominican Republic employ the Georgia Tech steel pump to complete the project.

Well Drilling Falling Behind

Well drilling has fallen from a monthly average of 58 wells in 1982 when production reached a peak to 40 wells per month in 1984 (a 31 percent loss in production). The lower production stems from a Mission and Ministry of Health decision to transfer the well drilling function from the Ministry of Health to the Institute for Potable Water and Sanitation (INAPA) in April 1982. The intent was to delegate the responsibility for well drilling to the agency responsible for potable water systems in the Dominican Republic in the hope that it would be more effective than the Ministry of Health. The reality proved quite different, resulting in delays in project implementation, loss of contractors, and lower production.

Although the agreement to have INAPA implement the well drilling component of the project was signed in April 1982, INAPA did not actually start any well drilling activity until August 1983. During this 17-month period, INAPA was preparing to assume its new role while the Ministry continued to drill wells under previous contracts. In August 1983, INAPA began drilling operations with five contractors but by December 1983, all but one had stopped drilling for the following reasons:

- INAPA was slow to make payments. The contractors told us that INAPA was two-to-three months behind in their payments. They noted that when the Ministry of Health was in charge of drilling they were normally paid within a few days after the end of the month.
- INAPA did not provide supervision as effectively or as often as needed. One contractor runs his drilling equipment 24 hours a day with three crews. He said that INAPA supervisors were often not available to direct him to a new location or to approve completed wells which caused his costs to go up. Consequently, he stopped drilling project wells. He said he had not had this problem with the Ministry of Health.
- INAPA did not deliver the well materials to the drilling site because INAPA expected the contractors to get the materials. The Ministry had always delivered the materials to the site.

--The price of the contract was no longer as attractive because of increased costs. Although the contractors did not believe this was the primary problem, INAPA thought an increase in the drilling price would improve the production.

In addition to contractor-drilled wells, INAPA has been drilling some wells with its own machine. This effort may not be as effective as the contractors' work because the INAPA supervisor can drill wherever and whenever he wants regardless of recommendations made by the project hydrogeologist. For example, when we field-inspected the INAPA drilling site in Puerto Blanco, we found that the site did not meet the basic selection criteria, such as being on a road or trail, near a rural cluster of homes, nor approved by the hydrogeologist.

According to the GODR loan coordinator, the Ministry of Health is willing and able to assume a greater role in drilling wells to complete the project.

Conclusion

Although INAPA is the agency responsible for water and sanitation in the Dominican Republic, the transfer of the well drilling responsibility from the Ministry of Health to INAPA delayed the completion of the drilling component. The decision gives INAPA experience with small water projects and should leave an institutional permanence after the project is completed. However, to complete the project in a timely fashion, the GODR project office located in the Ministry should also contract for well drilling which they have successfully done before and are willing to do now.

Recommendation No. 2

USAID/Dominican Republic renew its authorization to the GODR project office to contract for well drilling.

SANITATION COMPONENT NEEDS LATRINES, HYGIENIC IMPROVEMENTS, AND AN EVALUATION OF WATER-SEAL LATRINES

Only 54 percent of the project's 20,000 planned latrines ^{1/} are installed; however, only 40 latrines are in stock and none are being manufactured. Also, many installed latrines need seat covers and buildings for hygienic improvements, and a complete evaluation is needed of water-seal latrines which potentially are cleaner than the traditional latrines.

^{1/} The latrine is a concrete slab with a seat that covers a pit used to safely dispose of human wastes. The rural residents are responsible for digging the pit and constructing a latrine shelter.

Sanitation Component Lacks Latrines

With 76 percent of the project's time expended, only 10,802 latrines or 54 percent of the planned 20,000 latrines are installed while 40 latrines are in stock and none are being manufactured. The lack of latrines resulted when USAID/Dominican Republic failed to reorder the manufacture of latrines in a timely manner and because the GODR used about 3,300 project latrines outside of the project areas. The delay in latrine installation slows the project's goal for improved rural health.

