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FINAL REPORT
MALARIA CONTROL
SRI LANKA

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EXECUTIVE SUMMARY

BACKGROUND

This is the final report of a contract the International Science and Technology Institute, Inc. (ISTI) had in support of A.I.D.'s \$30 million Sri Lanka Malaria Control Project (Project No. 383-0043). The final contract amount was \$2,485,641. Expenditures will total \$2.1 million. Major contract activity was completed by February 26, 1988, but commodity procurement continued to September 30, 1988.

A project amendment in 1983, which provided the grant funds for this contract, added a major new component -- the institutionalization of an effective system of malaria control, using alternative malaria control activities -- to what had been a more traditional project based on insecticide spraying and surveillance.

MAJOR CONTRACT ACTIVITIES

Technical Assistance

ISTI supplied two long term resident advisors and 24.75 person months of short term technical assistance, including nine months of local consultant time. Forty-five percent of the TA was in training and in adult education. The remainder covered a wide range of topics -- from planning and management to microscope repairs and servicing. With one exception, all consultant reports were delivered within one month of the end of the consultancy.

Training

Major training activities included:

- o Training Abroad: 25 persons trained in a variety of subjects in the U.S., including 8 trained in Integrated Vector Control (IVC) and 34 field personnel on regional study tours which emphasized IVC.
- o In-country Training: 139 persons trained in 14 courses covering 10 different subject areas; 103 persons trained in IVC by staff members trained in the U.S.; a National Seminar with 40 attendees; and three Regional Workshops, with 144 attendees.

Considerable support was also provided to the AMC National Training Centre, but the appointment of technically qualified personnel to manage the Centre remains a critical need at the AMC. Internal AMC training also suffered because a Working Group on Training and a

Training Advisory Committee, established early in the project, ceased to function after the first two years.

Operational Research and Pilot Projects

Performance in this major activity fell far below contract projections. The AMC Research Committee was ultimately able to approve only four projects for ISTI funding. The primary reason for this was the fact that principal investigators were often reluctant to correct deficiencies or defects in their research proposals. Of the four approved projects, two achieved their objectives, one did not, and one was continuing at the end of February, 1988.

Information, Education and Communication (IE&C)

The major IE&C activity was the conduct of a multi-media publicity campaign under a subcontract with Thompson Lanka, an advertising agency. The campaign was aimed at correcting negative public perceptions of anti-malaria activities that were identified in a market research study commissioned to survey attitudes affecting community participation. Progress in other areas of IE&C was limited by the problems of the Training Centre, noted above, and AMC's inability to establish an Information Center.

Planning, Management and Evaluation

A Project Implementation Planning Workshop reached agreement on issues such as goals, strategies, priorities and implementation plans; and much of the training provided under the project was directed at enhancing supervision and management skills and team building. Despite this, progress in planning and management was hampered over the life of the project by such factors as:

- o Failure to decentralize and delegate more authority to the AMC regions, to adopt needed organizational changes, to revise job descriptions and to obtain approval for a two way radio communication system;
- o Inability to implement prepared detailed Annual Plans of Action (e.g. no monthly technical meetings were held in 1987), or to fill key vacancies and to hire needed staff, particularly for the IVC Project; and
- o Underutilization of the project supplied computer, and the personnel trained in its use, due in large part to restrictions on access to computer time.

A mid-term evaluation of the contract performance was generally favorable, but noted the lack of progress in the development of additional vector control methods, other than residual spraying. The evaluation recommended a regional pilot IVC demonstration

project. This project is underway in Hambantota, but it has been delayed by slow preparation of an Action Plan, and the planning and management problems cited above.

Reports

Over the life of the contract, monthly, quarterly and annual ISTI progress reports were sent to A.I.D., the AMC and the Health Ministry.

Equipment and Supplies

Working through a subcontracted procurement service agent, ISTI provided over \$600,000 worth of equipment and supplies to the AMC and the IVC pilot project. A notable example was the provision of 1.1 million glass slides, enabling blood slide examinations to reach a record total of 1.9 million in 1987.

CONCLUSIONS

Project implementation under the ISTI contract was nearly 100% in the areas of technical assistance, training abroad and within the country, implementation of study tours in the region and procurement. Implementation was less successful with respect to operational research and pilot projects and malaria education and information. Planning, management and evaluation, and IVC Project implementation were least successful.

There does not appear to have been adequate realization within the AMC of the full potential of the Project in terms of long-term effects on malaria control in Sri Lanka, particularly in introducing alternative malaria control activities which reduce reliance on house spraying with residual insecticides. There is an innate resistance, particularly among the medical officers, to change and to the use of new methods and techniques. This has resulted in a sharp decline in the effectiveness of the program. (1987 recorded the highest overall case incidence and incidence of P.falciparum infections in the last thirty years.)

Much of the initial impetus generated by the Project Implementation Planning Workshop in August 1984 was lost when the AMC directorate was unable to generate the effort that implementation of the Project activities required.

With the rapid deterioration of the malaria situation and the management problems of the Malaria Control Program, the direction from the Health Ministry to the AMC needs to be strengthened, and the Ministry needs to support the AMC Director against forces for the status quo within the AMC ranks. A key part of this is the reorganization of the AMC, which is urgently required.

I. BACKGROUND

A. GENERAL

The Government of Sri Lanka has had a continuous anti-malaria effort since the 1930's. It began as an anti-malaria campaign and expanded into a countrywide Malaria Control Program which continues today except for a few years in the 1960's when a malaria eradication program was operative. However the name of the organization responsible for the malaria control program is the Anti-Malaria Campaign.

In support of this effort, the Agency for International Development (A.I.D.) established the Sri Lanka Malaria Control Project (Project No. 383-0043) in 1978. Originally, the Project provided a loan of \$12 million, primarily for insecticides.

The Project grew out of a large increase in the incidence of malaria, as a result of a breakdown in surveillance and other routine anti-malaria operations, and climatic and other factors favoring malaria transmission. The project was defined as "a large-scale five-year effort to reduce the incidence of malaria in Sri Lanka to a minimum of one case per 1000 population per year country-wide." It was a traditional program, divided into three phases:

- intensive spraying,
- selective spraying with surveillance, and
- surveillance with phased integration into the General Health Services.

Seven program components in support of these three phases were identified.

In 1979, Amendment No. 1 to the Project Paper added \$4 million to the loan amount; deleted reference to completion within five years; and added an eighth program component. It called for specific anti-malaria services in the new development and settlement schemes in the Dry Zone (including Mahaweli) over the period 1980-1984.

In 1983, Amendment No. 2 changed the objectives and tactics of the A.I.D. project. Controlling the incidence of malaria remained, but institutionalization of an effective malaria control system was added. The amendment provided an additional \$10 million in loan funds for malathion, and a grant of \$4 million in support of institutionalization. This grant component provided the funds for the contract with the International Science and Technology Institute, Inc. (ISTI), which is the subject of this final report.

The institutionalization component contained three objectives:

- to improve the effectiveness of insecticide spray operations,
- to institutionalize effective surveillance, and
- to introduce alternative malaria control activities which minimize the need for house spraying of insecticides.

Amendment 2 also extended the Project Assistance Completion Date to October 31, 1987, and it was subsequently extended to December 31, 1988.

B. THE ISTI MALARIA CONTROL PROJECT

The Contract

The contract between A.I.D., the Small Business Administration (SBA) and ISTI, which established the ISTI Malaria Control Project (referred to hereafter as the Project), was effective June 30, 1984. The original contract was for \$2,935,700, with funds obligated in the amount of \$1,083,000, and a contract completion date of July 31, 1987. Amendment No. 1 increased the obligated amount to \$2,935,700 - the full contract amount. Amendment No. 2 reduced both the contract budget and obligated amounts to \$2,485,641, and extended the contract completion date to February 26, 1988. Amendments 3 and 4 extended the contract completion dates, to complete procurement only, to August 15, 1988 and September 30, 1988 respectively.

The complete Scope of Work for the contract is attached as Annex 7. The scope provided that ISTI's assistance would include, but not be limited to:

- Advice on technical matters in epidemiology and entomology;
- Studies of operational and scientific aspects of the program;
- Assistance with pilot testing of new approaches to malaria control and the incorporation of the most successful ones into the program and related training;
- Assessment of and advice on all aspects of training, both in-country and overseas;
- Advice and training on program management, including information systems, planning, organizational issues, and the like;

- Assumption of responsibilities associated with the procurement of A.I.D.-financed commodities, equipment, and training; and
- Assistance to strengthen the information/education capabilities of the AMC.

The Scope of Work provides more detailed statements of work for seven separate activities. These are discussed in more detail in the succeeding chapters of this report.

The Start-Up

The ISTI Malaria Control Project came into operation on July 11, 1984, when Dr. F.A. Wickremasinghe assumed the position of Project Coordinator. The other long-term staff member, John O. Stivers, assumed his duties as Vector Control Specialist on August 5, 1984.

At the beginning, the ISTI office was located in a room at the Bandaranaike Memorial International Conference Hall. It shifted at the end of February 1985 to the AMC premises, where the room assigned to ISTI was renovated and refurbished. The early months of the Project were taken up with organization and administrative matters: recruitment of staff; purchase of office equipment, furniture and supplies; formulation of organizational operating procedures; clearance of vehicles; etc.

The effective start-up for Project implementation was the holding of the Project Implementation Planning (PIP) Workshop, conducted by short-term consultant David Levine in mid-August 1984. The outcome of this workshop was the formulation of an eight-month work plan. This exercise was an extremely valuable one for all participants, as it demonstrated the value and methods of developing and implementing short- and long-term planning and programming. It also explained to the participants the relationships and functions of ISTI in relationship to the Project. The responsibilities and functions of AMC personnel were reviewed against the different components of the work plan. Four working groups in the AMC were established for the main components of the Project: Training, Operational Research, Information and Education, and Management and Evaluation. This workshop set in motion the implementing actions of the Project.

The Security Situation

Throughout the life of the contract, the activities of the AMC and ISTI's performance under the contract were adversely affected by the civil unrest, particularly in the north and eastern sectors of the country and later in the south, some unrest in Hambantota region greatly hindered the launching of the pilot Integrated

Vector Control Project there. However, over the life of the contract, AMC and ISTI activities continued, as means were found to work within and around the security situation.

Encephalitis Outbreak

Anti malaria activities were disrupted early in the project by the need to divert AMC and ISTI resources to combat an outbreak of Japanese encephalitis in the north central part of the country in late 1985. ISTI personnel spent considerable time in the field, working directly with AMC personnel to successfully combat it. Unfortunately, ISTI staff resources were diverted at the same time to deal with a Congressional inquiry resulting from an unwarranted vendor protest arising out of the emergency procurement of commodities to combat this encephalitis outbreak.

Project Direction

Several interrelated problems of project direction adversely affected project activities throughout the contract.

The first was the problem of AMC leadership. At the beginning of the contract, the then Director of AMC was on the verge of retirement. He was on extended leave for over six months and retired from service another six months after resumption of duties. In this situation he was not able to provide the positive direction that the project, which called for a shift away from reliance on residual spraying, required. This was compounded by the fact that his successor operated for some time in an acting capacity, a situation which circumscribed his ability to act decisively.

Another factor was the number of changes in A.I.D. Project Officers. Five different persons were responsible for the direction of the overall Malaria Control Project during the four year life of this contract. While all of them were competent and conscientious officers, differences in management style and outlook did present problems of continuity that had to be dealt with.

The third factor was the apparent lack of a clear commitment to the project by the Health Ministry. Throughout the project, the Ministry did not generally provide the firm direction and support which the Director of the AMC needed. This weakened the Director's ability to deal with senior members of his staff who, in turn, were not committed to an alternative approach to malaria control.

However, a mitigating factor was the presence of a limited number of key AMC personnel who were dedicated to the project, and willing to utilize its resources to the fullest. These persons contributed intelligently and energetically to the work of the project throughout. They were the primary source of counterpart support for short term consultants, which was generally excellent.

II. TECHNICAL ASSISTANCE AND TRAINING

A. TECHNICAL ASSISTANCE

The ISTI contract provided for 96 person-months (pm) of direct labor, consisting of 70 pm of key personnel and 26 pm of other personnel. The total number of pm of key personnel and other personnel utilized during the Project period was 71 and 24 3/4 pm respectively. The 71 person-months of key personnel were: N. Goonewardene, Project Manager (3.5); Dr. F.A. Wickremasinghe (43.5), and John Stivers (24). The 24 3/4 pm of other personnel included 15 3/4 pm of consultants from abroad and 9 pm of local consultants.

The nine person months of local technical assistance were particularly important to the project. Local consultants were utilized in 22 separate, relatively short assignments. All but one of these assignments were for training, or support of the national seminar and workshops. Half of the training assignments were in the field of management and team building -- areas where local expertise was critical.

Overall, forty-five percent of the short term Technical Assistance was for Training and Adult Education. The areas or fields of utilization of other personnel were:

- Planning and Management (2 3/4 pm)
- Data Management (9/8 pm)
- Training (1 pm)
- Public Opinion Measurement (3/4 pm)
- Training and Adult Education (11 pm)
- Vector Control (2 1/4 pm)
- Health Education and Materials Production (1 pm)
- Computer Applications (1 3/8 pm)
- Bti Production and Storage (7/8 pm)
- Research (1/4 pm)
- Education and Information (2 pm)
- Microscope Repairs and Servicing (1/2 pm)

Details of the foreign and local short-term consultant assignments are provided in Annex 1. A list of consultant reports is contained in Annex 2. The level of performance under this component was almost 95%, which is considered very good, taking into account the problems inherent in selecting, offering and supporting foreign consultants. Consultants were almost always those proposed by ISTI, except in a few instances where AMC indicated its preference. (The AMC was not responsive to suggestions for consultant preferences for training of local personnel in the use of computers.) Foreign consultants were recruited by ISTI/Washington, and local consultants by ISTI/Colombo; with USAID and GSL

concurrence. The reports of the consultants were made available to AMC/MOH within one month of the visit of each consultant, with one exception.

