- School Ward (8 - 15 beds)
- Child Isolation Ward (5 beds)
- Female Isolation Ward (5 beds)
- Newborn Ward (20 bassinets)

2) Training Area:

a) Auditorium (for general use, including meetings, seminars, in service training, formal lectures, etc.) approximately for 30 to 40 people.

b) Midwifery Laboratory

c) Small Classrooms for group work (3 to 5)

3) Administration Area:

a) Hospital Administrator's Office

b) Medical Director's Office

c) Matron's Office

d) Secretarial Pool

e) Accounts Section

A) Supply Area

B) Maintenance Area

C) Other Services: Kitchen, laundry, etc.

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2. Project development of a regionalized hospital care system

Background

Although Primary Health Care (PHC) has been identified as the key strategy to improving health in Belize, it is also considered necessary to significantly upgrade the hospital care facilities in the country, which

are at present insufficently equipped and staffed for providing the basic care which is demanded of them. PHC activities will probably lead to an increased demand for some secondary care services, as public awareness of health needs increases. PHC will have a definite impact on many major health problems, especially infectious diseases and perinatal morbidity, but other sources of morbidity may well become more frequent, due to wider coverage of now underserved areas of the country.

Extended PHC activities will also place an additional load on many hospital based support services, such as laboratories, out-patient departments, supply services, etc. All hospitals in the country are presently ill-equipped to meet the present needs; any further demand will place an unmanageable burden if steps are not taken to improve secondary care facilities.

Secondary and tertiary care is now concentrated in Belize City Hospital, which is the national referral center for the country. With the exception of Belmopan Hospital, all district hospitals are little more than maternity centers and first aid stations; most lack basic diagnostic and therapeutic facilities. As a consequence, established bed capacity is grossly underutilized. This places an excessive load on Belize City Hospital, where physical facilities are dilapidated, building maintenance is costly, and patient care is inefficient. The average length of stay for surgical or medical patients is around nine days, which is extremely high given the basic nature of the services provided. The reason for this is the existence of many material bottlenecks due to supply shortages, insufficient basic equipment, insufficient staffing, etc.

In essence, the quality of secondary and tertiary care now being provided in the country is not what the country could afford if scarce resources were used more rationally and efficiently. On the other hand, the basic hospital infrastructure now installed, with the exception of Belize City, is sufficient to deal with present and potential demand, but is not being fully utilized due to the deficiencies already mentioned. Belize City Hospital itself is in need of major upgrading and reconstruction, an investment that may not be worthwhile making if it remains at it's present site, exposed to hurricane damage.

In conclusion, the hospital care system requires major improvements at all levels. The principles on which upgrading should be made are the following:

a) Regionalization

Some district hospitals should be strengthened and upgraded to the point where they can provide basis hospital care, including the four basic specialities and ancillary diangostic facilities. These should be Orange Walk Hospital and Belmopan Hospital. Each would attend to approximately one third of the population in the Northern and Southern Districts respectively.

Belize City Hospital would provide secondary care for the Belize District and specialized tertiary care in some priority areas such as traumatology, rehabilitation, neonatalogy and cardiology, for the whole country.

b) Descentralization

Related to the above condition, it emphasizes that secondary

health care should be made available to the population as close as possible to where they live.

Objectives and Goals:

1) To reduce patient referrals from district hospitals to Belize City by 70% by 1987.

2) To increase surgical output in Belmopan Hospital by 100% by 1985.

3) To provide permanent surgical and obstetrical care at Orange Walk Hospital by 1985.

4) To provide permanent obstetrical care at Belmopan Hospital by 1985.

5) To provide basic postoperative care facilities at OWH, Belmopan Hospital and Belize City Hospital by 1985.

6) To provide basic laboratory and X-ray services at Corozal, San Ignacio, Dangriga and Punta Gorda Hospitals by 1984.

7) To provide basic laboratory services at San Antonio, San Narciso, Independence, Benque Viejo Health Centers by 1985.

8) To provide basic pediatric and medical care at all district hospitals.

9) To provide specialized tertiary care in the following areas in Belize City by 1987:

Orthopedics-Traumatology
Peri- and Neonatology
Cardiology and Intensive Care.

10) To establish a Central Supply Unit in Belize City Hospital by 1984.

Project Strategies:

To obtain the above goals, a complete revision of all available and potential resources, both human and material, must be made. It would be premature at this stage to detail all the required inputs in terms of manpower development, projected equipment and supply needs, transport facilities, etc. In any case, external assistance would undoubtedly be required in the following aspects, although it is not possible to determine definite quantities at this point.

- Renewal of basic hospital equipment
- Provision of basic laboratory and other diagnostic equipment (X-ray, EKG, microscopes, etc.)
- Renewal of surgical facilities in Orange Walk Hospital
- Expansion of bed capacity in Orange Walk and Belmopan hospitals.
- Reconstruction of some areas of Belize City Hospital vs. construction of a new hospital in Belize City or construction of a smaller Maternal and Child Hospital.

