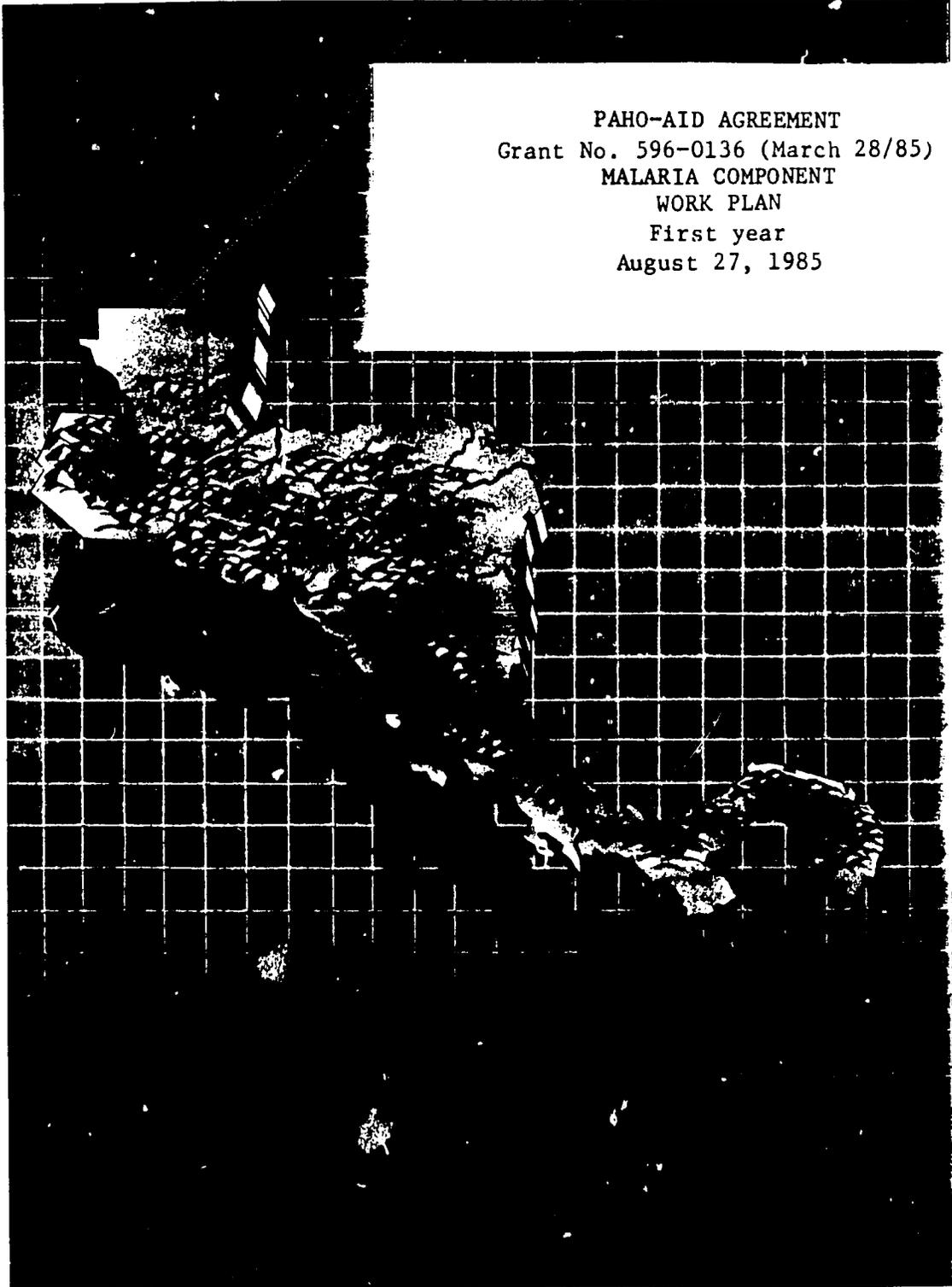


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# NECESIDADES PRIORITARIAS DE SALUD EN CENTRO AMERICA Y PANAMA

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PAHO-AID AGREEMENT  
Grant No. 596-0136 (March 28/85)  
MALARIA COMPONENT  
WORK PLAN  
First year  
August 27, 1985

*La salud como un puente para la paz, solidaridad y  
entendimiento entre los pueblos de Centro América y Panamá*

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1

A. INTRODUCTION

On March 28, 1985 the Government of the United States of America, acting through the Agency for International Development, awarded to the Pan American Health Organization a grant (No. 596-0136) to be used for support of a project to strengthen malaria control programs and improve essential drug procurement, distribution, quality control and utilization programs in the Central American Subregion.

The Grantee covenants that AID resources will be utilized only for technical assistance, training and operations research in or for Belize, Costa Rica, El Salvador, Guatemala, Honduras and Panamá.

AID's contribution to the project will be provided in increments not to exceed a total of \$6,500,000 United States Dollars, during the period from March 30, 1985 through March 31, 1989. It is estimated that, from the total contribution, the sum of \$3,500,000 will be allocated to the support of the Central America Malaria Control program.

In connection with the malaria component, the Agreement identifies five areas of support, as follows:

|                              | <u>Total</u><br><u>(thousands)</u> | <u>%</u> |
|------------------------------|------------------------------------|----------|
| Applied Field Research       | 950                                | 27.14    |
| Research and Training Center | 1,239.35                           | 35.41    |
| Short Term Training          | 500                                | 14.29    |
| Technical cooperation        | 610.65                             | 17.45    |
| Advisory Committee           | 200                                | 5.71     |
|                              | <hr/>                              | <hr/>    |
| 4-year total                 | 3,500.                             | 100.00   |

B. INFORMAL CONSULTATION (April 8-9, 1985)

As an initial step for the implementation of the project, an informal consultation was held at PAHO/HQs in Washington, D.C., in April, with the purpose of defining the best approaches for the establishment of a work plan as well as the timetable of activities to be carried out in the immediate future. This consultation was attended by representatives from AID/Washington, CDC/Atlanta, the University of South Carolina, and PAHO/WHO. The group recommended the drafting of updated country profiles in terms of the malaria problem, training needs and available resources.

C. VISIT TO COUNTRIES DIRECTLY INVOLVED IN THE PROJECT  
(April 29 - May 10, 1985)

In order to facilitate the input of national authorities, it was decided to plan a short visit to the countries directly involved in the project, to take place early in May, and to organize a planning workshop in Guatemala, about two weeks later (May 22-24) with the participation of Responsible Officers of Area 5 -Tropical Diseases.

Specific objectives of the Mission were:

- Information to PAHO/Representatives, AID/Missions, National Coordinators of the Plan (Priority Health Needs) and Responsible Officers of Area 5 - Tropical Diseases, regarding the scope of the agreement, and its limitations. Selected research and training institutions were also to be visited.
- Discussion on present needs and available resources;
- Identification of additional information needed for the planning workshop, thus facilitating the input of national authorities in the preparation of the First Year Work Plan.

The mission started in Panama, for the discussion of general terms of reference and to unify criteria to be followed, visited Belize, Costa Rica, El Salvador, Honduras and ended in Guatemala with the preparation of a joint report.

The joint report is available in Spanish only. It describes the activities of the two sub-groups, and provides information on the following:

- (a) Provisional list of specific training areas, identification of countries within the subregion which have offered support to the project;
- (b) Provisional list of training areas, and countries/institutions which have offered support to the project from outside the Sub-region;
- (c) Matrix which could be used as a model, albeit incomplete, for the review of training needs in terms of personnel and areas of knowledge.
- (d) Matrix similar to the above, in relation to research.

