Final Evaluation - Increased Productivity through Better Health Project

BELIZE

by

Jesse Hobbs, Sc.D. - Vector Control Specialist/Team Leader
Joseph Haratani, MS - Sanitary Engineer
Wilbur Hoff, Ph.D. - Community Development Specialist

January 1989

This assignment was carried out for USAID/Belize
under Contract Number 505-0018-C-00-9005.

JSI
JOHN SNOW, INC.

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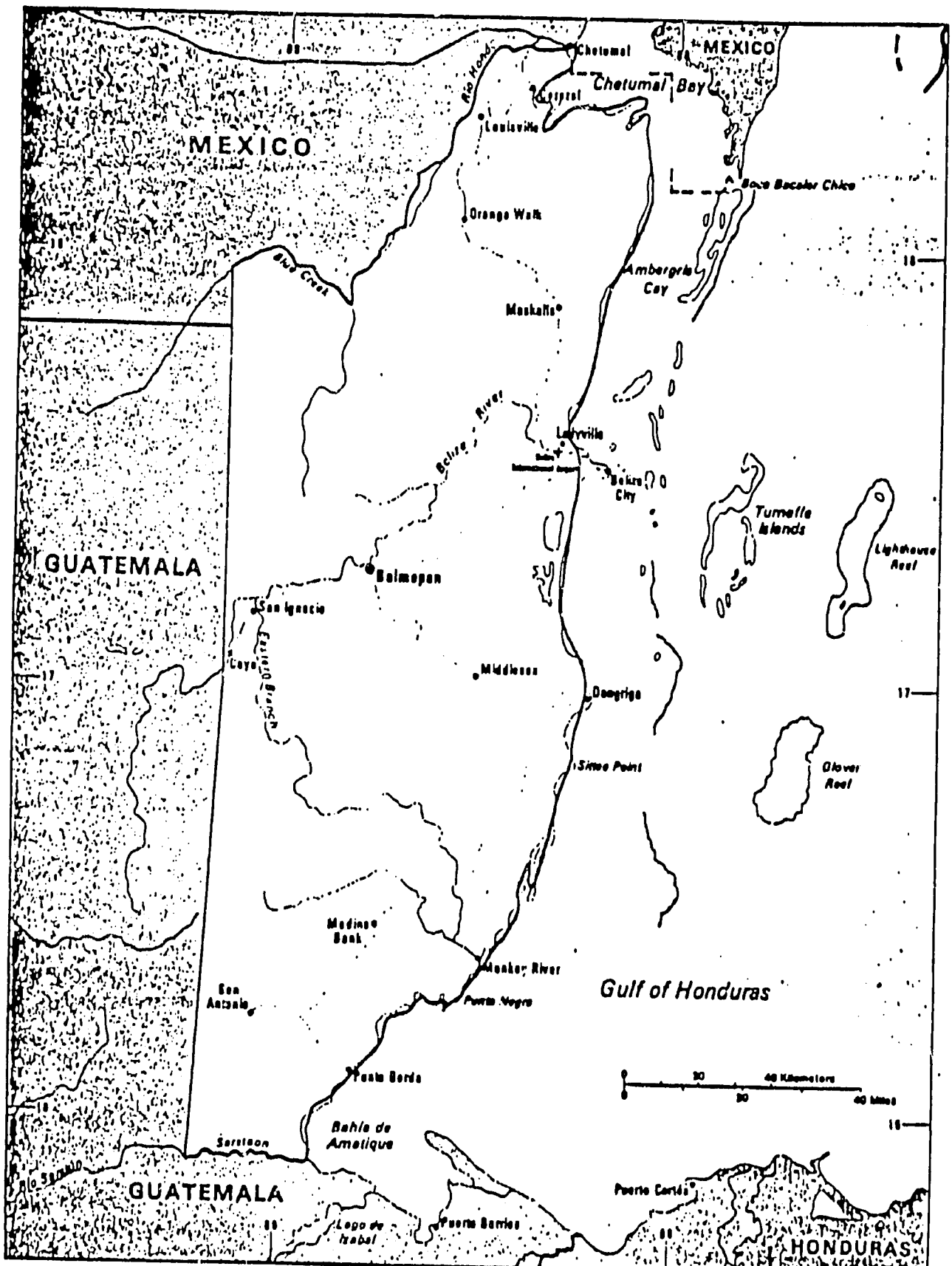
TABLE OF CONTENTS

ANNEXES

ACKNOWLEDGMENTS

This assessment could not have been done without the full cooperation and assistance of the agencies involved in the execution of the IPTBH project. These agencies are the Ministry of Health; the Ministry of Natural Resources; USAID/Belize; and the technical assistance contractor, PRAGMA/MCD. The evaluation team wishes to thank the staff of each of these entities for their willingness to assist us in our work. We are especially grateful to Ms. Mosina H. Jordan, AID Representative, for providing her full support and the services of her staff.

Belize



International boundary
National capital
Road
International airport

Boundary representation is not necessarily authoritative.

EXECUTIVE SUMMARY

I. PURPOSE OF THE EVALUATION

The purpose of this evaluation is to improve the management of the vector control and water and sanitation programs implemented by the Government of Belize.

II. COMPARISON OF PROJECT ACCOMPLISHMENTS VERSUS PROJECT TARGETS

VECTOR CONTROL

MALARIA: Project targets achieved except in problem areas in two districts.

Recommendation: Continue present activities to achieve project targets in next 2 years.

AEDES AEGYPTI: Project goals were changed in 1988 to emphasize focus on urban areas where Dengue is more likely to occur. Reduction of urban infestation not yet reached.

Recommendation: More frequent inspection and treatment cycles in urban areas to achieve goal within one year.

WATER SUPPLY AND SANITATION

Water supply and latrine targets were not met because targets were unrealistic. Also, more attention should have been focused on institution building and community development.

Recommendation: Attention should be focused on progress in community participation and institution building. Targets should be set based on District staff inputs and village priorities.

III. IMPACT OF USAID AND GOB INPUTS IN ACHIEVING PROJECT TARGETS

VECTOR CONTROL

MALARIA: 1. The NMCP still shows many signs of being a vertical eradication program with few attempts to integrate it with general health services.

Recommendation: Steps should be taken to integrate NMCP with general health services.

2. Budget support for NMCP has not been adequate for past few months.

Recommendation: Provide adequate budget support to carry out spraying operations, pay personnel and travel allowances and cover vehicle costs.

3. An increasing problem of malaria control in the country is the importation of malaria from neighboring countries. Malaria in immigrants causes re-infection of Belizean localities already cleared of the disease.

Recommendation: An in-depth study of malaria in immigrants should be made in order to understand the magnitude and geographical distribution of this problem and to devise counter measures such as early detection and treatment.

AEDES AEGYPTI: AACP has a better than average control unit but suffers from being a temporary organization with high personnel attrition rates.

Recommendation: Take steps to make AACP a permanent part of the MOH.

WATER SUPPLY AND SANITATION

1. Budget support for health education and community development training and educational materials were non-existent or inadequate.

Recommendation: Identify and fund specific budget items for HE and CD activities.

2. Full-time GOB counterparts were not identified and assigned to expatriate advisors and/or consultants.

Recommendation: Full-time counterparts should be assigned to advisors and consultants.

3. Both MOH and MNR have inadequate staff and resources in health education and community development.

Recommendation: GOB should integrate and build up its diverse HE as well as its CD activities.

IV. EFFECTIVENESS OF PRAGMA STAFF

While members of PRAGMA team demonstrated broad areas of strength, there were also areas of weakness. Among its strengths, team members as a whole showed tenacity to persevere and continue being productive in the face of adversity. They were less successful in building a cohesive working strategy as a team and in surmounting the cross-cultural differences with their counterparts.

Recommendation: Special care must be taken in preparing job descriptions, outputs desired and qualifications required. There is a need to make certain that candidates meet all job requirements and have successfully worked under similar conditions.

V. EFFECTIVE USE OF COMMUNITY PARTICIPATION

VECTOR CONTROL

While several workshops have already been conducted for vector control workers, actual community participation activities are yet to be initiated in the field.

Recommendation: Continue to train VC workers in skills to involve communities in source reduction, personal protection and screening. Prepare and implement an action plan for VC workers in community participation.

WATER SUPPLY AND SANITATION

There has been a lack of a well-defined community development activity, frequent turnover and inadequate training of District Health Educators and coordinators, as well as inadequate training and support of community leaders to carry out their respective roles.

Recommendation: Utilize the community development manual that has been prepared and conduct more intensive community based training for District Health Educators, District Coordinators and community leaders.

VI. PROJECT CONTRIBUTIONS TOWARD SUSTAINABLE DEVELOPMENT IN VECTOR CONTROL AND WATER AND SANITATION

VECTOR CONTROL

The most significant contribution toward developing a sustainable VC program has been technical training of personnel. The weakest link is the training in community involvement.

Recommendation: Train personnel in CD skills, provide more management assistance and prepare operations research design.

WATER SUPPLY AND SANITATION

1. In spite of considerable efforts made by expatriate advisors, an open and candid relationship with counterparts was not completely achieved. This interfered with the institution building process. The GOB had trouble in finding qualified candidates to fill key central office jobs in a timely manner.

Recommendation: Technical advisors should work side-by-side with their counterparts. They should work with their counterparts and through District staff to conduct field activities.

The GOB should review organizational structure of the several WS/S offices, job qualifications and performance of central office staff, and make necessary changes as needed.

2. There is concern that village health committees will stop functioning.

Recommendation: Broaden the scope of responsibilities of VHCs to cover other health problems. Provide follow-up assistance by District staff. Provide more training of village leaders to improve their leadership skills.