While the technical assistance was generally recognized as being of high quality, and the reports were submitted on time, the Project faced continuing problems of implementation. The AMC was generally reluctant to make changes and implement recommendations, even when no financial commitment was involved. It required a continuing effort by ISTI staff over the life of the Project to convince AMC of the usefulness of and need to implement recommendations in the interest of the Malaria Control Programme.

B. TRAINING

Progress under this component during the life of the Project was consistently maintained. Activities accomplished versus those planned or specified under the ISTI contract are set forth in detail in Annexes 3, 4 and 5, and are summarized below:

<u>ACTIVITY</u>	<u>PLANNED/ SPECIFIED</u>	<u>ACCOMPLISHED</u>	<u>NO. TRAINED</u>	<u>%</u>
Training abroad	30 pm	29 1/2 pm (Annex 3)	17	98%

Remarks: Training Program of 1/2 pm withdrawn by MOH

Training within country	Not specified	14 training activities in 10 different aspects (Annex 4)	139	
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Remarks: Number of training programs attended by staff ranged from 1 to 6.

Training in IVC by trainees on return from University of South Carolina	6	5 courses held at Hambantota, Anuradhapura (2), Kurunegala, Girandurukotte (Annex 4)	103	84%
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Remarks: AMC was unable to organize the sixth course.

Study Tours	30	34 in Thailand/ Malaysia and Thailand/ Indonesia (Annex 3)	34	113%
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Remarks: For PHIs (27) and EAs (7) in five batches.

National Malaria Control Seminar	1	1, Colombo, April 1985 (Annex 5)	40	100%
Regional Malaria Control Workshop	3	3: Tangalle, Kandy, Anu- radhapura (Annex 5)	144	100%
Vector Control Training, University of South Carolina	3	3 courses (Annex 3)	8	100%

Remarks: Trainees exceeded by two.

Training Abroad

The training in the U.S. was largely in Integrated Vector Control (IVC) at the University of South Carolina, field training at mosquito abatement centers, and participation in short courses in Biostatistics/Epidemiology, Computer Applications in Vector Control, and Procurement and Supply Management. Third-country training was in Basic Malariology at the National Institute of Communicable Diseases, Delhi, India, and Drug Sensitivity Training and Laboratory Techniques in Mahidol University, Bangkok.

The study tours were in operation from the second year of the Project, after visits of the Project Coordinator to the countries in the region, during which arrangements were finalized with host country authorities. However, after three successful study tours, ISTI had to contend with the withdrawal by the Health Ministry of the nominations of the PHIs for the fourth study tour after arrangements had been completed. Discussions between the Director of A.I.D. and the Minister of Health resulted in restoration of the nominations, and thereafter ISTI did not have any problem regarding nominations for training abroad.

In-Country Training

Fourteen in-country training activities were carried out, with 139 participants, some of whom attended more than one training activity.

AMC headquarters, regional, and sub-regional technical staffs received most of the in-country training. Attention was focused upon enhancing their skills in management and team-building and training methodologies, in order to improve the standards of training and operations and to improve efficiency.

Throughout the Project, management training and team building, and training of trainers were the major foci. Among others, this effort included:

- Two training of trainers workshops, one for senior headquarters staff, and a second for RMO's and PHI's;
- Supervisory skills training for headquarters staff, RMO's and PHI's;
- Team building workshops for the IVC pilot project at Hambantota; and
- An integrated series of management workshops which cut across organizational levels. These culminated in an overall workshop at which personnel from all organizational levels jointly addressed organizational and management issues and their solutions.

Five separate training programs on IVC were organized and conducted at Hambantota, Kurunegala, Girandurukotte, and Anuradhapura (2) by the trainees who returned from the South Carolina course. The participants at these short training courses included regional malaria officers, public health inspectors at regional, sub-regional, and peripheral levels, and Malaria Supervisors. Thus, nearly 65% of AMC supervisory staff of spray operations have been trained in IVC methodology -- providing the AMC with a high level of capability in this approach. The AMC IVC capability has been further strengthened through study tours of 34 PHIs/EAs in Thailand and Malaysia, where emphasis was upon IVC activities in Malaria Control Programs.

At the initiative of the ISTI Project Coordinator, AMC approved a training program for supporting staff: storekeepers and clerical staff engaged in statistical work. ISTI obtained placements for these staff members in courses conducted at the National Institute of Business Management. There were no requests from the AMC directorate for training of other support staff at courses run by National Training Institutes.

National Training Centre

The AMC National Malaria Training Centre was short of staff and lacked essential equipment and supplies. Some of the equipment provided by WHO and other donor agencies was in disrepair. ISTI assistance was extended to strengthening of the National Malaria Training Centre with the supply of audio-visual equipment, library books, and other accessory items such as air conditioners, costing Rs. 412,525. However, the utilization of these items of equipment was impaired, as the Centre was not available for use by other sections of the AMC when the Medical Officer in charge of the Centre was on leave or away from his duty station. At these times the Training Centre staff had strict orders not to issue any equipment. At times intervention of the Director/AMC was of no avail.

No determined efforts were made by the AMC directorate to strengthen the staff of the Training Centre by the appointment of an educational technologist and a health educator, or to develop a budget line for Training in the AMC budget; even though these matters were strongly urged by ISTI Project Coordinator at meetings of the Working Group on Training. The appointment of technically qualified personnel to manage the Training Centre remains a critical need at the AMC.

Seminars and Workshops

The National Malaria Control Seminar was held in April 1985 (as called for in the contract). The timing of the three regional workshops was upset because of postponement of the First Regional Workshop from January to April 1986 owing to an outbreak of Japanese encephalitis in the north central part of the country at the end of 1985. The representation of Government Departments and Agencies at the National Seminar and Regional Workshops was very good and most encouraging. The participants cooperated in the preparation of Working Papers and were actively engaged in the discussions. The seminars and workshops were extremely useful in bringing about close contact between the AMC Headquarters and Regional Staffs, and key personnel in other sectors at central and district levels. A number of useful and practical recommendations were adopted to be implemented at the district level. However, the implementation of these recommendations has been held up in the absence of a mechanism for direction and guidance of these activities. The establishment of a National Malaria Coordinating Committee with representation of important departments or agencies, which was recommended at the National Seminar in April 1985, is long overdue. This has been brought out at the Regional Workshops by the ISTI Project Coordinator, but action by the Ministry has been delayed.

Training Management

A Working Group on Training was established soon after the Project Implementation/Planning Workshop in August 1984. Meetings of this group were held regularly in the first year, but thereafter these meetings were less frequent and by the end of the second year were discontinued.

An advisory Training Committee comprised of the Deputy Director, a Medical Officer (Training/Health education) and an Entomologist was established. This Committee revised pre-service curricula content by including components in management, supervision, and community education. Unfortunately, training programs for field staff have not been held for over three years, and this Committee is now almost defunct.

III. OPERATIONAL RESEARCH AND PILOT PROJECTS

A. GENERAL

Other than procurement, the largest category of funding (\$402,000) was for this component of the Project. This component aimed to introduce alternative malaria control measures which would minimize the need for house spraying with residual insecticides.

At the Project Implementation Planning Workshop held in August 1984, a Working Group on Research was established and a convener identified. One of the initial activities under this component was the holding of a Malaria Research Workshop in October 1984, at which representatives of Sri Lanka Universities and Agencies with research capabilities and technical staff of the AMC and Health Ministry participated. Its purposes, which were achieved, were:

- to identify and prioritize the areas in which it was felt that research was required to improve malaria control in Sri Lanka;
- to determine which organizations were prepared to assist AMC in carrying out the research; and
- to assign to such organizations and/or AMC the responsibility of preparing protocols for carrying out the research in each of the projects identified.

At this workshop, sixteen ongoing research projects were identified, and fourteen new projects in Chemotherapy, Vector Biology and Control, Social and Cultural Determinants in Malaria Transmission, and Control Measures through Community Participation were identified. The principal investigators were largely from the AMC, working in collaboration with the Universities and other Government Agencies.

An AMC Research Committee consisting of the Director, Deputy Director, and Senior Entomologist was formed to screen the protocols and to forward them to ISTI for funding. A number of meetings of the Working Group were held where protocols were discussed and deficiencies were noted, but the principal investigators often were reluctant to rectify the deficiencies or defects for funding purposes. There were frequent delays in forwarding protocols to ISTI and USAID from the Research Committee.

Ultimately, of the fourteen new research proposals identified at the Workshop, only three protocols were approved for funding; and one additional project was approved. The four approved research projects were:

- A survey of public attitudes toward malaria control activities;
- A study of different drug regimens in the treatment of malaria in Sri Lanka;
- A survey to ascertain the prevalence of G6PD enzyme deficiency in Sri Lanka; and
- The introduction of ELISA as a tool in malaria entomology and epidemiology.

B. SPECIFIC PROJECTS

RESEARCH PROJECT NO. 1:

SURVEY OF PUBLIC ATTITUDES TOWARD MALARIA CONTROL ACTIVITIES

A project to determine the cause(s) of AMC's operational failures in residual insecticide spraying and drug administration was contracted to Sri Lanka Market Research Bureau (LMRB) in 1985. As there was no technical reason for these failures, it had been attributed to the high rate of refusal of householders to allow their dwellings to be sprayed, and the refusal of individuals with confirmed cases of malaria to complete the full regimen of treatment necessary to prevent relapses and continued transmission of the disease. The question which had to be answered before remedial action could be taken was, "Why these refusals?"

A survey was undertaken to determine the public's general reaction to AMC operations, specific reasons for refusal to cooperate with AMC, the depth of public knowledge about malaria and AMC operations, and best channels of information to the public. A questionnaire devised for the survey was field-tested by LMRB experts. The survey was carried out in Kurunegala district and was completed in May/June 1985. The report was made available to AMC, A.I.D. and ISTI in August. The findings of this survey provided the basis for an advertising agency to design sample posters and brochures and press advertisements, and for producing audio and visual tapes and radio/TV spots for a publicity campaign.

RESEARCH PROJECT NO. 2:
STUDY OF DIFFERENT DRUG REGIMENS IN SRI LANKA

The protocol for this research project was approved by ISTI and USAID as a high priority, because the findings and results could have an impact upon the AMC program by reducing the likelihood of the patients' discontinuing the treatment before it is completed and by drastically reducing the total drug requirements.

The principal investigator was Dr. L.D. Telisinghe. The co-investigators were Dr. W.P. Fernando and Dr. A.C.C. Senaratne of the AMC. The total budget approved was Rs. 593,500 (U.S.\$21,500). The total expenditure was Rs. 539,390.

The objective of the study was to determine the efficiency and tolerance of four drug regimens in the management of malaria. A fifth drug regimen was added during the project.

The project was carried out in the Puttalam health area. It came into operation on December 1, 1985, and terminated on February 28, 1987. In the implementation of the project, the principal investigator deviated from the approved protocol without prior approval. Supervision by the investigators was not consistent. In many instances, visits to the project were not supported by short notes of work carried out. There is some doubt regarding results of the G6PD deficiency study of 50 patients. Quarterly reports were of limited value and not submitted on the due dates as required. More management involvement was needed.

The report of the study was received in September 1987 after protracted correspondence. It provides information on the methodology, screening, and selection of patients under different drug regimens, follow-up of blood filming of patients after treatment, and of drug side effects observed. The results were tabulated for the five drug regimens. The sample size in each drug regimen was over 150 except regimen E with 52 patients, although a sample size of 500 was envisaged for the first four regimens. Of a total of 669 patients in the study, 191 patients (28.5%) dropped out -- the drop-out in each regimen being 35%, 30%, 27%, 20% and 34% respectively.

According to this study, the three-day regimen seems most effective and the one-day regimen least effective, but in view of the drop-out rate exceeding 15% in each group, the results of this study are inconclusive. Thus, the objectives of the study were not achieved.

RESEARCH PROJECT NO. 3:

SURVEY TO ASCERTAIN THE PREVALENCE OF G6PD ENZYME DEFICIENCY IN SRI LANKA AND ITS GEOGRAPHICAL AND ETHNIC DISTRIBUTION

The principal investigator and co-investigator of the research study were Dr. W.P. Fernando, Deputy Director/AMC, and Ms. R.P. Ratnapala, Parasitologist/AMC.

Limited studies on G6PD enzyme deficiency in Sri Lanka had been carried out earlier by a few workers, but this study was the first of its kind on a country-wide basis. The project sought to identify those geographical regions and population centers with a high prevalence of G6PD deficiency. This would enable clinicians to make informed choices concerning the risk of hemolysis versus the occurrence of relapses with increased transmission.

The study commenced in May 1986 with the receipt of G6PD test kits, and by November 1987 seventeen districts were completed. Surveys in eight districts in the north and east unfortunately could not be done because of disturbed conditions in these districts. To offset this disadvantage in ethnic distribution, a few Tamil and Muslim schools in Colombo were surveyed.

This survey was carefully planned, well supervised and efficiently carried out, with one of the investigators working in the field when the survey team was operating in the districts. The report provides information on the methodology, procedures adopted on sampling, and the screening process. The detailed results of testing in different school districts are given in an Annex. It would have been useful if the degree of deficiency graded as mild, moderate and gross deficiency had been noted.

