Operated by The CDM
Associates
Sponsored by the U. S. Agency
for International Development

1611 N. Kent Street, Room 1002
Arlington, Virginia 22209 USA

Telephone: (703) 243-8200
Telex No. WUI 64552
Cable Address WASHAID

The WASH Project is managed by Camp Dresser & McKee Incorporated. Principal Cooperating Institutions and subcontractors are: International Science and Technology Institute; Research Triangle Institute; University of North Carolina at Chapel Hill; Georgia Institute of Technology—Engineering Experiment Station.

COMPARATIVE COSTS OF THE AID TYPE PUMP FABRICATED IN THE DOMINICAN REPUBLIC AND THE U.S. MANUFACTURED MOYNO PUMP

WASH FIELD REPORT NO. 80

APRIL 1983

Prepared for:
The Office of Health
Bureau for Science and Technology
U.S. Agency for International Development
Order of Technical Direction No. 130

WATER AND SANITATION
FOR HEALTH PROJECT

COORDINATION AND
INFORMATION CENTER

Operated by The CDM
Associates
Sponsored by the U. S. Agency
for International Development

1611 N. Kent Street, Room 1002
Arlington, Virginia 22209 USA

Telephone: (703) 243-8200
Telex No. WUI 64552
Cable Address WASHAID

April 21, 1983

Mr. F. Eugene McJunkin, Chief
Division of Water and Sanitation
Office of Health
U.S. Agency for International Development
Washington, D. C. 20523

Dear Mr. McJunkin:

On behalf of the WASH Project I am pleased to provide you with 10 (ten) copies of a report on Comparative Costs of the AID Type Pump Fabricated in the Dominican Republic and the U.S. Manufactured Moyno Pump.

This is the final report by Justin Whipple and is based on his trips to Dominican Republic in January 1983 and to Haiti in January and February 1983.

This assistance is the result of a request by the AID Office of Health. The work was undertaken by the WASH Project on January 13, 1983 by means of Order of Technical Direction No. 130.

If you have any questions or comments regarding the findings or recommendations contained in this report we will be happy to discuss them.

Sincerely,

Dennis B. Warner

Dennis B. Warner, Ph.D., P.E.
Director
WASH Project

cc. Mr. Victor W.R. Wehman, Jr., P.E., R.S.
AID WASH Project Manager
S&T/H/WS
Mr. Rod MacDonald
LAC/DR/ENGR - AID

DBW:cdej

The WASH Project is managed by Camp Dresser & McKee Incorporated. Principal Cooperating Institutions and subcontractors are: International Science and Technology Institute; Research Triangle Institute; University of North Carolina at Chapel Hill; Georgia Institute of Technology—Engineering Experiment Station.

WASH FIELD REPORT NO. 80

COMPARATIVE COSTS OF THE AID TYPE PUMP FABRICATED IN THE DOMINICAN REPUBLIC AND THE U.S. MANUFACTURED MOYNO PUMP

Prepared for the Office of Health
Bureau for Science and Technology
U.S. Agency for International Development
Under Order of Technical Direction No. 130

Prepared by:

Justin H. Whipple

April 1983

Water and Sanitation for Health Project
Contract No. AID/DSPE-C-0080, Project No. 931-1176
is sponsored by the Office of Health, Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC 20523

TABLE OF CONTENTS

Chapter		Page
1.	INTRODUCTION	1
2.	ETINCA PUMP	2
2.1	General Description of the Dominican Republic Pump Program	2
2.1.1	Accomplishments to Date	2
2.1.2	Present SESPAS Project Implementation Methods	2
2.2	Manufacture, Procurement, and Installation Costs	4
2.2.1	Pump Manufacturing Cost	4
2.2.2	Inspection and Transportation Costs	4
2.2.3	Site Preparation (Excluding Well Costs)	4
2.2.4	Installation	5
2.2.5	Technical Supervision and Administrative Costs	7
2.2.6	Total Cost of the Installed Pump	7
2.3	Operating and Maintenance Cost	9
2.3.1	Labor	9
2.3.2	Transportation	9
2.3.3	Spare Parts	10
2.3.4	Other Maintenance Materials	15
2.3.5	Technical Supervision and Administrative Costs	15
2.3.6	Total Annual Maintenance Costs per Pump	15
2.4	Total Annual Cost of the ETINCA Pump	15
3.	MOYNO PUMP	18
3.1	General	18
3.2	Procurement and Installation Costs	18
3.2.1	Pump Cost	18
3.2.2	Inspection and Transportation Costs	19
3.2.3	Site Preparation	19
3.2.4	Installation	19
3.2.5	Technical Supervision and Administrative Costs	20
3.2.6	Total Cost of the Installed Pump	20
3.3	Operating and Maintenance Costs	20
3.3.1	Labor	20
3.3.2	Other Maintenance Materials	22
3.3.3	Technical Supervision and Administrative Costs	22
3.3.4	Total Annual Maintenance Costs Per Pump	22

Chapter Page

3.4 Total Annual Cost of the Moyno Pump..... 24

4. COMPARATIVE COSTS AND COMMENTS..... 26

APPENDIX

A. Order of Technical Direction..... 28

Chapter 1

INTRODUCTION

The information in this report on the AID type handpump manufactured by the Equipo Tecnico Industrial C x A (ETINCA) in the Dominican Republic was obtained during a field investigation in the Dominican Republic in January 1983. This investigation included visits to pump manufacturing facilities, installation sites, and maintenance centers as well as interviews with program management officials, counterpart engineers, maintenance technicians, pump inspectors, the local manufacturer, pump users, and representatives of village committees.

Information on the Moyno Pump was obtained through visits to sites in Haiti (where approximately 25 pumps have been installed) and interviews with PVO and UNICEF officials in Haiti. The manufacturer of the Moyno pump in the United States also provided price information.

The purpose of these investigations was to obtain sufficient data to estimate all direct monetary costs related to the procurement, manufacture, installation, operation, maintenance, and replacement of the two types of pumps in order to compare their respective costs on an annual or life cycle basis.

All cost figures shown in this report refer to Dominican pesos (DR$). At the present official rate one peso is equivalent to one U.S. dollar. However a "parallel" money market exists in the Dominican Republic, and in January 1983 dollars were being purchased at a rate of 1.49 pesos per dollar.

Chapter 2

ETINCA PUMP

2.1 General Description of the Dominican Republic Pump Program

2.1.1 Accomplishments to Date

Under a USAID supported rural project, the national public health institution "Secretaria de Estado de Salud Publica y Asistencia Social" (SESPAS) has been involved since 1980 in a rural handpump program being carried out in the southwestern portion of the Dominican Republic, principally in the provinces of Peravia, Azua, San Juan and Elias Pina. The SESPAS responsibilities under this program include drilling of the wells and procurement, installation, and maintenance of the handpumps.

The pumps are being produced by Equipo Tecnico Industrial C x A (ETINCA), a small foundry/machine shop complex located in Santo Domingo. Under its first contract with SESPAS (1980) the foundry produced 1,000 pumps, including 800 deep well pumps (piston operating below water level in a cylinder located at the end of the drop pipe) and 200 shallow well models (piston operating above ground in a cylinder incorporated into the pump stand). In 1982 the foundry received another contract from SESPAS for the production of 1,000 "modified" pumps which are similar to the deep well pump except that the piston operates inside of a PVC drop pipe and no auxiliary cylinder is required. To date, 357 of these pumps have been produced and delivered to SESPAS.

SESPAS initiated pump installation in October 1980 and as of January 1, 1983 had installed a total of 795 pumps. The installation rate was reasonably uniform during the two-year period, as shown below:

Date	Total number of pumps installed
January 1, 1981	20
July 1, 1981	215
January 1, 1982	370
July 1, 1982	529
January 1, 1983	795

The 795 pumps include approximately 720 deep well pumps and 75 shallow well. In 1983 SESPAS initiated the installation of the modified pumps and reports 40 to 50 of these models installed in January.