As a result of the Mission the following was accomplished:

- Better understanding of the agreement at country level (National Authorities, AID/Missions, PAHO/CR);
- An exchange of information regarding the present malaria situation, needs and resources in each country;
- A review of previously prepared profiles, in order to make them more relevant to the project in the present circumstances (updating);
- Preparation of a 20-30 pages document, by each participating country, regarding the Sub-regional component of their programs, bearing in mind present policies of the public health sector;
- The Responsible Officers - Area 5 -Tropical Diseases, arrived in Guatemala better prepared to participate in the planning workshop;
- All the national programs which are expected to benefit directly from the implementation of the agreement, including Belize, participated in the planning workshop. Therefore, the material used for the preparation of the workplan is country based.

#### D. SUMMARY OF THE MALARIA STATUS

##### 1. BELIZE

Total population: 164 thousand; Pop. malarious areas: 160,000 (97.6%).  
Year 1984.

Malaria in Belize is considered to be endemic but "responds" well to control measures. A National Malaria Eradication Program was started in 1957, and by 1963 it had been successful in interrupting autochthonous transmission and all the country was classified in the consolidation phase of the program. Only 17 cases were recorded that year.

Unfortunately, the situation deteriorated and the number of registered cases increased during the period 1965-1967. There was again a period (1968-1975) when enough resources were brought into the program, with relative good control of the situation and the number of annual cases reported was maintained below the 100 level. In 1970, for instance, the number of recorded cases was 33.

The situation now is considered to be very serious as a public health problem. Since 1976 there has been a steady increase in the number of cases from 90 cases recorded in 1975, to 4,595 recorded in 1983.

Another problem is the "dispersion" of positive localities, from 16% in 1977 to 62% in 1982.

In 1984 there was a slight improvement of the situation, as a result of the measures applied. The figures indicate an approximate reduction of 10% with 4,117 cases recorded (1984) as compared to 4,595 (1983). In addition, there was a reduction in the number of positive localities, and of P. falciparum infections (634 P. falciparum in 1983 and 521 P. falciparum in 1984).

The Annual Parasite Incidence (1984) was 25.5 per 1,000 inhabitants.

No technical problems, such as resistance of the vectors to the insecticides or resistance of the parasites to antimalarial drugs have been identified so far.

There is a new 4 year program planned for 1985-1988, which calls for the improvement of the structure of the national malaria service, financial support (already granted), and staff development.

The objectives of the program are:

- to obtain 70% reduction in the malaria level;
- to obtain 90% reduction of P. falciparum infections;
- to interrupt malaria transmission in 50% of the malarious areas.

The strategy to accomplish the objectives include:

- Assignment of appropriate human and budgetary resources;
- Use of residual insecticides in all affected areas;
- Improvement of case detection and treatment system;
- Training of personnel of the malaria program, and of the general health services;
- Community participation;
- Inter-institutional coordination.

## 2. COSTA RICA

Total population: 2.5 million; Pop. malarious areas: 700,000 (28.6%).  
Year 1984.

The national malaria eradication program started in 1957 with the use of DDT as the principal control measure, and by 1972 autochthonous transmission had been controlled and part of the country with 32% of the population of the originally malarious area was placed in the consolidation phase of the program.

In 1973 a new program of extension of coverage of the general health services to the rural areas was started, in close collaboration and with the active support of the national malaria eradication service. The new program aimed at (a) extension of basic health services;

(b) promotion of preventive activities; and

(c) improvement of epidemiological surveillance.

As of the same year (1973) malaria vigilance became an integral responsibility of the general health services, through the so-called "rural health program". The situation continued to improve, and by 1984 over 600,000 persons were living in areas in consolidation phase or 86.2% of the original malarious areas. It is now necessary to maintain a rigorous epidemiological vigilance in order to prevent a drawback.

A good prevention and control program has been maintained during the last ten years, with the lowest number of cases recorded in 1982 (110 cases, of which only 6 were P. falciparum infections). However, there was an alarming increase in 1983 (245 cases) and in 1984 (569 cases), with an increase in the Annual Parasite Incidence from 0.35 to 0.79 per 1000 inhabitants.

The number of positive localities has also increased (138 in 1984) and even localities which were not affected by malaria before are now reporting local transmission, a problem that weighs heavily on the general health services, and on the national malaria program which are now finding it difficult to cope with the increased demand.

It is to be mentioned that in the area of Guanacaste, North-western part of the country, near the border with Nicaragua, the Government is developing an irrigation project (Rio Tempisque) which would almost double agricultural production, and will attract new persons into the area, with the potential increase in malaria risk.

The Tempisque irrigation project will cover an area of 120,000 hectares; it is expected that the present population (40,000 inhabitants) of the area will increase to 250,000 people, by the time the project is in operation. It is also to be noted that the project is located in an "originally malarious" zone. The Government has requested IDB funds for the study of the health impact of the project.

The administration of the program is under the Office of International Cooperation. Technical activities are under the guidance of a central group, which works closely with the "Rural Health Program" in charge of malaria epidemiological vigilance in areas where transmission has been interrupted.

The movement of population through the Northern border, as well as the areas under the influence of migrants, displaced persons and refugees, due to social and political unrest in the Central America Sub-region, is cause of serious concern to the health authorities.

The program is oriented toward the goals of tactical variant No. 4 of the XVII Report of the Expert Committee on Malaria.

### 3. EL SALVADOR

Total population: 5.4 million; Pop. malarious areas: 4,133,000 (76.5%). Year 1984.

Malaria has been known to exist in El Salvador since the beginning of this century, with negative repercussions in the social and economic development of the country.

An area with 43% of the population is considered to be hyperendemic and has 85% of the cases registered in the country. In the rest of the malarious area, with 57% of the population, only 15% of the total number of cases are detected.

There are fluctuations in the number of cases registered per year, but, in general, the trend has been of increase. For instance, 10,066 cases in the year 1960; 45,436 in 1970; and 95,835 in 1980.

Several factors appear to be influencing this situation:

- technical, particularly resistance of A. albimanus to most available insecticides. This problem affects a large proportion of the country.
- Migration connected with labor movements in accordance with planting and harvesting cycles of agricultural crops. Around 200,000 persons are involved in these activities.
- Movement of displaced persons and refugees due to present political circumstances in the Sub-region.
- Administrative factors including financial constraints, difficulties in obtaining critical inputs and insufficient logistic support.

Starting in 1980 new strategies have been designed and adopted, so as to plan integral control in selected areas, including vector source reduction and treatment of cases. These approaches have been complemented by residual insecticides and space spraying (ULV) in some priority localities. The program, however, only covers about 25% of the area known to be hyper-endemic.

About 85% of all cases are P. vivax infections and 15% P. falciparum, with minor fluctuations during the last 5 years. In 1984 the percentage of P. falciparum infections was 16.71.

Control activities which are concentrated in priority areas, plus a wide distribution of antimalarial drugs through the voluntary collaborators network are credited with the control of mortality due to malaria.

Present goals of the program are:

- To organize malaria vigilance, prevention and control activities as an integral part of the General Health Services and within the Primary Health Care Strategy;

- To eliminate mortality due to malaria;
- To reduce morbidity to manageable levels.

To achieve the goals set forth above, the strategy includes:

- Support to General Health Services.
- Identification and better utilization of national resources.
- Technical cooperation among developing countries.
- Involvement of academic and other Institutions.
- Coordination with development projects.
- Mobilization of resources from international, bilateral and financial agencies, for the support of the program.

#### 4. GUATEMALA

Total population: 8.1 million; Pop. malarious areas: 3,104,000 (38.0%). Year 1984.

Malaria constitutes one of the principal public health problems in the country, considering the high number of cases which are being detected, the potential to generate epidemic situations and the negative social and economic impact of the disease in the individual, the family, and society in general.

The situation is illustrated by the fact that

- . in 1964 the program reported 20,401 cases, of which 5,003 were P. falciparum infections (24.52%);
- . in 1974 the figure was reduced to 4,030 cases, of which only 25 were P. falciparum infections (0.62%);
- . and in 1984 the figure reached 74,132 cases, of which 6,535 were P. falciparum infections (8.82%).