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3. *National malaria control service*

In 1979 Cabinet's approval was given for the construction of a revised plan of operation for the National Malaria Services based on the recommendations of a PAHO Short Term Consultant.

It was estimated that for the 1982 financial year, a sum of $923,000. BZE would be required to implement the revised plan of Operations reflecting increased costs of spraying operations for salaries and subsistence payments to the spraying squads.

Only $377,858. BZE were approved for the Programme in the 1982 estimates despite recognition of the fact that malaria posed and continues to pose the most serious health hazard to the country.

There was no projection for increases in materials, supplies and operational costs to meet the demands of a greatly intensified and expanded programme.

Implications of Reducing Scope of Programme

During the 1st five years the malaria situation in this country has detericrated progressively. Today malaria is one of our major public health problems because highest morbidity is recorded for this disease.

Number of Cases

1973	99	1978	1215
1974	96	1979	1394
1975	90	1980	1529
1976	199	1981	2072
1977	894	1982	+3000 (est.)

Aware of the deteriorating malaria situation, a PAHO Consultant was invited in 1979 and the National Malaria Program was reorganized. According to the re-organized program certain areas of the country were selected for intensive anti-malaria measures. These areas are designated as "Attack Phase" areas and are shown on the map (shaded red) as As and Ab areas. These areas were selected for intensive anti-malaria measures (including bi-annual DDT spraying) on the basis of intensive transmission of malaria, high population density and easy accessibility.

During the past year entomological studies were conducted to detect any mosquito resistance to the insecticide (DDT). In 1980 entomological studies were conducted with the assistance of a PAHO/HO consultant.

General Description

The total superficial area of the country covers 22,965.3 Km^2 with 155,370 inhabitants for 1980 of which is divided as follows:

Attack phase	15,804.3 km^2	88,144 inhabitants
Consolidation	7,149.69 km^2	27,339 "
Maintenance	11,371 km^2	39,887 "

For purposes of epidemiological evaluation (FCS) there is a total of 25,795 houses to be visited for fever cases detection.

For purposes of spraying operation with DDT there is a total of 15,795 houses to be sprayed to cut out the malaria transmission.

Based on these above figures the average household is comprised of 5 persons. The number of houses by localities should be

more than expected for the years 1982-1983.

Financial Support

PAHO/WHO is the only international agency assisting Government in the eradiction of malaria. This assistance has included a revolving fund for transport, anti-malaria drugs, laboratory supplies and short-term consultant.

Some of the factors involved in the financial increment of this program are:

1) Higher cost price of the (DDT) insecticide
2) Increase prices of gasoline, and kerosene oil
3) Salary increments

We are now faced with a financial problem, and the implementation of the reorganized programme is threatened if this unfortunate situation is not righted, then we can expect that the malaria program will deteriorate.

If the spraying operation in the "Attack Phase" is interupted for any length of time, i.e. one year, the current level of malaria transmission in the "Attack Phase" will extend into the present consolidation areas.

At present spraying itineries are prepared and a time is set for spraying of each district, but because there is not adequate transportation for the spray teams, the time that it takes to spray a certain district or locality is often doubled.

Spraying is being done in the districts by three (3) spray teams, to cover the inineries effectively we would need at least four spray teams and we also need proper transportation.

At present there are only four vehicles in working condition for the entire malaria program. Of these four vehicles, two are very old and are often in need of repairs.

There are only nine evaluators working at present, there are three vacant posts for which we are awaiting establishment permission to employ people to fill these posts. The villages should be visited once every twenty days but this cannot be done because we do not have a full staff of evaluators.

Community Participation

It is a felt need and must be improved if malaria control activities are to be more effective. Although a small network of voluntary collaborators already exists, supervision and training is deficient. A major component of a revised Malaria Control Program should be to increase their members and provide sufficient training, materials and supervision so that these collaborators can participate in case detection and treatment and other health education activities. The communities must become more actively involved in the program, including planning, implementing and evaluating activities.

Objectives and Goals

1) To decrease the yearly incidence of malaria by 66% in the

next three years.

2) To decrease the yearly incidence of malaria by 60% in the subsequent two years.

3) To erradicate malaria from major urban areas in the next three years.

Strategies

1) To ensure an adequate supply of materials and supplies (insecticide, spray equipment, slides, etc.)

2) To improve training and supervision of all malaria field workers.

3) To improve transport facilities to ensure adequate mobility and coverage.

4) To extend spraying and detection activities to all malaria infested communities.

5) To strengthen community participation, by increasing the network of voluntary collaborators, including training, supervision and supplying team with needed materials.

6) To increase health education activities and public awareness.