2.1.2 Present SESPAS Project Implementation Methods

After pumps are delivered to the SESPAS warehouse each pump is inspected by SESPAS personnel, and defective pumps are returned to the manufacturer for repair. The pumps of acceptable quality are later transported to the SESPAS field operation base at Azua, some 150 kilometers from Santo Domingo.

SESPAS maintains two teams in the field for the pump installation program. The "platform" team, consisting of a mason and two assistants, does the necessary concrete site work prior to pump installation, and a second "installation" team (a mechanic and three assistants) installs the pump.

The above personnel are not SESPAS employees but are subcontracted at a rate of DR$30.00 per platform and DR$18.00 per pump installation. SESPAS provides trucks and drivers for both teams.

Maintenance of the pumps is carried out by a four-man team (all SESPAS employees) that operates out of the Azua Center. This team is also provided with a full-time truck and driver.

At present community participation in pump maintenance appears to be limited to reporting pump failure to the Social Promoter and in some case lubricating the pump.* SESPAS is attempting, without much success so far, to increase village participation by charging each family a fee of DR$0.50 per month until a total sum of DR$60.00 is available for purchase of tools and spare parts.

The previously mentioned pump inspection effected by SESPAS in Santo Domingo was initiated in December 1982 by the new Project Engineer and reflects SESPAS concern about the lack of quality control in the ETINCA foundry.

Visits to the foundry confirmed that cast parts show a higher than normal percentage of voids and that machining is often deficient with inadequate use of jigs and fixtures. Inspection procedures are either deficient or non-existent since finished components in storage include a mixture of satisfactory and obviously defective pieces.

SESPAS reports that 92 of the last 200 pumps delivered by ETINCA have been rejected for the following reasons:

- Bushings too loose in the pivot holes	60%
- Pump base inadequately threaded	30%
- Pump misaligned, casting defects, etc.	10%

Since the SESPAS inspection was only recently initiated most of the pumps now in the field have not been inspected and undoubtedly many are defective. Data for frequency of replacement shown below, therefore, are probably much higher than would be expected in a situation where adequate manufacturing quality control exists.

---

*Apparently the community does maintain the concrete platform since the SESPAS maintenance team does not include a mason.

2.2 Manufacture, Procurement, and Installation Costs

2.2.1 Pump Manufacturing Cost

ETINCA's manufacturing price is DR$136.00 for each deep well or modified pump completely assembled and painted and placed in the SESPAS warehouse in Santo Domingo. The corresponding price for the shallow well pump is DR$118.70.

The above prices do not include the cost of pins, bushings, and other pump components which are procured locally by SESPAS and delivered to the pump manufacturer without charge. The cost per pump of these components based upon unit prices provided by SESPAS are the following:

- Deep well pump: 9 bushings, 3 steel pins, 4 screws, 6 cotter pins, 2 galvanized pipes (3"x14"), 1 PVC pipe (2-3/4"x14"), 1 steel rod (7/16"x14"), and 2 galvanized pipe reducers for a total value of DR$38.35.

- Shallow well pump: 9 bushings, 3 pins, 4 screws, 6 cotter pins, 1 galvanized pipe (3"x14"), 1 steel rod (7/16"x14") and 1 brass screw, washer, nut assembly with a value of DR$27.05.

- Modified pump: 9 bushings, 3 steel pins, 4 screws, 6 cotter pins, 1 galvanized pipe (3"x14") and 1 steel rod (1/2"x14"); total cost: DR$26.85.

Adding the cost of the SESPAS purchased components to the manufacturer's price, the total cost of each of the three types of pumps warehoused in Santo Domingo, is as follows:

Deep well pump:	DR$174.35
Shallow well pump:	DR$145.75
Modified pump:	DR$162.85

2.2.2 Inspection and Transportation Costs

The cost of the pump inspection effected by SESPAS in Santo Domingo, based upon the salaries of the personnel assigned to this task, is estimated at approximately DR$1.00 per pump.

The cost of transportation of the pumps to the Operations Center in Azua (approximately 150 kilometers from Santo Domingo) based upon vehicle, fuel, and driver costs and assuming an average of 30 pumps per trip is about DR$3.00 per pump.

2.2.3 Site Preparation (Excluding Well Costs)

Materials

The material requirements and costs for the standard concrete platform, apron, and drainage canal are as follows:

Material	Quantity	Unit Cost (DR$)	Total Cost (DR$)
Portland cement	5 bags	4.20	$ 21.00
Cement blocks	22 blocks	0.35	7.70
Sand and Gravel	1 m^3	8.00*	8.00
Total materials			$36.70

Labor

SESPAS pays a standard fee for direct platform construction labor of DR$30.00 per platform.

Transportation

SESPAS provides a full-time truck and driver to the "platform" team. Estimated costs** for this service are as follows:

	Cost/platform (DR$)
Driver	$ 8.60
Vehicle	2.90
Fuel	0.50
Total transportation costs	$12.00

2.2.4 Installation

Materials

The materials required for pump installation vary depending upon the type of pump. Quantities and costs provided by SESPAS are shown in Table 1.

---

*A mixture of sand and gravel is obtained from a river bed by members of the community. SESPAS provides a truck and driver and estimates a cost of DR$8.00/$m^3$ to cover this service.

**Costs based upon the following data:
1. Vehicle is Datsun or Toyota diesel-powered pick-up truck
2. Avg, monthly travel = 600 kilometers
3. Depreciation, maintenance, insurance, etc.=DR$0.20/km
4. Fuel consumption=32km/gallon diesel
5. Diesel price in Dominican Republic=DR$1.18/gallon
6. Driver is paid a salary of DR$220/month + Christmas bonus
7. Driver receives an average of DR$120/month daily living allowance
8. According to reports submitted by SESPAS, 10 platforms are being constructed each week

Table 1: Materials and Costs of Installation of Pumps

Installation Material	Unit Cost (DR$)	Deep well pump No.	Deep well pump Total Cost (DR$)	Shallow pump No.	Shallow pump Total Cost (DR$)	Modified pump No.	Modified pump Total Cost (DR$)
Galvanized bolts 1/2"x6"	$1.10	8	$8.80	8	$8.80	8	$8.80
Steel rods 1/2"x20'	4.00	4	16.00	0.2	0.80	4	16.00
Rod couplings	1.70	4	6.80	1	1.70	4	6.80
1-1/4" steel drop pipe*	21.00	4	84.00	1	21.00	-	-
2" PVC drop pipe*	21.00	-	-	-	-	4	84.00
Brass strainer**	10.00	1	10.00	1	10.00	-	-
Plastic well screen	8.00	-	-	-	-	1	8.00
Reducer 1-1/4"x3/4"	2.50	-	-	-	-	1	2.50
Nipple 3/4"x2"	0.60	-	-	-	-	1	0.60
PVC female adapter	1.00	-	-	-	-	1	1.00
Nipple 2"x4"	4.00	-	-	-	-	1	4.00
PVC cement	-	-	-	-	-	-	0.50
Plywood templates	1.50	-	-	-	-	4	6.00
Total installation materials			$125.60		$42.30		$138.20

*Average well depth for deep well pump and modified pump = 80 ft. Average depth for shallow well = 20 ft.

**SESPAS informed that the first lot of purchased brass strainer/foot valves had a unit cost of DR$40.00. However, they have since found a local source for Taiwan-made strainers priced at DR$10.00.

Labor

SESPAS pays a standard installation fee of DR$18.00 per pump.