Around 3.5 million inhabitants of the Republic of Guatemala (1984) live in areas originally classified as malarious. Of the 22 Departments (primary administrative units) in which the country has been divided, six Departments are responsible for about 3/4 of the total number of cases, as follows:

|               |                       |              |
|---------------|-----------------------|--------------|
| El Peten      | (North)               | 20.76%       |
| Escuintla     | (Pacific Coast-South) | 16.40%       |
| Alta Verapaz  | (North)               | 15.84%       |
| Izabal        | (North)               | 9.61%        |
| El Quiché     | (North)               | 6.21%        |
| Huehuetenango | (North)               | <u>5.08%</u> |
|               |                       | 73.90%       |
|               |                       | =====        |

The malarious area of Guatemala has been divided in 3 zones, in accordance with ecological conditions, epidemiological situation and the response to control measures.

- The North, where El Petén and Alta Verapaz are located, has high rainfall, areas of rain forest, high relative humidity, and areas where agriculture is being developed. High risk of malaria transmission.
- The South, (Pacific Coastal Zone) is smaller than the North, but also has conditions favourable to malaria transmission. Main crops are cotton and sugar cane. The heavy use of insecticides in the Pacific Coastal Zone is blamed for the development of resistance of the mosquito vectors of malaria to these compounds.
- There is a third ecological zone, Central-Eastern Zone, with high temperatures, but low rainfall and low humidity. The risk for malaria transmission is also low in this zone.

The year 1974 was the period when the malaria control program had its best accomplishments, with 4,030 cases registered, as mentioned before. After that year there were fluctuations regarding availability of critical inputs, with corresponding ups and downs in the number of recorded cases; during 1977 there was a sharp increase in the number of cases, which peaked at 34,907 for that year. This phenomenon was attributed to the fact that the Government had to mobilize all available resources to assist the population displaced by the earthquake which affected Guatemala in 1976, and new settlements appeared, while most of the malarious areas were left unprotected.

## 5. HONDURAS

Total population: 4.2 million; Pop. malarious areas: 3,867,000 (91.4%). Year 1984.

The control of malaria has been included in the priority health needs of the country. The malaria eradication program started in 1958, and, in general was successful up to 1974 in keeping the transmission under control.

There were some fluctuations, however. For instance, in 1970 a total of 34,537 cases were recorded, of which 5,875 were P. falciparum infections. But by 1974 the situation was again under control and, in that year, the number of recorded cases was down to 7,503 with only 150 P. falciparum (2%).

From 1975 on, the situation has been steadily deteriorating with an all time peak in 1982 of 57,482 cases. Some control of the transmission was obtained in 1983 (37,536 cases) and 1984 (27,332 cases).

The objectives of the malaria program, at present, are:

- To Prevent mortality due to malaria;
- To lower malaria morbidity to levels which would not hinder the social and economic development of the country. To this end, a gradual reduction of the annual parasite incidence (API) to levels below 1.5 cases per 1,000 inhabitants, in a 5 year period, has been adopted as a goal. Present API is 7.07 x 1,000 (year 1984).

In order to achieve the objectives of the program the following strategic approaches have been identified:

- Strengthening of epidemiological vigilance;
- Training of personnel, as multiplying agents;
- Inter-institutional coordination and participation; this would include the active involvement of the General Health Services in antimalarial activities.
- Community participation;
- Intersectoral coordination and support;
- Optimal use of existing national resources.

In 1977 the National Malaria Eradication Service (NMES) was disestablished and a new Division of Vector Control was created with the goal of achieving the integration of antimalarial activities in the General Health Services and obtaining full participation of the community in the program. However, from 1977 to the present, malaria control activities have continued under the direct supervision and the executive authority of the head of the Division and joint activities with the General Health Services have been sporadic.

Considering the trend of the epidemiological situation of malaria, at present, and the adoption of new control strategies, there is a stated interest in stressing the participation of the general health services in the program, leading, eventually to a complete integration of the programs, through a gradual process. When this goal is accomplished, the Vector Control Division (VCD) would function as a central normative body, in charge of planning, programming, monitoring and evaluation of the malaria control program. Within this scheme the general health services would be in charge of the actual execution of the program. To this end, the personnel of the VCD should be retrained, in order that they may be able to act as multiplying agents, and that, in turn, they could offer training courses to the staff of the general health services. It is also envisaged that there will be a need to offer training in other health priority programs to the malaria personnel but maintaining malaria as the main focus of their activities so as not to jeopardize the proper execution of the program.

The process of interrelating the malaria program with the general health services was one of the issues discussed and analyzed during a recent evaluation of the program.

6. PANAMA

Total population: 2.1 million; Pop. malarious areas: 2,037,000 (95.4%). Year 1984.

At the beginning of the eradication campaign, in 1956, malaria was an important cause of mortality and morbidity in the country.

In 1959 the number of cases recorded was 5,066. There was a marked reduction in the number of cases between 1961 and 1968, but in 1969 another "peak" occurred, with 5,937 cases. After 1970 the number of cases recorded has been steadily declining as a result of the activities of the program. In 1975 the number was below the 1,000 mark, with less than 500 cases, per year, reported during the last seven years. In 1984 only 125 cases were reported of which 78 were P. falciparum infections.

Of the 125 cases diagnosed last year, 95 (76%) were imported from other countries, 28 cases were autochthonous and 2 cases were classified as introduced. Of 9,706 localities surveyed, 37 were positive but only in 17 there was local transmission.

Of the total number of cases, 48 were reported in Darien Province and 63 in San Blas, which means that these two provinces were responsible for about 90% of the cases recorded in 1984. There are ten provinces in Panamá.

It is considered that eradication of malaria is possible to achieve in Panamá, provided certain prerequisites are met, such as:

- (a) Implementation of the Primary Health Care Strategy (PHC);
- (b) integration of malaria (NMES) into the general health services. This would involve "joint programming" of malaria vigilance and control together with the activities of the general health services, and not just "coordination";
- (c) maintenance of an adequate technical profile of malaria personnel and their activities (i.e. priority in their field of action);
- (d) proper training of general health services in the epidemiology and control of malaria;
- (e) public awareness and community participation;
- (f) research on problems encountered, in cooperation with other sectors or other disciplines of the health sector; and
- (g) maintenance of a high standard of professional competence.

Finally, it is to be mentioned that, although malaria is well under control in Panama, the interest on research and training in vector borne diseases is maintained to the extent that the country has service and academic institutions which can actively participate in a Sub-regional program in these disciplines.