It would also have been useful if the findings of the survey were discussed in relation to malaria endemicity in the country.

Except for the three districts of Anuradhapura (7.75%), Polonnaruwa (19%) and Hambantota (7%), in all districts the enzyme deficiency rate was found to be less than 4%; and in ten districts less than 1%. This study needs to be intensified in the three high-deficiency districts - Anuradhapura, Polonnaruwa and Hambantota - and if possible should include quantitative estimations.

There is no reference in the report as to whether those found deficient were issued cards indicating that they are G6PD-deficient individuals, and of the need for these individuals to inform those prescribing anti-malarials of the enzyme deficiency trait.

The overall prevalence of G6PD enzyme deficiency in Sri Lanka is 2.97% (range 0-19%), which compares favorably with India and Thailand. On the basis of these findings, the withholding of

primaquine in the radical treatment of malaria by some clinicians is not tenable. The Health Ministry should share the study's findings with the medical community in Sri Lanka.

Publication of this study in an international journal would be useful to researchers and those interested in this enzyme deficiency trait. If published, the authors should acknowledge that funding of this study was by USAID. The operational costs of this study, excluding test kits, was Rupees 43,412. The cost of test kits was \$4,922.

RESEARCH PROJECT NO. 4:
INTRODUCTION TO ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA) IN THE
STUDY OF MALARIA ENTOMOLOGY/EPIDEMIOLOGY IN SRI LANKA

This study, which is considered essential and urgent towards malaria control efforts, was approved on 2 April 1987. The principal investigator is Dr. P.R.J. Herath, Senior Entomologist/AMC. She was afforded training in ELISA at the Walter Reed Army Institute for Medical Research. Limited initial supplies were provided by ISTI, but the bulk of equipment and supplies, including the ELISA Reader, were not available until the spring of 1988. Studies carried out with limited supplies and borrowed equipment have demonstrated the presence of both P.vivax and P.falciparum circum-sporozoite protein (CSP) antigens in a number of anophelines. With Pf there is clear evidence of five species: An. culcifacies, An. annularis, An. nigerrimus, An. subpictus, and An. vagus. Sporozoite antigens at low sporozoite loads have also been detected in other anopheline species. In general, however, An. culcifacies appears to be the most infected with these plasmodia. The findings of this study on development of malathion pesticide resistance in some anopheline species will have a strong bearing on planning of malaria control strategy in the future in the country.

IV. MALARIA EDUCATION AND INFORMATION

A. PUBLICITY CAMPAIGN

In order to promote this activity, in January 1985 ISTI engaged John Davies, a Public Opinion Measurement Specialist, with previous experience in Sri Lanka as a consultant. His task was to recommend the most appropriate method of determining reasons for the lack of public cooperation with the AMC, and for correcting these public attitudes. He recommended that the task be contracted to professionals in the field, and he assisted ISTI/AMC in choosing a local agency to carry out a mass public opinion survey on knowledge of malaria and AMC programs and operations. This became Research Project No. 1, discussed above.

The survey report was made available to AMC in August 1985. However, action on the next phase of the survey, namely, the launching of a publicity campaign based on the survey's findings, was delayed for over 18 months by the AMC authorities. During this period, ISTI continued to press for a publicity campaign aimed at increasing public acceptance of spraying and taking the full course of radical treatment. Because of the importance of the public education activity, ISTI's concerns ultimately resulted in a meeting between the Director of the A.I.D. Mission and the Minister of Health. As a result, a Health Education and Materials Production consultant was employed in April 1987, a national communication strategy for the AMC was developed, and a contract was signed with Thompson Lanka, an advertising agency, for a publicity campaign.

The contract called for Thompson to develop an effective communications package consisting of a media campaign using the press, radio and TV; a poster campaign to take messages to specific places; booklets, largely for use in schools; leaflets for distribution to the public; and production of a film on malaria. The agency was also required to construct, decorate and equip the AMC stall for Gam Udawa in Kataragama. The budget approved for the publicity campaign, including Gam Udawa, was US\$63,461.78 (Sri Lanka Rupees 1,898,660).

At the outset of the publicity campaign, the advertising agency encountered difficulty because of the non-availability of the AMC Officer who was to liaise with them. With his replacement by a more responsive officer, it was possible to complete the Gam Udawa activities in time, and thereafter the publicity campaign gathered momentum. The media campaign was in full stride from September 1987 until the end of February 1988. The other items of the communication package -- 25,000 booklets, 45,000 posters, 82,300 leaflets and 16 sets of 13 posters, each screen-printed, were made available to AMC before project termination.

B. OTHER ACTIVITIES

The National Seminar and Regional Workshops referred to in Chapter II were given adequate publicity in the centers where they were held.

The AMC authorities did not adequately address some of the constraints to improvement in the education and information area, such as appointment of a health educator and educational technologist, and the establishment of a materials production unit and an AMC information center. This may have contributed to the limited community support and participation which resulted.

ISTI support under this component covered technical assistance, equipment to supplement audio-visual facilities, local costs for social marketing research and development, and production of audio-visual materials.

V. PLANNING, MANAGEMENT AND EVALUATION

A. PLANNING AND MANAGEMENT

The Project Implementation Planning Workshop referred to in Chapter II was extremely useful in reaching agreement among involved organizations and individuals on issues such as goals, strategies, priorities, implementation plans, and management arrangements. A number of training activities were held, referred to earlier under the Training section, to enhance supervision and management skills of staff at the Headquarters, Regional and Subregional levels, and to emphasize team effort through team building and interactive training processes.

During the Project there was no change in the organizational structure of the AMC. Although the number of personnel increased by five percent, there has been no reduction in the number of vacancies of key personnel, such as Regional Malaria Officers, Malaria Supervisors, Entomological Assistants, and Medical Laboratory Technologists. Revision of job descriptions of AMC staff to support IVC activities was not looked upon favorably by some staff members and has been held in abeyance.

Though the need for more decentralization and greater delegation of powers to the regions has been accepted, it has not been effectively implemented. This has adversely affected the malaria situation because of delays in institution of remedial measures, and has been frustrating for the Regional Officers.

Proposals for strengthening the organization structure were not effected. Midway through the Project there was a change in leadership of the AMC which, though supportive of ISTI Project activities, did not result in the hoped-for level of decision-making.

The development of a viable management information system to facilitate management and decision-making was disrupted by the inability of the AMC to obtain frequencies for radio transmitters from the Ministry of Telecommunications, with the approval of the Defense Ministry. The frequencies were required to establish a two-way radio system linking AMC Regional Offices with AMC Headquarters. ISTI assisted the AMC in procedural matters and meetings with officials of the two ministries, but the AMC directorate was never able to obtain clearance even for some safe areas. Thus the AMC lost an opportunity to have its regional offices linked to AMC Headquarters through a radio system, to update information, issue instructions, institute remedial measures promptly, obtain urgent supplies, etc.

In support of information systems development, ISTI provided the AMC with a microcomputer and software at the recommendation of a consultant who studied AMC requirements and the availability of computer maintenance facilities in Sri Lanka. ISTI also arranged training for AMC Headquarters staff on the use of the computer and also engaged a consultant in computer applications. Despite the facilities and assistance provided by ISTI for computerization of data, the computer made available to AMC in November 1986 has not been effectively utilized. Even the few staff members proficient in the use of the computer have not had regular access to it. This problem was also raised by ISTI at meetings with the Ministry. In support of information systems development, ISTI also supplied calculators to Headquarters and Regional Offices and stood ready to provide further supplies to the AMC directorate.

A continuing problem under the contract has been that the AMC management system has not always made minutes of meetings available; and, if minutes were issued, they were often delayed. This has limited their utility in the institution of prompt action. In addition, a mechanism for follow-up action in the AMC has not been established.

B. PROGRAM EVALUATION

Evaluation of the Program is based primarily on reports from field units and field visits by supervisory staff. However, field visits by AMC Headquarters staff have been infrequent, because of low per diem rates, which do not compensate for the expenses they incur. Thus, internal evaluation of the Program by AMC and the Health Ministry has largely been based on case incidence data, and has not been carried out as systematically as might be desired. As a result, there has been primary reliance on the external evaluations carried out by the donors through the multi-donor reviews.

These multi-donor reviews were carried out in 1984, 1985, and 1986. The 1986 review was conducted by a special team of experts who were convened to provide recommendations to the government on a comprehensive strategy for a National Malaria Control Program for the period 1987-1991. Based on the recommendations of the 1986 review team, AMC and the WHO formulated a Plan of Operations for Malaria Control in Sri Lanka, and an agreement was signed between the Government and WHO in February 1987. A Plan of Action for 1987 based on the Plan of Operations was developed. Unfortunately, the two annual plans were not consistent with regard to some activities and targets.

Many of the activities listed in the Annual Plan for 1987 have not been carried out by AMC. These include:

- Stratification,
- Introduction of biological control methods,
- Establishing mobile malaria clinics,
- Establishment of two Regional Laboratories in Kandy and Moneragala,
- Deployment of four entomological teams to the IVC Project,
- Training of newly recruited personnel of those deployed for other sectors, and
- Holding of monthly meetings of the District Malaria Control Committee and the Malaria Control Technical Committee, and quarterly meetings of the Malaria Control Advisory Committee.

Many of the recommendations of the multi-donor review teams have not been implemented, and some donor agencies are sceptical of the outcome of these reviews. This may have influenced the 1986 review team to recommend that external reviews be held biennially, and that, in alternate years, an internal evaluation be carried out. An internal evaluation was included in the Plan of Action for 1987, but it was not carried out.

C. PROJECT EVALUATION

The mid-term evaluation of the ISTI Project was carried out by a team of experts in March/April 1986. The team visited eight of the sixteen AMC regions. The team was impressed with the progress in certain areas, such as training, intersectoral coordination of anti-malaria measures, and the establishment of volunteer treatment centers. But the team noted that progress in the development of additional vector control methods was limited.

Specific recommendations in specific areas were included under projected needs in each section of the mid-term evaluation report. The evaluation team's primary recommendation was the planning and operational implementation of a regional trial and demonstration of an Integrated Malaria Control Program, towards which specific guidelines were given.

Further implementing actions which were recommended included selection of a region for the demonstration project and training of RMOs in an operational mosquito control district; the

development of a plan and modification of staff duties at the regional level; modifications in the current surveillance system; development of a standardized routine entomological surveillance system, in conjunction with epidemiological surveillance; and further development of computerization of the AMC.

When the government accepted the primary recommendation of the evaluation team and forwarded a project proposal for a 'Regional Demonstration Pilot Project' on Integrated Malaria Vector Control in Sri Lanka, the ISTI Project was extended to February 26, 1988.

D. REPORTS

Monthly, quarterly and annual ISTI progress reports have been sent regularly to A.I.D., the AMC and the Health Ministry. The format for the monthly reports, which were devised by ISTI, emphasized project implementation activities. The quarterly reports were tailored to the needs of A.I.D. and included, in addition to project activities, AMC program highlights. However, there were frequent delays on the part of the AMC Headquarters staff in providing the required information, and, as a result, the ISTI quarterly reports were often delayed.

Annual Work Plans of ISTI were sent to A.I.D. and the Government in July of each of the years 1985, 1986, and 1987. Despite this, some of ISTI's activities were not included in the AMC Plan of Action for the ensuing years.

Reports of each short-term consultant, both foreign and local, were issued within one month of their assignment, except in one case, the Seminar and Regional Workshops on Intersectoral Collaboration Report.

VI. EQUIPMENT AND SUPPLIES

In pursuance of the ISTI Contract, which enabled the AMC to extend laboratory facilities to all regions, ISTI initiated action for the establishment of two laboratories at Embilipitiya and Puttalam. ISTI advised the AMC regarding furniture, equipment and supplies to be obtained from its resources, with ISTI providing 25 microscopes with accessories and replacement parts. These laboratories were established in February 1986 and are functioning satisfactorily. However, some urgent repairs and improvements need to be effected, and additional furniture needs to be provided.

ISTI supplied 200,000 glass slides, which were ordered under the loan agreement, and 300,000 glass slides annually for three years, making a total supply of 1.1 million slides. Blood filming activities, which had been hampered in earlier years because of shortage of glass slides, have been maintained without interruption, with a record of 1,942,409 blood slides being examined in 1987. However, the proposed establishment of two new laboratories in Moneragala and Kandy in 1987, with AMC resources, did not materialize.

The selection of a procurement agent in the USA for procurement of equipment and supplies under the Project was completed in the early months when Franklin Export Trading Company (FETCO) was approved by A.I.D. and employed as a subcontractor by ISTI. Other facilities, such as letters of commitment, were also finalized, and FETCO was in a position to act on purchase orders issued by ISTI in early 1985. The first consignment of goods, comprising Hudson spraying machines, nozzle tips, adulticide foggers and glass slides, was delivered to the AMC in August 1985. The next supply of items, including microscopes with accessories and spares, glass slides, and books, was delivered in February 1986. An emergency consignment of spraying equipment to control Japanese encephalitis was airlifted and made available to AMC in January 1986. The last supply of regular equipment was made by FETCO in February 1987, but the contract was extended solely for the purpose of procuring supplies and equipment for the Integrated Vector Control pilot project. FETCO also handled this procurement.

In addition, equipment and supplies were also obtained locally by off-the-shelf procurement. These were largely for the ISTI office and the Training Center. A few items, such as a computer for AMC, were also bought locally to ensure that maintenance and repair were available.

All the items of equipment and supplies specified in the contract (and more) were supplied to the AMC. A complete list of equipment and supplies furnished to the AMC is contained in Annex 6.