The project purchased a total of 15,304 latrines of which 10,802 were installed and about 1,200 (this is an 8 percent estimate) were broken. According to the GODR loan coordinator, the remaining latrines, about 3,300 valued at over \$46,000, were taken in August 1982 without his permission or knowledge by local authorities with the permission of the Minister of Health. The loan coordinator and the project director have not been able to determine the location of the latrines but to the best of their knowledge, the latrines were not installed in project locations. The latrines have already been paid for from project funds.

The shortage of latrines in stock has slowed down the installation of new latrines. The average number of latrines installed each month in 1984 is 114 compared to 651 for 1983. If the 1984 rate of installation continued, the project would not be completed until 1991. After the 40 latrines in stock are installed, the project must await the invitation for bids, construction, and transportation of latrines before installation can begin again.

Conclusion

Latrine installation lags behind all the other project components and may delay the project completion date unless immediate action is taken to initiate an invitation for bids for latrine construction. USAID/Dominican Republic's planning and management process should have also triggered an earlier decision to order new latrines before the latrine stock was nearly depleted. In addition, the latrines taken by the GODR for use outside of the project locations should not be charged to the project.

Recommendation No. 3

USAID/Dominican Republic:

- (a) immediately initiate an invitation for bids for latrine construction,

(b) design a project monitoring system to plan and estimate needs before the needs delay the project's implementation, and

(c) recover the costs from the GODR of the 3,300 latrines taken for use outside of project locations.

Installed Latrines Need Improvements

During our field inspections of latrine conditions, we observed that most latrines needed basic improvements--shelters and seat covers--because the rural residents did not fully appreciate the need for completed latrines. According to AID Health Officials, the privacy of a shelter normally increases the use of a latrine and seat covers will reduce the access of insects that carry disease from human waste. We also observed one latrine with a shelter which was used to store food. The proper disposal of human wastes can reduce disease because water sources are not contaminated and insects cannot carry disease from the waste to food. While great achievements have been made in the project by introducing latrines to many homes that previously didn't use them, the full health benefit will not be achieved until the latrines are used properly.

Part of the problem with the shelters can be attributed to a GODR program that gives some residents a free shelter with a latrine. Many residents simply expected to get a free shelter. The seat cover problem is more difficult because the latrine smell is often offensive when the cover is removed for use.

Despite these problems, at least one community organizer has successfully motivated his community to use seat covers and to build shelters. For example, in the village of Achinas in San Juan, virtually every home--54 out of 55--had a latrine with a shelter and a seat cover. The loan coordinator and area supervisor attributed this to the project supervisor and community organizer who had properly educated the community. The loan officer noted that other supervisors and community organizers had not been so energetic or successful.

The program has not used the experience of successful supervisors and community organizers to train or motivate other supervisors and organizers. However, the GODR loan coordinator thought that such training could be quite useful.

Conclusion

Although the project has introduced about 10,000 latrines to rural residents who had not used latrines before, the full potential for health improvement will not be realized until shelters and seat covers are commonly used. The training techniques of successful community organizers to encourage the use of shelters and seat covers should be shared with other community organizers.

Recommendation No. 4

USAID/Dominican Republic and the GODR project office organize and conduct a training seminar for community organizers so that successful organizers can share the techniques they have used to encourage the proper use of latrines by rural residents.

Complete Evaluation of Water-seal Latrines Needed

The project agreement called for a test of 150 water-seal latrines in ten communities during 1979 and 1980; however, only a limited test of the water-seal latrines has been made thus far so their full effectiveness in the Dominican Republic cannot yet be determined. The water-seal latrine looks like a regular toilet and can be located in or near a home because it is flushed and sealed with water. Until the test is completed, the project must rely on traditional latrines which are often not as attractive because of their appearance and smell.