EPIDEMIOLOGICAL EVALUATION

BELIZE

| YEAR | Population<br>Mal. Areas | B.S.<br>Exam. | B.S.<br>Posit. | Pf+Mixed | ABER  | SPR   | API   | %Pf+ Mixed |
|------|--------------------------|---------------|----------------|----------|-------|-------|-------|------------|
| 1959 | 90,000                   | 11,307        | 1,019          | 712      | 12.56 | 9.01  | 11.32 | 69.87      |
| 1960 | 90,000                   | 13,307        | 196            | 55       | 14.79 | 1.47  | 2.18  | 28.06      |
| 1961 | 93,000                   | 12,355        | 23             | 1        | 13.28 | 0.19  | 0.25  | 4.35       |
| 1962 | 100,000                  | 14,556        | 20             |          | 14.56 | 0.14  | 0.20  | 0.00       |
| 1963 | 100,000                  | 13,085        | 17             |          | 13.09 | 0.13  | 0.17  | 0.00       |
| 1964 | 104,000                  | 11,826        | 35             |          | 11.37 | 0.30  | 0.34  | 0.00       |
| 1965 | 105,000                  | 10,787        | 206            | 188      | 10.27 | 1.91  | 1.96  | 91.26      |
| 1966 | 107,000                  | 13,920        | 552            | 260      | 13.01 | 3.97  | 5.16  | 47.10      |
| 1967 | 114,000                  | 14,773        | 375            | 170      | 12.96 | 2.54  | 3.29  | 45.33      |
| 1968 | 119,000                  | 12,271        | 39             | 1        | 10.31 | 0.32  | 0.33  | 2.55       |
| 1969 | 122,000                  | 12,194        | 28             |          | 10.00 | 0.23  | 0.23  | 0.00       |
| 1970 | 120,000                  | 15,522        | 33             |          | 12.94 | 0.21  | 0.28  | 0.00       |
| 1971 | 124,000                  | 15,703        | 33             | 3        | 12.66 | 0.21  | 0.27  | 9.09       |
| 1972 | 128,000                  | 19,835        | 86             |          | 15.50 | 0.43  | 0.67  | 0.00       |
| 1973 | 132,000                  | 24,414        | 99             |          | 18.50 | 0.41  | 0.75  | 0.00       |
| 1974 | 135,000                  | 23,100        | 96             |          | 17.11 | 0.42  | 0.71  | 0.00       |
| 1975 | 132,000                  | 19,116        | 90             |          | 14.48 | 0.47  | 0.68  | 0.00       |
| 1976 | 136,000                  | 23,513        | 199            |          | 17.29 | 0.85  | 1.46  | 0.00       |
| 1977 | 141,000                  | 39,151        | 894            |          | 27.77 | 2.28  | 6.34  | 0.00       |
| 1978 | 143,000                  | 30,818        | 1,218          | 2        | 21.55 | 3.95  | 8.52  | 0.16       |
| 1979 | 158,000                  | 20,952        | 1,391          | 13       | 13.26 | 6.64  | 8.80  | 0.93       |
| 1980 | 158,000                  | 23,925        | 1,529          | 34       | 15.14 | 6.39  | 9.68  | 2.22       |
| 1981 | 167,000                  | 46,460        | 2,041          | 41       | 27.82 | 4.39  | 12.22 | 2.01       |
| 1982 | 163,000                  | 31,945        | 3,868          | 191      | 19.60 | 12.11 | 23.73 | 4.94       |
| 1983 | 159,000                  | 31,889        | 4,595          | 634      | 20.06 | 14.41 | 28.90 | 13.80      |
| 1984 | 160,000                  | 31,146        | 4,117          | 521      | 19.47 | 13.22 | 25.73 | 12.65      |

EPIDEMIOLOGICAL EVALUATION

COSTA RICA

| YEAR | Population<br>Mal. Areas | B.S.<br>Exam. | B.S.<br>Posit. | Pf+ Mixed | ABER  | SPR  | API  | %Pf+ Mixed |
|------|--------------------------|---------------|----------------|-----------|-------|------|------|------------|
| 1959 | 361,000                  | 55,524        | 1,890          | 121       | 15.38 | 3.42 | 5.26 | 6.37       |
| 1960 | 382,000                  | 57,603        | 2,000          | 64        | 15.08 | 3.47 | 5.24 | 3.20       |
| 1961 | 409,000                  | 87,889        | 1,073          | 18        | 21.49 | 1.90 | 4.09 | 1.08       |
| 1962 | 412,000                  | 183,642       | 1,583          | 5         | 44.57 | 0.86 | 3.84 | 0.32       |
| 1963 | 420,000                  | 257,850       | 1,228          | 9         | 61.39 | 0.48 | 2.92 | 0.73       |
| 1964 | 423,296                  | 123,285       | 1,212          | 7         | 29.13 | 0.98 | 2.86 | 0.58       |
| 1965 | 441,000                  | 197,751       | 2,563          | 5         | 44.84 | 1.30 | 5.81 | 0.20       |
| 1966 | 460,143                  | 250,135       | 3,057          | 2         | 54.36 | 1.22 | 6.64 | 0.07       |
| 1967 | 484,061                  | 164,109       | 4,490          | 0         | 33.90 | 2.74 | 9.28 | 0.00       |
| 1968 | 510,134                  | 142,029       | 1,191          | 0         | 27.84 | 0.84 | 2.33 | 0.00       |
| 1969 | 519,719                  | 202,362       | 688            | 0         | 38.94 | 0.34 | 1.32 | 0.00       |
| 1970 | 549,575                  | 195,484       | 351            | 8         | 35.57 | 0.18 | 0.64 | 2.28       |
| 1971 | 580,900                  | 185,011       | 257            | 10        | 31.85 | 0.14 | 0.44 | 3.89       |
| 1972 | 578,906                  | 191,152       | 159            | 3         | 33.02 | 0.08 | 0.27 | 1.89       |
| 1973 | 595,521                  | 166,355       | 161            | 18        | 27.93 | 0.10 | 0.27 | 11.18      |
| 1974 | 635,107                  | 154,656       | 152            | 22        | 24.35 | 0.10 | 0.24 | 14.47      |
| 1975 | 642,263                  | 166,814       | 290            | 31        | 25.97 | 0.17 | 0.45 | 10.69      |
| 1976 | 663,842                  | 171,753       | 473            | 154       | 25.87 | 0.28 | 0.71 | 32.56      |
| 1977 | 592,830                  | 175,973       | 217            | 46        | 29.68 | 0.12 | 0.37 | 21.20      |
| 1978 | 608,243                  | 202,284       | 313            | 28        | 33.26 | 0.15 | 0.51 | 8.95       |
| 1979 | 624,422                  | 176,219       | 308            | 32        | 28.22 | 0.17 | 0.49 | 10.39      |
| 1980 | 641,593                  | 166,894       | 376            | 68        | 26.01 | 0.23 | 0.59 | 18.09      |
| 1981 | 659,171                  | 162,861       | 168            | 9         | 24.71 | 0.10 | 0.25 | 5.36       |
| 1982 | 677,495                  | 139,019       | 110            | 6         | 20.52 | 0.08 | 0.16 | 5.45       |
| 1983 | 696,329                  | 120,116       | 245            | 10        | 17.25 | 0.20 | 0.35 | 4.08       |
| 1984 | 717,714                  | 103,987       | 569            | 7         | 14.49 | 0.55 | 0.79 | 1.58       |

EPIDEMIOLOGICAL EVALUATION

EL SALVADOR

| YEAR | Population<br>Mal. Areas | B.S.<br>Exam. | B.S.<br>Posit. | Pf+ Mixed | ABER  | SPR   | API   |
|------|--------------------------|---------------|----------------|-----------|-------|-------|-------|
| 1959 | 1,440,000                | 71,259        | 17,521         | 4,051     | 4.95  | 24.59 | 12.1  |
| 1960 | 1,900,000                | 76,287        | 10,066         | 2,959     | 4.02  | 13.19 | 5.3   |
| 1961 | 1,885,000                | 127,293       | 12,563         | 2,960     | 6.75  | 9.87  | 6.6   |
| 1962 | 1,820,000                | 194,069       | 15,433         | 2,557     | 10.66 | 7.95  | 8.4   |
| 1963 | 1,641,000                | 238,791       | 17,846         | 1,879     | 14.55 | 7.47  | 10.8  |
| 1964 | 1,900,014                | 350,843       | 25,827         | 2,661     | 18.47 | 7.36  | 13.5  |
| 1965 | 2,451,000                | 506,442       | 34,070         | 2,186     | 20.66 | 6.73  | 13.9  |
| 1966 | 2,936,233                | 530,357       | 68,562         | 10,703    | 18.06 | 12.93 | 23.3  |
| 1967 | 2,117,609                | 535,494       | 82,960         | 7,227     | 25.29 | 15.49 | 39.11 |
| 1968 | 2,179,914                | 805,311       | 35,831         | 1,025     | 36.94 | 4.45  | 16.4  |
| 1969 | 2,912,731                | 858,916       | 25,299         | 1,994     | 29.49 | 2.95  | 8.6   |
| 1970 | 3,063,932                | 572,373       | 45,436         | 4,286     | 18.68 | 7.94  | 14.8  |
| 1971 | 3,136,175                | 414,331       | 46,858         | 3,235     | 13.21 | 11.31 | 14.94 |
| 1972 | 3,210,646                | 394,935       | 38,335         | 3,059     | 12.30 | 9.71  | 11.94 |
| 1973 | 3,220,875                | 393,110       | 35,095         | 7,286     | 12.21 | 8.93  | 10.90 |
| 1974 | 3,361,476                | 478,553       | 66,691         | 13,133    | 14.24 | 13.94 | 19.84 |
| 1975 | 3,523,569                | 538,909       | 83,100         | 16,309    | 15.29 | 15.42 | 23.58 |
| 1976 | 3,625,259                | 533,610       | 83,290         | 13,820    | 14.72 | 15.61 | 22.97 |
| 1977 | 3,870,848                | 471,109       | 32,243         | 2,934     | 12.17 | 6.84  | 8.33  |
| 1978 | 3,906,000                | 507,237       | 56,533         | 8,634     | 12.99 | 11.15 | 14.47 |
| 1979 | 3,941,000                | 434,475       | 75,657         | 13,391    | 11.02 | 17.41 | 19.20 |
| 1980 | 3,158,179                | 425,264       | 95,835         | 15,782    | 13.47 | 22.54 | 30.35 |
| 1981 | 4,360,000                | 367,447       | 93,187         | 10,878    | 8.43  | 25.36 | 21.37 |
| 1982 | 4,558,000                | 351,426       | 86,202         | 10,267    | 7.71  | 24.53 | 18.91 |
| 1983 | 4,683,000                | 306,648       | 65,377         | 9,696     | 6.55  | 21.32 | 13.96 |
| 1984 | 4,133,252                | 270,156       | 66,874         | 11,172    | 6.54  | 24.75 | 16.18 |