7) To undertake massive mobilization campaigns, including community organizations and voluntary organization, combining vector control activities and host treatment.

8) To establish coordination and support (human, material) from other government agencies (Agriculture, BDF, Social Development, etc.).

Budget Estimates 1983-1987

A. Government of Belize (one thousand Belize $)

	1983	*1984*	*85*	*1986*	*1987*	*TOTAL*
Personal Emoluments	260	260	260	260	260	1.300
Travel & Subsistence	180	180	180	180	180	900
Operating & Mtce.	80	90	100	100	100	470
Materials & Supplies	-	-	100	100	150	350
TOTAL	520	530	640	640	690	3.020

B. External Funding Agency (one thousand Belize $)

	1983	*1984*	*1985*	*1986*	*1987*	*TOTAL*
Training Activities	15	10	5	5	5	40
Equipment	10	5	-	-	-	15
Materials & Supplies	200	200	100	100	50	650
Vehicles	120	-	-	-	-	120
TOTAL	345	215	105	105	55	825

APPENDIX I

VIII. Evaluation Operations, 1981

	Phases of the Program				
	Attack phases	*Consolid. phase*	*Mainten. phase*	*Non-malar area*	*TOTAL*
1) Passive case findings:					
a) Hospitals, health and medical services					
Slides examined	5540	865	1895	0	8300
Positive cases	1265	136	52	0	1453
b) Voluntary collaborators					
Slides examined	1453	213	305	0	1971
Positive cases	353	11	9	0	373
2) Active case findings:					
Slides examined	6078	3613	1173	0	10864
Positive cases	130	4	2	0	136
3) Epidemiological investigation and follow-up:					
Slides examined	15202	8819	1304	0	25325
Positive cases	75	4	0	0	79
4) TOTAL					
Slides examined	28273	13510	4677	0	46460
Positive cases	1823	155	63	0	2041
P. falciparum	29	12	0	0	41
P. vivax	1794	143	63	0	2000
P. malariae	0	0	0	0	0
Mixed infections	0	0	0	0	0
Without species diagnosed	0	0	0	0	0

APPENDIX II

National malaria control services

Description:

This subhead is concerned with all activities oriented towards control and eventual eradication of malaria, including:

a) Spraying operations

b) Epidemiological evaluation

c) Entomological investigation

d) Health education.

A staff directed by a Medical Officer of Health undertakes the above work. Particulars of staff are set out in the schedule of Personal Emolument. An analysis of proposed expenditure in terms of Objective Accounts is as follows:

21.5 National Malaria Eradication Service

.1 Personal emoluments		*259.547*
1	Chief of Operation T2	8,405
1	Administrator C2	7,629
3	District Supervisors T4	17,813
1	Flying Squad Chief T4	5,388
1	Statistical Aid C3/4	5,233
12	Evaluators	58,208
1	Miscroscopist I T4	6,170
1	Miscroscopist II	4,404
1	Laboratory Aid	3,579
1	Mechanic T4	6,204
1	Assistant Mechanic T4	6,204
1	Secretary C4/3	7,047
1	Typist C4/3	7,047
1	Watchman & Relief T6	3,966
1	Messenger M	2,220
3	Spraymen (3 spray team 8 spraymen per team)	76,320
4	Flying Members T5	22,020

.2 Travel and Subsistence					*183.195*
A. Subsistence					
1	Chief of Operations	4 day/wk @ $48/wk	x	50 wks	2,400.
1	Flying Squad Chief	4 day/wk @ $48/wk	x	50 wks	2,400.

3 District Supervisors	4 day/wk @ $48/wk	x 50 wks	7,200
1 Statistical Aide	2 day/wk @ $24/wk	x 50 wks	1,200
4 Flying Squad Members	4 day/wk @ $48/wk	x 50 wks	9,600
12 Evaluators	3 day/wk @ $36/wk	x 50 wks	21,600
3 Spraying Squad Chiefs	7 day/wk @ $66.50/wk	x 50 wks	10,065
24 Spraymen	7 day/wk @ $88.50/wk	x 50 wks	96,600

B. Subsistence: (Motor-cycle allowance)

12 Motor-cycles @ $45.00 per month for 12 months	6,480
12 Motor-cycles @ .40 per mile @ 500 miles per month	2,400

C. Lodging

1 Chief of Operation	- 3 days/wk @ $45	for 50 wks	2,250
1 Flying Squad Chief	- 3 days/wk @ $45	" 50 wks	2,250
3 District Supervisors	- 3 days/wk @ $135	" 50 wks	6,750
4 Flying Squad Members	- 3 days/wk @ $180	" 50 wks	9,000
12 Evaluators			3,000