VIII. COMPARISON OF IPTBH, UNICEF & CARE WATER AND SANITATION PROJECTS

All three projects use the same hand pump, latrine design and service levels for hand pumps (one per ten families) and for latrines (one per family). There are some differences in organizational structures and operational details such as providing materials for latrine superstructures and payment of personnel outside of GOB rules and regulations.

Recommendation: Convene a meeting with broad vertical representation of personnel from each agency involved to assess project experience to date and to agree upon a more integrated and uniform structure and operating methodology.

IX. PROJECT IMPACT ON VILLAGERS HEALTH & HEALTH PRACTICES

Baseline data is lacking against which improvements can be measured. Observations made during field visits by this evaluation team in addition to anecdotal information provided by villagers tend to indicate improvement in health practices if not in actual health status.

Recommendation: Regarding impacts from water supply and sanitation, it is generally accepted that improvements in health will follow. Therefore, large sums of money should not be spent to attempt to measure specific impacts of water supply and sanitation on health.

I. INTRODUCTION

A. PROJECT DESCRIPTION

There are four major components within the Improved Productivity Through Better Health (IPTBH) project: (1) malaria control; (2) Aedes aegypti control; (3) potable water delivery; and (4) sanitation. Health education and community participation are underlying themes for the implementation of these components. The planned level of effort (LOE) is $1.886 million for vector control, $3.008 million for water and sanitation, and $1.892 million for technical management support. Contingency and fiscal adjustments result in a total level of effort of $7.0 million.

Community participation and health education are central to the achievement of project goals. Participant and in-country training are emphasized to enhance the indigenous managerial capacity within Belize.

B. PROJECT HISTORY

The PID (Project Identification Document) was completed on October 12, 1984. This led to the fielding of a project development team that prepared the project paper. The project was approved on December 21, 1984 and the Project Authorization was signed on March 21, 1985. The Project Agreement between AID and the Government of Belize was signed on March 26, 1985.

A contract with PRAGMA/MCD to provide technical assistance through a Management Support Unit consisting of a Project Manager (Chief of Party, Water Supply and Sanitation Advisor, Community Development/Health Education/Training Advisor and a Vehicle Maintenance Specialist was negotiated and became effective January 1, 1986.

Prior to finalizing the negotiated contract, three of the four proposed technical assistance team members (the Chief of Party, the WS/S Advisor and the CD/HE/T Advisor) travelled to Belize in September 1985 for the project orientation and for interviews and approval by the GOB and USAID/Belize. These three advisors arrived in Belize on January 21, 1986.

Although the Project Agreement was signed in March, 1985, start-up was sluggish, due to delays of procurement, staffing, vehicle delivery, and preparation of the annual implementation plan for 1985/6, which was a condition precedent to the first disbursement. The IPTBH project entered its fourth Belizean fiscal year in April 1988, and the PRAGMA/MCD entered its third calendar year as of January, 1988.

C. PURPOSE OF THE EVALUATION

The purpose of the evaluation is to determine whether sufficient conditions have been created by the project to promote sustained development in the vector control sector, specifically malaria and dengue

fever control, and in the rural water supply and sanitation sector of Belize. This is the final evaluation prior to the project assistance completion date (PACD) of March 31, 1989.

D. SCOPE OF WORK

The evaluation team will have the following responsibilities:

- to review project accomplishments against planned targets;
- to assess the impact that the timing, quality and level of USAID and GOB inputs have had on project accomplishments;
- to determine the extent to which this project has contributed to sustained development in the vector control and water and sanitation areas.

In carrying out this scope, the team will provide answers to the following specific questions:

- How effective has the assistance provided through the contract with PRAGMA Corporation been? What has been the impact of the long-term advisors and of the analysis and recommendations made by short-term consultants?
- Has community participation been used effectively as a development tool in both components of this project?
- Has a structure for efficient delivery of rural water and sanitation programs been established?
- Has the project assisted with the establishment of an efficient structure for delivering the vector control programs?
- How cost/effective have the water and sanitation programs been, compared to other sectorial efforts being pursued by UNICEF and CARE? How do these projects compare in project conditions, strategies and accomplishments?
- What impact have the combined contributions of USAID (TA, equipment, and tools) and GOB (staff, garage construction) had on the effective establishment of vehicle maintenance and repair capability of MOH?

- How has procurement of commodities and equipment affected project accomplishments? Assess the different mechanisms used, the time periods between submission of requests by the Ministries and delivery of the items.

- Has the project had any positive impact on the health status and habits of the Villagers whose lives have been touched by the project? Assess the extent of Villagers involvement and their "ownership" of the project in their communities.

E. METHODOLOGY

The evaluation team conducted interviews, reviewed project documents at USAID, PRAGMA and the Ministries, and made site visits to field locations to meet field staff and to observe and assess progress made. The team included a representative from the Ministry of Health.

II. FINDINGS AND CONCLUSIONS

A. ACCOMPLISHMENTS VS. TARGETS

1. Vector Control

The goals of the National Malaria Control Program and the Aedes Aegypti Control Program, as outlined in the Project Paper, are as follows:

- To reduce the number of cases to 8 per 1000 population, or lower;
- To reduce falciparum malaria to 5 percent or less of total cases;
- To reduce the infected Aedes aegypti localities to less than 10 percent of Belize's total localities.

At present, the goals of the NMCP remain unchanged. The goals of the Aedes aegypti program were re-examined in 1988, and re-defined, after a consultant visit to the project by Dr. Robert Tonn. This consultant recommended that routine activities of the AACP should attempt to maintain a house index of 3 percent or less in urban areas. This is a logical and technically sound change, since urban areas are more at risk for outbreaks of dengue, and dengue prevention is the ultimate goal of Aedes aegypti control.

a. Accomplishments

The activities of the NMCP have brought about a decline in malaria rates country-wide. Problem areas are still to be found in Cayo and Toledo, especially in areas with a lot of inter-country population movement. Malaria has not responded as quickly to the control interventions as in areas with a more stable population. Goals of reducing the API to 8 cases per 1000 population have been reached in some localities in all of districts, but not in all malarious areas. Rates could be expected to come down with uninterrupted spray rounds this year, and next year, and even more rapidly if a solution could be found to importation of malaria in refugees and the re-infection of Belizean localities.

In the AACP, the concentration of the operation in urban areas is a recent change, and house infestation indices are still high in many areas. Belize City, however, has had a favorable response to inspection and treatment, and the house index at the end of 1988 was about 5 percent.

More frequent rounds of inspection and treatment should bring down infestations to acceptable levels in all urban areas during the coming year.

In Annex V are the graphs for Annual Parasite Incidence, by District, for the years 1985 - 1988. Included also are graphs for the percentage of falciparum cases, also by District and year, and Aedes aegypti infestation, by month in 1988, for the urban areas of the country.

2. Water and Sanitation

Although the Project Paper and other related documents stress the importance of the community participation and institution building aspects of the IPTBH project, the target numbers for wells and latrines continued to be the main basis for measuring accomplishments. Table I below compares accomplishments against those and other numerical targets listed in the Logical Framework section of the Project Paper. In the future it would be more useful to focus on the progress made in community participation and institution building as indicators of project achievement , since they provide a better measure of sustained development than the Number of physical installations.

TABLE I
IPTBH ACCOMPLISHMENTS
WATER SUPPLY AND SANITATION COMPONENT

	ORIGINAL TARGET	REVISED TARGET	NUMBER COMPLETED	NUMBER IN PROGRESS
DRILLED WELLS				
With Hand pumps	250	83-100	41	7
For RWS	26*	3+3 Design	0	3
LATRINES	3000	1250	629	185
VILLAGE HEALTH COMMUNITY	40	30	24	-
O&M MAN WITH TOOL KIT	20	20	0	-
WORKSHOPS				
PROJECT MANAGEMENT	1	1	1	-
COMMUNITY DEVELOPMENT	6	6	1**	-
HAND PUMP MTCE	4	4	0	1
APPROPRIATE TECHNOLOGY	12	3	1	-
WATER QUALITY TESTS	1/Well/Yr	2/Well/Yr	In 1988 52% of wells were sampled and tested.	

* Project paper page 110 indicates 26 RWS while Log Frame indicates 20 RWS.
**One or more community development workshops were held.

3. Health Education and Community Development

One of the sub-purposes of the W/S component of the project plan is to increase community participation in maintenance of water and sanitation systems and strengthen the role of district - level health teams. Two indicators are listed in the log frame to verify this:

a. "All participating communities have an established and functioning health committee which manages the water system."

Data from IPTBH monthly progress reports on 24 villages showed the following accomplishments:

(i) Village health committees established in all 24 villages;

(ii) 157 VHC meetings called by IPTBH staff in 22 of those villages;

(iii) 45 VHC meetings called by the VHC;

(iv) 254 adult health education talks given;

(v) 135 lessons given to schools.

The project staff agreed that a practical criteria for a "functioning health committee" was one where a project agreement was signed and they became active in implementing it. Most VHCs have met this criteria.

On the negative side, one would assume that an active VHC would call meetings on their own to manage the activities of a project in their village. The data are not encouraging in this respect. In only 9 of the 24 villages did the VHC call meetings on their own - this was an average of 5 meetings per village over the duration of the project.

b. "The District Health Team meets regularly with community groups to promote self-help activities."

There were no data available to determine this accomplishment. In this regard, however, a number of health education and community development workshops were conducted for district-level staff (coordinators, health educators and others). Seven of these workshops were conducted.

Other training accomplishments were:

- one 4-day workshop on CD for National and district-level staff, project staff and representatives from other agencies.