Transportation

SESPAS provides a fulltime vehicle and driver for the Installation Team. Costs for this service based upon the criteria used above for an average of 12 installations per week (verified by latest SESPAS reports) are as follows:

	Cost per pump, (DR$)
Driver	$ 7.20
Vehicle	2.40
Fuel	0.40
Total transportation costs	$10.00

2.2.5 Technical Supervision and Administrative Costs

Technical Supervision

The technical supervision cost was estimated by considering the annual salaries of the SESPAS project staff (Coordinator, Project Engineer, Comptroller, Field Engineer, Assistant Engineer, Warehouse Managers and Assistants) and estimating the percentage of time spent by each person on the various project tasks (well-drilling, pump procurement and installation, pump maintenance, latrines, and other activities).

Results of the above analysis showed an annual cost of DR$21,970 for pump procurement and installation.

Since both platform and installation teams are currently operating at a rate approximately equivalent to 500 installations per year, the estimated annual technical supervision represents a cost of about DR$44.00 per pump.

Administrative Costs

SESPAS was unable to provide information concerning other indirect costs. However, the budget shown in the AID Loan Agreement includes a specific amount to cover administrative costs equivalent to 18 percent of all project personnel costs.

Applying this 18 percent factor to the total cost of direct labor, truck drivers, and technical staff involved in pump procurement and installation, the administrative costs amount to DR$21.00 per pump.

2.2.6 Total Cost of the Installed Pump

The total estimated cost of the three types of pumps completely installed at the well site based upon the above information are presented in Table 2.

Table 2: Installed Pump Costs*

	Deep well pump (DR$)	Shallow well pump (DR$)	Modified pump (DR$)
Cost of pump Sto. Domingo	$174	$146	$163
Inspection labor	1	1	1
Transportation to Azua	3	3	3
Sub-total pump at Azua	$178	$150	$167
Platform materials	$ 37	$ 37	$ 37
Platform labor	30	30	30
Platform transportation	12	12	12
Sub-total platform	$ 79	$ 79	$ 79
Installation materials	$126	$ 42	$138
Installation labor	18	18	18
Installation transportation	10	10	10
Sub-total installation	$154	$ 70	$166
Total direct cost	$411	$299	$412
Technical supervision	$ 44	$ 44	$ 44
Administrative costs	21	21	21
Total cost	$476	$364	$477

*Assuming average well depths of 80 ft for the deep well and modified pumps, and 20 ft for the shallow well pump.

SESPAS has designed their pump program for an average of 10 families using each pump. Assuming six persons per family, 60 users would benefit from each installation. The total installed pump cost, therefore, represents the following per-capita investment.

	DR$ per capita
Deep well pump	7.93
Shallow well pump	6.07
Modified pump	7.95

2.3 Operating and Maintenance Cost

2.3.1 Labor

At the present time one four-man maintenance team is responsible for inspecting and maintaining all pumps in the field. Their salaries represent an annual cost of DR$15,730.*

Now that 800 pumps are in operation in the field the above level of effort is proving to be inadequate, and the Project Engineer plans to organize another four-man maintenance team in the immediate future. Each team will then cover approximately 400 pumps. This appears reasonable since the pump installations are not widely dispersed. SESPAS has subdivided the area where pumps are being installed into zones each containing on the average some 50 pumps.** The maintenance team normally covers one zone per week and is supposed to inspect all pumps within the zone, repairing those that require corrective maintenance. The maintenance technicians do not fill out inspection forms and only report the number of pumps repaired (an average of 18 per week during the last eight-week period). Assuming that they do inspect 50 pumps per week, each of the 400 pumps could theoretically be inspected once every eight weeks.

Dividing the total annual cost of DR$15,730 by 400 pumps, the annual maintenance labor cost per pump would be about DR$39.00.

2.3.2 Transportation

SESPAS also provides a full-time truck and driver for the maintenance team and estimates 700 kilometers traveled per month. Considering a total of 400 pumps being maintained and the same criteria as used previously the annual transportation cost per pump is estimated as follows:

---

*One Team Leader at DR$340/month + Christmas bonus
Three Assistants at DR$290/month + Christmas bonus
Maintenance personnel do not receive daily allowance

**Variations from a low of 32 pumps in Las Casas to highs of 85 pumps in Bani and 151 pumps in Azua.

	Cost per pump (DR$)
Driver	$10.75
Vehicle	4.20
Fuel	0.80
Total transportation costs	$15.75

2.3.3 Spare Parts

The ETINCA deep well pump components and their unit costs when purchased as spare parts* are shown in the following table:

Component	Unit cost (DR$)	
Pump head	14.00	
Rod end	2.10	
Handle	10.00	
Handle Fulcrum	7.50	
Pump Body	15.25	
Pump Stand Cylinder	4.00	
Pump Base	18.00	
Pivot pins	3.40	(3/pump-total cost 10.20)
Bushings	1.80	(9/pump-total cost 16.20)
Sliding blocks	2.00	(2/pump-total cost 4.00)
Cotter pins	0.03	(6/pump-total cost 0.18)
Cylinder	17.86	
Plunger Cage	3.00	
Poppet valve	3.50	
Plunger Spacer	2.00	
Foot valve	3.50	
Plunger follower	3.00	
Leather Cups	1.10	(2/pump-total cost 2.20)

To date SESPAS has had experience with the maintenance of 800 handpumps installed over a period of two years (average pump life in the field = approximately one year). They do not have written records covering spare parts used during this period. However, the Project Engineer and the maintenance technicians were able to provide the following verbal information based upon their experience concerning the performance of each pump component in the field.

Pump Head. No wear problems to date. Some breakage has occurred usually associated with a casting defect (void). Approximately 2.0 percent of the pump heads have been replaced due to breakage.

Rod End. Little wear or breakage problems. About 3.0 percent of these components have been replaced due to factory machining defects (threaded hole out of line).

*Prices as negotiated in SESPAS/ETINCA contract.

Handle. About 40 handles have been broken to date (5.0 percent) with the break almost always associated with a casting defect. More handles have broken during transportation of the pump than in the field.

Handle Fulcrum. Same comments as for the pump head - 2.0 percent replacement.

Pump Body. Few problems. Possibly 1.0 percent breakage. Breaks usually occur at the thread when tightening the components with pipe wrenches.

Pump Stand Cylinder. Same comments as for the pump body.

Pump Base. A few broken components due to casting defects - about 1.0 percent.

Pins and bushings. The maintenance technicians estimate that 10 percent of the bushings and pins have already been replaced. Some pins have worn and some bushings have broken. However, many pins and bushings have simply been lost when they fall out after failure of the cotter pin.*

Sliding blocks. Although signs of wear are evident, only about 2.0 percent of the blocks have been replaced to date. This percentage will undoubtedly increase drastically in coming years.

Cotter pins. High frequency of failure. Replacement of all pins required every three months on the average. The Project Engineer believes that the cotter pins are too weak and that the holes in the steel pins are not far enough apart to prevent abrasion of the cotter pin by the bushing. The maintenance technicians, despite the Engineer's instructions to the contrary, are now replacing the cotter pins with nails.

Cylinder. About 1.0 percent breakage of the cylinder body when tightening components with pipe wrenches.

Plunger cage. To date about 7.0 percent of these piston components have been replaced due to breakage. The maintenance technicians claim that the plunger cage breakage is almost always associated with the presence of small stones in the cylinder. They believe that children were responsible for the stones, either dropping them down the hole in the pump head or throwing them up the spout.

Poppet valve. About 2.0 percent breakage.

Plunger spacer and Plunger follower. No replacement to date.

Foot valve. Only about 5.0 percent of the flapper valves have been replaced due to failure of the leather.**

---

*Due to the previously mentioned fabrication problems, bushings are too loose in the pivot holes.