VII. INTEGRATED VECTOR CONTROL PROJECT

A. OBJECTIVES

The proposal for an Integrated Vector Control (IVC) Project in Hambantota as a Regional Demonstration Pilot Project was put forward by the Health Ministry in December 1986 and accepted by A.I.D. Its objectives were:

- To carry out a pilot project to test and demonstrate the integrated vector control approach in one region within the currently existing resources of the AMC;
- To demonstrate the nature and extent of community involvement feasible in an IVC approach to malaria control;
- To determine the efficacy and cost-effectiveness of some of the vector control components used in IVC, and of an overall integrated approach to vector and malaria control; and
- To use the Regional trial (if found suitable) as the basis for extension of the IVC approach to other regions.

The proposal included local and external inputs. It also called for the development of a Plan of Action by the AMC, which unfortunately was delayed.

B. ISTI INPUTS

ISTI inputs to the IVC Project included technical assistance, training, and supplies and equipment. Four types of technical assistance were provided. They were:

- Dr. G. Brooks, for management, implementation, planning - One month;
- Dr. Robert Rose, for Bti production, storage and application - Four weeks;
- Lynn Dubose, for project implementation - Four weeks;
- Two research assistants, for baseline data collection and analysis and the preparation of maps under the guidance of the Senior Entomologist - Eighteen person-months.

The Regional Malaria Officer, Hambantota, was trained in a six-weeks' course at the University of South Carolina, followed by six weeks' field training at a county mosquito control center. To facilitate team building for the IVC Project, senior regional staff members were also trained, before departure and on return of the RMO from training in the USA, in two courses of four days' duration. The Senior Entomologist was trained in Computer Applications in Vector Control and Research. A study tour in Thailand (four weeks) was also provided for five Public Health Inspectors in malaria control activities, with emphasis on IVC aspects.

ISTI requested that AMC provide a list of equipment and supplies for the IVC in December 1986, but the list was not made available until August 1987. The list was reviewed, and reduced where the quantities requested exceeded estimated actual requirements. The final approved list was provided to ISTI in the spring of 1988, and the items were shipped in September.

C. IMPLEMENTATION PROBLEMS

In addition to the delay in the preparation of a Plan of Action, implementation of the IVC Project was delayed by failure to resolve the following administrative and operational matters:

- Posting of required staff - entomological teams and field assistants.
- Revisions of the job descriptions of the Regional and Headquarters staffs.
- Unavailability of the computer and computer time.
- Training of field personnel in specific activities, such as geographical reconnaissance, vector surveillance, and the introduction of larvivorous fish.
- Mobilization of the communities for support and participation in surveillance and operational activities.

D. STATUS

As a result, by the end of February 1988, progress on IVC implementation had been limited to the training discussed above, and the following actions:

- Baseline data extraction, by village, for malaria surveillance 1982-1986, but with no analysis or climatological factors - 1982/87.

- The preparation of field operational sketch maps, with vector breeding habitats, and a few composite maps.
- Preparation of a list of villages within the Project area, grouped under Grama Sevaka Divisions.
- Data entry for one GS Division in one AGA Division. This work was interrupted because of the non-availability of a computer.

VII. CONCLUSIONS

Project implementation under the ISTI contract was nearly 100% in the areas of technical assistance; training abroad and within the country; implementation of study tours in the region; and procurement. Implementation was less successful with respect to operational research and pilot projects; and malaria education and information. Planning, management and evaluation, and IVC Project implementation were least successful.

The only item in the contract which was not implemented was the provision of a two-way radio system linking AMC Headquarters with the Regional offices. Necessary contacts were established by ISTI with the relevant ministries, but the AMC directorate was unable to obtain the required ministry approvals.

There does not appear to have been adequate realization on the part of the AMC, and consequently the Health Ministry, of the full potential of the Project in terms of long-term effects on malaria control in Sri Lanka. There needs to be a greater recognition of the importance of institutionalizing an effective malaria control system through improving insecticide spray operations; strengthening of surveillance; and, particularly, introducing alternative malaria control activities which minimize the need for house spraying and thereby reduce reliance on residual insecticides.

Much of the initial impetus generated by the Project Implementation Planning Workshop in August 1984 was lost when the AMC directorate was unable to generate the effort that implementation of the Project activities involved -- such as the development of protocols and the conduct of research, organizational change, and the conduct of seminars and workshops.

One of the major constraints for the AMC has been the shortage at the Headquarters of experienced senior staff who clearly recognize the need for new, alternate approaches to malaria control. This has limited the AMC's capacity to institutionalize these alternative methods of control, and has resulted in operations largely geared to continue existing activities. This, in turn, has resulted in a sharp decline in the effectiveness of the program, which is clearly evident in the steep rise in malaria incidence and P.falciparum infections over the years 1982 to 1987. (1987 recorded the highest overall case incidence and incidence of P.falciparum infections in the last thirty years.)

There are serious management problems in the AMC, particularly at the directorate level. There is a need for strong, dynamic and inspirational leadership, and greater cohesion, interest, and responsibility on the part of the senior technical staff. There

is an innate resistance, particularly among the medical officers, to change and to the use of new methods and techniques, such as computerization of data. Unless these attitudes are changed, we believe that the Anti-Malaria program will continue to deteriorate and that malaria will spread.

While detailed Annual Plans of Action are formulated, they have not been effectively implemented. A case in point is that not a single technical meeting was held in 1987, though such meetings were to be held monthly. Nor have quarterly meetings of the Advisory Committee been held.

Evaluation of the Project by the AMC is largely operational and limited. An independent internal evaluation scheduled for 1987 did not materialize.

With the rapid deterioration of the malaria situation and the management problems of the Malaria Control Program, the direction from the Health Ministry to the AMC needs to be strengthened. The Ministry should focus more on the malaria situation and the annual expenditure of Rs. 320 million, as well as the need to support the AMC Director against forces for the status quo within the AMC ranks. The Ministry must avoid encouraging these forces, or the Program will continue to go downhill. We strongly recommend that the Ministry take a more active, positive and emphatic role, in order to salvage the malaria situation -- the worst in South and Southeast Asia. A key part of this is the reorganization of the AMC, which is urgently required. X

TECHNICAL ASSISTANCE -- (FOREIGN.) Short-Term Consultants to AMC,
July 1984 -- February 1988

FOREIGN

<u>NAME OF CONSULTANT</u>	<u>SPECIALITY</u>	<u>PURPOSE OF CONSULTANCY</u>	<u>PERIOD</u>	<u>DURATION IN COUNTRY</u>
1. David Levine	Planning/ Management	Conduct of Project Planning Planning Workshop -- Implementation start-up.	10-24 August 1984	2 Weeks
2. Maria Le Clere	Training	Training Needs Survey	6-19 October 1984	2 Weeks
3. John Davies	Public Opinion Measurement	To recommend ways of deter- mining reason for lack of public cooperation with AMC and correcting these attitudes	15 January-2 February 1985	2 1/2 Weeks
4. Bo Razak	Adult Education and Training	Design and conduct of Train- ing of Trainers Workshop	6-31 May 1985	3 1/2 Weeks
5. Robert Emrey	Data Management	To examine data collection system in AMC and to recom- mend optimum microcomputer, software and hardware for AMC	4-29 October 1985	4 Weeks
6. Dr. Samuel Breeland	Vector Control	To advise on reduction of vector production in Maha- weli river system	31 October - 26 November 1985	4 Weeks
7. James Carney	Adult Education and Training	To plan and design TOT for RMOs	4-13 December 1985	2 Weeks
8. James Carney	"	To conduct TOT for RMOs	12 February - 2 March 1986	2 1/2 Weeks

<u>NAME OF CONSULTANT</u>	<u>SPECIALITY</u>	<u>PURPOSE OF CONSULTANCY</u>	<u>PERIOD</u>	<u>DURATION IN COUNTRY</u>
9. James Carney	Adult Education and Training	Planning and designing of the Workshop on Supervision and Management	13-22 November 1986	10 Days
10. James Carney	"	Preparation and conduct of the Workshop on Supervision and Management, Hambantota	21 January-8 February 1987	3 Weeks
11. Dr. Gerald Brooks	Consultant in Management Implementation Planning for IVC	To advise on implementation of IVC Project, Hambantota	3-31 March 1987	4 Weeks
12. Terry Lovis	Health Education and Materials Production	To advise on designing and graphic work of posters etc. for propaganda program	6 April-1 May 1987	4 Weeks
13. Dr. Robert Rose	Bti Production	To conduct assessment/design of potential Bti production, storage and application	23 April-12 May 1987	3 Weeks
14. James Carney	Adult Education and Training	To conduct Supervision and Management Workshop, 6-12 May 1987	3-12 May 1987	12 Days
15. James Carney	"	Conduct of Senior Executive Management Workshop	31 October-3 November 1987	10 Days
16. Dr. Vishnu Praya Sneller	Computer Applications and Management	Computer applications and assist training in biostatistics and fundamentals of epidemiology and computer management	8 December 1987-13 January 1988	5 Weeks

17.	Dr. Frances Jean Mather	Biostatistics/ Epidemiology	Conduct of training program on elementary biostatistics and fundamentals of epidemi- ology	28 December 1987- 9 January 1988	2 Weeks
18.	James Carney	Adult Education and Training	Conduct of workshop follow-up training for AMC professional staff	18-29 January 1988	10 Days
19.	Lynn Dubose	Vector Control	Integrated Vector Control Project, Hambantota	24 October-22 November 1987	30 Days

Total person-months, including preparation and travel: 15.875

TECHNICAL ASSISTANCE -- FOREIGN SHORT-TERM CONSULTANTS TO USAID
July 1984 -- February 1988

<u>NAME OF CONSULTANT</u>	<u>SPECIALITY</u>	<u>PURPOSE OF CONSULTANCY</u>	<u>PERIOD</u>	<u>DURATION IN COUNTRY</u>	<u>PERSON-DAYS CONSULTANCY INCLUDING REPORT PREPA- RATION TIME</u>
1. Dr. Donald Weidhass	Malariology	Project mid-term evaluation	10 March -4 April 1986	25 days	30
2. Dr. Gerald Brooks	Medical Entomology	"	"	"	"
3. Mr. Steven Bjorge	Malaria Control Operations	"	"	"	"
4. Mr. Alton Wilson	Health Education	"	"	"	"
5. Mr. Lawrence Cowper	Malariology/ Management	To review further anti-malaria operations in Sri Lanka	26 April- 24 May 1986	27 days	"

Total person-months including preparation and travel: 6.82

TECHNICAL ASSISTANCE -- SHORT-TERM LOCAL CONSULTANTS TO AMC
July 1984 -- February 1988

LOCAL

<u>NAME OF CONSULTANT</u>	<u>SPECIALITY</u>	<u>PURPOSE OF CONSULTANCY</u>	<u>PERIOD</u>	<u>DURATION</u>
1. Dr. Kamini Mendis	Parasitology and malaria research	Planning and conduct of workshop on malaria research	25-26 October 1984	2 Days
2. Prof. T.E.J. De Fonseka	Community Medicine	Planning, participation and preparation of report of National Malaria Control Seminar	22-26 April 1985	5 Days
3. George Mendis	Education/Information	"	"	5 Days
4. Ms. H. Kulatilake	Office Management	Purpose: to write a general administration system for office with job description for actual and potential staff	October 1985	3 Weeks
5. M.C. Mathupala	Training and Adult Education	To serve as co-trainer in TOT for RMOs	12 February-2 March 1986	18 Days
6. Prof. T.E.J. De Fonseka	Community Medicine	STC for first Regional Malaria Control Workshop	7-10 April 1986	5 Days
7. M.C. Mathupala	Training and Adult Education	Planning and designing the Workshop on Supervision and Management	13-22 November 1986	10 Days
8. M.C. Mathupala	Training and Adult Education	Preparation and conduct of Workshop on Supervision and Management	25 January -4 February 1987	11 Days

9. M.C. Mathupala	Training and Adult Education	Conduct of workshop on team building for IVC Project, Hambantota	15-18 March 1987	4 Days
10. Athula Seneviratne	Training and Adult Education	"	"	4 days
11. Prof. Malcolm Fernando	Community Medicine	Conduct of the Second Regional Malaria Control Workshop, Kandy	5-9 January 1987	5 Days
12. M.C. Mathupala	Training and Adult Education	Conduct of Supervision and Management Workshop with Mr. James Carney, at Hambantota	6-12 May 1987	7 Days
13. M.C. Mathupala	Training and Adult Education	Conduct of Workshop on Team Building for IVC Project, Hambantota	26-29 July 1987	4 Days
14. Athula Seneviratne	"	"	"	"
15. M.C. Mathupala	"	Conduct of Workshop on Supervision and Management	10-15 September 1987	6 Days
16. Athula Seneviratne	"	"	"	"
17. M.C. Mathupala	"	Conduct of Executive Management Workshop for AMC headquarters staff	31 October-3 November 1987	4 Days
18. Prof. T.E.J. De Fonseka	Community Medicine	Conduct of Third Regional Malaria Control Workshop for intersectoral collaboration, Anuradhapura	5-9 October 1987	5 Days
19. H.C.P. Peiris	Microscope maintenance/servicing and repairs	Conduct of workshop on maintenance/servicing and repairs of microscopes	7-12 December 1987	6 days

20. M.C. Mathupala	Training and Adult Education	Joint Training Programme for RMOs and PHIs	12-15 Decem- ber 1987	4 Days
21. Athula Seneviratne	"	"	"	"
22. M.C. Mathupala	"	Conduct of Workshop on follow-up training for AMC professional staff	22-26 Janu- ary 1988	4 Days