EPIDEMIOLOGICAL EVALUATION

GUATEMALA

| YEAR | Population<br>Mal. Areas | B.S.<br>Exam. | B.S.<br>Posit. | Pf+Mixed | ABER  | SPR   | API   | %Pf+Mixed |
|------|--------------------------|---------------|----------------|----------|-------|-------|-------|-----------|
| 1959 | 1,544,000                | 108,047       | 7,894          | 1,548    | 7.00  | 7.31  | 5.11  | 19.61     |
| 1960 | 1,610,000                | 129,742       | 3,387          | 417      | 8.06  | 2.61  | 2.10  | 12.31     |
| 1961 | 1,770,000                | 218,628       | 4,083          | 780      | 12.35 | 1.87  | 2.31  | 19.10     |
| 1962 | 1,782,000                | 323,373       | 5,996          | 1,601    | 18.15 | 1.85  | 3.36  | 26.70     |
| 1963 | 1,912,000                | 348,866       | 15,116         | 5,557    | 18.25 | 4.33  | 7.91  | 36.76     |
| 1964 | 1,918,603                | 289,058       | 20,401         | 5,003    | 15.07 | 7.06  | 10.63 | 24.52     |
| 1965 | 1,944,000                | 380,562       | 14,472         | 2,313    | 19.58 | 3.80  | 7.44  | 15.98     |
| 1966 | 2,070,263                | 376,439       | 22,045         | 3,230    | 18.18 | 5.86  | 10.65 | 14.65     |
| 1967 | 2,132,371                | 439,186       | 19,683         | 1,377    | 20.60 | 4.48  | 9.23  | 7.00      |
| 1968 | 2,214,292                | 492,940       | 10,407         | 364      | 22.26 | 2.11  | 4.70  | 3.50      |
| 1969 | 2,291,794                | 521,336       | 10,494         | 209      | 22.75 | 2.01  | 4.58  | 1.99      |
| 1970 | 2,229,537                | 447,706       | 11,046         | 83       | 20.08 | 2.47  | 4.95  | 0.75      |
| 1971 | 2,436,086                | 332,531       | 8,280          | 34       | 13.65 | 2.49  | 3.40  | 0.41      |
| 1972 | 2,086,919                | 345,156       | 7,750          | 4        | 16.54 | 2.25  | 3.71  | 0.05      |
| 1973 | 2,153,532                | 386,026       | 6,182          | 3        | 17.93 | 1.60  | 2.87  | 0.05      |
| 1974 | 2,295,632                | 421,240       | 4,030          | 25       | 18.35 | 0.96  | 1.76  | 0.62      |
| 1975 | 2,345,894                | 418,749       | 4,979          | 100      | 17.85 | 1.19  | 2.12  | 2.01      |
| 1976 | 2,404,756                | 435,097       | 9,616          | 320      | 18.09 | 2.21  | 4.00  | 3.33      |
| 1977 | 2,404,756                | 472,297       | 34,907         | 2,159    | 19.64 | 7.39  | 14.52 | 6.19      |
| 1978 | 2,561,000                | 463,794       | 59,755         | 5,234    | 18.11 | 12.88 | 23.33 | 8.76      |
| 1979 | 2,643,865                | 440,712       | 69,039         | 6,631    | 16.67 | 15.67 | 26.11 | 9.60      |
| 1980 | 2,730,247                | 456,784       | 62,657         | 4,361    | 16.73 | 13.72 | 22.95 | 6.96      |
| 1981 | 2,820,211                | 475,777       | 67,994         | 5,718    | 16.87 | 14.29 | 24.11 | 8.41      |
| 1982 | 2,905,099                | 468,430       | 77,375         | 7,841    | 16.12 | 16.52 | 26.63 | 10.13     |
| 1983 | 3,002,485                | 442,745       | 64,024         | 4,356    | 14.75 | 14.46 | 21.32 | 6.80      |
| 1984 | 3,104,070                | 526,694       | 74,132         | 6,535    | 16.97 | 14.07 | 23.88 | 8.82      |

EPIDEMIOLOGICAL EVALUATION

HONDURAS

| YEAR | Population<br>Mal. Areas | B.S.<br>Exam. | B.S.<br>Posit. | Pf+ Mixed | ABER  | SPR   | API   | %Pf+ Mixed |
|------|--------------------------|---------------|----------------|-----------|-------|-------|-------|------------|
| 1959 | 1,347,000                | 66,391        | 6,675          | 3,170     | 4.93  | 10.05 | 4.96  | 47.49      |
| 1960 | 1,359,000                | 109,677       | 5,517          | 1,737     | 8.07  | 5.03  | 4.06  | 31.48      |
| 1961 | 1,409,000                | 164,965       | 4,334          | 861       | 11.71 | 2.63  | 3.08  | 19.87      |
| 1962 | 1,561,000                | 239,655       | 5,750          | 597       | 15.35 | 2.40  | 3.68  | 10.38      |
| 1963 | 1,892,000                | 264,131       | 7,077          | 688       | 13.96 | 2.68  | 3.74  | 9.72       |
| 1964 | 1,900,776                | 207,000       | 6,673          | 641       | 10.89 | 3.22  | 3.51  | 9.61       |
| 1965 | 1,851,000                | 310,301       | 6,952          | 141       | 16.76 | 2.24  | 3.76  | 2.03       |
| 1966 | 1,912,268                | 360,760       | 17,127         | 1,204     | 18.87 | 4.75  | 8.96  | 7.03       |
| 1967 | 1,969,636                | 465,598       | 16,144         | 872       | 23.64 | 3.47  | 8.20  | 5.40       |
| 1968 | 2,028,725                | 584,696       | 15,666         | 4,281     | 28.82 | 2.68  | 7.72  | 27.33      |
| 1969 | 2,113,358                | 591,544       | 29,584         | 5,528     | 27.99 | 5.00  | 14.00 | 18.69      |
| 1970 | 2,132,242                | 357,436       | 34,537         | 5,875     | 16.76 | 9.66  | 16.20 | 17.01      |
| 1971 | 2,268,264                | 255,773       | 48,586         | 4,444     | 11.28 | 19.00 | 21.42 | 9.15       |
| 1972 | 2,314,524                | 226,578       | 18,651         | 652       | 9.79  | 8.23  | 8.06  | 3.50       |
| 1973 | 2,425,797                | 226,231       | 8,862          | 239       | 9.33  | 3.92  | 3.65  | 2.70       |
| 1974 | 2,504,367                | 287,842       | 7,503          | 150       | 11.49 | 2.61  | 3.00  | 2.00       |
| 1975 | 2,542,574                | 266,923       | 30,289         | 1,078     | 10.50 | 11.35 | 11.91 | 3.56       |
| 1976 | 2,580,781                | 295,128       | 48,804         | 2,603     | 11.44 | 16.54 | 18.91 | 5.33       |
| 1977 | 2,583,412                | 264,233       | 39,414         | 1,355     | 10.23 | 14.92 | 15.26 | 3.44       |
| 1978 | 2,670,000                | 236,650       | 34,554         | 2,539     | 8.86  | 14.60 | 12.94 | 7.35       |
| 1979 | 2,758,100                | 143,485       | 25,297         | 4,505     | 5.20  | 17.63 | 9.17  | 17.81      |
| 1980 | 3,267,235                | 175,591       | 43,009         | 6,789     | 5.37  | 24.49 | 13.16 | 15.79      |
| 1981 | 3,492,000                | 221,822       | 49,377         | 5,667     | 6.35  | 22.26 | 14.14 | 11.48      |
| 1982 | 3,627,611                | 322,802       | 57,482         | 4,019     | 8.90  | 17.81 | 15.85 | 6.99       |
| 1983 | 3,756,104                | 336,879       | 37,536         | 2,640     | 8.97  | 11.14 | 9.99  | 7.03       |
| 1984 | 3,867,209                | 452,184       | 27,332         | 1,511     | 11.69 | 6.04  | 7.07  | 5.53       |