**Since SESPAS uses an auxiliary strainer/foot valve in the installation, problems with the leather flapper valve may not be readily detected.

Leather cups: Pulling up the pump to replace the leather piston cups accounts for more maintenance time than any other activity. The frequency varies considerably depending upon pump usage. Some pumps after almost two years of service are still operating with the original leather cups. Others require cup replacement every three or four months. On the average, a replacement frequency of nine months appears reasonable.

Based upon the above information, the average annual cost per pump for spare parts the first year is estimated in Table 3 below:

Table 3: Average Annual Cost per Pump for Spare Parts

Component	Number per pump	Cost per pump (DR$)	Replacement frequency (%)	Replacement cost per pump (DR$)
Pump Head	1	$14.00	2	$ 0.28
Rod End	1	2.10	3	0.06
Handle	1	10.00	5	0.50
Handle Fulcrum	1	7.50	2	0.15
Pump Body	1	15.25	1	0.15
Pump Stand Cylinder	1	4.00	1	0.04
Pump Base	1	18.00	1	0.18
Pins	3	10.20	10	1.02
Bushings	9	16.20	10	1.62
Sliding Blocks	2	4.00	2	0.08
Cotter Pins	6	0.18	400	0.72
Cylinder	1	17.86	1	0.18
Plunger Cage	1	3.00	7	0.21
Plunger Valve	1	3.50	2	0.07
Plunger Spacer	1	2.00	0	-
Plunger Follower	1	3.00	0	-
Foot Valve	1	3.50	5	0.18
Leather Cups	2	2.20	133	2.93
Total cost per pump spare parts				$8.37

The above cost refers only to the first year of pump operation in the field and cannot be considered representative of the average annual cost of spare parts throughout the life span of the pump, since the accelerated wear of major components in later years will certainly increase costs.

In order to estimate the average annual cost, a pump life span of 10 years was considered, assuming that SESPAS continues to provide maintenance service at least equal to the present level and that spare parts are available throughout the 10-year period.

The selection of a 10-year life span is arbitrary since theoretically pump life could be extended almost indefinitely simply by continously replacing components as they wear out. All ETINCA pump components can be removed and replaced by SESPAS quality maintenance technicians using standard tools, and no single component has a value greater than DR$20.00.

If an institutional maintenance program with available spare parts did not exist, average life span longer than four or five years should not be expected, and even to achieve this level, community members would have to be capable of effecting minor repairs and using their ingenuity to replace or repair worn components. If, for example, villagers were incapable of changing leather piston cups, the pump could become inoperable after only a few months in the field.

Considering a ten year life span, the spare parts requirements during this period were estimated as follows:

Pump Head, Rod End, Handle, and Handle Fulcrum

These components are all moving parts and can be expected to wear, especially at the pivot holes. It is estimated that these components, on the average, would be replaced three times during the ten year period due to wear. In addition, it is assumed that some replacement due to breakage would be required at the same annual rate as that experienced by SESPAS during the first year of operation (pump head - 2.0 percent, rod end - 3.0 percent, handle - 5.0 percent, handle fulcrum - 2.0 percent).

Pump Body, Pump Stand, and Base

These components have no moving parts and should not wear out during the ten year period. Replacement due to breakage is estimated at a constant rate of 1.0 percent per year.

Pins and Bushings

Considering the problems experienced by SESPAS, it is estimated that all pins and bushings would be replaced five times during the ten year period.

Sliding Blocks

These relatively high-wear components would probably require replacement four times during the life span.

Cotter Pins

A constant replacement of cotter pins every three months is assumed.

Cylinder

A constant replacement of cylinders equivalent to 1.0 percent per year is assumed.

Piston Components

- Plunger cage — 7.0 percent per year
- Poppet valve — 2.0 percent per year
- Plunger spacer — No replacement necessary
- Plunger follower — No replacement necessary
- Foot valve — Replace three times during the ten year period
- Leather cups — Constant replacement every nine months on the average

The above estimates are summarized in Table 4 below.

Table 4: Cost of Pump Replacement Parts over Ten Years

Component	Cost per pump (DR$)	Average replacement during 10 years	Total cost (DR$)
Pump head	$14.00	3.2*	$ 44.80
Rod end	2.10	3.3	6.93
Handle	10.00	3.5	35.00
Handle fulcrum	7.50	3.2	24.00
Pump body	15.25	0.1	1.53
Pump stand cylinder	4.00	0.1	0.40
Pump base	18.00	0.1	1.80
Pins	10.20	5.0	51.00
Bushings	16.20	5.0	81.00
Sliding blocks	4.00	4.0	16.00
Cotter pins	0.18	40.0	7.20
Cylinder	17.86	0.1	1.79
Plunger cage	3.00	0.7	2.10
Poppet valve	3.50	0.2	0.70
Plunger spacer	2.00	0.0	-
Plunger follower	3.00	0.0	-
Foot valve	3.50	3.0	10.50
Leather cups	2.20	13.3	29.26
Total cost (10 years)			$314.00

*Three replacements due to wear plus 2 percent/year breakage

According to the above estimates, the average annual cost of spare parts per pump during the 10 year life span would be DR$31.40. This figure is based upon present prices; inflation has not been considered.

2.3.4 Other Maintenance Materials

The SESPAS Project Engineer considers an annual sum of DR$300.00 adequate to cover the purchase of lubricants, tool replacements, etc. This would represent a cost of about DR$0.75 per pump.

2.3.5 Technical Supervision and Administrative Costs

Using the same method described previously in Section 2.2.5, the total annual technical supervision cost for maintenance is estimated at DR$12,870.00. Since the technical staff covers some 800 pumps, the annual cost per pump would be approximately DR$16.00.

Applying the 18 percent administrative cost factor to the total cost of direct maintenance labor, truck driver, and technical staff, the annual administrative costs per pump amount to DR$12.00.

2.3.6 Total Annual Maintenance Costs per Pump

Based upon the previous estimates, the average annual maintenance cost per deep well pump is the following:

Annual maintenance cost

	DR$
Direct labor	$ 39
Transportation	16
Spare parts and other materials	32
Sub-total direct costs	$ 87
Technical supervision	$ 16
Administrative costs	12
Total maintenance cost per pump	$115

Since an average of 60 persons benefit from each pump, the total annual cost of DR$115.00 represents a per-capital cost of DR$1.92.

The above is based upon present prices. If a constant inflation rate of eight percent per year is assumed throughout the 10 yer period, the average annual maintenance cost would be DR$167.00, representing a per-capita cost of DR$2.78.

2.4 Total Annual Cost of the ETINCA Pump

The total annual cost of the ETINCA pump was estimated by adding the capital costs to the above maintenance costs. The capital costs include the following:

- o Direct depreciation of the installed pump cost over the ten year period with no residual value considered.
- o Average annual interest during the ten year period on the unpaid balance of the installed pump investment.
- o Annual interest on the working capital needed to support the maintenance program.*

In Table 5 the annual costs are shown for interest rates of 5, 10, 15 and 20 percent.

Table 5: ETINCA Deep Well Pump

Average annual cost (DR$) during 10 year life span**

Costs	Interest rate			
	5%	10%	15%	20%
Depreciation pump and installation	$ 48	$ 48	$ 48	$ 48
Average interest on initial investment	13	26	40	53
Interest on working capital	1	2	3	5
Sub-total capital costs	$ 62	$ 76	$ 91	$106
Maintenance labor	39	39	39	39
Transportation	16	16	16	16
Spare parts and materials	32	32	32	32
Technical supervision	16	16	16	16
Administrative costs	12	12	12	12
Sub-total maintenance costs	$115	$115	$115	$115
Total annual costs	$177	$191	$206	$221

*Working capital assumed equal to a six months stock of spare parts and one month of cash requirements for all other factors.