Total person-months including report preparation: 8.5

TECHNICAL ASSISTANCE TO USAID AND AMC STAFF, ISTI WASHINGTON

	<u>DESIGNATION</u>	<u>PURPOSE</u>	<u>PERIOD</u>	<u>DURATION</u>
1. Mr. Nihal Goonewardene	Manager/ISTI Malaria Control Project	For Plan Implementation Workshop. Discussions with AID, Ministry and AMC officials on implementation of IVC project and for overseeing ISTI project activities in the ab- sence of the permanent ISTI Project Coordinator.	10-24 August 1984 12 December 1986-3 January 1987	14 Days 27 Days
2. Mr. R. Huntington	Staff/Washington	To attend Regional Malaria Control Workshop	5-15 April 1986	10 Days
3. Mr. R. Huntington	"	To have discussions with USAID and ISTI/Colombo regarding project im- plementation progress	25 June-5 July 1985	10 Days
4. Mr. S. Gardiner	"	To assist Project Coordinator and to develop action plan for integra- ted vector control	5-18 August 1986	14 Days
5. Mr. M. Masters	"	"	16 August-5 September 1986	21 Days
6. Mr. W.R. Thomas	"	Project management and support to Project Coordinator and discussions with USAID and AMc authorities	12-24 Novem- ber 1987	12 Days
7. Mr. Nihal Goonewardene	Manager/ISTI Malaria Control Project	Discussions with AID and Ministry officials, ISTI Project Coordinator and AMC officials, and project management	19 December 1987-9 Janu- ary 1988	3 Weeks

Total person-months including travel time: 5.875

TECHNICAL ASSISTANCE -- REPORTS OF LOCAL SHORT-TERM CONSULTANTS

LOCAL

<u>NAME</u>	<u>PURPOSE OF CONSULTANCY</u>	<u>DATE OF ISSUE OF REPORT</u>
1. Dr. Kamini Mendis	Planning and conduct of Workshop on Malaria Research	17 January 1985
2. Prof. T.E.J. De Fonseka	Planning, participation and preparation of report of National Malaria Control Senimar	23 September 1985
3. George Mendis	"	"
4. Ms. H. Kulatilake	Purpose: to write a general administration system for office, with job description for actual and potential staff	October 1985
5. M.C. Mathupala	To serve as co-trainer in TOT for RMOs	20 June 1986
6. Prof. T.E.J. De Fonseka	STC for first Regional Malaria Control Workshop	10 October 1986
7. M.C. Mathupala	Preparation and conduct of workshop on Supervision and Management	28 October 1987
8. M.C. Mathupala	Conduct of workshop on team building for IVC Project, Hambantota	April 1987
9. Athula Seneviratne	Conduct of workshop on team building for IVC Project, Hambantota	"
10. Prof. Malcolm Fernando	Staff for the Second Regional Malaria Control Workshop, Kandy	7 May 1987

11. M.C. Mathupala	Conduct of the Supervision and Management Workshop with Mr. James Carney, at Hambantota, January/February 1987	April 1987
12. M.C. Mathupala	Conduct of workshop on team building for IVC Project, Hambantota, 26-29 July 1987	14 August 1987
13. Athula Seneviratne	"	"
14. M.C. Mathupala	Conduct of Workshop on Supervision and Management	15 October 1987
15. Athula Seneviratne	"	"
16. M.C. Mathupala	Conduct of Executive Management Workshop for AMC headquarters staff	"
17. Prof. T.E.J. De Fonseka	STC for Third Regional Malaria Control Workshop for intersectoral collaboration, 5-9 October 1987, Anuradhapura	March 1988
18. H.C.P. Peiris	Conduct of workshop on maintenance/servicing and repair of microscopes	29 February 1988
19. M.C. Mathupala	Joint Training Programme for RMOs and PHIs, 12-15 December 1987	29 February 1988
20. Athula Seneviratne	"	"
21. M.C. Mathupala	Conduct of Workshop on follow-up training for AMC professional staff, 22-26 January 1988	

TECHNICAL ASSISTANCE -- REPORTS OF FOREIGN SHORT-TERM CONSULTANTS

<u>NAME OF CONSULTANT</u>	<u>PURPOSE OF CONSULTANCY</u>	<u>DATE OF ISSUE OF REPORT</u>
1. David Levine	Conduct of Project Planning Workshop Implementation start-up	August 1984
2. Ms. Maria Le Clere	Training Needs Survey	October 1984
3. John Davies	To recommend ways of determining reason for lack of public cooperation with AMC and correcting these public attitudes	February 1985
4. Bo Razak	Design and conduct of Training and of Trainers' Workshop	July 1985
5. Robert Emrey	To examine data collection system in AMC and to recommend optimum microcomputer, software and hardware for AMC	November 1985
6. Dr. Samuel Breeland	To advise on reduction of vector production in Mahaweli river system	November 1985
7. James Carney	To conduct TOT for RMOs	20 June 1986
8. James Carney	Preparation and conduct of workshop on Supervision and Management, Hambantota	28 October 1987
9. Dr. Gerald Brooks	To advise on implementation of IVC Project, Hambantota	25 April 1987
10. Terry Lovis	To advise on designing and graphic work for posters etc. for propaganda programme	29 June 1987

11. Dr. Robert Rose	To conduct assessment/design of potential BTI production, storage and application	6 July 1987
12. James Carney	To conduct Supervision and Management Workshop, 6-12 May 1987	15 October 1987
13. James Carney	To conduct Senior Executive Management Workshop	NOT SENT
14. Dr. Vishnu Priya Sneller	Computer applications, and assist training in biostatistics and fundamentals of epidemiology and computer management	11 February 1988
15. Dr. Frances Jean Mather	Conduct of training programme in elementary biostatistics and fundamentals of epidemiology	
16. James Carney	Conduct of Workshop follow-up training for AMC professional staff, 22-26 January 1988	
17. Lynn Dubose	Integrated Vector Control Project, Hambantota	23 December 1987

STATEMENT OF AMC STAFF PARTICIPANT TRAINING SPONSORED BY USAID

<u>SERIAL NUMBER</u>	<u>MONTHS/YEAR</u>	<u>NAME OF PARTICIPANT</u>	<u>TITLE/ DESIGNATION</u>	<u>NATURE OF TRAINING</u>	<u>DURATION OF TRAINING</u>	<u>START AND END DATES</u>	<u>LOCATION OF TRAINING</u>
1.	Feb-Apr '85	Dr. M.U.L.P. Samarasinghe	Deputy Director	Integrated Vector Control	6 Weeks	25Feb-5Apr '85	Univ. of South Carolina (USA)
2.	Feb-Apr '85	Dr. M.B. Wickremasinghe	Entomologist	"	6 Weeks	25Feb-5Apr '85	"
3.	Oct-Nov '85	Dr. A.A.C. Senaratne	Medical Officer	Basic Malariology, National Institute of Communicable Diseases	8 Weeks	30Sep-30Nov '85	(NICD) New Delhi
4.	Dec. '85	Sanath Dassanayake	Public Health Inspector	Study Tour of Malaria Control Programme	4 Weeks	2-28Dec '85	Thailand/ Malaysia
5.	Dec. '85	S. Puvanendran	"	"	4 "	"	"
6.	Dec. '85	S. Rajeswaran	"	"	4 "	"	"
7.	Dec. '85	S. Renganathan	"	"	4 "	"	"
8.	Dec. '85	S. Wignarajah	"	"	4 "	"	"
9.	Dec. '85	H.M. Somasekera	"	"	4 "	"	"
10.	Dec. '85	W.B. Fernando	"	"	4 "	"	"

11.	Jan-Mar'85	Mrs R. Ratnapala	Parasitologist	Drug sensitivity testing, cryopreservation, reviving of malaria culture Immunological techniques. Continuous cultivation of <u>P. falciparum</u> .	5 Weeks	17Feb-21Mar'86	Mahidol University, Thailand
12.	Mar'86	M. Rajadurai	Entomological Assistant	Study Tour of Malaria Control Programme relating to entomological services	4 Weeks	2-29Mar'86	Thailand Malaysia Singapore
13.	Mar'86	G. Chandratilleke	"	"	4 "	"	"
14.	Mar'86	W.M. Weerasinghe Banda	"	"	4 "	"	"
15.	Mar.'86	S.L. Alavudeen	"	"	4 "	"	"
16.	Mar'86	M.I.A. Jiffri	"	"	4 "	"	"
17.	Mar'86	T. Shanmugarajah	"	"	4 "	"	"
18.	Mar'86	I.B. Nandasena	"	"	4 "	"	"
19.	Apr-May'86	Dr W.P. Fernando	M.O., AMC	Integrated Vector Control, University of South Carolina, and 1 week field training.	8 Weeks	2Apr-25May'86	USA
20.	Apr-May'86	Dr P.R.J. Herath	Senior Entomologist	"	8 "	"	"

21.	Apr-May'86	Mr T.M.D.R. De Alwis	Regional Malaria Officer	Integrated Vector Control, University of South Carolina, and 1 week field training.	8 Weeks	2Apr-25May'86	USA
22.	June'86	Mr N.Y. Gunasiri	Public Health Inspector	Study Tour of Malaria Control Programme	4 Weeks	2-28June'86	Thailand Malaysia
23.	June'86	Mr W.W.P.F. Ranjith	"	"	4 "	"	"
24.	June'86	Mr K.A. Wilson	"	"	4 "	"	"
25.	June'86	Mr A.M. Prematilake	"	"	4 "	"	"
26.	June'86	Mr E. Namasivayam	"	"	4 "	"	"
27.	June'86	Mr W.A. Somapala	"	"	4 "	"	"
28.	June'86	Mr D.B. Senanayake	"	"	4 "	"	"
29.	June-July'86	Dr M.B. Wickremasinghe	Entomologist	Graduate Summer Session in Epidemiology, University of Minnesota/USA	3 Weeks	22June-12July'86	USA
30.	June-July'86	Dr(Mrs) L.D. Telisinghe	Medical Officer, Epidemiology	Graduate Summer Programme in Epidemiology, Johns Hopkins University School of Hygiene & Public Health, Baltimore, USA	3 Weeks	"	"

31.	June-July'86	Ms G. Yapa Bandara	Regional Malaria Officer	Graduate Summer Programme in Epidemi- ology, Johns Hopkins University School of Hygiene & Public Health, Baltimore, USA	3 Weeks	22June-12July'86	USA
32.	Oct-Nov'86	Ms B.S.L. Peiris	"	Basic Malariology Programme, National Institute of Communi- cable Diseases (NICD)	8 Weeks	6Oct-28Nov'87	Delhi
33.	Oct-Nov'86	Ms M.D.B. Perera	"	"	8 Weeks	"	"
34.	Apr-Jul'87	Ms B.S.L. Peiris	"	Intensive Course in Epidemiology and Con- trol of Malaria and Vector-Borne Diseases, University of South Carolina; field train- ing in mosquito abate- ment measures	12 Weeks	6Apr-2Jul'87	USA
35.	Apr-May'87	Mr H. Kodisinghe	"	"	6 Weeks	6Apr-15May'87	"
36.	Apr-May'87	Mr T.A. Abayawardene	Entomologist	"	6 Weeks	"	"
37.	Apr-May'87	Mr R. Subramaniam	Accountant	Procurement and Supply Management Training Course, AAPC, Inc.	4 Weeks	20Apr-15May'87	"
38.	July'87	Mr N.T. Dayananda	Public Health Inspector	Study Tour in Thailand & Indonesia			

39.	July'87	Mr N.V.S. Narangamana	Public Health Inspector	Malaria Control Programme	4 Weeks	1-29July'87	Thailand/ Indonesia
40.	July'87	Mr Hemachandra	"	"	4 "	"	"
41.	July'87	Mr Dhanapala	"	"	4 "	"	"
42.	July'87	Mr B.T. Sahabandu	"	"	4 "	"	"
43.	July'87	Mr A.M. Ananda	"	"	4 "	"	"
44.	July'87	Mr Punchi Nilame	"	"	4 "	"	"
45.	July'87	Mr A.M. Ram Banda	"	"	4 "	"	"
46.	July'87	Mr D.W.S. Jayaratne	"	"	4 "	"	"
47.	Aug'87	Mr L.D.F.F. Senanayake	MLT, AMC, LAB	Training in Parasi- tological Aspects and New Techniques, Mahidol University	4 Weeks	2-30Aug'87	Bangkok, Thailand
48.	Sept-Oct'87	Dr P.R.J. Herath	S/Entomologist AMC	Use of computer in Vector Control, Uni- versity of South Carolina	4 Weeks	21Sept-16Oct'87	USA
49.	Sept-Oct'87	Mr H.D.S. Gunasekera	Lab/Technician AMC	Training in Parasi- tological Aspects and New Techniques, Mahidol University, Bangkok	4 Weeks	21Sept-16Oct'87	Thailand
50.	Sept-Oct'87	Mr A.A.D.H. Chandrasena	"	"	4 Weeks	"	"

51.	Dec.'87	Mr S.P. Dayaratne	PHI/AMC Hambantota	Study Tour--Integrated Vector Control, Bangkok, Thailand, Malaria Control Programme	4 Weeks	6-30Dec'87	Thailand
52.	Dec.'87	Mr G.S. Wimalaratne	"	"	4 "	"	"
53.	Dec.'87	Mr R.P. Jayatissa	"	"	4 "	"	"
54.	Dec.'87	Mr C. Weerasooriya	"	"	4 "	"	"