EPIDEMIOLOGICAL EVALUATION

PANAMA

| YEAR | Population<br>Mal. Areas | B.S.<br>Exam. | B.S.<br>Posit. | Pf+ Mixed | ABER  | SPR  | API  | % Pf+Mixed |
|------|--------------------------|---------------|----------------|-----------|-------|------|------|------------|
| 1959 | 960,000                  | 80,471        | 5,066          | 583       |       |      |      |            |
| 1960 | 969,000                  | 77,141        | 4,464          | 670       | 8.38  | 6.30 | 5.28 | 11.51      |
| 1961 | 1,033,000                | 88,961        | 3,911          | 1,378     | 7.96  | 5.79 | 4.61 | 15.01      |
| 1962 | 1,091,000                | 145,012       | 3,249          | 631       | 8.61  | 4.40 | 3.79 | 35.23      |
| 1963 | 1,121,000                | 152,898       | 2,670          | 236       | 13.29 | 2.24 | 2.98 | 19.42      |
| 1964 | 1,165,363                | 131,634       | 1,804          | 101       | 13.64 | 1.75 | 2.38 | 8.84       |
| 1965 | 1,194,000                | 102,996       | 1,929          | 172       | 11.30 | 1.37 | 1.55 | 5.60       |
| 1966 | 1,235,000                | 97,525        | 3,664          | 906       | 8.63  | 1.87 | 1.62 | 8.92       |
| 1967 | 1,275,456                | 88,612        | 2,646          | 527       | 7.90  | 3.76 | 2.97 | 24.73      |
| 1968 | 1,317,216                | 83,211        | 1,625          | 512       | 6.95  | 2.99 | 2.07 | 19.92      |
| 1969 | 1,358,469                | 94,596        | 5,937          | 4,104     | 6.32  | 1.95 | 1.23 | 31.51      |
| 1970 | 1,404,977                | 237,477       | 4,584          | 3,405     | 6.96  | 6.20 | 4.37 | 69.13      |
| 1971 | 1,449,600                | 301,030       | 1,041          | 573       | 16.90 | 1.93 | 3.26 | 74.28      |
| 1972 | 1,466,058                | 269,098       | 819            | 543       | 20.77 | 0.35 | 0.72 | 55.04      |
| 1973 | 1,510,436                | 344,315       | 1,595          | 651       | 18.36 | 0.30 | 0.56 | 66.30      |
| 1974 | 1,618,100                | 368,820       | 1,184          | 481       | 22.80 | 0.46 | 1.06 | 40.82      |
| 1975 | 1,636,400                | 394,995       | 666            | 307       | 22.79 | 0.32 | 0.73 | 40.63      |
| 1976 | 1,654,700                | 384,941       | 727            | 337       | 24.14 | 0.17 | 0.41 | 46.10      |
| 1977 | 1,705,330                | 377,059       | 674            | 308       | 23.26 | 0.19 | 0.44 | 46.35      |
| 1978 | 1,757,500                | 382,942       | 263            | 73        | 22.11 | 0.18 | 0.40 | 45.70      |
| 1979 | 1,811,280                | 369,775       | 316            | 129       | 21.79 | 0.07 | 0.15 | 27.76      |
| 1980 | 1,881,740                | 360,172       | 304            | 97        | 20.42 | 0.09 | 0.17 | 40.82      |
| 1981 | 1,835,900                | 387,276       | 340            | 189       | 19.14 | 0.08 | 0.16 | 31.91      |
| 1982 | 1,881,766                | 392,458       | 334            | 186       | 21.09 | 0.09 | 0.19 | 55.59      |
| 1983 | 1,923,174                | 380,135       | 341            | 154       | 20.86 | 0.09 | 0.18 | 55.69      |
| 1984 | 2,037,191                | 373,072       | 125            | 78        | 19.77 | 0.09 | 0.18 | 45.16      |
|      |                          |               |                |           | 18.31 | 0.03 | 0.06 | 62.40      |

E. REVIEW OF PROGRAM OBJECTIVES AND STRATEGIES

As a preliminary exercise for the preparation of the workplan, the following issues were discussed and analyzed:

- (1) The malaria problem in Central America and Panama - in terms of health impact, social factors and medical aspects.
- (2) The objectives of the program in the Sub-region.

Belize, Costa Rica and Panama are in a position to aim at the eradication of the disease but the strategy being applied at present is that of integrated malaria control. In the rest of the Sub-region the goal is to eliminate malaria as a cause of death, and to reduce morbidity to levels compatible with social and economic development.

Complementary objectives are:

- To prevent epidemics of the disease;
  - To maintain the gains in areas free of transmission;
  - To avoid dissemination of the disease to non-malarious areas;
  - To augment the operating capacity of the public health services in order to develop and implement effective epidemiological vigilance and control of malaria;
  - To strengthen the specialized malaria services in the area of applied field research, in order to enable the program to gain better knowledge about the social, economic, biomedical and ecological variables that determine malaria transmission; and to assist in the selection, application and evaluation of control measures.
- (3) National and external resources will be mobilized, with the aim of achieving, by 1990, the following:
    - Organization, implementation and coordination of malaria vigilance, prevention and control, within the general health services, following the Primary Health Care Strategy;

- Elimination of mortality due to malaria in the Sub-region;
  - Maintenance of the downward trend of malaria incidence in Costa Rica and Panamá, and, if possible, to eliminate residual foci of transmission through the strengthening of the epidemiological vigilance system;
  - Elimination of malaria transmission in Belize and reduction of incidence in El Salvador, Guatemala, Honduras and Nicaragua.
- (4) The strategic approaches were also discussed, and are presented in summary form in Chapter D of this document as they refer to individual countries. Common approaches are the following:
- Political decision at National level;
  - Full utilization of Primary Health Care;
  - Identification and utilization of national resources;
  - Technical Cooperation Among Developing Countries;
  - Establishment of collaborative research and training projects with national academic institutions in order to design better vigilance and control methodologies;
  - Coordination of malaria programs with national development projects;
  - Resource mobilization, from bilateral and international agencies.

#### F. TRAINING NEEDS 1985-1986

Prior to discussing the proposed workplan for first year of the PAHO-AID Agreement, the group, which included the Responsible Officers - Area 5 - Tropical Diseases of Belize, Costa Rica, El Salvador, Guatemala, Honduras and Panama, during the planning workshop held in Guatemala City, reviewed the following:

- Background information on the Agreement;
- Epidemiological profiles of each country;
- Objectives, goals, strategies, tactical variants.