**Costs based upon present prices.

The effect of variations of plus or minus 25 percent in the pump life span upon total annual costs is shown in Table 6.

Table 6: Total Annual Costs (DR$)

Life span	Interest rate			
	5%	10%	15%	20%
7.5 years	$194	$208	$223	$239
10.0 years	177	191	206	221
12.5 years	167	181	196	210

As can be seen, the annual cost estimates vary from a low of DR$167 (5 percent interest - 12.5 years) to a high of DR$239 (20 percent interest - 7.5 years).

Under average conditions the cost can be estimated at approximately DR$203 per year.

Chapter 3

MOYNO PUMP

3.1 General

The U.S. manufactured Moyno pump, unlike the ETINCA pump, is operated manually by giving a rotating motion to the handle. This rotational movement is transmitted through a gear box to a shaft connected to a truncated screw device operating inside of a female-threaded plastic cylinder located at the end of the drop pipe.

Since this system eliminates the use of such high-wear components as leather piston cups, pins, bushings and sliding blocks, maintenance requirements are reduced.

Approximately 25 of these pumps have been installed by Compassion International on Gunave Island, Haiti. A number of these were inspected, and most appear to be operating satisfactorily under heavy usage conditions. One inoperative pump was observed (reason unknown), and another pump had a handle bent badly enough to hit the pump stand (cause unknown).

Compassion officials were able to provide information concerning the methods used to install pumps but have had no experience with pump maintenance since this activity was supposed to be the responsibility of a national institution.

Compassion could provide no information concerning the cost of the pump and spare parts.

3.2 Procurement and Installation Costs*

3.2.1 Pump Cost

The list price of the Moyno pump is $575.00 FOB South Carolina. However, there apparently is some possibility of a discount if pumps are purchased in large quantities.

Considering shipping costs to Santo Domingo, customs clearance costs, and transportation to the warehouse, an estimate of approximately DR$600.00** per pump appears reasonable.

---

*In order to present a fair comparison of estimated pump costs, a hypothetical case is assumed where Moyno pumps would be procured, installed, and maintained by the same SESPAS Institution.

**Assuming the official rate of exchange.

3.2.2 Inspection and Transportation Costs

It is assumed that SESPAS would use similar procedures to install Moyno pumps as those currently used for the ETINCA pump. In the case of a U.S. manufactured pump, however, they would probably eliminate present inspection procedures. Transportation of the pumps to Azua would still represent a cost of about DR$3.00 per pump.

3.2.3 Site Preparation

Materials

According to Compassion, a metal pump support stand is normally fabricated in a local machine shop (4" pipe with flanges on either end, including a 2" pipe nipple welded to the stand as an access port for measuring well depth). The cost of this stand is estimated at DR$50.00. Since the stand must be embedded in the concrete, it would have to be installed by the SESPAS "platform" team.

Since Compassion has had problems with the stability of the concrete-embedded pump stand, it is probable that a somewhat larger concrete platform would be required. Material costs for the platform, therefore, are estimated at DR$55.00, about 50 percent higher than the present cost for the ETINCA pump.

Labor

Due to the increase in materials for pump stand installation, the labor cost per platform is estimated at DR$45.00, 50 percent higher than the present costs.

Transportation

Estimated transportation costs for the ETINCA pump were based upon ten platforms/week. Due to the more complicated site preparation tasks with the Moyno pump, seven platforms/week appears reasonable. The transportation cost per platform, therefore, would increase proportionally to DR$17.00

3.2.4 Installation

Materials

The materials required for installation of the Moyno pump are the following:*

Material	Unit cost (DR$)	No.	Total cost (DR$)
Bolts	$ 1.10	4	$ 4.40
Steel rods 1/2"x20'	4.00	4	16.00
Rod couplings	1.70	4	6.80
1-1/4" steel drop pipe	21.00	4	84.00
Total installation materials			$ 111.20

*80 foot well depth.

Labor

SESPAS would probably continue to pay a standard fee of DR$18.00 per pump.

Transportation

Since the pump stand is installed by the "platform" team, installation procedures are somewhat simple. Approximately 15 installations per week are considered probable instead of the average of 12 for the ETINCA pump. Transportation costs would, therefore, decrease proportionally to DR$8.00 per pump.

3.2.5 Technical Supervision and Administrative Costs

Since the use of the Moyno pump would eliminate the need for pump inspection and other problems associated with local manufacture, a 10 percent reduction in technical supervsion and administrative costs is estimated.

Technical supervision:	DR$40.00/pump
Administrative costs:	DR$19.00/pump

3.2.6 Total Cost of the Installed Pump

The total estimated cost of the Moyno pump completely installed at the well site is shown in Table 7. For purposes of comparison the equivalent cost of an installed ETINCA deep well pump is also included.

Considering an average of 60 persons per pump, the DR$966 cost of the installed Moyno pump would represent a per-capita investment of DR$16.10.

3.3 Operating and Maintenance Costs

3.3.1 Labor

It is assumed that SESPAS would continue to provide a maintenance service for the Moyno pumps using maintenance teams transported from site to site by SESPAS-provided trucks and drivers.

Due to the design characteristics of the Moyno pump, it is expected that the frequency of pump removal from the well would be drastically reduced in comparison with the ETINCA pump thereby eliminating much of the heavy labor. For this reason, the use of a team consisting of two men instead of four is considered feasible, with the communities providing additional unskilled labor on those occasions when a pump must be removed.

Considering the salaries of a Team Leader and an Assistant, the total annual cost of maintenance labor would be DR$8,190.

Table 7: Installed Pump Cost

	Moyno Pump (DR$)	ETINCA Deep Well Pump (DR$)
Cost of pump Santo Domingo	$600	$174
Inspection labor	-	1
Transportation to Azua	3	3
Sub-total pump at Azua	$603	$178
Pump stand	50	-
Platform materials	55	37
Platform labor	45	30
Platform transportation	17	12
Sub-total platform	$167	$ 79
Installation materials	$111	$126
Installation labor	18	18
Installation transportation	8	10
Sub-total installation	$137	$154
Total direct cost	$907	$411
Technical supervision	$ 40	$ 44
Administrative costs	19	21
Total cost	$966	$476

In the case of the ETINCA pump it was assumed that each team would inspect 50 pumps per week, repairing those that require corrective maintenance and that a total of 400 pumps would be covered by each team permitting a theoretical inspection frequency of eight weeks.

As far as the Moyno pump is concerned, little information is available regarding pump performance and maintenance requirements in the field. The pump components on the average are more expensive and more complex than ETINCA pump parts, and there is some doubt that SESPAS technicians would be competent to repair or replace individual parts inside of the factory-sealed gear box.

Lacking more information, and for comparative cost purposes, it is assumed that SESPAS would be able to maintain the Moyno pumps in the same manner as with the ETINCA model, extending pump life almost indefinitely through constant replacement of worn components. A 10-year life span or depreciation period will be considered, therefore, the same as for the ETINCA pump.

Although the Moyno pump components are more costly, the replacement frequency should be far less than for the ETINCA pump since the design eliminates most high-wear components, and the workmanship in general can be considered superior to the ETINCA model.*

The average annual cost of spare parts for the ETINCA pump was estimated to be DR$32.00 or 18 percent of the original cost of the pump. Assuming a frequency of part replacement for the Moyno pump about one-fourth that of the ETINCA model, the annual spare parts cost would be equivalent to 4.5 percent of the original Moyno pump cost. This amounts to DR$27.00.

3.3.2 Other Maintenance Materials

The cost per pump of other materials is considered insignificant.