LIST OF IN-COUNTRY TRAINING ACTIVITIES1. Training of Trainers

a. 8-29 May 1985

Dr M.U.L.P. Samarasinghe, Director/AMC
 Dr W.P. Fernando, D/Director/AMC
 Dr (Mrs) L. Telisinghe, M.O. El
 Dr P.B.R. Dias, M.O.(T&HE)
 Dr (Ms) P.R.J. Herat, Senior Entomologist/AMC
 Dr M.B. Wickremasinghe, Entomologist (2) AMC
 Ms R. Ratnapala, Parasitologist/AMC
 Ms B.S.L. Peiris, RMO/AMC
 Ms P.H.D. Kusumawathie, RMO/AMC
 Mr P.M.D.R. Alwis, RMO

b. 17 February-1 March 1986

Dr P.B.R. Dias, M.O.(T&HE)
 Mr H.T. Karunaratne, PHI/AMC
 Mr S. Munasinghe, PHI/AMC
 Mr K. Selvaratnam, PHI/AMC
 Ms B.S.L. Peiris, RMO/AMC
 Mr D.M. Gunawardana, RMO/AMC
 Mr J.M.D.T. Everard, RMO/AMC
 Ms P.H.D. Kusumawathie, RMO/AMC
 Mr H. Kodinsingho, RMO/AMC
 Ms M.D.B. Perera, RMP/AMC
 Dr (Ms) Pooneswari, RMO/AMC
 Ms A.G.M. Yapa Bandara, RMO/AMC
 Mr P.M.D.R. Alwis, RMO
 Dr S.K. Sivaguru, RMO

2. IVC Training Courses conducted by officers after IVC training in USA

a. 26-29 November 1985

Mr M. Dhanapala, PHI/AMC
 Mr A.J.S.P. Wilfred, PHI/AMC
 Mr G.S. Wimalaratne, PHI/AMC
 Mr G.G. Gunadasa, OIC/SRO Malaria
 Mr R.P. Jayatissa, PHI/VU Malaria
 Mr K. Jayawarna, MC Supervisor
 Mr G.P.B. Mendis, MC Supervisor
 Mr N.T. Dayananda, PHI/VU
 Mr R.M. Chandrasena, MC Supervisor
 Mr C. Weerasooriya, PHI/VU
 Ms B.S.L. Peiris, RMO/AMC

Mr L.P.M. Loku-Bandara, OIC/SRO
 Mr B.H. Wijesinghe, PHI/VU
 Mr N.W.G. Narangamma, PHI/VU
 Mr R.M. Ratnayake, PHI/VU
 Mr K. Piyadasa, MC Supervisor
 Mr H.L.T. Dias, MC Supervisor
 Mr P.S.K. De Silva, MC Supervisor
 Mr T.W. Somasiri, MC Supervisor

b. 4-7 March 1986

Mr D.B. Senanayake, PHI/AMC
 Mr D.M.M.A. Dhanapala, PHI/AMC
 Mr W.D. Senanayake, PHI/AMC
 Mr K.A.D.W. Wilson, PHI/AMC
 Mr H.D. Karunaratne, PHI/AMC
 Mr S.P. Dayaratne, PHI/AMC
 Mr L.A.D. Pragnasena, OIC/SRO
 Mr S.M.A. Somasekera, PHI/OIC/SRO
 Mr E.M. Punchinilame, PHI/OIC/SRO
 Mr J.M.D.T. Everard, RMO/AMC
 Ms M.D.B. Perera, RMO/AMC
 Dr (Ms) Pooneswari, RMO/AMC
 Mr S.M. Dayaratne, PHI/AMC
 Mr A.M. Ranbanda, PHI/VU
 Mr W.M. Ariyasinghe, PHI/VU
 Mr D.B. Sanarakoon, PHI/VU
 Mr M. Ponnaperuma, PHI/VU
 Mr S. Hemachandra, PHI/VU
 Mr S.P. Somaratne, MC Supervisor
 Mr M.S. Fernando, MC Supervisor
 Mr K.D.P. Siriwardane, MC Supervisor
 Mr D.S. Nandalal, MC Supervisor
 Mr M.B. Dayasena, MC Supervisor
 Mr K.M. Sisiripala, MC Supervisor
 Mr S.P.A. Aloysius, MC Supervisor
 Mr D. Dissanayake, MC Supervisor
 Mr J.M. Ranbanda, MC Supervisor
 Mr D.M. Jayakody, MC Supervisor
 Mr M.N. Adikaram, MC Supervisor
 Mr M.R. Weerasinghe, MC Supervisor

c. 17-20 November 1986

Mr J. Ratnayake, PHI/AMC
 Mr D.A.D. Weerasinghe, PHI/AMC
 Mr S. Amarasena, OIC/SRO
 Mr A. Siriwardane, PHI/AMC
 Mr S.K.D. Dassanayake, PHI/AMC
 Ms P.H.D. Kusumawathie, RMO/AMC

Ms A.G.M. Yapa Bandara, RMP/AMC
 Mr D.R. Jayaweera, PHI/AMC
 Mr D.M. Kiribanda, PHI/VU
 Mr W.U.P. Ranjith, PHI/VU
 Mr P.S. Kularatne, PHI/VU
 Mr D.W.W.M.A.P. Wijewardane, PHI/VU
 Mr A.M. Ananda, PHI/VU
 Mr J.K.R.M. Perera, MC Supervisor
 Mr R.M. Wijesekera, MC Supervisor
 Mr M.P. Abeywickrema, MC Supervisor
 Mr M.P. Upawansa, MC Supervisor

d. 1-5 June 1987

Mr P.H. Donald William, PHI/AMC
 Mr C.B.W. Palle-Kumbura, PHI/AMC
 Mr W.A. Somapala, PHI/AMC
 Mr S. Munasinghe, PHI/AMC
 Mr K. Nelson, PHI/AMC
 Mr G.H. Amarasena, PHI/AMC
 Mr P.J. Wimalanathan, PHI/AMC
 Mr W.M.G.S.D. Fernando, PHI/AMC
 Mr K.G. Ariyaratne, PHI/AMC
 Mr P.G.M. Fernando, PHI/OIC/SRO
 Mr M.V.S. Kumarasena, PHI/VU
 Mr W.M. Ukkubanda, PHI/VU
 Mr H.A. Gunawardana, PHI/VU
 Mr D.M.S. Jayaratne, PHI/VU
 Mr W.M.H.G.W. Banda, MC Supervisor
 Mr J.M.C. Abeytunge, MC Supervisor
 Mr S. Narangoda, MC Supervisor
 Mr L. Jinapala, MC Supervisor
 Mr H.W. Punchi Banda, MC Supervisor
 Mr W.B.M. Nandapala, MC Supervisor

e. 7-11 December 1987

Mr S.A. Gunasekera, PHI/AMC
 Mr H.H. Senaratne, PHI/AMC
 Mr A.H.T.D. Ariyasinghe, PHI/AMC
 Mr A.H. Prematilake, PHI/AMC
 Mr M.L. Somasiri, PHI/VU
 Mr K.P. Prematilake, PHI/VU
 Mr A.S. Liyanage, PHI/VU
 Mr O.C. Dasanayake, PHI/VU
 Mr D. Chandrasiri, PHI/VU
 Mr S.P.T.A. Senaratne, PHI/VU
 Mr B.H. Jayaratne, PHI/VU
 Mr U.P. Ariyaratne, MC Supervisor
 Mr K.W. Wedaratchy, MC Supervisor

Mr N.W. Seneviratne, MC Supervisor
 Mr D.K. Gunasekera, MC Supervisor
 Mr P.M. Ratnayake Banda, MC Supervisor
 Mr K. Thurairajah, MC Supervisor

3. Training in Supervision and Management

a. 25 January - 4 February 1987

Dr M.U.L.P. Samarasinghe, Director/AMC
 Dr (Ms) C. Senaratne, M.O. E2
 Dr P.B.R. Dias, M.O. (T&HE)
 Mr T.A. Abeywardane, Entomologist (3) AMC
 Mr D.M. Gunawardana, RMO/AMC
 Mr J.M.D.T. Everard, RMO/AMC
 Ms P.H.D. Kusumawathie, RMO/AMC
 Dr U.G. Karunaratne, RMO/AMC
 Mr H. Kodinsingho, RMO/AMC
 Ms M.D.B. Perera, RMO/AMC
 Ms A.G.M. Yapa Bandara, RMO/AMC
 Mr P.M.D.R. Alwis, RMO/AMC
 Dr D. Bhagiradhan, RMO/AMC
 Ms B.S.L. Peiris, RMO/AMC

b. 6-12 May 1987

Mr P.H. Donald William, PHI/AMC
 Mr D.B. Senanayake, PHI/AMC
 Mr M. Dhanapala, PHI/AMC
 Mr A.J.S.P. Wilfred, PHI/AMC
 Mr D.M.M.A. Dhanapala, PHI/AMC
 Mr W.D. Senanayake, PHI/AMC
 Mr K.A.D.W. Wilson, PHI/AMC
 Mr H.T. Karunaratne, PHI/AMC
 Mr C.B.W. Palle-Kumbura, PHI/AMC
 Mr W.A. Somapala, PHI/AMC
 Mr S. Munasinghe, PHI/AMC
 Mr S.A. Gunasekera, PHI/AMC
 Mr K. Selvaratnam, PHI/AMC
 Mr H.H. Senaratne, PHI/AMC
 Mr J. Ratnayake, PHI/AMC
 Mr S.P. Dayaratne, PHI/AMC
 Mr G.S. Wimalaratne, PHI/AMC
 Mr K. Nelson, PHI/AMC

c. 10-15 September 1987

Mr R.P. Jayatissa, PHI/VU Malaria
 Mr S. Thambirajah, PHI/AMC
 Mr R.L. Xavier, PHI/AMC

Mr S. Wignarajah, PHI/AMC
 Mr D.A.D. Weerasinghe, PHI/AMC
 Mr A.H.T.D. Ariyasinghe, PHI/AMC
 Mr G.H. Amarasena, PHI/AMC
 Mr S. Puvendran, PHI/AMC
 Mr P.J. Wimalanathan, PHI/AMC
 Mr W.M.G.S.D. Fernando, PHI/AMC
 Mr S. Amarasena, OIC/SRO
 Mr A. Siriwardane, PHI/AMC
 Mr L.P.M. Loku-Bandara, OIC/SRO
 Mr L.A.D. Pragnasena, OIC/SRO
 Mr S.M.A. Somasekera, PHI/OIC/SRO
 Mr E.M. PUNCHINILAME, PHI/OIC/SRO

4. Executive Management Workshop for Senior Staff, 31 October - 3 November 1987

Dr M.U.L.P. Samarasinghe, Director/AMC
 Dr W.P. Fernando, D/Director/AMC
 Dr (Ms) P.R.J. Herat, Senior Entomologist/AMC
 Dr M.B. Wickremasinghe, Entomologist (2) AMC
 Mr T.A. Abeywardane, Entomologist (3) AMC
 Ms R. Ratnapala, Parasitologist/AMC
 Mr R. Subramaniam, Accountant/AMC
 Mr K.D.D. Jinadasa, D/Director (Adm)/AMC

5. Joint Training Course for RMOO and PHII

a. 12-15 December 1987

Mr K. Nelson, PHI/AMC
 Mr D.M. Gunawardana, RMO/AMC
 Mr J.M.D.T. Everard, RMO/AMC
 Ms P.H.D. Kusumawathie, RMO/AMC
 Dr U.G. Karunaratne, RMO/AMC
 Mr H. Kodinsingho, RMO/AMC

6. National Institute of Business Management

a. November 1986

Mr J. Dabare, Asst. S/Keeper (Stores Management)
 Mr H.L.N.P. Samarasekera, Asst. S/Keeper (Stores Management)

b. April-May 1987

Ms J. Witharana, PPA/Clerk, Assessment Branch, AMC HQ
 (Statistical Methods)
 Ms R.M. Mabel, PPA/Clerk, Assessment Branch, AMC HQ
 (Statistical Methods)
 Ms W.A.D. Baba Nona, PPA/Clerk, Assessment Branch, AMC HQ
 (Statistical Methods)

7. Team Building for IVC Project, Hambantota, 15-18 March 1987

Dr M.U.L.P. Samarasinghe, Director/AMC
 Dr (Ms) P.R.J. Herat, Senior Entomologist/AMC
 Mr S.P. Dayaratne, PHI/AMC
 Mr G.S. Wimalaratne, PHI/AMC
 Mr G.G. Gunadasa, OIC/SRO Malaria
 Mr R.P. Jayatissa, PHI/VU Malaria
 Mr G.M. Somasiri, PHI/VU
 Mr K. Jayawarna, MC Supervisor
 Mr G.P.B. Mendis, MC Supervisor
 Mr N.T. Dayananda, PHI/VU
 Mr R.M. Chandrasena, MC Supervisor
 Mr M.I.K. Jiffri, Entomologist Asst.
 Mr M.D.A.S. Dasanayake, Entomologist Asst.
 Mr C. Weerasooriya, PHI/VU
 Ms B.S.L. Peiris, RMO/AMC

8. Team Building for IVC Project, Hambantota, 26-30 July 1987

Dr M.U.L.P. Samarasinghe, Director/AMC
 Dr (Ms) P.R.J. Herat, Senior Entomologist/AMC
 Mr S.P. Dayaratne, PHI/AMC
 Mr G.S. Wimalaratne, PHI/AMC
 Mr R.P. Jayatissa, PHI/VU malaria
 Mr G.M. Somasiri, PHI/VU
 Mr K. Jayawarna, MC Supervisor
 Mr G.P.B. Mendis, MC Supervisor
 Mr N.T. Dayananda, PHI/VU
 Mr R.M. Chandrasena, MC Supervisor
 Mr M.I.K. Jiffri, Entomologist Asst.
 Mr M.D.A.S. Dasanayake, Entomologist Asst.
 Mr C. Weerasooriya, PHI/VU
 Ms B.S.L. Peiris, RMO/AMC