- one communications workshop was sponsored by PRAGMA and facilitated by the CHE and PRAGMA HE/CD advisor. Participants included District Coordinators, DHE's, CARE and UNICEF personnel.

- nine workshops for members of VHCs. These workshops taught communication skills, project monitoring and conflict management.

- seven VC workshops were conducted which included sessions on Health Education.

A number of health education materials were produced during the life of the project. These covered various aspects of W/S and VC activities and included:

3 - pamphlets

2 - posters

1 - flipchart

3 - lesson plans

2 - slide shows

4 - health education and community development manuals for VC workers, HE and CD trainers.

1 - Training Trainers Guideline for conducting CD workshops.

7 - Modules for training VHC's in CD, project monitoring and introduction to the RWS.

B. IMPACT (EFFECTIVENESS AND RESULT) OF USAID AND GOB INPUTS IN ACCOMPLISHING TARGETS

1. Vector Control

The National Malaria Control Service and Aedes aegypti Control Program are organized in many respects along the lines of a previously existing Malaria Eradication Program, and Aedes aegypti Eradication Program. For many years these programs were autonomous, vertically organized, and with little integration with each other or with the general health services of the Ministry of Health. Both programs were considered time-limited, and received donor support from UNICEF and PAHO. When donor and GOB support were reduced, vector control deteriorated, leading to re-establishment of malaria transmission in the country and the return of malaria as a significant public health problem. The same happened with the Aedes aegypti program, and the country was reinfected with these vectors.

With the initiation of the IPTBH project, both USAID and GOB made inputs which brought about a reestablishment and re-vitalization of vector control. Strategies and goals were changed, in order to create a non-time-limited project which would eventually be partially integrated into the general health services and have a strong element of community participation in vector control. In reorganizing these programs, some strengths were retained, such as a good supervisory system, a good mechanism for geographical reconnaissance, and the framework of a passive case detection system. At the same time, a large degree of autonomy and separateness have been retained. The general health service should have by this time assumed the responsibility for the diagnosis and treatment of malaria, but these activities are still in the hands of the malaria service.

In general the inputs have enabled the NMCP to carry out their mission of applying the appropriate interventions in malaria areas, and to operate a case detection system.

This capability is totally dependent on adequate support by the Government of Belize. This support has not been forthcoming in recent months, and the NMCP has not been able to pay travel allowances of field personnel, begin the first round of spray operations, scheduled for mid-January 1989, or maintain and operate their vehicles. In other words, the NMCP is semiparalyzed for lack of operating funds.

The Aedes aegypti Control Program seems to be well organized and operated, in spite of the fact that most of the employees have temporary status, and turnover is abnormally high. A lot of effort must be channelled into training of new employees because of this turnover. This service has also experienced a lack of budget support, particularly for the payment of travel allowances for supervisory travel. In spite of these problems, the Aedes aegypti control program seems to be a better than average Vector Control unit, fully capable of maintaining low indices of infestation in urban areas, and capable of responding in an appropriate way should a dengue outbreak occur.

2. Water and Sanitation

The project paper sends mixed signals regarding the roles of USAID and Technical Assistance Team vis a vis the GOB. The Project Summary states that the MOH Vector Control services will benefit from long and short-term training...project commodities will increase the services' operational efficiency...' Regarding the Water and Sanitation Component, the project 'will strengthen the administrative and technical capability' of the EHS 'through long and short-term technical assistance.' These statements allude to the classic technical assistance role of providing advice and assistance directly to the staff of relevant host government agencies.

In describing the community development and health education component, the Project Summary states that 'technical assistance in community development and health education will motivate and educate communities to improve their own health; it will also strengthen the community development/health education/training skills of MOH personnel...'

This statement seems to describe a dual role for the CD/HE advisor, i.e. direct assistance to communities and also advice and assistance to MOH staff.

In the Project Description section, the project paper states that the 'Management Support Unit is responsible directly to the USAID General Development Officer.' Further on, it states that the 'Manager will be responsible for the writing of detailed annual work plans developed in collaboration with the appropriate technical specialists. The advisor will be responsible for the overall procurement, management and day to day administration of the project.'

The project paper continues by stating that the CD/HE advisor 'will, in collaboration with the Manager, develop a detailed work plan for the community development/health education/training activities for the water and sanitation and vector control components of the project.' Finally it states that 'institutional reinforcement through technical assistance, training and equipment will be provided for personnel at the district level to support the activities of the Project.'

The evaluation team believes that instead of placing the responsibility for project planning, management and day to day administration squarely in the hands of the GOB, the project paper as well as the technical assistance contract placed that responsibility on the Technical Assistance team.

While it is understood that direct AID contracts require the contractor to be responsible to AID, the main issue is the nature of the contractor's responsibility. The evaluation team believes that technical assistance contractor should have been responsible for providing technical assistance to the GOB and not responsible for planning, implementing and managing the project.

Both the project paper and the technical assistance contract directed the technical assistance team to play an executive or line role as well as a staff or advisory role.

Also, by requiring T.A. team members to provide technical assistance at the district and community levels, their focus and energies were diverted away from the project's main goal that of building an institution capable of providing sustained development in rural water supply and sanitation and vector control areas.

The evaluation team believes that for any technical assistance endeavor to succeed, it must be based on developing a partnership between ex-patriot advisors and host government representatives based on trust and mutual respect. Without it there exists no basis for the honest exchange of ideas and information and for the reciprocal transfer of knowledge. The project paper describes contradictory roles for the T.A. team making it extremely difficult for the advisors to form a close working relationship with their counterparts. This is one reason why progress in the area of institution building was constrained especially in upgrading planning, management and administrative skills of the senior project staff.

Prior to the IPTBH project, the GOB was poorly equipped to carry out a rural water supply and sanitation program. It had four old drilling rigs (2 Dando's and 2 Bucyrus Erie 22W's) which were in bad mechanical condition. It did not have a reliable vehicle fleet to provide necessary transportation for staff, equipment and supplies to the field. Nor did it have the necessary commodities (handpumps, pipe, casing, spare parts, tools, etc.) with which to mount a large, comprehensive program.

The IPTBH project made major, if not unprecedented investments in purchasing project commodities. Among the major items were two new drilling rigs, spare parts for new and old drilling rigs, steel casing, PVC pipe, handpumps, pick-ups, trucks and motorcycles. It is an example of an activity going from famine to feast. However, the process was not smooth. Major delays were experienced in the procurement of large items such as drilling rigs and vehicles which hindered some field activities.

While it is not possible to list specific delays in procurement and their specific impacts on project implementation, the evaluation team believes that the sum total of procurement delays placed a significant constraint on project implementation. The team also feels that the AID procurement process is overly cumbersome, time-consuming and in specific instances (e.g. the procurement of a rotary drilling rig of questionable quality) counterproductive.

PRAGMA, in submitting candidates who did not meet all job requirements, placed itself, as well as the project, in jeopardy. Although USAID and the GOB share responsibility for accepting less-qualified advisors, the main responsibility rests with PRAGMA for nominating them whether or not this situation contributed to the ensuing breakdown of intra-team communications is debatable. In any case, the lack of qualification did impede project implementation specifically in community development. Furthermore, the breakdown in the intra-team communications made it impossible for the team to develop a cohesive health education and community development component for the water supply and sanitation activity for about a year.

For its part, the GOB made the task of institution building difficult. Its decision to "change horses in the middle of the stream" resulted in a hiatus in project implementation for about nine months. The uncertainties created in transferring the water supply and sanitation portfolio from the MOH to MNR was demoralizing to both national and ex-patriot staffs. Although the transfer was announced in mid-1986, official action transferring staff to MNR was delayed for nine months until April 1987. In the intervening period GOB personnel and expatriate advisors were left in a quandary wondering who was really in charge of project activities and decision making. As a consequence, little progress was made during these months thereby, further delaying project implementation.

In summary, all three agencies - the GOB, USAID and PRAGMA - share responsibility for the disappointing level of accomplishments in the project.

3. Health Education and Community Development

a. The delayed procurement of vehicles for the IPTBH staff hampered the HE/CD Advisor in carrying out health education, training and community development activities with District staff and communities at an early date. These activities should have been done in the very beginning to insure that District staff were able to begin the community development process to prepare communities for the construction activities that would follow.

b. Although the project plan states that "a strong CD/HE/Training element has been incorporated into the design of the water and sanitation and VC components" the plan contains very little specific information about how the CD process should have taken place.

In addition, there were no funds provided in the budget to conduct training workshops and to develop and produce health education materials and training manuals. It is inconceivable to expect that these activities could take place without providing resources for them.

c. The selection of the HE/CD Advisor was a good one in terms of her background and experience in health education in sanitation programs. But she had little formal training in CD and less than the 3 years experience in community development in international programs that was recommended for that position.

This deficiency was alleviated after she got support from the project staff for CD activities, and the short-term consultant on CD was employed, but this did not happen until October 1987, almost 2 years (21 months) after the CD/HE Advisor had arrived.

d. One of the most significant difficulties in developing early and sustained HE and CD activities was the lack of a full-time counterpart for the HE/CD Advisor. Such a counterpart was not readily available until January 1988. The Government Chief Health Educator was transferred from the MOH to MNR in October '87 and was then assigned to work with the CIDA project in WASA until January '88.

One of the GOB Covenants specified in the project was that, "A Belizean HE/CD/Trainer will be assigned as a full-time counterpart". This assignment has still not been officially made or clarified although the Chief Health Educator, MNR was assigned to work with the HE/CD/TR Advisor as his time was available.