3.3.3 Technical Supervision and Administrative Costs

Considering the reduced maintenance effort, it is estimated that the annual technical supervision cost per pump would be only half that estimated for the ETINCA pump or DR$8.00.

Applying the 18 percent factor to the cost of maintenance labor, truck driver, and technical supervision, the annual administrative cost per pump is DR$5.00.

3.3.4 Total Annual Maintenance Costs Per Pump

Based upon the previous estimates, the average annual maintenance cost per Moyno pump is shown in Table 8. For comparison purposes the equivalent ETINCA costs are included.

*Some verbal information was obtained concerning problems with early Moyno pumps relating to clutch failures and stripping of the plate on the rotors. It is assumed that these problems were temporary and have now been resolved.

Table 8: Average Annual Maintenance Cost*

	Moyno Pump (DR$)	ETINCA Pump (DR$)
Direct labor	$12	$39
Transportation	9	16
Spare parts and other materials	27	32
Sub-total direct costs	$48	$87
Technical supervision	$ 8	$16
Administrative costs	5	12
Total cost per pump	$61	$115
Cost per capita (60 users)	$1.02	$1.92

*At present prices.

3.4 Total Annual Cost of the Moyno Pump

The total annual cost of the Moyno pump is estimated in Table 9 including the same capital costs as considered for the ETINCA pump. Figures are given for interest rates of 5, 10, 15 and 20 percent.

Table 9: Moyno Pump

Average annual cost (DR$) during 10 year life span*

Costs	Interest rate			
	5%	10%	15%	20%
Depreciation pump and installation	$ 97	$ 97	$ 97	$ 97
Average interest initial investment	27	53	80	106
Interest on working capital**	2	3	5	6
Sub-total capital costs	$126	$153	$182	$209
Maintenance labor	$ 12	$ 12	$ 12	$ 12
Transportation	9	9	9	9
Spare parts and materials	27	27	27	27
Technical supervision	8	8	8	8
Administrative costs	5	5	5	5
Sub-total maintenance costs	$ 61	$ 61	$ 61	$ 61
Total annual costs	$187	$214	$243	$270

*Costs based upon present prices.
**Working capital assumed equal to 12 months of imported spare parts plus one month cash requirements for all other factor.

The effect of variations of plus or minus 25 percent in the pump life span upon total annual costs is shown in Table 10:

Table 10: Total Annual Costs (DR$)

Life span	Interest rate			
	5%	10%	15%	20%
7.5 years	$219	$248	$278	$306
10.0 years	187	214	243	270
12.5 years	166	192	221	249

Costs vary from a low of DR$166 (5 percent interest for 12.5 years) to a high of DR$306 (20 percent interest for 7.5 years).

Under average conditions the annual cost is approximately DR$236.

Chapter 4

COMPARATIVE COSTS AND COMMENTS

- Most estimated costs in this report are based upon the present situation in the Dominican Republic which includes a pump manufacturing operation with severe quality problems, a less than optimum maintenance program with very little community participation, and maintenance teams operating in chauffeur-driven vehicles. The annual cost per pump and the per capita costs shown in the report, therefore, are probably higher than would be expected under other more problem-free conditions.

- The estimated cost of the Moyno pump completely installed at the well site (DR$966) is twice that of the ETINCA pump (DR$476). On the other hand, the estimated annual maintenance cost per Moyno pump (DR$61) is only 53 percent of the corresponding cost for the ETINCA pump (DR$115).

- Under average conditions, the estimated annual cost for the Moyno pump (DR$236) is about 16 percent higher than the ETINCA pump (DR$203). This difference, however, might not be too significant since it could well fall within estimating error.

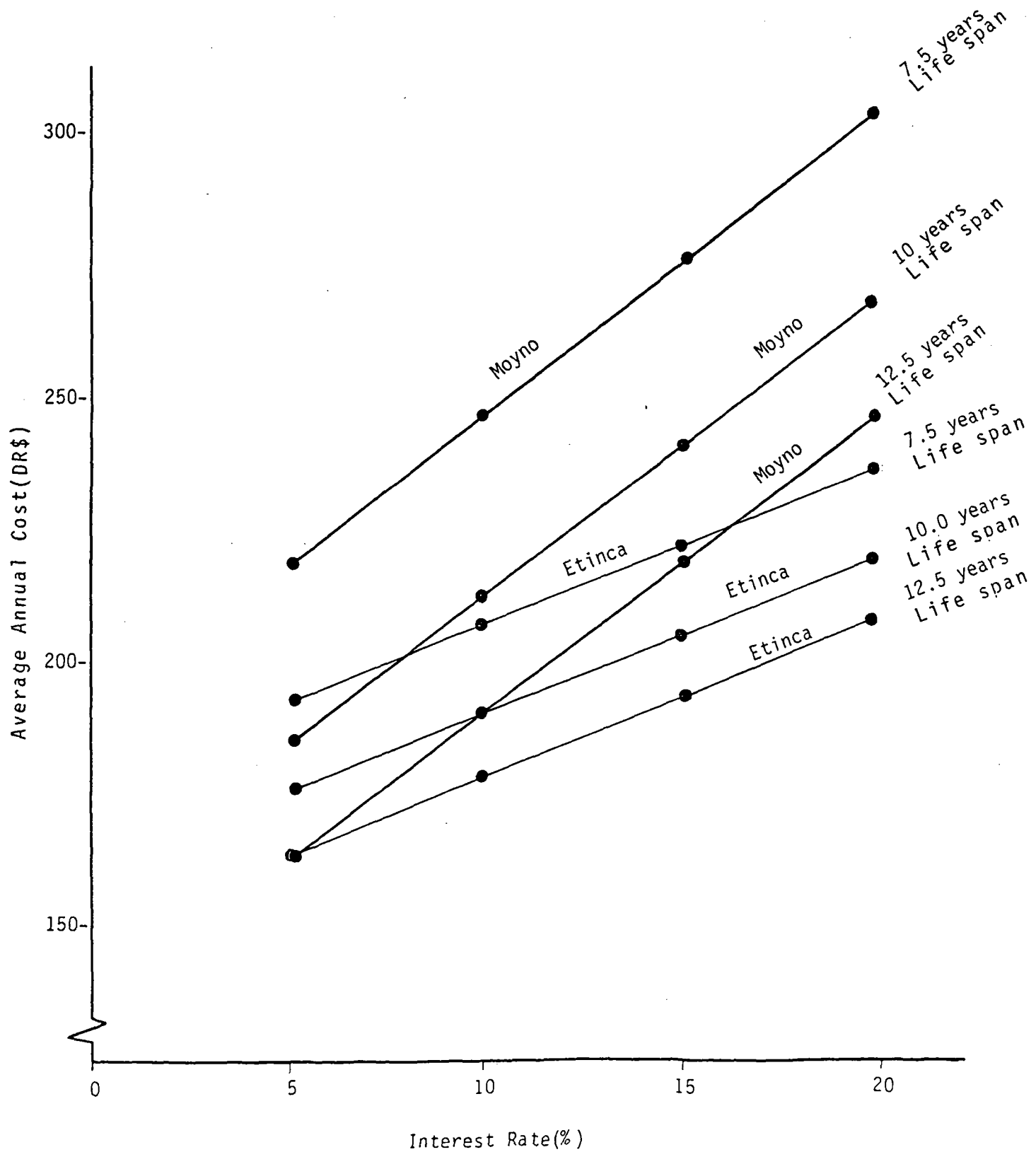
- At a low interest rate (5 percent) and a relatively long life span (12.5 years) the estimated total annual costs are almost identical for the Moyno and ETINCA pumps. At a high interest rate (20 percent) and short life span (7.5 years) the estimated annual cost of the Moyno pump (DR$306) is 28 percent greater than the corresponding estimate for the ETINCA pump (DR$239). This is due to the effect of the higher capital costs for the Moyno pump.