9. Training in Maintenance and Servicing of Microscopes, 7-12 December 1987

Mr K.L. Silva, Microscopist
 Mr W.M. Tikiri Banda, Microscopist
 Mr P.G. Wijeratne, Microscopist
 Mr R.A.M. Perera, Microscopist
 Mr W.M. Wijithapala, Microscopist
 Mr D.A. Somaweera, Microscopist
 Mr N.A. Karunasena, Microscopist
 Mr R. Rudantha, Microscopist
 Mr P. Mahendrarajah, Microscopist
 Mr L.D.F.F. Senanayake, Med. Lab. Technologist
 Mr Jayamatha, Microscopist

10. Training in Biostatistics and Epidemiology, 28 December 1987-
9 January 1988

Dr (Ms) C. Senaratne, M.O. E2
Dr (Ms) P.R.J. Herat, Senior Entomologist/AMC
Mr T.A. Abeywardane, Entomologist (3)/AMC
Ms R. Ratnapala, Parasitologist/AMC
Ms B.S.L. Peiris, RMO/AMC
Ms P.H.D. Kusumawathie, RMO/AMC
Ms M.D.B. Perera, RMO/AMC

11. Follow-up Training for AMC Professional Staff, 22-26 January
1988, Kalutara

Dr M.U.L.P. Samarasinghe, Director/AMC
Dr W.P. Fernando, D/Director/AMC (in part)
Dr M.B. Wickremasinghe, Entomologist (2)/AMC
Mr R. Subramaniam, Accountant/AMC (in part)
Mr H.T. Karunaratne, PHI/AMC
Mr G.S. Wimalaratne, PHI/AMC
Mr S. Thambirajah, PHI/AMC
Mr S. Amarasena, OIC/SRO
Mr S.M.A. Somasekera, PHI/OIC/SRO
Mr D.M. Gunawardana, RMO/AMC
Ms P.H.D. Kusumawathie, RMO/AMC
Mr H. Kodinsingho, RMO/AMC
Ms A.G.M. Yapa Bandara, RMO/AMC

NATIONAL SEMINARS/REGIONAL WORKSHOPS ON MALARIA RESEARCH AND
INTERSECTORAL COLLABORATION IN MALARIA CONTROL

<u>Activity</u>	<u>Date</u>	<u>Venue</u>	<u>Ministries/Departments/Agencies Represented</u>	<u>Number of Participants</u>	<u>Report issued</u>	<u>Number of recom- mendations</u>
1. Malaria Research Workshop	25-26 October 1984	Hotel Lanka Oberoi	Ministries of Health, Irrigation, Fisheries and Departments of Health, Anti-Malaria Campaign, Medical Research Institute, Universities of Colombo, Kelaniya, Peradeniya, Sri Jayawardanapura; State Gem Corporation, Mahaweli Economic Agency, South Asia Environmental Programme, Natural Resources Energy Sciences Authority of Sri Lanka, Central Environmental Authority	42	Jan.'85	3
2. National Seminar on Intersectoral Collaboration for Malaria Control in Sri Lanka	22-26 April 1985	Hotel Sapphire Colombo	Ministries of Health, Education, Local Government, Housing and Construction, Finance and Planning, Fisheries, Departments of Health Services, Agriculture, Irrigation, Land Commssioners, Forest, State Gem Corporation, Central Environmental Authority, Mahaweli Economic Authority, Sarvodaya	38	23/9/85	20
3. First Regional Workshop for Intersectoral Collaboration in Malaria Control	7-11 April 1986	Tangalle Bay Hotel, Tangalle	Ministries of Health, Ministry of Fisheries, Departments of Health Services, Education-Moneragala, Irrigation-Colombo/Ratnapura, Local Government-Hambantota, Surveys, Wildlife Conservation, Agriculture, Sri Lanka Broadcasting Corporation Ruhunu Sevaya, Integrated Rural Development Project-Hambantota, State Gem Corporation-Eheliyagoda, St. Mary's College-Hambantota, Anti-Malaria Campaign	37	10/10/86	11

4. Second Regional Workshop for Inter-sectoral Collaboration in Malaria Control	5-9 January 1987	Hotel Topaz, Kandy	Ministries of Health, Fisheries-Dambulla, Departments of Health Services-Kandy, Kurunegala, Nuwara Eliya and Kegalle, Local Government-Kandy, Agriculture, Irrigation-Kandy, Surveys-Kurunegala, Rural Development-Matale, Forest-Kurunegala, State Timber Corporation-Maduruoya, State Gem Corporation-Naula, Sri Lanka Broadcasting Corporation-Mahanuwara Sevaya, Mahaweli Authority-Sarvodaya Centre-Kuliyapitiya, Anti-Malaria Campaign	43	7/05/87	18
5. Third Regional Workshop for Inter-sectoral Collaboration in Malaria Control	5-9 October 1987	Nuwarawewa Rest House, Anuradhapura	Ministries of Health, Home Affairs-Anuradhapura, Polonnaruwa and Puttalam, Fisheries-Dambulla, Departments of Health Services, Meteorology-Colombo, Inland Fisheries-Anuradhapura, Surveys-Polonnaruwa, Animal Production and Health-Anuradhapura, Agriculture-Anuradhapura and Polonnaruwa, Local Government-Puttalam and Anuradhapura, Education-Anuradhapura, Forest-Anuradhapura, State Timber Corporation-Anuradhapura, Mahaweli Economic Authority Systems B,C,G and H, Sri Lanka Broadcasting Corporation-Mahanuwara Sevaya, Rajarata Sevaya, Sarvodaya Project-Anuradhapura, Cultural Triangle-Anuradhapura, Sri Lanka Army Medical Corps-Colombo, Anti-Malaria Campaign	64	7/03/88	12

EQUIPMENT/SUPPLIES FURNISHED TO AMC

<u>ITEMS</u>	<u>NO. OF UNITS</u>
Mdl. 67322A, 3 Gal X-Pert Sprayers	760
Glass Slides 75mm (72/per box)	13202 boxes
Nozzle Tips, #805855, TJ Tip #8002HSS	5000
Tifa Model TAPA Adulticide Fogger	2
American Optical MDL Monocular Microscopes	24
Illuminator Bulbs, AO #613	100
AO 100X Infini Cor Achromatic Objectives	50
Mechanical Stages, AO #1534	25
Fine and Coarse Adjustment Mechanisms	50
Condensers, #225	25
Slide-Holder Mechanisms	25
Lenses (10X)	25
Illuminators 220V	25
Mirrors	25
ULV Generators (Beeco Whispermist Heavy Duty)	3
Installation Kits	3
Spare 10 Micron Sleeves	6
Spare Spray Head Assembly	1
Insecticide Filters	6
Battery Testers	3
Back-Pack ULV Generators (Hudson) #98600A	3
Spare Parts Kits for #98600A	3
AF267 Cholinesterase Field Test Kits w/ Reagents	25
SIGMA 400K-100X, 100X1 Kit	100
" " G5888, 6X6X.5ML Deficient Serum	6
" " " Normal Serum	6
Micropet Flint Non-Heparinized prec. bore tubing	12 cases
Culture Test Tubes, Glass	1 case
Support Test Tube racks stainless steel	20 ea
Isotemp Incubator	1 ea
Laminated Charts 17" x 22"	4 sets
Proof	1
Herbarium Tape 3/4" x 3/47 yds	5 ea
Micro Slides 1 concavity	2 cases
Mosquito Chart 76 x 102	1 ea
Pump (#600070A 0-25 oz.)	2
Trinocular Tube BH2-TR30	1
Fully Automatic 35MM Camera	1
Microtiter, U Plates 100/box	13
Sealers, Plate, 100/box	3
Phosphate Buffered Saline 50 L	25
Bovine Serum Albumin 1 kg.	1
Casein, 500gm	1
Thimerosal 25 gm	2
Phenol Red Sodium Salt, 25 gm	1
Peroxidase Substrate, 600ml/kit.	25
" " Systems, ABTS 450 ml	6
Digital Microdispenser, 25ul	2
Digital Microdispenser, 75-300ul	2
Digital Microdispenser, 1000ul	1
Pestles for Centrifuge Tubes	1
Standard Size Stirrer, 230v/50hz	1
Stirring Magnet 1 x 3/8 in	1

Teflon Covered Magnet	1
Vortex-Genie Mixer 230 vac/50hz	1
Pipet D 50/100/200ul	2
Pipette Series D 250ul	2
Surepette M.R. .5-.7-1-2ml	2
Pump Infu M-Rate, 115V/230V/50/60Hz	1
Syringe/1CC/26G/3/8in	1
Syringe 3CC 23G x lin	1
Syringe 5CC 21G x lin	1
Cul Tube Bor SC 16 x UOO	1
Micro Cent Tubes PP 1.5	55
Repl Tube 25ul	25
Tips #C 75-300ul	10
Tween 20, 100ml	1
Fisher Fine Tip Pen Blk, 12/pk	1
ELISA Reader	1
Paper Tape for ELISA	10
1.5 ml Microtubes	14
1.5mml Microtubules with Pestles	5
Superpack 96 Withholder .005-.20 ml	26
IBM PC AT Computer w/ accessories	1
Mitsubishi Air Cond. model M2	1
Canon Calculators model F56	38
Sharp Calculators Model BL1611	12
Sharp Calculators model 344	12
Field Test kits	20
Bondwell Computers and Disk Drives	2
Guardman UPS System	1
Diskettes, Maxell	5
Diskettes, d BASE 3 plus	7
Diskettes, Lotus 1-2-3	5
Diskettes, WordPerfect	5
Diskettes, MED 1930	10
" " Norton Utilities	14
" " Freelance Plus	14
" " Sideways	14
" " SQZ	14

EQUIPMENT FURNISHED TO THE AMC TRAINING CENTER

<u>ITEMS</u>	<u>NO. OF UNITS</u>
Stacor Hardwood Easels, #901	2
Flip Chart Easel Pads, 26 3/4 x 33 1/2	10
Color TV 14"	1
National Video Cassette Recorder	1
National Cassette Recorder	1
Magi board 4' x 4'	1
Mobile Stand for Magi Board	1
Set markers 12/pk	1
Slide Projector	1
Color TV Sanyo	1
AM Megaphone	1
J28 Mike	1
J9 Mike	1
DGT mike stands	4
DGN mike stands	2
Video camera	1
Video cassette recorder portable	1
Astron, tripod	1
Cat Kit code LAV3	1
Bell & Howell Portable Overhead Projector	1
Roll Feed Attachment	1
Acetate Roll	1
B & H Screens with Tripod Stands	2
Hitachi blank video cassette tapes	2
Robin Petrol/Kerosene Generating Set	1
Toshiba Air Conditioners	3
Technics Speakers	2
Microphones J25	2
" " J20	2
" " J17	1
SPG12 8 OHMS Speakers	4
National Cassette Recorder Model RQ341	1
Kodak SAV 2010 Slide Projector	1
4 M. Remote Control	1
Audiotronics tape cassette recorder	1
Leather carrying case	1
Spare Rotary Tray SAV for Carousel	1
250V 24V Lamp for SAV Models	2
AMCA Bulletin #6 "The Biological Control of Mosq."	1
Mosquito Control and Biology Film	1
Books:	
<u>Biomathematics of Malaria</u>	2
<u>Thegaurus of Entomology</u>	2
<u>Genetic Control of Insect Pests</u>	2
<u>Integrated Mosquito Control Methodologies</u>	2
<u>Pest Resistance to Pesticides</u>	2
<u>Biostatistics</u>	2
<u>Insects and Hygiene</u>	2
<u>Malaria</u>	2
<u>Pesticides: Preparation and Mode of Action</u>	2
<u>Insects and Other Arthropods of Medical Import.</u>	2
<u>Integrated Mosquito Control Methodologies</u>	3
<u>Insect Behavior</u>	2
<u>The Ecology of Insect Population in Theory & Prac.</u>	2
<u>Statistics for Biologists</u>	2

<u>Trends in Ecological Research - for the 1980's</u>	2
<u>Laboratory Guide to Insect Pathogens and Parasites</u>	2
<u>Introduction to Integrated Pest Management</u>	2
<u>Insects, Experts and the Insecticide Crisis</u>	2
<u>Pest Resistance to Pesticides</u>	2
<u>Biodegradation of Pesticides</u>	2
<u>An Introduction to Biological Control</u>	2
<u>Monoclonal Antibodies - Hybridomas</u>	2
<u>Monoclonal Antibodies and Functional Cell Lines</u>	2
<u>Toxicology of Insecticides</u>	2
<u>Ecological Entomology</u>	2
<u>Insect Thermoregulation</u>	2
<u>Biocontrol and Other Innovative Components..</u>	1
<u>Experience and Components from Conventional Chem...</u>	1