.3 *Materials & Supplies* — *185.150*

	Quantity	Cost
DDT - 100% - (500 gms/house)	5,000 kgs	$17,000
DDT - 75% - (670 gms/house)	19,500 kgs	80,500
Kerosens for 100% DDT @ 54 gls. /24 lbs DDT	300 drms	50,000
Chloroquine 150 mg Tablets	170,000	8,500
Primaquine 15 mg Tablets	40,000	2,000
Primaquine 5 mg Tablets	27,000	1,350
Gemsa Stain	150 gms	2,000
Immersion Oil	14,000 cc	700
Sodium Posphate	700 gms	600
Microslides	60,000	4,500
Blood Lanclets	60,000	4,000
Uniforms		6,000
Stationery & incidentals		8,000

.4 *Other operating & maintenance services* — *79,500*

Running & maintenance of vehicles	70,000
Transport	7,500
Rentals	2,000

.8 *Equipment* — *4,500*

6 Hudson X-Pert Sprayers (3 gals)	3,000
Pump parts Hudson X-Pert	1,500

APPENDIX II

CAPITAL EXPENDITURE		*120,000*
Four (4) vehicles for spray team & District Supervisor	120,000	
		600,000
Total Recurrent Expenditure:		(711,892)
Total Capital Expenditure:		120.000

4. Development of primary health care infrastructure

A. Buildings in Toledo as part of infrastructure for PHC

(1) Renovation of Punta Gorda Hospital

- Lab including equipment
- Storage space to serve as District Supply Center
- Office space for:
  - (i) Health Education, Communication Center
  - (ii) Financial Management
  - (iii) Rural Water Project Manager
- Space for 2 physicians
- The design work space to accomodate Mayan culture
- Build Thatch kitchen in rear for visitors use
- Build shelter for hammocks " " "

(2) Renovate San Antonio H.C.

- Training Center conference room
- Laboratory
- 2 Bed holding area
- Bathroom with shower
- Office for C.N.P.
- Storage Vat
- Housing shelter - Thatch for hammocks

(3) Partition in S.P.C. for Treatment room

B. Radio Communication System for Toledo - Compatible with R.C.F.M. system

C. Development of National P.H.C. program

(1) Training D.N.T.s to be trainers, all districts including Belize - CARICOM/AID

(2) Administrative infrastructure for coordination center of all Government and NGO PHC activities

(a) Data processing
(b) Word processing
(c) Office space and equipment

(3) Upgrading and renovating existing clinics and hospitals preparatory to extension of service

(4) Plan to use volunteers through NGOs as health extension officers for the first 3 years

(5) Information Library. Central to each of 7 District Centres including B.C.H.

D. *Equipment Maintainence/Vehicle Maintainence* - Part of above

(1) Equip service facility

(2) Training

E. *Hurricane Shelter* - St. Martin de Porres

- Serve as pre-school
- Mobile H.C.
- Community Center

F. *Support for Health Education* - Part of C above

Video cassettes for urban H.C.s - 3-4 B.C.
6 Districts

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5. *Toledo rural water supply and sanitation project*

I. Summary

For the past year and a half, the Government of Belize has undertaken to introduce primary health care in the country. The Toledo District has been chosen as the site of Government's first major primary health care effort and a pilot programme of this nature is currently being implemented in the rural areas of the district. It is proposed that this programme be expanded to include a rural water supply and sanitation project.

Funds, in the amount of $415 (USCY), overa three (3) year period are requested by the Ministry of Health for this project which would be integrated into the overall Toledo Primary Health Care Programme.

II. Background Information - The Toledo District

A. General

The Toledo District, with an area of some 1979 square miles, is the most southernmost of the six districts of Belize. The 1980 Census reported a total population of 11,762 with the main district town of Punta Gorda having a population of 2,396 and rural Toledo with 9,366.

About 70% of the population are Mayan Indians (consisting of two groups - Mopan Mayans and Kekchi Mayan). 20% are Garinagu (Caribs of African descent) with the remainder being Creole, East Indians and Chinese. The Mayan population is found in and around the villages of San Antonio, San Pedro Columiba, Crique Sarco and remote villages in the interior. The Mopan Maya live mainly around San Antonio and Aquacate. The Kekchi Maya

live in the south and in the interior. The Garinagu live chiefly in Punta Gorda Town and in the coastal settlements of Monkey River and Barranco.

Toledo is the least developed district of Belize. One of the main factors that has affected the district's development is the lack of an adequate communication/transportation system within the district as well as from Toledo to the other parts of the country. Bad weather conditions, prevailing for a large part of the year, affect communication by road, sea and air. The road network in the rural areas is poor.

The Maya of the interior practice subsistence farming although in some areas red kidney beans and rice are grown as cash crops; citrus and bananas are produced in the northern part of the district. The Carib villages rely largely on fishing, including lobster and shrimp.