The project has tested six water-seal latrines in Peravia since August 1983. This limited test met with mixed results as the latrines initially had problems with clogged pipes because the residents in that area put the objects used to clean themselves (corn cobs, small stones) into the toilets which blocked the flow of water. However, the water-seal latrines are now functioning properly and two more are going to be tested in another Peravian community.

During our field visit to the province of Santiago Rodriguez, we interviewed five families that had been given water-seal latrines by a local manufacturer (the company has distributed a total of 13 water-seal latrines for testing). The project's community organizers help install the latrines. Two families were still in the process of installing the latrines while three were installed and being used. All five of the families were quite pleased with the new latrines and cited improved hygiene (cleaner, no smell, did not attract flies) over their normal latrines as the primary reason for wanting the water-seal latrine. They also thought that the water-seal latrine improved

their status in the community. The GODR province supervisor and community organizer told us that they also prefer the water-seal latrine because it's easier to install than the normal latrine.

The positive results in Santiago Rodriguez with water-seal latrines are quite a contrast to the problems initially encountered in Peravia. The differences may be cultural or related to the efforts of the community organizer to educate the residents. However, the Mission engineer cautions that water-seal latrines will not be effective unless the homes are located near a constant source of water since flushing requires about one gallon of water. The real effectiveness and peculiarities of the water-seal latrine will not be known until a large-scale test is conducted in different provinces as was planned in the project agreement.

Conclusions

For rural residents with adequate water supplies, the water-seal latrine potentially offers a clean and safe means of waste disposal that can be located close to or in their homes. A test of the water-seal latrine was included in the project agreement to determine the extent of acceptance of the latrine by rural residents and to identify the extent of maintenance problems with it. A complete test of the latrine in different provinces is needed to fully determine its effectiveness.

Recommendation No. 5

USAID/Dominican Republic conduct a complete evaluation of the water-seal latrine as provided in the project agreement.

WELL MAINTENANCE AND LATRINE INSTALLATION TECHNIQUES SHOULD BE INSTITUTIONALIZED

Project supervisors and community organizers provide technical guidance to rural communities on well maintenance and latrine construction. However, when the project is completed in November 1985, this institutional capacity may be lost because the project does not have plans to leave a permanent organization. Since USAID/Dominican Republic has determined that AID projects will not include water and sanitation components in the near future, the experience and knowledge gained from this project should be institutionalized in the GODR.

A possible means of keeping the knowledge gained from their work is for the Basic Health Service to use them as part of the

permanent structure that provides health services to rural residents. In addition to their knowledge of wells and latrines, project supervisors and organizers received the same training as those in the SBS.

The project's supervisors and organizers are a positive contrast to many of the supervisors in the SBS who were often appointed for political reasons and have had little interest in the health program. One regional supervisor noted that 55 of her 59 supervisors are political appointees and that they are her biggest problem. She also observed that their political connections make their replacement unlikely. A more likely possibility is for the SBS to hire the project's supervisors and organizers as attrition makes positions available. For attrition to work effectively, the transition should begin well before the project is completed.

Conclusion

The Basic Health Service offers a logical placement for GODR project personnel since the SBS provides health services in rural project areas and because project personnel have received the same health training as SBS personnel. The transition may take some time, depending on SBS attrition rates, so plans are needed now to make a successful and timely change from project assistance to a permanent GODR institution.

Recommendation No. 6

USAID/Dominican Republic and GODR project coordinator prepare plans to transition project personnel to the Basic Health Service so knowledge gained from this project can be utilized effectively and not lost after the project is completed.

NO ANNUAL EVALUATIONS OR RESEARCH PLAN

Annual evaluations of the Health Sector II project have not been made although such evaluations often provide valuable insight and guidance to project managers who are caught up in the daily details of running a project. USAID/Dominican Republic and GODR have missed a valuable opportunity to measure the project's progress, identify problem areas, and obtain outside recommendations to enhance the project's implementation because the annual evaluations were not made. In addition, a research plan to measure the health benefits from the water and sanitation improvements was never implemented.