- The effect of the above variables is illustrated in the following graph which shows annual costs for each pump for three different life spans with interest rates varying from 5 to 20 percent. As can be seen, the higher capital costs for the Moyno pump result in curves of greater slope than for the ETINCA pump, and generally higher cost levels except at low interest rate/long life span conditions.

- It is interesting to note that at an interest rate of approximately 15.5 percent, the Moyno pump must have a life span five years greater than the ETINCA pump in order to show an equivalent annual cost.

ETINCA AND MOYNO PUMPS

EFFECTS OF VARIABLE INTEREST RATES AND
LIFE SPAN UPON AVERAGE ANNUAL COSTS



APPENDIX A

WATER AND SANITATION FOR HEALTH (WASH) PROJECT
ORDER OF TECHNICAL DIRECTION (OTD) NUMBER 130
January 13, 1983

TO: Dr. Dennis Warner, P.E.
WASH Contract Project Director

FROM: Victor W.R. Wehman, Jr., P.E., R.S.
A.I.D. WASH Project Manager
A.I.D./ST/H/WS

SUBJECT: Provision of Technical Assistance Under WASH Project Scope of Work for LAC/DR/ENGR for Comparative Life Cycle Cost Analysis of AID and Moyno Design Handpumps Being Used in Developing Countries.

REFERENCES:
A) State 360968
B) State 361142
C) Committee Meeting -- Pipeline Review of Dominican Republic Rural Water Supply Project, 17 Nov 1982
D) LAC/DR and S&T/H/WS Meeting Requesting Life Cycle Cost Analysis be made for AID and Moyno Design Handpumps, Nov 1982

1. WASH contractor requested to provide technical assistance to LAC/DR and S&T/H/WS as per oral requests for comparative life cycle cost analysis in meetings (Ref C and Ref D), Ref B para. 1-6, and per Ref A para. 8.

2. WASH contractor/subcontractor/consultants authorized to expend up to 30 person days of effort over a three (3) month period to accomplish this technical assistance effort.

3. Contractor authorized up to 20 person days of international and or domestic per diem to accomplish this effort.

4. Contractor to coordinate with S&T/H/WS (Mr. F.E. McJunkin), LAC/DR/ENG (Mr. R. MacDonald), USAID/Dominican Republic (Dr. Oscar Rivera), USAID/Haiti (Mr. Jim Gardner), USAID/Honduras (Mr. Bill Smith and Mr. Richard Dudley), appropriate desk officers (Haiti, Dominican Republic, and Honduras) and LAC/DR/HN (Ms. Linda Morse).

Camp, Dresser & McKee, Inc.
WASH PROJECT

JAN 13 1983

5. Contractor authorized to provide up to one (1) international round trip for consultant from Guatemala City, Guatemala to Dominican Republic, to Haiti, and return to Guatemala. Consultant authorized second trip from Guatemala City, Guatemala to Washington, D.C. (for debriefing and review of his cost analysis).

6. Contractor authorized local travel in Dominican Republic and Haiti as necessary and appropriate to accomplish the scope of work. Local travel NTE $1600 without the prior written approvl of the A.I.D. WASH Project Manager.

7. Contractor authorized to obtain secretarial, graphics or reproduction services in WASH CIC, subcontractor facility or consultants location in Guatemala, Haiti and/or Dominican Republic while on travel status.

8. Contractor authorized to provide for car rental if necessary to facilitate effort.

9. Contractor's consultant to follow these instructions:

A. Meet appropriate local and USAID officials in the Dominican Republic and Haiti (including site visits to representative handpump installations) to collect and validate or estimate all direct monetary costs associated with procurement, manufacture, installation, operation, maintenance, and replacement costs of handpumps used for community rural water supplies. The costs of the pump platforms should be included, but not the costs of the wells. Interviews should also include pump users, maintenance technicans, pump caretakers, village promoters, et al in addition to management officials. In Haiti, interviews should include PVO and UNICEF officials with local handpump experience.

B. When documented costs are not available, the consultant should develop reasonable cost estimates from such data as are available using appropriate and defendable assumptions plus from derivative data from local labor costs, e.g. vehicle costs for servicing pumps. The source and basis for unit cost estimated should be supported by explanatory notes.

C. Primary attention will be focused on the locally manufactured handpumps used in the USAID-supported rural water project in the Dominican Republic and the "Moyno" type handpumps installed by Compassion International on La Gonave Island in Haiti. S&T/H/WS (McJunkin) will make available supplemental data on "Moyno" handpumps from USAID projects in Africa.

D. The annual cost of the pumps shall be estimated on an annual cost basis for the estimated average life span of the handpump, i.e., life cycle costing. Separate analysis should be made for interest rates of 5, 10, 15, and 20 percent per annum. Because of the limited data available on the life span of the pumps, the consultant should provide a

"sensitivity" analysis, i.e., the calculations should be repeated for each pump for life spans of 25 percent shorter and 25 percent longer than the consultants "best estimate".

E. The consultant should direct particular attention to long-term maintenance costs borne by the host governments, particularly the vehicular, fuel and labor requirements to maintain the handpumps.

F. Standard engineering economics analytical procedures, such as those described in Grant and Ireson, Principles of Engineering Economy, various editions, should be followed.

G. Consultant should prepare and present an oral debriefing to AID/W staff (in addition to his/her written report).

10. Contractor authorized to make various international phone calls as necessary and appropriate to develop data from handpump manufacturers (Moyno-Robbins and Meyers Co. and/or ETINCA for the A.I.D. Handpump in Dominican Republic) NTE $300 without the prior written approval of the A.I.D. WASH Project Manager.

11. WASH contractor will adhere to normal established administrative and financial controls as established for WASH mechanism in WASH contract.

12. WASH contractor should definitely be prepared to administratively or technically backstop field consultants and subcontractors.

13. Contractors consultant report (draft final) is requested to be available for distribution and discussion in Washington within 15 days of return of consultant to Guatemala from field visits to Haiti. No reports are required to be left with USAID's in Haiti or Dominican Republic other than oral if missions request oral debriefing. Final report due to A.I.D./W (S&T/H/WS) within 30 days of return of consultant from field visit in Haiti to Guatemala.

14. Missions should be contacted immediately, consultants selected and technical assistance initiated by 17 January 1983.

15. New procedures pertaining to cost estimates and justifications for selection of consultants remain in effect.

16. Appreciate your prompt attention to this matter. Good luck.

Camp, Dresser & McKee, Inc.
WASH PROJECT

JAN 13 1983

Department of State

OUTGOING TELEGRAM

PAGE 01 STATE 360968 1899 826085 AID3158

ORIGIN AID-00

ORIGIN OFFICE STHE-01
INFO LADR-03 SAST-01 RELO-01 MAST-01 LACA-03 /010 A0

INFO OCT-00 /020 R

DRAFTED BY AID/ST/HEA/WS:FEMCJUNKIN:DDC
APPROVED BY AID/ST/HEA:CAPEASE
AID/LAC/CAR:BKOSHELEFF (INFO)
AID/LAC/DR:RMACDONALD (INFO)
AID/LAC/DR:LMORSE (INFO)

116371 3182SEZ /38

P 310046Z DEC 82
FM SECSTATE WASHDC
TO AMEMBASSY SANTO DOMINGO PRIORITY

UNCLAS STATE 360968

ADM AID PASS TO O. RIVERA

E.O. 12356: N/A
TAGS:
SUBJECT: REQUEST TO VISIT THE DOMINICAN REPUBLIC AS PART OF MULTI-COUNTRY EVALUATION OF HAND PUMP PROGRAMS

1. AID MISSIONS AND ST/HEA HAVE SPONSORED HAND PUMP DEVELOPMENT PROJECTS AND PROGRAMS IN SOME TEN COUNTRIES OVER THE PAST FIVE YEARS. ST/HEA/WS IS CURRENTLY UNDERTAKING AN APPRAISAL/EVALUATION OF THESE ACTIVITIES IN ORDER TO ADVISE/ASSIST/PLAN/FUND/IMPROVE FUTURE AID HAND PUMP ACTIVITIES.