B. Health

The mortality rates in Toledo are significantly higher than the national figures. In 1980, the mortality rate was estimated to be 9.5/1000 for Toledo and 5.5 for all districts. Accurate data on the causes of death in Toledo are not readily available. Nevertheless, important causes of death appear to be acute respiratory infections including pneumonia and whooping cough, gastroenteritis, hypertension and diabetes mellitus.

The reported infant mortality rate for Toledo in 1980 is 58.3 in contrast to the national rate of 40.2. The reported neonatal death rate is not significantly higher than that of total Belize, hence it appears that the excess infant deaths occur in the postnatal period when

environmental factors exert their influence. The data, however, must be interpreted with caution as it is likely that there is considerable under reporting of vital events in the Toledo District. There is reason to believe that when accurate data are available the infant mortality rate will be shown to be higher than what is now recorded.

Reliable morbidity data for the district are difficult to obtain. The main problems of the Maya would seem to be intestinal parasitic infections, especially hookworm and Trichuris diseases. A study done by Garcia in 1977 in the villages of San Antonio, Santa Elena, Pueblo Viejo, Crique Sarco and San Lucas showed that 91% of the 812 persons from which stool specimens were obtained had at least one intestinal parasite. More than one third had multiple infestation. The main parasites were found to be hookworm (Necator), Ascaris and Trichuris.

Malaria is prevalent, cases were reported in 1981 but there is thought to be considerable under-reporting in view of the remoteness of the region and difficulties experienced in adequate epidemiological surveillance of Malaria.

Anemia is reported to be a major problem in women and children but due to the absence of laboratory facilities it is impossible to quantify the extent of its occurrence. A survey on the prevalence of parasitic infection and anemia conducted in May of 1979 in the San Antonio-San Pedro area revealed that the vast majority of school children and pregnant mothers are anemic.

Malnutrition is prevalent. Computations from clinic records of weights at the Punta Gorda Hospital for 1976 show that of the 359 children

studied, two percent were found to be severely mal-nourished (Gomez III); eleven percent were Gomez II and thirty-three percent in Gomez I.

Gastroenteritis quite frequently occurs affecting chiefly the under five population.

Skin infections - impetigo and fungus infections are common. The former occurs chiefly in children.

C. Water supply and sanitation

The Government of Belize has adopted the goal of providing one well fitted with a hand pump for every ten (10) households (average household size according to 1980 Census: 5.7) in rural areas with a population under 250 and a community rudimentary water supply system in those villages with a population over 250. There are a total of thirty-one (31) hand pumps in rural Toledo, or one had pump for every 296 persons.

Over the last ten years several attempts have been made to improve environmental sanitation in Toledo through the provision of pit latrines in the rural areas. These efforts have not met with success. Although more than 1,700 seats and concrete slabs have been provided, just over 600 latrines have been built. It is estimated that only between 5 and 10% of the latrines built in Mayan villages are used as toilets. The reasons for this lack of success may be failure to convince the Maya of the need to use latrines and of the problems associated with them. The water table is very high in Toledo so that the pits are quickly filled with water. There is an associated offensive odour, users are splashed by the water during defecation, and the Mayas believe that the latrines are

breeding places of mosquitos and may therefore be the cause of the recrudescence of malaria.

III. Objectives

Over a three-year period, it is proposed:

A. To ensure a safe water supply to approximately 6,500 persons in the Toledo District by providing fourteen (14) villages with a total of forty-eight (48) wells and hand pumps and six (6) villages with rudimentary community water supply systems.

B. To identify and introduce sanitary, appropriate and culturally acceptable methods of excreta disposal to the rural population of the Toledo District.

C. To provide health education to the Toledo population specifically related to water and sanitation.

IV. Strategies and Activities

The project will be an integral component of overall Toledo Primary Health Care Programme. Through village health committees (presently being established) and the village councils, community members will participate in the planning, construction, financing, operation and maintenance of both water supply and excreta disposal systems. Through stipended village Community Health Workers, trained at the districts primary health centres, water supply and sanitation public health education will be delivered to the population.

The following table outlines by village the number of wells,

fitted with hand pumps, that will be installed.

Village	*Population (1980)*	*Number of households*	*Present # of wells & pumps*	*Wells & pumps to be constructed*	*Total upon completion of project*
Aquacate	149	32	0	3	3
Baranco	229	58	0	5	5
Big Falls	323	57	0	5	5
Crique Sarco	184	42	0	4	4
Dolores	193	38	0	3	3
Laguna	205	50	0	5	5
Moho River/San Lucas	197	34	0	3	3
Otoxha	182	36	0	3	3
San Benito Pointe	261	42	0	4	4
San Miquel	227	43	1	3	4
Santa Elena	177	32	1	2	3
Santa Teresa	116	23	0	2	2
Silver Creek	175	27	1	2	3
Forest Home	206	38	0	4	4
TOTAL	2,824	552	3	48	51

Rudimentary piped water supply systems will be provided to the following villages:

Village	*(1980) Population*
Indian Creek	264
Pueblo Veijo	346
San Antonio	1,087
San Jose	599
San Pedro Columbia	784
Santa Cruz	349

Prior to introducing the programme to any of the villages,

community surveys will be conducted to determine present water supply and sanitary practices.