It is important to acknowledge that the combined resources for HE, CD and training in the MOH and MNR is understaffed and severely limited and the few staff that are available are extremely overextended in dealing with many pressing needs throughout the country. This has been a critical limitation in providing more HE and CD assistance to the IPTBH project.

e. The quality of HE/CD/TR assistance that has been provided by the staff of HECOPAB in the MOH and the Chief HE in the MNR has been good even though it has been limited in time and resources. Art work and reproduction facilities of the MOH were used to produce some high quality HE materials. And the assistance of the Chief HE in planning and implementing HE, CD and Training Workshops has been invaluable.

C. EFFECTIVENESS OF PRAGMA TECHNICAL ASSISTANCE

1. Background

The PRAGMA team got off to a slow start due to factors beyond its control. The A.I.D. contracting and selection process delayed fielding the team 9 months. This left the team facing the prospect of completing a 4-year job in 39 months. Meanwhile PRAGMA technical assistance team-building efforts were not completely successful leaving a communications gap among team members. This delayed the development of an integrated project implementation plan upon which to base its advisory assistance to the MOH. This intra-team problem was addressed by PRAGMA/MCD home office representatives during a supervisory visit in early 1987 and apparently resolved. The PRAGMA team now had 25 months to accomplish its tasks of advising and assisting the MOH (and the MNR after April 1, 1987) in implementing the project and in building an institution capable of sustaining a successful development program in rural water supply, sanitation and vector control.

The PRAGMA team's effectiveness and prestige suffered further setbacks as two successive Chiefs of Party were replaced. The present Chief of Party came on board at the end of October, 1988, just 5 months before the scheduled end of the project. He is functioning admirably in his leadership role.

2. Vector Control

a. Long-term advisor

The original PRAGMA Chief of Party (COP) was a Vector Control specialist with many years of experience in malaria control and a strong orientation toward field operations. During his tenure from January 1986 to January 1988, the field operations of the NMCP were strengthened and improved. The evaluation team feels that he was less successful in the management aspects of the total IPTBH project and in developing good working relations with senior GOB health officials. These problems may have been due to circumstances beyond his control. Technical assistance to the vector control programs has been provided by PRAGMA short-term consultants since the departure of the original COP.

b. Short-term consultants

During the course of the IPTBH, PRAGMA has provided short-term consultants in epidemiology, information systems management, evaluation of vector control operations, health education, Aedes aegypti control and dengue prevention. These consultants have been recognized experts in their field and have generally provided a high quality of technical advice and training to the vector control programs.

3. Water Supply and Sanitation

a. Long-term advisor

Based on the requirements set forth in the description of this position, the incumbent was technically well qualified both in educational background and in work experience. In his advisory role, he provided technical assistance to the MOH and MNR staffs at the national and district levels direct on-the-job training to District Coordinators in topographic surveying and mapping designed reusable forms for producing VIP latrine components and prepared designs for rudimentary water systems. He dedicated a significant portion of his time travelling in the field, first to become acquainted with village demography and the physical environment and, later, to become involved in project implementation focussing mainly in the area of water supply. The advisor also conducted and participated in a number of workshops covering a variety of water supply and sanitation topics.

Although the WS/S advisor made indispensable and significant contributions to the project he was able to transfer only a limited amount of his technical expertise to the MNR staff. This was mainly due to two factors. First his counterpart was not clearly assigned on a full-time basis. Second, he was not able to foster a collegial relationship with the senior MNR project staff which would have enhanced his efforts to share and exchange technical information and knowledge.

b. Short-term consultants

1. Water Laboratory Consultants

The project brought in two laboratory consultants. The first was brought in to develop a laboratory capability to perform inorganic, chemical and microbiological analyses to monitor water quality. She established laboratory and water sampling procedures. She also developed water sampling schedules and trained a laboratory technician to perform analytical tests. The consultant reviewed and revised the equipment and supply lists and conducted a workshop on water sampling for district health inspectors.

The second consultant reviewed and updated the sampling program and reassessed the equipment and supply lists making changes where they were appropriate. She reviewed and recommended changes in sampling and testing procedures. She provided advice on recommended treatment of water sources and held a second training workshop for public health inspectors.

The evaluation team believes that both consultants accomplished their main assignments.

2. Well-drilling consultant

The short-term consultant conducted a two-day introducing course covering the following topics:

- Identification of drilling equipment compounds, tools and supplies.
- Description of various geological formations and drilling procedures.
- Well construction materials and procedures.

He provided on-the-job training to drilling crews at various locations around the country and standard forms to record drilling information and diagrams illustrating different aspects of the drilling process. He also assessed the condition of existing drilling equipment and developed a list of spare parts, tools and supplies needed. Although he drew attention to major problems in the drilling activity, his effectiveness was limited by his difficulty in relating to local staff and field personnel.

3. Medium-term Well-drilling consultant

The medium-term drilling consultant arrived in March 1988. His main responsibilities were to provide training and technical assistance in the following areas:

- Planning and management of the well-drilling program
- Equipment operation and maintenance
- Well-drilling and well installation techniques and practices.

The advisor is effectively carrying out his assignment and is making progress in providing additional training to the drilling crews both on-the-job and in the classroom. He is concentrating most of his time and efforts in providing direct technical advice and assistance to well-drilling crews in the field. His personal attributes of empathy with and understanding of his counterparts serve him extremely well.

4. Health Education and Community Development

a. Long-term advisor

The HE/CD/TR Advisor in the project has performed admirably in light of the difficulties she faced. For the first year she had little support from the project staff to conduct CD activities, had no transport and had no resources for developing health education materials or conducting training workshops.

In spite of these handicaps she was imaginative in using the resources of HECOPAB, Peace Corps and other sources for art work and materials production. She was able to develop a number of health education materials including posters, pamphlets and lesson plans for schools. And using the resources in the MOH and MNR she was able to conduct a variety of workshops for HE and CD workers.

Although she did not have a strong background in CD, with the help of a consultant she developed a logical and comprehensive system for carrying out HE and CD activities in communities. Details of this approach are spelled out in the CD Manual and the Project Cycle for HE/CD/CD.

We believe if the CD consultant had been used earlier in the project this may have speeded up the development of the CD process in the target villages.

b. Short-term consultants

The project employed three short-term consultants:

1. Ms. Buzzard who came twice:

   a. During her first visit she achieved the following:

      - developed a monitoring system for integrating CD/HE with the technical program;

      - recommended that a more formal strategy be developed for community organization in RWS communities;

      - recommended increased training for field staff and VHC's in CD skills.

   b. Her second visit was to draft modules for and conduct a CD workshop.

The outputs of these visits were very valuable. They included:

- a draft plan of action to strengthen CD activities for the next year,

- 5 CD training modules for a CD workshop for MNR and other donors.

- a 4 day workshop on CD conducted by the consultant and PRAGMA HE advisor for project and District staff.

Although the content of the CD workshop was very appropriate for the participants there may have been too much content for the District staff to assimilate. It might have been better to break the workshop into two parts:

a. A beginning workshop which taught basic communication and CD skills that are essential for day to day practice.

b. Conduct follow-up sessions at District levels to provide further information and practical training focused on actual problem situations in the field.

Also, the workshop was held in Belize City which was removed from a community setting. If it had been held at a District center, more inputs could have been obtained from District HE's and Coordinators and actual villages could have been used as sites for training for participants in practical skills such as how to communicate with village residents, how to conduct group discussions, and so forth.

2. Ms. Burdman was employed to establish HE as an integral part of the VC program. Her findings recommended that HE materials and training be provided to VC workers to improve their effectiveness.

3. The recommendations of Ms. Burdman were carried out by employing Ms. Dickey to draft a CD/He manual for training VC workers and to develop HE materials for the VC component. The first part of this has been accomplished and the second part was underway at the time of this evaluation.

It is the opinion of the evaluation team that if these three consultants had been used earlier in the development of the project it would have facilitated the HE and CD activities in the target areas.

D. EFFECTIVE USE OF COMMUNITY PARTICIPATION

Effective community participation is when the following conditions are present:

1. Village leaders are skilled at bringing their members together to discuss problems and needs in the community, identify and agree upon their goals and priorities, and organize themselves and their resources to accomplish these goals.

2. Outside assistance is available to help them organize and achieve their goals when their own knowledge, skills and resources are insufficient to attain their needs by themselves.

The purpose of this project was to provide resources to help villages achieve better water and sanitation by stimulating and promoting communities to participate towards this end. The rationale of the project design for this was good but the result was only partially achieved for the following reasons:

- the community development process was delayed in starting by at least a year because the project management staff gave it little if any support.

- the training of District level staff in CD skills was hampered because no project funds were budgeted for workshops.

- although training was given to VHCs to teach how to organize the village to construct improved water supplies and latrines no training was provided to community leaders to build leadership skills to promote general community development.

1. Vector Control

Communities do participate to some extent in the vector control programs in that the NMCP recruits and trains volunteer collaborators among community leaders. These Volunteer Collaborators are trained to take blood films from fever cases in the community and to administer presumptive treatment. This network is an essential part of the case detection and treatment system.

Other than the Volunteer Collaborators, there has been little participation of the community in source reduction, promotion of self-protection from mosquito bites, or house improvement and screening. Some recent progress has been made in the development of health education materials for involving communities. The potential is there, certainly in the control of Aedes aegypti which is a community generated problem, and for additional community efforts in malaria control.

E. PROJECT CONTRIBUTIONS TOWARD SUSTAINABLE INSTITUTIONAL DEVELOPMENT IN VECTOR CONTROL AND WATER AND SANITATION PROGRAMS

1. Vector Control

The most significant contributions of this project towards sustainable development in vector control have been in the area of training of NMCP and AACP program personnel, both in country and abroad. Approximately 15 people from these two programs have been trained in vector control technology at the University of South Carolina. New Orleans Mosquito Control, and at training courses organized by the Pan American Health Organization in Panama, El Salvador, Guatemala, and Mexico. In-country training and workshops have been given in spraying equipment operation and maintenance, information systems, health education, and the biology and control of Aedes aegypti.