EQUIPMENT/SUPPLIES FURNISHED TO THE IVC PROJECT, HAMBANTOTA

<u>ITEMS</u>	<u>NO. OF UNITS</u>
Tifa Thermal Fogger w/ ULV attach.	1
15% Spare Parts	1 set
Tifa Fog SN12 w/ standard accessories	10
15% Spare Parts	10 sets
1 1/3 gal. Hudson Poly Utility Sprayer	8
Wheelbarrows, 4 cu. ft, metal 2 handles	6
Mosquito Screening Nylon 72"	1640 yds
Measuring Tapes 50' length	50
Thumb tacks (box 100)	144 boxes
Flash Lights (Torches)	200
Extra bulbs for flash lights	600
Folding tables 36' x 24" x 29"	8
Tents w/ sewn inflow and fly sheet	4
Teflon Slides, 25/box	1 box
Mosquito Net Cover for cot	2378
Luminous paint white	10 liter
Pentagraph	3
Polyporous Strips, 1 oz/pk	25 pk
Field Bag	25
Forceps #4731	6
Forceps #4732	6
Scissors	1 dozen
Field Collecting bag	100
Paper cup, 8 oz, unwaxed	10 M
Aspirator, Plexxitube, Latex & Screen	100
Insect Box	1 dozen
Collapsible Cage	2 dozen
Netting, white poly, 72"	220 yards
Dipper, white 5" diam.	10 ctn.
Dipper Handle, telescopic	100
Vial 1/2 dr., w/ cork	52 gr.
Vial 1 dr. w/ cork	52 gr.
Larval Tray, white, plastic	50
Vial, 2 dr., w/ cap	8 dozen
Bacillus Thuringiensis	3
H-14 Serotype, 40 lb bag	3 bags
Malathion (54 gal. drum)	1 drum
Permethrin 4 gal cases	2 cases
Altosid 4 gal cases	1 case
Aerosurf MSF	5 gallon
Compass 25mm	50
23 Special, micr., binoc., tungsten illum.	4
23 Special, micro., stereo	4
Wash Bottle PE	4 pk
Dissect Needle Straight 12/pk	2 pk
20X Pocket Loupe	12
Cover Glasses 10 pk/case	5 cases
Insect/reptile cage	24
Filter paper 100 sh/pk	48 pack
Pipet Straight Med Drop 10pk/case	2 cases
Desiccator w/ plate 200 MM	12
Mechanical Aspirators w/ collecting tubes	12
Extra Collecting Tubes	24
Altimeters w/ booklet	4
Case for Altimeters	4

Portable PH Meter	4
Salinity Meter	4
Hygrothermograph w/ charts	1 dozen
Extra Ink Cartridges	2 dozen
Charts, Hydro-Paper	10
Max-Min Thermometer	2 dozen
Sling Psychrometers	1 dozen
Clip Boards	50
Plastic Rulers 12"	50
Tracing Papers	200 meters
Drawing Sheets	1000
Drawing Pencils Venus H	300
" " Venus 24	300
Erasers, Steadler	50
Pencil Sharpeners	50
Haversacks	50
Folding Chairs	40
Folding Camp Beds	30
Survey Department Maps	14
Rotring 2000 Pentel	3
Tracing Paper	1 roll
Miscellaneous stationery and supplies	(Rs. 1,735)

ARTICLE I - SCOPE OF WORK

A. The Contractor shall provide long-term and short-term technical assistance to the malaria control program (hereinafter program) of The Government of Sri Lanka, administered by the Anti-Malaria campaign (AMC). Contractor assistance shall include, but not be limited to, the following:

1. Advice on technical matters in epidemiology and entomology;
2. Studies of operational and scientific aspects of the program;
3. Assistance with pilot testing of new approaches to malaria control and the incorporation of the most successful ones into the program and related training;
4. Assessment of and advice on all aspects of training; and
5. Advice and training on program management, including information systems, planning, organizational issues, and the like;
6. Assumption of responsibilities associated with the procurement of A.I.D.-financed commodities, equipment, and training;
7. Assistance to strengthen the information/education capabilities of the AMC.

B. Training

The Contractor shall provide both in- and out-of-country training to strengthen AMC staff capabilities in all major components of the malaria programs, prepare staff to serve as trainers, and develop an inter-institutional network through a series of seminars and workshops.

The Contractor's effort in training shall include, but not be limited to, the following tasks:

1. Develop a training plan for the AMC ensuring that needs are carefully identified, training is properly scheduled, and linkages are established between out-of-country and in-country training to maximize cost-effectiveness. The long-term advisors shall participate in both the planning and the implementation of training events, ensuring that these activities are coordinated with WHO and other donors.

2. Organize a National Malaria Control Seminar for upper-level staff and administrators of Ministry of Health (MOH), Anti-Malaria Campaign (AMC), other relevant ministries (e.g., Agricultural Development and Research, Lands and Land Development, Mahaweli Development, Finance and Planning, Plan Implementation, Education and Higher Education) by mid-1985 to enhance awareness of malaria and its control, the need for inter-institutional collaboration, and the potential contribution of each institution in the network, and the importance of a malaria information and education program in achieving community support and participation. Outside authorities on malaria will be brought in for major presentations and to serve as resource people.

3. Organize three (3) Annual Malaria Control Workshops of approximately one week's duration each, to reinforce topics discussed at the National Seminar, with primary focus on vector control and other program components in accordance with priorities to be established by the AMC in conjunction with technical assistance personnel, A.I.D., and WHO. Workshop participants will include AMC senior headquarters staff, Regional Malaria Officers, other regional staff as appropriate, and representatives of collaborating institutions. One to two resource people per workshop will be provided.

4. Provide in-country, in-service training support in the form of short-term technical assistance to the National Malaria Training Centre, to introduce

social, communication, and alternative control measure skills into its curriculum.

5. Provide study tours of approximately four weeks each, out-of-country, to visit other malaria programs and relevant institutions for ten field and technical staff annually, for a total of thirty study tours. The principal objective of the study tours will be to study malaria control methodology and organization in similar areas, to gain insights into approaches and techniques used successfully in programs of the countries visited. The AMC Public Health Inspectors (PHIs) will focus on the program as a whole, and the Entomology Assistants (EAs) will concentrate on entomological aspects, including vector control, spray programs, operational research, and taxonomy.

6. Build AMC capability in the area of vector control by arranging the annual participation (over three years) of medical or senior technical officers in the eight-week Comprehensive Vector Control Short Course conducted by the International Center for Public Health Research at the University of South Carolina, or a similar course in vector control. After their return, these staff will, with the assistance of the long-term vector control specialist, organize and conduct approximately six short courses for AMC and other organizations collaborating in the vector control program.

7. Provide approximately 30 person-months of short-term training (1-11 months) for upgrading the competence of senior AMC headquarters/regional staff in the various program components being strengthened through the malaria control project. The specific areas of specialization, and duration and location of the training, will be determined by the AMC in cooperation with its technical advisors and USAID (an illustrative list of such areas would include epidemiology, entomology, data and information management, logistics and supplies, social and communications skills, preparation of educational materials, malaria program management, evaluation -- including attitudinal and motivational, operational research, specialized techniques for alternative control methods, training and laboratory services).

C. Operational Research and Pilot Projects

The Contractor shall assist the AMC to develop and implement an effective vector control program based on successful operational research studies which include such components as epidemiological assessment, surveillance, vector control, economic and social factors important to the malaria program. The Contractor's effort shall include, but not be limited to, the following tasks:

1. Identify, develop and implement (with close collaboration of AMC and A.I.D. personnel):

- those projects which will enhance present epidemiological surveillance and control functions. Parasitological, entomological, socio-economic, cultural and immunological studies are to be included.
- those projects designed to test alternative methods of malaria control under local conditions, including studies in bio-environmental, mechanical, and biological control of vectors. The number and distribution of such projects will ultimately be determined by need, opportunity and expected value toward the malaria control project purpose.
- those research projects which test side-effects, acceptance rate, and G6PD-associated problems of presumptive, prophylactic and radical drug treatment.
- those research projects which test new insecticide compounds and application methodology.

2. Assist in testing, on a pilot project basis, new methods and techniques resulting from the operational research projects or from technology

developed and proven abroad but not previously used in Sri Lanka. The exact nature of such projects will be determined from the results of the operational research projects and review of experience in malaria control programs in other countries. Pilot projects will be approved only if the GSL is prepared to allocate funds to expand those projects that prove to be successful. The Contractor will be primarily responsible for developing and managing each pilot project approved by A.I.D. Agreements between the Contractor and the organizations implementing the pilot projects must be approved by A.I.D.

D. Malaria Education/Information

To achieve greater residential spray acceptance and community participation, and to increase people's awareness of malaria and the ongoing control program, and strengthen the AMC's education/information capabilities, the Contractor shall:

1. Strengthen AMC capability to produce malaria education materials and supplement audio-visual facilities already available.
2. Assist in the development, production, and field-testing of various types of educational programs and materials, so that appropriate information material can be designed (by mid-1985), printed and distributed to all malarious areas by the end of 1985, and appropriate educational presentations can be initiated in 65 malarious areas.
3. Effectively publicize the three annual workshops.
4. Organize twelve or more media placements per year (for three years) for informing and educating the public.

E. Planning, Management and Evaluation

The Contractor shall develop a viable management information system, intensify operational assessment activities, and strengthen the organization structure of the AMC to achieve effective surveillance and institutionalization of the malaria control program.

1. In conjunction with AMC personnel, the Contractor shall review and design the planning, management and evaluation activities of the AMC by providing short- and long-term technical assistance, so that:
yearly Plans of Action for the program are prepared by the AMC and approved by the GSL;
the Plan of Operations for 1987-1991 is prepared by AMC by the end of 1986; USAID is assisted to see that GSL/AMC program evaluations are completed by the multi-donor teams in 1985, 1986, and 1987;
and A.I.D. mid-term (18-month) and final end-of-project evaluations are completed by USAID.
2. The Contractor shall provide a two-way radio system to link all regional AMC offices with AMC headquarters, a microcomputer (with appropriate peripherals and software for information storage, analysis, and quick retrieval) and other small equipment items (e.g. calculators, etc.) required to develop a viable AMC management information system, and assist in installation and initial use of the system. The data storage and retrieval system should be in place, with two trained operators, by the end of 1985.

F. Equipment and Supplies for Regional Laboratories

To enable the AMC to establish laboratory capacities in all regions (16) of the country, the Contractor shall:

1. Ensure that surveillance programs are not constrained by lack of sufficient glass slides for blood smears, by providing 300,000 glass slides per year (approximately 40% of the AMC requirements of glass slides) for

three years.

2. Provide 25 microscopes with accessories and replacement parts.

G. Other Procurement

The Contractor shall provide to the extent possible within the \$123,000 loan funds available approximately 1,500 sprayers, 5,000 nozzle tips, 4 mosquito adulticiding machines and around 500,000 glass slides (in addition to the requirement in paragraph F.1 above), to be procured as soon as possible.

H. Reports

The Contractor shall prepare reports in a form that meets A.I.D. requirements, and shall submit quarterly and annual progress reports, the latter of which shall be prepared jointly by AMC and the Contractor. The Contractor shall submit to USAID and GSL, at twelve-month intervals after commencing contract implementation, updated work plans based on joint A.I.D./GSL reviews of work progress. In addition, the Contractor shall keep the USAID Project Officer informed of project progress at all times.

Successful completion of the above tasks is expected to result in achievement of the following outputs, defined in terms of progress towards institutionalizing a malaria control system throughout Sri Lanka.

1. Insecticide Spray Program

A carefully targeted and stratified residual insecticide house spraying program to reduce the incidence of malaria, to control focal outbreaks, and aimed at operational interventions that will lower the total insecticide requirement. Perennial and seasonal spray areas will be reduced, and non-spray or focal spray areas will be increased, as follows:

	1982	End of Project
No. perennial areas	26	13
No. seasonal areas	39	29
No. non-or focal areas	42	65
	107	107

2. Surveillance System

A functioning, effective and continuous epidemiological, parasitological and entomological surveillance system to:

- a. Provide requisite information for directing insecticide spraying operations promptly and accurately, using an effective insecticide, and
- b. Monitor the impact of alternative control measures such as vector control.
- c. Provide current epidemiological status of malaria in the country.

The achievement of the following targets for collective and rapid analysis of valid data and fast reporting of developing foci is expected:

- All PCD slides examined and reported by AMC to concerned health institutions within 5-10 days of collection;
- All slides from malaria volunteers examined by AMC and reported to the Volunteer Treatment Centers within 10-14 days;

- Active Case Detection agents increased according to epidemiological trends;
- Resistance tests on A. culcificies adults completed each year in 75% or more health areas;
- Minimum of 125 resistance tests completed each year against A. culcificies and other potential vectors, as well as other candidate insecticides; and
- Minimum of 3 intensive field investigations conducted each year to determine the level of malaria parasite susceptibility to anti-malaria drugs used or expected to be used by the AMC in its field program.

3. Vector Control Program

An effective vector control program, supported by a viable, multi-institution, operational research program and monitored through the surveillance systems, to reduce the vector population to a level that will not support transmission of malaria, and to reduce house spraying operations in selected pilot areas, with a plan for phased expansion.

The following end-of-project achievements are expected:

- Implementation of at least two operational research projects to test alternative control methods in representative areas;
- Seven research pilot projects to test various methods of vector control under Sri Lankan epidemiological conditions; and
- Continuing vector census system installed in each region of the country.

4. Drug Treatment Program

Effective presumptive, prophylactic and radical drug treatment system in place and responsive to surveillance data. Annual Blood Examination Rate (A.B.E.R.) should be increased to 10% by EOP, and radical treatment must be initiated within a maximum of 14 days after blood sampling.

5. Malaria Education and Information Program

An ongoing program carried out, for example, in conjunction with schools, PHC workers, hospitals, community organizations, and religious organizations, that effectively utilizes various media to reach targeted audiences and potential beneficiaries in the malarious regions with relevant information about malaria prevention, treatment, and control.

6. Training Program

A revised, better planned, intensified training program for AMC staff and other relevant organizations that incorporates training in social and behavioral change skills and broader technical skills (e.g. alternative control methods) into the conventional technical training program.

7. Program Planning, Management and Evaluation

Improving the capability of the AMC organization and management to carry out effective forward planning, rapid problem solving and institutional learning through evaluation (including operational assessment), such that outputs 1 through 6 are achieved in a timely, effective manner.