In the case of villages receiving a piped rudimentary water supply system, residents will be mobilized in the laying of the pipes. A revolving loan fund will be established to make financing available to residents to cover the costs of home connections.

Through the village councils, residents will contribute a small monthly fee which will be used to maintain the equipment. Each village will choose a resident who will be trained to and responsible for maintaining the equipment.

Technical assistance has been requested of the British Development Division to determine the most feasible and appropriate water supply for each village as well as to identify appropriate latrine technologies. The United States Peace Corps will be requested to provide a volunteer for on site, day-to-day technical assistance.

In addition to intra-sectoral coordination with all health care programmes of the Ministry of Health, inter-sectoral coordination is anticipated with the Ministry of Social Services (community development and village councils), the Ministry of Education (water conservation and environmental sanitation curriculum development in the schools) and other programmes and projects operating in the Toledo District.

The entire project will be administered by the Ministry of Health through the Principal Public Health Inspector. A Project Coordinator, based in the Toledo District will be hired for the duration of the project.

The project will be coordinated through the district health team.

Research and study will be undertaken to determine appropriate latrine technology suited to the local economic, geographic and social conditions. On an experimental basis, various types of sanitary excreta disposal systems will be introduced to some of the villages.

V. *Budget*

A. Funds requested (over a three year period) — *In U.S. currency*

1.	Salary of Project Coordinator	$ 17,000
2.	Supplies	
	- 6 piped water systems (fittings, pipes, generator, casings, cement tanks)	200,000
	- 48 wells and hand pumps (fittings, pipes, well roads, casings)	48,000
	- latrines	60,000
	- spare parts	4,000
3.	Equipment	
	- four-wheel drive vehicle	15,000
	- well rig	50,000
4.	Revolving Loan Fund	15,000
5.	Health Education Supplies and Equipment	
	- 2 generators for showing movies	2,000
	- electric stencil cuter	2,000
	- movies, printed material, etc.	2,000
		$ 415.000

B. Resources provided by the Ministry of Health

The Ministry of Health's contribution to the project will include:

- administrative support
- clerical support

- telephone and telegraph
- office space
- office supplies
- vehicle maintenance and gas
- support of Ministry staff in organizing communities and in health education
- use of educational equipment, i.e. mimeograph machine, movie projectors, overhead projectors, etc.
- use of one of the Ministry's well rigs*
- manpower of well drilling teams assigned to the project

Rural Water Supply System

As part of the International Drinking Water Supply and Sanitation Decade, the Ministry of Health has adopted the following goals for achievement by the year 1990.

1. To provide all rural areas with populations over 250 with a public rudimentary water supply system.
2. To provide all rural areas with populations under 250 with bored wells and hand pumps at the rate of one per every ten households (WHO Standard)

A number of strategies will be employed in the provision of rural water supply. These include:

- integration with primary health care programmes
- community participation

*The Ministry of Health currently has four (4) well rigs. However they are not in very good condition. Given the terrain of the Toledo District, it will not be possible to use them in certain remote areas. Hence an additional well rig, suitable for Toledo's terrain is requested in this proposal.

- close linkage with health education
- appropriate technologies
- inter and intra sectoral coordination

Criteria for providing water supply will include:

- health aspects with recognition of existing health and health related programmes
- population sizes to give the greatest cost effectiveness versus health effectiveness
- existing levels of service
- cost effectiveness versus village spread
- accessibility
- logical progression of drilling from a logistics point of view
- water quality

Recently the Public Health Inspectorate undertook a study of the present situation of rural water supply. Based on available data it was determined that the present situation of water supply, by district, is as follows:

District	*Number of Persons Per Available Hand Pumps and Wells*
Belize	44
Cayo	160
Corozal	134
Stann Creek	190
Orange Walk	119
Toledo	296

Although greater study and analysis is required, a cursory

review of data suggests a significant relationship between health status and the availability of potable water supply, by district, in Belize.

A draft proposal has been developed for a rural water supply project in the Toledo District, to be implemented over the next three years. The following is a project of the number of additiona wells, hand pumps and piped rudimentary water supply systems that would be required to bring similiar projects to the other districts of the country by the year 1990.