Perhaps of equal importance has been the provision of commodities essential for the operation of the vector control programs. These commodities have included insecticides, spraying equipment, anti-malarial drugs, laboratory equipment, trucks and motorcycles. The AID procured commodities have been received and delivered to the NMCP or AACP.

Sufficient supplies of insecticide are now on hand to continue the field spraying operations, supervision and the servicing of the surveillance system. Some evaluators are still without motor cycles, but this should be corrected in the near future.

Technical assistance provided by the project has led to the establishment of a computerized data management system and a system for prioritizing localities to be covered in spraying operations. The surveillance system has been changed so that active case detection can be eliminated, and the passive case detection reinforced. Strategies of Aedes aegypti control have been re-aligned to make them more pertinent to dengue control. Entomological services have been established, although this has happened recently, with the training of three entomological technicians in Tapachula, Mexico.

The prospects of developing an entomology team are promising, with the construction of an entomology lab, and the continuing technical assistance from the regional PAHO entomologist. The establishment of this unit also allows for the execution in the coming year of some important operational research projects. Provision was made in the original project paper for the support of operational research, but to date no research projects have been carried out. The team feels that several investigations could be initiated in the near future, and that information derived from these studies would be of benefit to future Vector Control operations. Suggested studies are outlined in Annex IV.

2. Water and Sanitation

While the project was able to provide significant contributions in terms of commodities, it was less successful in contributing toward sustainable development in rural water supply and sanitation.

The major contributions toward sustained development were in the area of training provided and workshops conducted. The actual numbers and types of training and workshops are listed in Table II below. In addition, significant contributions are being made through in-service training in the of well-drilling, topographic surveying, village mapping and household surveys.

The evaluation team also acknowledges the fact that the mere existence of the IPTBH Project (together with those of CARE and UNICEF) has drawn increased GOB attention to this sector and could lead to increased future commitment of GOB resources.

According to the original plan, the MOH was slated to implement the project. For reasons not fully explained to the evaluation team, the MOH did not provide adequate staff resources to the project. In June 1986, the GOB announced the transfer of the rural water and sanitation portfolio from MOH to MNR. This meant that a completely new organization would have to be built from scratch.

TABLE II

TRAINING/WORKSHOPS CONDUCTED
WATER SUPPLY AND SANITATION

DATES	WORKSHOP SUBJECT	PARTICIPANTS
11/7/86	Project Implementation	DC's,DHE's,DT's,SC's,MT's, DPHI's,DDO's,DMO's,AID & MOH Staffs
12/9/86	Project Technology	DC's, DHE's, SC's, DPHI's
1/21-22/87	Topographic Levelling	DC's
2/12-13/87	Drilling Methodology	DT's
3/11-12/87	Water Sampling	DPHI's, DC's, Lab. Tech.
6/3/87	Program Orientation	DC's,DHE's,DT's,SC's,MT's, DDO's,AID,MNR,CARE & UNICEF Staffs
6/4/87	Appropriate Technology	DC's, DHE's
6/29-30/87	Water Source/Topog. Levels	DC's
11/12-13/87	Management	Nat'l Coordinator,Chief HE, DC's, DHE's, W/S Advisor
4/88	Driving and Basic Mechanics	DC's, Chief HE
8/1-3/88	Drilling Theory/Practice	DT's
10/2-14/88	RWS Observation/Ecuador	DC's
11/4/88	Laboratory Procedures and Water Sampling	DPHI's
11/30/88	Topography and Water Resources	DC's

DC-District Coordinator
DHE-District Health Educator
DT-Drilling Team
SC-Sanitation Crew
MT-Maintenance Team
DPHI-District Public Health Inspector
DDO-District Development Officer
DMO-District Medical Officer

The national coordinator, the chief of operations and a few office staff were transferred to the MNR in April 1987, since then the office has added an administrator, chief and assistant health educators, a mechanic, a second clerk/typist, a master driller trainee and a messenger. This staff is supported at the district level by district coordinators, health educators, well-drilling crews, maintenance crews and carpenter foremen. At this writing the central office has lost the services of the national coordinator to long-term training and will soon lose the chief health educator for the same reason.

3. Health Education and Community Development

The contribution of the project towards institutional development and sustainability in HE and CD can be measured at three levels: A. The community; B. The District and C. National.

a. Community Level

The project activities have certainly developed a system through the HE/CP/CD Project Cycle to organize and educate communities about the importance of installing and using improved water and sanitation facilities. And VHCs have been established in each of the project villages to help plan, organize and facilitate these improvements.

The long range success of this approach will depend upon what happens when the project ends. Will the committees continue to function on their own to educate their communities and promote other health improvements? Will the initial enthusiasm be sustained and will local leaders continue to work on health needs in their villages?

At this point it is impossible to give a definitive answer, but there are pessimistic indications for the future. The project records show that in only 9 out of a group of 24 villages did the VHCs call meetings of their own. In several of the villages that the evaluation team visited several VHCs had already stopped functioning.

It is the team's opinion that few of these VHCs will continue to function unless:

1. their scope of responsibility is broadened to include other health and development priorities,

2. VHC leaders and members have been trained to conduct meetings and effectively involve their communities in working on projects that they want,

3. that District health staff - be they in W/S or PHC programs provide continued support and technical assistance to these committees.

b. District Level

The project activities have made some impact at this level by developing systematic procedures for planning and implementing W/S improvements and by developing evaluation forms to monitor and evaluate progress. Training in HE and CD has been provided to District Coordinators and Health Educators and this will surely contribute to improved confidence and skills of staff.

An additional project contribution has been the development of a variety of health education materials which District staff can use to promote W/S and VC activities.

A significant problem continues to exist in the area of supervision and follow-up. The lack of transport and time of supervisory staff severely curtails this important support service. This problem situation occurs at 2 levels: the inability (lack of time) of the Chief HE in MNR to provide adequate supervision to District HE's and the inability (lack of transport) of District HE's to provide adequate follow-up to VHCs.

c. National Level

The project HE/CD Advisor has made some progress toward the building of HE/CD capability at the national level. She worked with her counterpart as his time was available in developing a systematic approach to HE and CD in villages and in planning and conducting workshops for National and District staff and for VHCs. She also helped produce a variety of useful HE and CD materials. The development of the CD Manual for water and sanitation projects was a big contribution towards planning, implementing and evaluating W/S projects. It describes a step by step approach in getting communities involved in improving their health and contains other valuable information on health education in W/S projects.

She was handicapped in these activities because of the limited availability of her counterpart and the very limited resources in HECOPAB.

The evaluation team believes that the project advisory team could have made a greater contribution to the development of their counterparts and respective government staff if the following conditions and policies had been established:

1. If the project team, instead of being housed separately in their own office, had been located alongside their respective counterparts. This would have structured a situation which would have improved communication and made closer working relationship for planning and conducting work activities.

2. If the project team had followed a policy of not working independently and directly with villages to implement activities but to always work through or in conjunction with their counterpart and/or the District staff.

3. If the project team had given priority from the very beginning to develop the capability of their counterparts and their respective institutional staff at the National and District levels rather than focusing on the achievement of physical targets in communities. It may have been better in the long run to reduce the number of constructions of water supplies and latrines and increase the time and effort developing good working relationships, improving the knowledge and skill levels of National and District staff and developing a high quality CD process which local staff could use to facilitate village development in health.

F. IMPACT OF USAID AND GOB INPUTS ON THE ESTABLISHMENT OF VEHICLE MAINTENANCE AND REPAIR CAPABILITY OF MOH

Prior to the IPTBH project the MOH vehicle maintenance and repair function consisted of two apprentice-level mechanics working with a totally inadequate variety and quality of handtools a house in a ramshackle shed. The roof of the shed was shot full of rust holes and provided little, if any, protection against the frequent tropical storms. Because of this limited maintenance and repair capability, the MOH vehicle fleet was constantly breaking down and interfering with project activities.

Through the IPTBH project, spearheaded mainly by the long-term vehicle maintenance advisor, the MOH now has a well-built, spacious vehicle maintenance and repair shop, a full complement of quality handtools and mechanical equipment, and a staff including mechanics trained to the journeyman level. This facility is now geared to providing preventive maintenance for the first time as well as quality and comprehensive repairs. This activity has had a tremendous positive impact on the MOH vehicle fleet.

G. COMPARISON OF THE IPTBH, UNICEF & CARE WATER SUPPLY AND SANITATION PROJECTS

Although there are many similarities among the three projects, there were enough differences to make a direct and equitable comparison not possible. For example, the CARE project made little or no capital investments in the purchase or major repair of well-drilling rigs. The IPTBH project made the largest investment in well-drilling rigs, vehicles, spare parts and repairs. It also provided a larger percentage of project funds for technical assistance focussing on institution building and training.

There are major differences in project design and implementation strategies. The CARE project is virtually self-contained. It hires and utilizes its own local staff to plan, implement and manage its operations. It is dependent on the GOB solely for well-drilling services. CARE also operates its own personnel, procurement and logistics systems.

In comparison, the IPTBH project strategy was just the opposite of CARE's. The central idea was to assist in building a GOB institution capable of sustaining development in the rural water supply and sanitation sector. The strategy was to put the GOB institution in full charge of the project. This necessitated working with and through two government bureaucracies, GOB and USAID, with all of their rules and regulations. In effect, decision making authority, as well as responsibility, was diluted and made complex. As a result, project implementation slowed down two specific areas where bureaucratic constraint manifested itself were in AID procurement and GOB personnel actions.