2. USAID/SANTO DOMINGO'S HAND PUMP PROJECT IS OF PARTICULAR INTEREST DUE TO ITS SIZE, AGE, STRESS ON LOCAL MANUFACTURE, COMMUNITY PARTICIPATION, AND SUBSTANTIAL ST/HEA/WS AND WASH PROJECT ASSISTANCE.

3. A FOUR MEMBER TEAM OF G. MCJUNKIN, CHIEF, WATER AND SANITATION DIVISION, ST/HEA; E. HOEKES, ENGINEER, INTERNATIONAL REFERENCE CENTRE FOR COMMUNITY WATER SUPPLY; AND D. DONALDSON, ASSOCIATE DIRECTOR, WASH PROJECT, AND G. TSCHANNERL, RURAL WATER SUPPLY ENGINEER WITH THE WORLD BANK, ACCOMPANIED BY P. POTTS, GEORGIA INSTITUTE OF TECHNOLOGY, REQUESTS CLEARANCE TO VISIT

SANTO DOMINGO O/A JAN 23-25, 1983. THE TEAM WILL BE COMING FROM TEGUCIGALPA.

4. TEAM TENTATIVELY PLANS HALF DAY WITH MISSION FOR DISCUSSIONS AND BACKGROUND, HALFDAY AT FOUNDRY, HALF DAY WITH LOCAL AUTHORITIES, TWO DAYS IN FIELD, PRELIMINARY REPORT, DEBRIEFING, AND CONTINGENCIES REMAINING TIME.

5. REQUEST THAT USAID ARRANGE VISITS PER ABOVE OR AUTHORIZE ST/HEA/WS TO AUTHORIZE ITS WASH CONTRACTOR TO MAKE ARRANGEMENTS DIRECTLY. OTHER THAN LOCAL ARRANGEMENTS, TEAM WILL REQUIRE MINIMAL DIRECT ASSISTANCE BY MISSION.

6. EARLY RESPONSE REQUESTED. PLEASE DIRECT ATTN: G. MCJUNIN, ST/H/WS. --

7. TSCHANNERL AND MCJUNKIN ALSO WISH TO FOLLOW UP WITH USAID AND D.R. OFFICIALS ON EARLIER DISCUSSIONS INVOLVING O. RIVERA, G. MCJUNKIN, J. FREEDMAN (WORLD BANK) REGARDING POTENTIAL DOMINICAN REPUBLIC PARTICIPATION IN UNDP/WORLD BANK GLOBAL PROJECT IN HAND PUMP DEVELOPMENT. PARTICIPATION COULD HAVE SIGNIFICANT BENEFITS FOR THE D.R. PROJECT.

STATE 360968 1899 826085 AID3

8. CLEARANCE ALSO REQUEST FOR ING. JUSTIN WHIPPLE, INSTITUTO CENTRO AMERICANO DE INDUSTRIA TECHNOLOGIA INGENIERIA (ICAITI), GUATEMALA CITY, TO VISIT SANTO DOMINGO O/A 19-26 JANUARY 983 IN ORDER TO UNDERTAKE A LIFE-CYCLE ECONOMIC ANALYSIS OF HAND PUMPS IN THE D.R. THIS TASK IS SUPPORTIVE OF OUR OVERALL EVALUATION AND WAS BEEN SPECIFICALLY REQUESTED BY LAC/DR. WHIPPLE'S TASK IN D.R. WOULD BE DEVELOPMENT AND FIELD VALIDATION OF LONG-TERM ECONOMIC AND COST DATA FOR INFRASTRUCTURE, INSTALLATION, OPERATION, MAINTENANCE, AND REPLACEMENT OF HAND PUMPS IN LATIN AMERICA.

9. G. MCJUNKIN WILL CONTACT DR. RIVERA BY TELEPHONE DURING WEEK OF JAN 10. DAM

MCJUNKIN
WEHMAN
WITTEN
AUSTIN

Camp, Dresser & McKee, Inc.
WASH PROJECT
JAN 13 1983

Department of State TELEGRAM

PAGE 01 STATE 361142 2306 026128 AID3239
ORIGIN AID-00

ORIGIN OFFICE STHE-01
INFO LADP-03 LADR-03 FVA-01 SAST-01 PVC-02 RELO-01 STHP-01
MAST-01 LACA-03 7V-00 /017 A0

INFO OCT-00 /020 R

DRAFTED BY AID/ST/H/WS:FEMCJUNKIN:DDC
APPROVED BY AID/ST/HEA:CAPEASE
AID/LAC/CAR:JHOLTAWAY (PHONE)
AID/LAC/DR:RMCDONALD (INFO)
AID/LAC/DR:LMORSE (INFO)

121111 310618Z /38

P 310318Z DEC 82
FM SECSTATE WASHDC
TO AMEMBASSY PORT AU PRINCE PRIORITY

UNCLAS STATE 361142

ADM AID

E.O. 12356: N/A
TAGS:
SUBJECT: HAND PUMPS IN HAITI

REFTELS: A) PORT-AU-PRINCE 6013, B) MEMO GARDNER TO WEHMAN DATED 10/1/82, C) STATE 321436, D) PORT-AU-PRINCE 6564

1) PER DISCUSSIONS WITH J. GARDNER, F. TEMMELL, D. ADAMS, USAID/PORT-AU-PRINCE, AND R. MCDONALD LAC/DR, A ST/HEA/WS TEAM IS PLANNING A STOPOVER VISIT TO HAITI FOLLOWING AN INTERNAL EVALUATION OF ST HEA/WS-WASH ASSISTED HAND PUMP ACTIVITIES IN DOMINICAN REPUBLIC.

2) TIMING IS PLANNED TO ENABLE TEAM TO PARTICIPATE IN RURAL WATER SUPPLY SEMINAR FOR HAITI FYO S. REFTEL D, SUBJECT OF SEPARATE CABLE TO DAVID ADAMS.

3) TEAM PLANS TO ARRIVE PORT-AU-PRINCE ON SATURDAY, 29 JANUARY FROM SANTO DOMINGO VIA CH 18C. TEAM TO DEPART NLT 3 FEB.

4) TEAM PROPOSES VISIT TO MOYNO PUMP INSTALLATIONS ON LA GONAVE ISLAND ON SUNDAY, 30 JAN. PART OF TEAM WOULD LIKE TO VISIT CAMP PERRIN HAND PUMPS ON SUBSEQUENT MONDAY AND/OR TUESDAY (REFTELS A, B, C).

5. TEAM MEMBERS ARE G. MCJUNKIN, ST/HEA/WS; D. DONALDSON, WASH; E. HOFKES, IRC-CWS, AND G. TSCHANNERL, WORLD BANK; ACCOMPANIED BY P. POTTS, GIT. TEAM MAY BE JOINED BY J. WHIPPLE, ICAITI, GUATEMALA CITY.

6) ST/HEA/WS PLANS TO ARRANGE A CONFERENCE CALL WITH MISSION CERCA 12 JANUARY TO REVIEW PLANNING FOR VISIT.

7) REQUEST CABLED CLEARANCE FOR TEAM VISIT TO HAITI. DAM

~~MCJUNKIN~~
WEHMAN
WITTEN
AUSTIN HC

Return to FEB

TO WASH: 4 JAN 83 JNG

UNCLASSIFIED