District	*Piped Rudimentary Supply Systems*	*Bore Wells Fitted With Hand Pumps*
Corozal	20	12
Orange Walk	7	23
Belize	8	19
Cayo	9	53
Stann Creek	7	45
TOTAL	51	152

A rough estimate of the material and equipment for implementing projects in the above mentioned five (5) districts is as follows:

(In U.S. Currency)

District	*Rudimentary Systems*	*Hand Pumps*	*Total*
Corozal	$ 650,000	$ 24;000	$ 674,000
Orange Walk	227,500	46,000	273,500
Belize	260,000	38,000	298,000
Cayo	292,500	106,000	398,500
Stann Creek	227,500	90,000	317,500
	$1,657,500	$304,000	$1,916,500

USCY

These costs do not include labour, nor administrative and support costs.

Estimates* for cement slabs and wooden risers for drop privy-pit latrines for the country of Belize with the exception of the Toledo District.

1.	Belize District	- 500
2.	Orange Walk District	- 500
3.	Corozal District	- 500
4.	Cayo District	- 500
5.	Stann Creek District	- 500
		2,500

Total slabs and risers required - 2,500

1.	Materials - slabs	- $ 50.00
2.	- risers	- 20.00
3.	Labour	- 5.75
		$ 75.75

Cost of producing 1 slab and riser - $75.75

Cost for 2,500 slabs and risers x $75.75 = $19,000.00

*Belize currency

HP - Hand Pumps
RWS - Rudimentary Water Supply

WATER SUPPLY

Villages and Rural Localities With More Than 50 People

Area	*Population 1980 Census*	*No Households*	*Water Supply*
Corozal District			
Buena Vista	330	60	2-HP
Calcutta	709	118	1-HP
Caledonia	942	160	1-HP
Carolina	197	32	
Chan Chen	351	62	4-HP
Chunok	439	61	
Concepcion	608	107	8-HP
Consejo	60	11	
Consejo Road	59	11	
Copper Bank	190	28	
Cristo Rey	377	60	11-HP
Estrella	118	21	
Libertad	1,518	274	RWS
Little Belize	329	51	
Louiseville	439	82	7-HP
Paraiso	510	84	4-HP
Patchakan	700	112	13-HP
Progresso	781	130	
Ranchito	604	98	8-HP
San Adres	459	73	4-HP
San Antonio	264	42	4-HP
San Joaquin	929	161	RWS
San Narciso	1,436	245	3-HP
San Pedro	271	53	6-HP
San Roman	448	78	6-HP
San Victor	349	63	5-HP
Santa Clara	449	72	3-HP
Santa Cruz	69	13	
Sarteneja	1,005	187	
Kaibe	760	125	10-HP
Yo Chen	78	17	1-HP
Orange Walk District			
August Pine Ridge	885	154	2-HP
Blue Creek	661	118	
Carmelita	164	64	
Chan Pine Ridge	291	48	
Douglas	453	78	

Area	Population 1980 Census	No Households	Water Supply
Orange Walk District (cont)			
Guinea Grass	1,291	201	RWS
Hill Bank	66	41	
London	64	15	1-HP
Nuevo San Juan	111	21	4-HP
Richmond Hill	50	13	
San Antonio	345	61	2-HP
San Estevan	978	166	RWS
San Felipe	585	96	RWS
San Jose	1,164	185	RWS
San Jose Palmar/Nuevo	477	77	1-HP - RWS
San Lazaro	567	106	6-HP - RWS
San Lorenzo Road	404	72	
San Luis	162	34	5-HP
San Pablo	638	101	1-HP -RWS not working at present
San Roman, Rio Hondo	352	65	
Santa Cruz, Rio Hondo	76	9	
Santa Martha	121	31	5-HP
Ship Yard	2,446	374	
Tower Hill	193	39	
Trial Farm	483	85	15-HP
Trindad	423	75	12-HP
Yo Creek	810	130	RWS
Belize District			
Ambergris Caye	1,136	241	RWS
Bermudian Landing	220	39	6-HP
Biscayne	136	31	2-HP
Bomba Nor. River	51	11	
Burrell Boom Area	684	157	8-HP -RWS
Caye Caulker	435	116	
Corozalito	71	13	5-HP
Crooked Tree	508	105	7-HP
Crooked Tree Road	111	14	3-HP
Double Head Cabbage	294	52	12-HP
Flowers Bank	142	31	3-HP
Freetown Sibun	71	18	1-HP
Gales Point	365	65	RWS
Grace Bank	114	14	
Gracie Rock	366	57	
Isabella Bank	58	16	3-HP
Kings College	53	2	
Lucky Strike	160	45	5-HP
Ladyville	1,806	338	11-HP - RWS connected to B.C. System