The UNICEF project strategy falls somewhere between those of CARE and IPTBH. Because it operated in only one district, the UNICEF project was less dependent on the central GOB office than was the IPTBH project. It did however depend on GOB district personnel to implement its program. UNICEF was more concerned with developing an institutional capacity at the district, rather than the national, level.

It should also be noted that had the large capital investments in new well-drilling rigs, tools, spare parts and vehicles been spread over their working lives (5,10 or 20 years), the per capita beneficiary costs of the UNICEF and, especially, the IPTBH projects would be significantly lower. Therefore continuation of project activities, by spreading these capital costs over a larger number of beneficiaries, will lower the per capital costs in both the IPTBH and UNICEF projects shown in Table III below.

H. IMPACT ON THE HEALTH AND PRACTICES OF VILLAGERS

Prior efforts sponsored by A.I.D., WHO and the World Bank have been unsuccessful in isolating and measuring the direct impact that the provision of water supplies has on the health and health practices of the beneficiaries. However, it may safely be assumed that there is general acceptance and support by the professional health community that the provision of safe water is a necessary, if not sufficient, ingredient for improved health.

The evaluation team did not have the resources necessary to conduct health surveys of project villages nor does it believe it useful to collect ex post facto information without having baseline data against which to compare them. Anecdotal information obtained from interviewing villagers were inconclusive. However, it may be assumed that villagers who regularly utilize the newly installed water supplies and VIP latrines have a better opportunity to make improvements in their health.

The Chief Health Educator in the MNR has reported that the MNR has received increased requests for improved water and latrines from villages that are near-by to the project villages. Although the demand is higher for water than for latrines.

TABLE III

COMPARISON OF IPTBH, UNICEF & CARE PROJECTS

	IPTBH	UNICEF	CARE
BUDGET DISBURSEMENT (US$1,000)	1,452*	975	1,200
TARGETS PLANNED			
NEW WELLS/H PUMP	250 (83-110)	145	160 (100)
RWS	20 (3+3)	7**	(3)
LATRINES	3000 (1250)	450	1600 (1187)
TARGETS COMPLETED			
NEW WELLS/H PUMP	42*	115	91
RWS	0		2
LATRINES	461*	233	1092
TARGETS IN PROGRESS			
RWS	3	0	1
BENEFICIARIES PLANNED			
WATER	40,000	6,500 + 2 RWS	6,000
LATRINES	10,000	2,000	8,500 (6300)
BENEFICIARIES ACTUAL			
WATER	2,520*	6,900	5460
LATRINES	2,766*	1,398	6552
COST PER CAPITA			
ACTUAL***	$525/CAPITA***	$141/CAPITA	$183/CAPITA

(-) REVISED TARGETS

* AS OF 9/30/88

** LATER ELIMINATED

*** BASED ON COMPLETIONS TO DATE USING STANDARD SERVICE LEVELS OF 6 PERSONS PER LATRINE OR 60 PERSONS PER WELL, WHICHEVER IS LARGER.

40

I. OTHER FINDINGS AND CONCLUSIONS

1. Use of the Pan American Health Organization's Services for Health Education and Vector Control

a. Because of the fundamental importance of health education in promoting improved water, sanitation and other health improvements; and that the present health education capability of the GOB is in its early stages of development it is recommended that the GOB request a short-term consultant from the Pan American Health Organization to assess the needs and requirements for health education within the country and make recommendations for the structure and resources necessary to achieve the country's desired health goals.

b. The NMCP and AACP should maintain a close coordination with the Regional Office of PAHO to obtain consultation and technical assistance in training, vector control techniques and evaluation.

III. RECOMMENDATIONS

A. For USAID:

1. It is recognized that specific targets and goals are necessary in every project, as well as specific policies and procedures to implement them; but it is recommended that these targets be finalized only after consulting with and getting agreement from appropriate District staff and the specific communities concerned. And it is also recommended that these guidelines and policies be administered in a flexible way to be sensitive to the specific needs and conditions of each community.

2. Along with changing targets to be measured, USAID, both directly and through its TA contractor, should concentrate its technical assistance resources on providing advice and assistance to the MNR and MOH mainly in the areas of project management and supervision and training in the area of community development.

3. Although community development was a strong component of this project the methods and outcomes were not clearly spelled out nor were any resources provided for the production of HE/CD materials and for conducting workshops. We believe that some of the difficulties in getting communities involved and sustaining this involvement could have been avoided it the project plan had provided more specific guidelines about implementing this approach. It is recommended, therefore, that the methods and outputs criteria for future community development projects be clearly described and that adequate resources are provided for training and materials production.

4. The evaluation team believes that the only way to assist the GOB in strengthening its relevant institutions is by working operationally and physically within the MOH and MNR. This realignment means physically housing the advisors side by side with their counterparts. It also means the elimination of multiple channels of communications between USAID, PRAGMA and the Government of Belize. Written communications which deal with MOH and MNR activities should follow official ministry channels.

5. Since the IPTBH, CARE and UNICEF water and sanitation projects have carried out slightly different approaches, the evaluation team believes the GOB could benefit from a review of their experiences and outcomes. The team therefore recommends that USAID and the IPTBH project sponsor a workshop to review the experiences of these three projects and develop guidelines for the GOB to promote effective water and sanitation programs.

   Such a workshop should be held before the end of the project and be organized in collaboration with key staff members of the MOH, MNR, WASA and the 3 projects. Workshop participants should come from all levels including representatives from the Village Health

47

Committees, Community Health Workers, District Coordinators and Health Educators, and health education and community development staff from the MOH, MNR and the three projects.

The workshop should be structured to review the strengths and weaknesses of the W/S projects and to develop guidelines for planning, implementing and evaluating rural W/S programs. These guidelines should include recommendations for the following:

- how to involve communities in the programs
- ways to improve coordination and communication between VHC's and the DHT
- HE & CD tasks required of VHC's, CHW's & District Health Educators
- training requirements for these workers

6. USAID, the TA team and the MOH and MNR staffs should meet before the end of the project for the purpose of analyzing ministerial organizations and specifically how they relate to IPTBH project functions and procedures. The analyses should further identify specific structural and staff strengths and weakness. Based on the result of these organizational analyses, the four agencies should then proceed in developing a plan for making any necessary structural and staffing adjustments, for recruiting any new personnel, and for training of staff. The plan of action must be supported by complete job descriptions and qualification requirements.

   Further, operational plans need to be developed and agreed upon. The operational plans should include implementation schedules, logistic and commodity requirements and budget needs.

   The roles, responsibilities and relationships of each agency and their respective staffs need to be defined and agreed to by the GOB. The final question of who pays for what must be addressed.

7. Assuming that USAID will continue to assist the GOB in building an organization capable of sustaining development in Vector Control and WS/S, it should take the necessary steps to achieve that goal. These steps would include bringing in a project re-design team comprised of members with outstanding knowledge and skills in the areas of management, community development, institutional development and training to prepare a modified extension of the project.

   Based on a re-designed and extended project, USAID should seek project approval and funding as soon as possible in order to avoid or minimize any break in project implementation.

8. Assuming that a revised and extended project is approved and funded, the composition of a new technical assistance team would be similar to the present team but would require exceptional expertise in the areas of management supervision and training and also all team members would have to understand and practice the traditional technical assistance role of working with and through the relevant GOB counterparts and avoid directly implementing the project themselves. Continued service of short-term technical consultants will be required in each of the main program areas, i.e. malaria and aedes aegypti control, water supply, sanitation, health education and community development.

9. Most of the short-term consultants were well qualified and did a credible job. The few who exhibited some shortcomings should not be hired for future assignments.

The experience with both long and short-term consultants for the ITPBH Project points to the importance for USAID, the TA contractor and the GOB to get together in developing and writing precise job descriptions and qualification requirements so that the candidates' talents match the needs of the job to be done.

B. For GOB:

1. Rather than continuing to measure project accomplishments by focussing mainly on physical targets, i.e. wells drilled, hand pumps installed and latrines built, the focus should be shifted to:

   (a) amount of community participation, effectiveness of community health committees, functioning of safe water groups and gains in building other community institutions at the village level;

   (b) progress made in the training of and experience gained by district staff in their specialty fields, degree of improvement in coordinating activities of the various project components (including health education, community development, latrine construction, well-drilling, and pump maintenance), work planning, scheduling and reporting;

   (c) development of the national organizational structure, hiring and training of headquarter's staff, progress in program planning and budgeting, improvements in providing direction and support, both technical and material, to project staff at all levels and in instituting and utilizing management information systems.

2. At the present time community development activities are being carried out in the MOH through HECOPAB and the PHC programs, through the MNR in the W/S program and through the Ministry of Labor and Social Services. It is recommended that these activities be coordinated:

   (a) at the National level by the Inter-Ministerial Committee, and;

   (b) at the District level by meetings of the District Health Team and the Core Committee.

3. Since the District Health Educators and the CHW's play a key role in conducting health education and community development in W/S and other health improvements it is recommended that their job descriptions be reviewed and tasks be clearly defined for these responsibilities. It is also important that the requirements for initial and on-the-job training be identified so that they can be properly prepared for their job.

4. It is recommended that the person in the District who will be responsible for health education and community development, and the CHW's, be given training in health education and community development at a level that is appropriate to their job.

5. It is strongly recommended that the scope of the existing VHC's be broadened to include other aspects of human development so they could fit within the framework of the PHC structure and receive assistance from the District Health Teams. This would help insure that the present VHC's would not terminate at the end of the project and would continue to focus the responsibility for health development upon the community.