A summary of these aspects has been presented in previous chapters of this working document. Once the above was accomplished, the group discussed the following issues:

- Training needs for operations, research and training:
  - . in the malaria service
  - . in the general health services
  - . in research and training centers.
- Training approaches or type of training activity by level of personnel:
  - . Courses (technical, graduate and post-graduate level)
  - . Seminars
  - . Modules. Selfteaching
  - . Continuous education. Refresher courses
  - . Distance education
- Planning of training activities:
  - . Review of job descriptions
  - . Establishment of occupational profiles
  - . Design of curricula
  - . Identification of resources (institutions, teaching staff, suitable places for field practice)
- Development of teaching material for classroom, laboratory and field:
  - . Manuals
  - . Audio-visual aids
  - . Brochures, publications, newsletters
- Timetable of activities
- Budgetary implications for training activities
- Evaluation and future projections

During the workshop held in Guatemala, it was noted that a review of the training needs should be based on present budgetary provisions rather than on an "ideal staffing" of the programs. There was awareness of the fact that efforts are being made to mobilize additional resources for program operations (Inter American Development Bank, European Community, Bilateral and Other International Agencies), but it was the consensus of the group that training of candidates should not be undertaken, unless there was a specific position for the individual involved, either in the specialized malaria services, or in other institutions participating in the program.

There was also a discussion on training needs regarding the staff of the general health services and their participation in vigilance and control of malaria. While tables 1 and 2 reflect the needs of specialized services, there was no consensus regarding criteria on which to base the needs of the general health services, a matter that was postponed for a future review, in coordination with the Health Manpower Development Program.

#### G. RECOMMENDED ACTIVITIES (1985-1986)

It is to be noted that the proposed work plan covers only the period July 1985-March 1986, that is, the time remaining within the first year of the PAHO-AID Agreement. This plan is presented, taking into consideration:

- Informal consultation, Washington D.C., April 8-9, 1985;
- Visit to six countries of the Sub-region, April 19-May 10, 1985;
- Planning seminar, held in Guatemala City, May 22-24, 1985;
- Meeting of an ad-hoc Technical Advisory Committee, June 20-21, 1985.

Note: The expenses already incurred in connection with the preparation of the workplan and the meeting of the Advisory Committee are presented in table 3, activity 1.0.

The work plan for year 1 is presented under seven main line items:

- Academic courses (with a duration of 10 months, or more);
- Short courses (with a duration of 4 months, or less);
- Workshops and seminars (with a duration of 1 to 2 weeks);
- Development of teaching aids and manuals for field use;
- Technical and administrative support (STC's, duty travel, contractual services, grants);
- Supplies and equipment.
- Advisory Committee Meetings.

#### 1. ACADEMIC COURSES

Table 1 presents the estimation of needs as perceived by the national authorities (7 MPH/Malaria and 4 MSc/Entomology), for a total of 11 persons needing post-graduate training starting in year 1. This figure may increase as a result of further promotion of the program, and the availability of additional funding for operations.

The Technical Advisory Committee (June, 1985) reviewed courses offered by four institutions, of which 2 were selected to send candidates as follows:

1.1 Malariology and Environmental Health,  
Maracay, Aragua, Venezuela  
Maximum number of students: 32  
Next course: January - October, 1986  
Periodicity: Annual  
Level: Post-graduate  
Diploma: Negotiations are underway to associate the School of Malariology and Environmental Health with the University of Carabobo. Students writing a thesis in their own countries will be awarded a Master's degree.  
Total duration, including research thesis: 18 months

1.2 Master of Science in Medical Entomology  
University of Panama, Panama  
Coordinated by the School of Medicine  
Maximum number of students: 10  
Next course: starts September 1985  
Duration: 20 months  
Periodicity: Bi-annual  
(Following course will start in September 1987)  
Level: Post-graduate  
Diploma: Master of Science

2. SHORT COURSES

2.1 "Short Course on Comprehensive Vector Control"  
Place: The Wedge, South Carolina  
Sponsor: University of South Carolina (USC)  
Period: August 5 - September 13, 1985  
Language: Spanish  
Maximum number of students: 20

2.2 "Short International Course on Insecticide Application Techniques, and Handling and Maintenance of Spraying Equipment"  
Place: Panama City  
Date: 4-15 November 1985  
Maximum number of students: 16  
Level: Undergraduate  
Sponsors: University of Panama  
Ministry of Health/Panama  
PAHO/WHO

- 2.3 "Emergency Control of Aedes aegypti"  
University of Panama  
Duration: 1 week  
Maximum number of students: 10  
Period: March 1986
- 2.4 "Refresher Course on Medical Entomology"  
Site: University of Panama - 4 weeks  
Field practice in an endemic area of another country of the Sub-region (Guatemala) - 2 weeks.  
Period: First Quarter 1986
- 2.5 "Course on technical and administrative Management for middle level personnel"  
Site: Quiriguá, Guatemala  
Duration: 3 months  
Date: 1986  
Note: This course, to be organized, will aim at training of Public Health Sanitarians and Malaria Program District or Sector Chiefs.  
Activities during this planning period will be concentrated on development of curricula and identification of teaching resources.

3. WORKSHOPS AND SEMINARS

- 3.1 "Development of occupational profiles and educational technology"  
Place: Costa Rica  
Duration: 3 weeks  
Date: September - October 1985  
Maximum number of participants: 20  
Technical support: PASSCAP
- 3.2 "Principles and Techniques for the Preparation of Teaching Material - Audiovisuals"  
Place: Costa Rica  
Duration: 2 weeks  
Maximum number of participants: 18  
Date: November 1985  
Technical support: PASSCAP
- 3.3 "Epidemiology and Control of Malaria"  
Places: All countries CAP  
Duration: 1 week (per seminar)  
Maximum number of participants per seminar: 20  
Expected number of participants CAP: 120  
Material: PAHO-Modules  
Dates: September 1985 - March 1986

- 3.4 "Promotion and orientation of community participation".
- 3.4.1 "Updating of Voluntary Collaborators in malaria control within the Primary Health Care (PHC) Strategy"  
Places: All countries CAP  
Five Workshops per country  
Duration: 2 days  
Participants: 20 per workshop  
Material: To be developed  
Dates: October 1985 - March 1986
- 3.4.2 "Promotion of the participation of the Community in malaria control activities"  
Places: All countries CAP  
Five workshops per country  
Duration: 2 days  
Participants: 20 per workshop  
Material: To be developed  
Dates: October 1985 - March 1986
- 3.5 "Research Methodology"  
Utilization of a Manual to facilitate the development of health manpower  
Duration: 1 week

Note: This workshop was considered but will be scheduled to take place in year 2.

4. DEVELOPMENT OF TEACHING AIDS AND MANUALS FOR FIELD USE

- 4.1 "Comprehensive Vector Control"  
Potential contributors:  
- University of Panama  
- University of South Carolina  
- PAHO/WHO  
Period: 6 months (plus) for preparation of draft, which has to be translated, field tested, edited and published (in stages).
- 4.2 "Manual on Clinical parasitological and immunological diagnosis of malaria"  
Potential contributors to be identified: CDC, Walter Reed Army Institute of Research, Venezuela, Brazil  
Period: 6 months (plus) for preparation of draft, which has to be translated, field tested, edited and published (in stages).

- 4.3 Note: The possibility of preparing a manual on treatment of Malaria, and medical handling of severe cases, was discussed but it was decided to leave this manual for the following planning period, considering that material on this subject is to become available in the near future. The subject of manuals for field personnel, such as spraymen, evaluators, health education auxiliary personnel, was also discussed. It was decided that cooperation could be provided to individual country programs, for them to prepare their own manuals, but this item would not be included in the list of priorities of the PAHO-AID project at this time.