The project agreement calls for a joint annual evaluation program that includes

- an evaluation of progress toward the objectives of the project,
- identification and evaluation of problem areas or constraints,
- assessment of how such information may help overcome the problems, and
- evaluation of the overall development impact.

The GODR loan coordinator said that the evaluations were not conducted because he did not have the technical support to develop an evaluation plan (which was also required by the project agreement).

The project paper also calls for this project to research the effect of potable water and sanitation on the health of the rural residents by randomly selecting 12 villages for an in-depth study of the effects of health education, potable water, and latrines. This was never carried out but the data is available and could be used to complete the research. The project paper noted that this project is in a unique position to add valuable information to the literature on the effectiveness of water and sanitation projects to the health of rural inhabitants because the effectiveness of these projects is not fully known.

Conclusion

We believe an evaluation next year of the project would be valuable to measure the project's progress from this audit and to adjust the project's implementation to meet new needs and circumstances. Implementation of the research plan to measure the benefits of the water and sanitation component would provide valuable information to USAID/Dominican Republic and the GODR for meeting the needs of rural Dominicans with future projects, as well as to AID/Washington in formulating policies affecting water and sanitation efforts worldwide.

Recommendation No. 7

USAID/Dominican Republic implement:

(a) annual evaluations and

(b) the research plan both of which are outlined in the project paper.

THEFT OF PIPE FROM GODR STORAGE LOCATION

In March 1984, 4,942 plastic well pipes, with an acquisition value of \$30,433.28, were stolen from a GODR storage facility. The pipes were stored behind a hospital surrounded by a high fence with two guards on duty at all times. The GODR loan coordinator noticed the missing pipes, ordered an inventory, located some of the pipes in hardware stores because the pipes had unique markings and size, and informed local police. The police made two arrests--a night guard at the storage facility and a truck driver--and recovered 1,121 pipes with an acquisition value of \$3,829.13 from hardware stores who had bought the pipes. One of the guards allegedly colluded with a truck driver to take the pipes. The intended beneficiaries--rural residents--of the loan money will receive less project benefits than they should unless the value of the missing pipes is recovered.

Conclusion

Although some pipes were recovered, 3,821 pipes with an acquisition value of \$26,604.15 still remain missing with little likelihood of recovery. The pipes were under the care of the GODR at the time of the theft; thus, the GODR should rightly bear the financial loss represented by the stolen pipes.

Recommendation No. 8

USAID/Dominican Republic recover the cost of missing pipe from the GODR.

LIST OF REPORT RECOMMENDATIONS

Recommendation No. 1

USAID/Dominican Republic employ the Georgia Tech steel pump to complete the project.

Recommendation No. 2

USAID/Dominican Republic renew its authorization to the GODR project office to contract for well drilling.

Recommendation No. 3

USAID/Dominican Republic:

(a) immediately initiate an invitation for bids for latrine construction,

(b) design a project monitoring system to plan and estimate needs before the needs delay the project's implementation, and

(c) recover the costs from the GODR of the 3,300 latrines taken for use outside of project locations.

Recommendation No. 4

USAID/Dominican Republic and the GODR project office organize and conduct a training seminar for community organizers so that successful organizers can share the techniques they have used to encourage the proper use of latrines by rural residents.

Recommendation No. 5

USAID/Dominican Republic conduct a complete evaluation of the water-seal latrine as provided in the project agreement.

Recommendation No. 6

USAID/Dominican Republic and GODR project coordinator prepare plans to transition project personnel to the Basic Health Service so knowledge gained from this project can be utilized effectively and not lost after the project is completed.

Recommendation No. 7

USAID/Dominican Republic implement:

- (a) annual evaluations and
- (b) the research plan both of which are outlined in the project paper.

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USAID/Dominican Republic recover the cost of missing pipe from the GODR.

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