6. Communities that have good quality leadership are more able to achieve their basic minimum needs when leadership is poor. It is therefore recommended that more effort be given to training men, women and youth leaders in basic leadership skills to enable them to help communities identify their development needs and priorities and to use their own and outside resources to implement projects to achieve these goals.

7. Field activities involving the drilling of wells, installing hand pumps and promoting and assisting in the installation of VIP latrines have become fairly routine. Major investments have been made in upgrading older drilling rigs and purchasing new equipment, however, due to the heavy reliance on mechanical equipment, we can expect continued problems in the well-drilling activity. A major factor contributing to the problem has been the failure to reduce the types of drilling equipment to a minimum number, thereby reducing their operation and maintenance requirements. Therefore continued efforts and pressure must be maintained to finally achieve standardization of equipment.

8. In the rural water supply and sanitation sector where upwards of 80% of the budget comes from external sources, the GOB will be faced in the near future with the problem of assuming a larger share of the financial burden. Assuming that present pressures on the GOB budget will continue in the foreseeable future, the GOB should begin planning a strategy for meeting its obligations in this sector.

   This planning exercise could be made an integral part of or an extension of the multi-agency workshop recommendation described in item 5 to USAID. Among the strategy options available to the GOB are: (1) reducing the level of project activities by stretching out the implementation schedule; (2) placing more emphasis on community development and health education and less on well-drilling and latrine installation; (3) requiring greater contributions by villagers; and (4) changing villagers nominal amounts for specific commodities and services.

9. Because of the length of service already provided by the National Coordinator and the Chief of Operations, the GOB should look ahead and begin identifying and preparing candidates to replace these senior officials. Although our contacts with project staff was limited and incomplete, the evaluation team was impressed with the the work of Ravey Smith, CARE project coordinator and George Andrews, and believe that they could be considered as candidates for national coordinator. One of the obvious candidates for chief of operations would be the master driller trainee, Donald Bennett. In mentioning these names, the team fully realizes that the senior GOB officials who are in close and constant contact with project staff are in the best position to make final judgements about the capabilities and future potential of specific individuals.

10. Preventive spraying should continue in these areas with P. falciparum cases and where the API exceeds 8 cases per 1000 population. A mechanism now exists for the stratification or prioritization of localities according to their positivity. In future spraying operations, only the priority localities need be sprayed. A revision of the spray plan should be made twice a year, before each spray cycle begins.

11. It is recommended that additional efforts be made to involve communities in Vector Control. Community participation, particularly in urban areas, can be of great help in reducing Aedes aegypti infestations. A start has been made, but more could possibly be done in promoting community programs of house improvement and self protection, as well as source reduction for malaria control.

12. A serious technical problem of malaria in immigrants has presented itself in recent years. Not only is malaria difficult to detect and treat in this population group, but movements of immigrants from neighboring countries can reinfect Belizean localities where malaria transmission has been reduced or eliminated. An investigation of malaria in immigrants should be started in 1989

to answer the many questions about the disease in this group. A brief outline of such a study is given in this report. There is an opportunity to carry out other projects of operational research as well, such as evaluation of ULV sprays, dosage and cycle studies of DDT, and locally available biological control agents.

13. Integration of malaria diagnosis and treatment into the general health services is not very far along. Hospital laboratories, both Government and private, should be doing microscopic diagnosis of malaria, with the central malaria laboratory acting as a reference, training and supervisory laboratory. Malaria cases should be treated by the personnel of the general health services in those areas that they serve. Slides should be collected from fever cases in all government hospitals, clinics and health centers, as a part of their normal responsibilities, and not as a special favor to the malaria service.

14. At present the NMCP and the AACP are semi-paralyzed for lack of funds to pay travel allowances, spraymen salaries, gasoline and maintenance expenses. It is recommended that funds be made available to allow these projects to function as planned.

15. Most of the employees of the Aedes aegypti control program are temporary and the turnover is extremely high. It is recommended that these employees be part of the establishment of the Ministry of Health. This project is not a temporary one and efforts to prevent dengue must continue for many years to come.

ANNEX I

DOCUMENTS REVIEWED

ANNEX I

DOCUMENTS REVIEWED

AID. Increased Productivity Through Better Health - Project Paper, approved 12/21/84.

CARE. Belize City Office documents and reports

PRAGMA Corporation. 1985. Belize Increased Productivity Through Better Health Project #505-0018, Technical Proposal, October 11, 1985. Falls Church, Virginia.

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ANNEX II

PERSONS CONTACTED

ANNEX II

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Name	Title
Government of Belize	
David Gibson	Permanent Secretary, MNR
Douglas Fairweather	Permanent Secretary, MOH
Dr. Jose Lopez	Director, Medical Services
Denroy McCord	Chief Engineer, WASA
Winston Michael	Chief Executive Officer, WASA
Roland Rivers	National Coordinator, MNR
Anthony Nicasio	Chief Health Educator
Ivan Tingling	Chief of Operations, MNR
Hugh Broaster	Administrator, MNR
Pearl Serano	Assistant Health Educator, MNR
Eldo Gideon	Mechanic, MNR
Charles Selgado	District Coordinator, Toledo District
Michael Flowers	District Coordinator, Belize Rural
Eugene Middleton	District Health Educator, Belize Rural
George Andrews	District Coordinator, Cayo District
Herman Joseph	District Coordinator, Stann Creek
David Diego	District Health Educator, Stann Creek
Fred Smith	Principal Public Health Inspector
Frank Westby	Administrator, NMCP
Rafael Guerra	Chief of Operations, NMCP
Doreen Gabourel	Senior Supervisor, AACP
Cruz Silva	Chief of Labs, NMCP
Cherry Caddle	Lab Technician, MOH
Angel Arzu	District Malaria Supervisor
Timothy Westby	District Malaria Supervisor, Stann Creek
John McDougal	District Malaria Supervisor, Cayo District
USAID Belize	
Mosina H. Jordan	AID Representative
Mellen Tanamly	General Development Officer
Sam Dowding	Project Officer

Name	Title
PRAGMA/MCD	
Ray McGuire	Chief of Party
Harry Philippeaux	WS/S Advisor
Terry McLean	HE/CD Advisor
Ray Robertson	Vehicle Maintenance Advisor
Daryl Bartholomew	Well-Drilling Advisor
Richard Killian	Pragma Project Co-Director
Joseph Carter	MCD Project Co-Director
CARE	
Frank Brechin	Country Director
Estelito Loria	Project Manager
Sylvano Guerrero	Program Manager
Ravey SMITH	Project Coordinator
UNICEF	
Dorothy Rosga	Former Director
Thierry Del Rue	Former Director
Project CONCERN, Inc	
Wayne Urbanos	Health Coordinator, Toledo

ANNEX III

SUGGESTED OPERATIONAL RESEARCH TOPIC IN VECTOR CONTROL

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During the past few years, the emphasis has been on operations in the National Malaria Control Program, and not on investigations. During this period, several problems have arisen, which should be examined in a scientific way, in order to provide a basis for the solution of these problems. Some of these research topics are:

A. Malaria in Immigrants

The Problem - There is a large influx of immigrants from neighboring countries, and some of these people arrive in Belize with malaria infections. This importation of malaria is difficult to measure and difficult to control, and can lead to focal outbreaks of the disease in areas of Belize where malaria was formerly under control by house spraying. There is a need to know how much malaria exists in immigrant communities, and if their malaria was locally acquired or imported from another country. In addition, the National Malaria Control Program needs to know where fever cases in its population group go for treatment when they develop fever, if they recognize the symptoms of malaria, and what the movement patterns are of malaria infected persons.

Experimental design - A study area is chosen that is known to have immigrant people, from Guatemala or El Salvador, or both countries. The communities studied should have at least 25 houses and be accessible by road. Mass blood surveys (by thick blood film) should be carried out, with an attempt to collect slides not only from actual and recent fevers, but from all residents of the community.

The slides collected in this survey are examined in the central diagnostic laboratory of the Malaria Service. All positive cases will be followed-up , and interviewed, using a specially designed case investigation form. The information collected and recorded will include name and age of case, previous experience with malaria, movements within the past six weeks, knowledge of malaria and treatment of disease, and knowledge of local availability of treatment for fever cases. An analysis of data collected in these surveys will provide information on the extent of malaria in these communities, where the infections were acquired, and the perceptions of immigrants concerning the treatment and cure of the disease.

Resources required - A short-term consultant, knowledgeable in the health aspects of community development, and in the conducting of KAP surveys, should be contracted for two three week periods, one at the beginning of the study, and one at the end. This expert will develop a study protocol in collaboration with the Epidemiologist of the Ministry of Health, and the Chief of Field Operations of the National Malaria Control Program. This consultant will develop the required survey forms, and train two interviewers who will be employed for the duration of the survey (2 - 3 months).

The National Malaria Control Program will detail two employees for the duration of the project to carry out the mass blood surveys in immigrant villages. If this is not feasible, then the NMCP should arrange for the training of two persons in making house to house surveys and the actual taking of malaria blood films, these persons to be employed for the duration of the project.

Slides from this survey will be examined at the central malaria diagnostic lab in Belize City. Motor transport will be needed by the survey and interview team, and should be provided on loan by the NMCP, or rented locally if necessary. The short-term consultant should return at the completion of the survey in order to analyze the data collected. A report should be submitted to the Ministry of Health and AID, and consideration given to the publication of the findings in an appropriate scientific journal.