Area	*Population 1980 Census*	*No Households*	*Water Supply*
Belize District (cont)			
La Democracia	113	27	3-HP
Lemonal	191	29	
Maskall	675	126	14-HP
May Pen	132	22	
Hattieville	657	119	4-HP -RWS
Northern Highway (20 - 27 mile)	168	41	
Old Hattieville	132	35	
Rancho Dolores	282	45	3-HP
Rockstone Pond	114	18	13-HP
San Hill Area	412	87	10-HP
Santana	195	47	11-HP
Salt Creek Road	75	12	3-HP
Scotland Half Moon	117	20	5-HP
St Ann's	98	22	11-HP
St Paul's Bank	120	18	6-HP
Western Highway (Burdencana to Tropical Park)	110	24	
Willows Bank	120	26	10-HP
Cayo District			
Arnez	159	25	
Augustine Pine Ridge	164	43	
Benque Viejo Rural	179	32	2-HP
Blackman Eddy	201	37	3-HP
Buliett Tree Falls	438	67	1-HP
Calla Creek	149	27	
Central Farm	250	54	
Chiquibul Road	82	11	
Cool Shade	55	7	
Cotton Tree Bank	127	21	1-HP
Cristo Rey	335	55	3-HP
Esperanza	845	130	RWS - connected to San Ignacio System
Georgeville	405	70	2-HP
Hummingbird Hershey	108	42	
La Clarissa Falls	58	8	
Lower Barton Creek	230	34	
Macaw	86	16	
Mile 30 to Sibun River	104	26	
More Tomorrow	84	13	
Norland Farm	100	28	
Ontario	408	71	2-HP

Area	*Population 1980 Census*	*No Households*	*Water Supply*
Cayo District (cont)			
Paslow Falls, Plantain Sucker and Romanso	124	19	
Paslow Falls Road	88	14	
Pilgrimage Valley	45	11	
Roaring Creek	842	138	6-HP - connected to Belmopan System
San Antonio Caye	736	119	4-HP
Santa Familia	441	72	
San Jose	68	11	
San Jose Succotz	945	164	1-HP -RWS- connected to Benque System
Spanish Lookout Road	76	15	
San Luis	103	39	
San Martin and Branch Mouth	129	16	
Spanish Lookout	1,276	217	
Teakettle	576	93	5-HP
Unitedville	324	56	6-HP
Upper Barton Creek	111	13	
Stann Creek District			
Agriculturel Station	57	17	
Alta Vista	182	33	
Canada Hill Road	70	13	1-HP
Cow Pen	266	80	1-HP
Georgetown	220	42	2-HP
Hopkins/Commerce Bight	749	127	2-HP
Lyman	91	2	1-HP
Mango Creek/Independence	1,474	261	2-HP
Maya Centre	91	15	
Maya Mopan	61	12	1-HP
Melinda	179	32	
Middlesex	275	55	
Mullins River	211	38	
Placnecia	334	164	
Pomona	434	104	1-HP -RWS
Qualn Bank	112	59	
Riversdale	54	15	
Santa Rosa	162	26	
Seine Bight	465	94	
Stann Creek Valley Road			
A. Dangriga Boundary (To Five Miles)	154	30	1-HP

Area	Population 1980 Census	No Households	Water Supply
Stann Creek Valey Road (cont)			
B. 5 Miles to Hope Creek Bridge	69	11	?
C. Hope Creek to Melinda	96	26	?
D. Agri. Station to Pomona	65	14	?
E. Pomona to Alta Vista	162	40	?
F. Alta Vista to 35½ Mls.	97	20	?
G. 16 Miles to 21 Miles	361	83	
H. Wala Loaf	104	?	
Toledo District			
Aguacate	149	32	
Barranco	229	58	
Big Falls (including Never Delay and Esperanza)	323	57	
Big Falls Road	175	30	3-HP
Blue Creek	191	36	
Cattle Landing	97	19	
Crique Jote	164	30	1-HP
Crique Largario	53	9	
Crique Sarco	184	42	
Dolores	143	38	
Dump	53	7	
Elridge	135	20	
Fairview	56	10	
Forest Home	206	38	
Golden Stream	68	13	
Hicattee Creek	110	21	
Indian Creek	264	51	
Jacintqville	107	19	1-HP
Jalacte	58	12	
Laguna	205	50	
Mabila	57	10	
Mafredi	129	22	1-HP
Moho River	134	23	
New Road	106	15	
Otoxha	182	36	
Pueblo	346	66	1-HP
P.G./San Antonio Road 2½ - 3½ Miles	87	15	9-HP
P.G./San Antonio Road 10 miles	67	11	9-HP
P.G./San Antonio Road 14 Miles	92	17	9-HP
P.G./San Antonio Road 18 Miles	70	14	9-HP

Area	*Population 1980 Census*	*No Households*	*Water Supply*
Toledo District (cont)			
P.G./New City Area	81	16	
Punta Negra	55	7	
San Antonio	1,087	229	2-HP
San Benito Pointe	261	42	
San Felipe	47	10	
San Jose	599	110	
San Lucas			
San Miguel	227	43	1-HP
San Pedro Columbia	784	142	2-HP
Santa Cruz	349	75	1-HP
Santa Elena	177	39	1-HP