B. Effectiveness of Ultra Low Volume Sprays in the Control of Aedes aegypti in Belize City

The Problem - Although truck mounted ULV generators are locally available, and have been used routinely in anti- Aedes aegypti work, there are still some questions about the efficiency of this method under Belizean conditions. There is some doubt that the aerosols reach adult mosquitoes resting in houses built high off the ground, as is the case with many Belizean houses. Another question is whether ULV spraying has any effect, and particularly any lasting effect, on house positivity indices based on larval inspection.

Experimental design - A protocol will be developed with the technical assistance of the regional PAHO Entomologist, or in the absence of this resource, with a short-term consultant with experience in the evaluation of ULV spraying operations.

A 15 - 20 block area will be chosen in urban Belize City for these trials. A pre-spray larval survey will be done in every premise of the trial area. Caged adult Aedes aegypti will be placed inside and outside of houses. The area will be sprayed with ULV malathion at 4 fl. oz./acre. Post spraying adult mortalities from the bio-assay tests will be recorded, and post-spray larval surveys performed after the application at two weekly intervals. In addition, 20 ovitraps will be run before and after spraying.

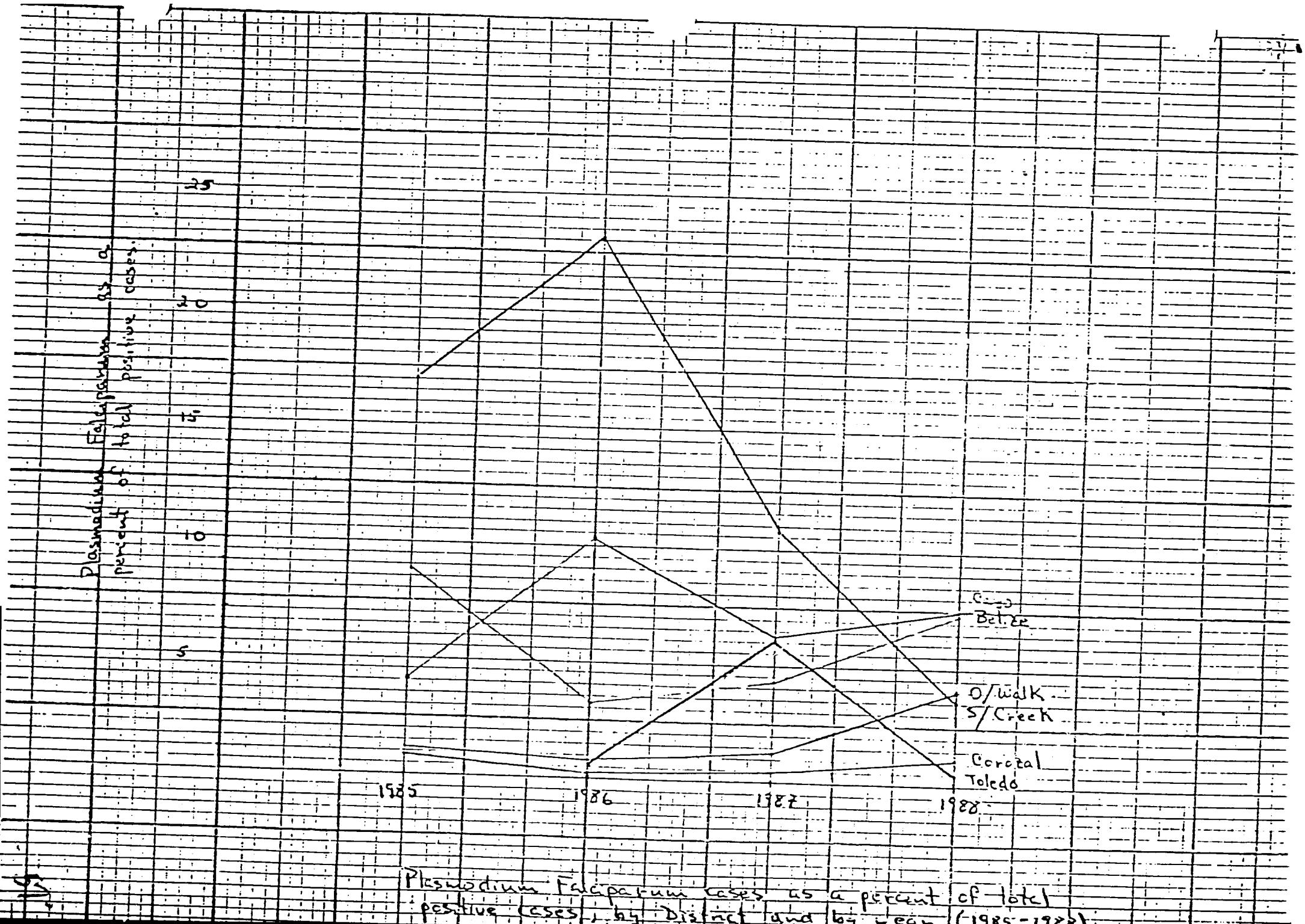
Resources required - After the initial development of the protocol, the three entomological aids already trained and at work in the NMCP will be able to carry out the bio-assay component of the trial, under the direction of the Supervisor, Aedes aegypti Control Program. For a dependable source of adult mosquitoes for these tests it would be advisable to establish a laboratory colony of Aedes aegypti, and accumulate eggs for several weeks before the trial is to begin. A ULV machine and trained operator are available in the Aedes aegypti program. The findings can be evaluated and a report submitted by the Supervisor, Aedes aegypti Control Program.

ANNEX IV

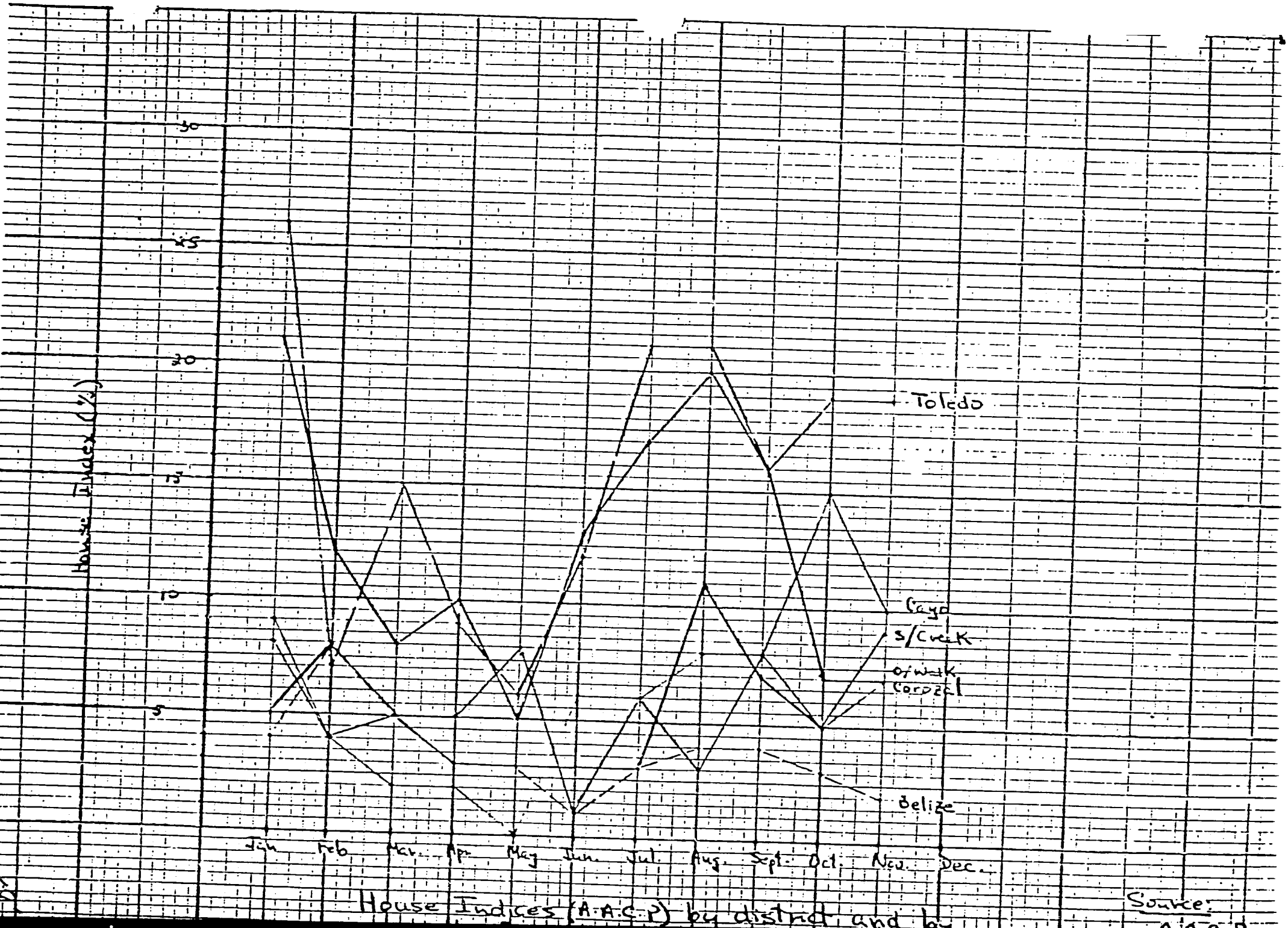
A. ANNUAL PARASITE INDICES, BY DISTRICT AND YEAR

B. PERCENTAGE OF FALCIPARUM MALARIA, BY DISTRICT AND YEAR

C. AEDES AEGYPTI, BY DISTRICT AND MONTH, 1988



Plasmodium Falciparum cases as a percent of total positive cases, by District and by year (1985 - 1988)



House Indices (A.A.C.P) by district and by

Source: A.A.C.P