## 5. TECHNICAL AND ADMINISTRATIVE SUPPORT

- 5.1 Emphasis will be placed on institutional strengthening. The University of Panama will play a leading role in the development of training activities during the life of the project. These will include: a Master of Science course on Medical Entomology, short courses on Vector Control, and the development of teaching aids, manuals and other supporting training material. It is expected that after the completion of the project, the University will be able to serve as a major regional resource in the training of personnel involved in the prevention and control of vector-borne diseases.

In order to enable the University of Panama to provide the above mentioned services, it is considered necessary to assign a coordinator, under local contractual services, for a period of eight months (August 1985 - March 1986) to help plan and implement the courses on vector control. The incumbent of this position should have sound technical expertise in medical entomology and experience in management. Experience in training would be an asset. The consultant should also be available to travel to other countries of the Sub-region when necessary, to identify sites for field training, to promote technical cooperation among countries of the Sub-region, and to provide support to other institutions participating in the project.

- 5.2 This planning period (year 1) is primarily devoted to training activities and to the preparation of teaching aids. However, it is also recognized that some preparatory work has to be carried out also in the area of operational research. Based on past experience, the following subjects which have not been studied recently, were selected: management, epidemiological vigilance and information system.

### 5.2.1 Management

There is a need to improve management of the programs, and to forecast problems in the administrative area. This should be accompanied by the selection of alternative courses of action, to minimize negative effects of financial constraints. Furthermore, it is necessary to improve the ability of the programs to "absorb" new resources which are now being mobilized under the "Contadora Initiative" to solve the priority health needs of the Sub-region.

The study would be carried out in Guatemala with the cooperation of the "Unidad de Investigación del Instituto Nacional de Administración Pública" - INAP; the National Malaria Eradication Service - NMES - PAHO/WHO.

The results of the study would eventually serve as a basis for the drafting of training modules in the area of administration.

A protocol should be prepared to this effect.

### 5.2.2 Epidemiological Vigilance and Information System

The present epidemiological vigilance and information system has been in use in the malaria programs, without major changes, during the last 25 years, and follows the pattern set when eradication of malaria, within a fixed period of time, was the goal of the program.

The strategy has changed in some of the countries, as well as the administrative structure and the selection of control measures. New technologies have become available. There is interest in (1) reviewing the present malaria surveillance system in light of current program goals and activities; (2) refining the system to better provide timely and accurate information for the purposed of decision-making; and (3) exploring the potential application of microcomputer technology to improving the flow, accuracy and timeliness of this information.

This activity could be carried out in one or more countries of the Sub-region (Honduras, El Salvador) with the support of a University. The Department of Biostatistics and Epidemiology, Tulane University, New Orleans, has the technical resources to support these studies.

It was agreed that a protocol should be prepared on this subject.

5.2.3 The activities listed above need to be supported by short term consultants, temporary advisors, duty travel of PAHO officers,

contractual services, and grants. These inputs are included in each of the activities presented in Table 3.

6. SUPPLIES AND EQUIPMENT FOR TRAINING

Emphasis will be placed in the strengthening of institutions located in the countries of Central America and Panama. Limited support will also be provided to institutions located outside the Sub-region, which will be directly involved in the training of central american personnel.

Some laboratory equipment and other supplies are needed to supplement the resources already available in the local institutions which will be providing training, particularly to the University of Panama and to PASSCAP (Costa Rica). This is reflected in Table 3. Budget, under items 6.1, 6.2 and 6.3.

7. ADVISORY COMMITTEE MEETING

The proposed budget includes provisions for two meetings of the Technical Advisory Committee, and one meeting of National Officers responsible for the Tropical Diseases Program in Countries of Central America and Panama. This item appears in table 4 under activity 7.

Table 4 also presents a summary of the estimated costs for the malaria program for Central America and Panama, within the context of the PAHO-AID Agreement.

Annexes: Tables 1, 2, 3 and 4.

NATIONAL MALARIA PROGRAMS - PERCEIVED TRAINING NEEDS - YEAR 1

Table 1

| Name of the Course  | Level                        | Approx. Duration | Guatemala | El Salvador | Honduras | Costa Rica | Panama | Belize | Total |
|---|------------------------------|------------------|-----------|-------------|----------|------------|--------|--------|-------|
| 1. Master of Public Health Emphasis on Malaria and other vector borne diseases  | Phys. Eng.                   | 10 months        | 0         | 1           | 1        | 1          | 3      | 1      | 7     |
| 2. Master of Science Emphasis on Medical Entomology                             | Phys. Biol. Vet. Agric. Eng. | 24 months        | 1         | 0           | 1        | 1          | 1      | -      | 4     |
| 3. Medical Entomology (Refresher)   | Technical Offic.             | 3 weeks          | 1         | 0           | 1        | 3          | 2      | 10     | 17    |
| 4. Vector Control (Planning and Management)                                     | Technical Offic.             | 6 weeks          | 2         | 3           | -        | 4          | 1      | -      | 10    |
| 5. Parasitological and Immunological diagnostic techniques                      | Phys. Biologist              | 4 weeks          | 1         | 0           | 0        | 2          | 5      | -      | 8     |
| 6. Computing for the Health Sciences - Application to malaria vigilance         | Technical Offic.             | 3 months         | 4         | 0           | 0        | 1          | 3      | -      | 8     |
| 7. Management for Middle Level Personnel (District or Sector Chiefs)            | Technical Offic.             | 3 months         | 4         | 0           | 25       | 10         | 2      | 3      | 44    |
| 8. Advances in Chemotherapy Monitoring of Susceptibility of parasites to drugs. | Phys. Biol. Tech. Offic.     | 3 weeks          | 1         | 0           | 0        | 2          | 14     | 2      | 19    |
| TOTAL   | -                            | -                | 14        | 4           | 28       | 24         | 31     | 16     | 117   |

RESEARCH AND TRAINING "CENTERS" - PERCEIVED TRAINING NEEDS - YEAR 1

Table 2

| Type of Activity   | Number of Participants per Country |             |          |        |            |        | Total | Approx. Duration |
|--|------------------------------------|-------------|----------|--------|------------|--------|-------|------------------|
|  | Guatemala                          | El Salvador | Honduras | Belize | Costa Rica | Panama |       |                  |
| 1. Short course<br>Development of<br>Educational Profiles                    | 3                                  | 3           | 3        | 3      | 3          | 3      | 18    | 1 week           |
| 2. Short course<br>Educational Technology                                    | 3                                  | 3           | 3        | 3      | 3          | 3      | 18    | 1 week           |
| 3. Short course<br>Preparation and<br>utilization of<br>audiovisual material | 3                                  | 3           | 3        | 3      | 3          | 3      | 18    | 1 week           |
| 4. Short course<br>Research Methodology                                      | 3                                  | 3           | 3        | 3      | 3          | 3      | 18    | 1 week           |
| 5. Seminar<br>Epidemiology and<br>Control of malaria                         | 5                                  | 5           | 5        | 2      | 3          | 3      | 23    | 1 week           |
| 6. Seminar<br>Clinical, Parasitological and Immunological Diagnosis          | 5                                  | 5           | 5        | 2      | 3          | 3      | 23    | 1 week           |
| <b>T O T A L</b>   | 22                                 | 22          | 22       | 16     | 18         | 18     | 118   | ---              |

TABLE 3. TENTATIVE BUDGET FOR THE SUPPORT OF PLANNED ACTIVITIES

| Item No. | Activity No. | Component   | No. of Participants | Local Costs                | Consultants Temp. Advisors               | Registration, Travel and Stipends of Participants  | Supplies & Equipment | Total Estimated Cost |
|----------|--------------|---|---------------------|----------------------------|--|--|----------------------|----------------------|
| 0        | 1.0          | Preparation of 1st year Workplan & meetings Advisory Committee  |                     |                            | STC 14.572<br>DT 11.742<br><u>26.314</u> |  |                      |                      |
|          |              |   |                     |                            | 26.314                                   |  |                      | 26.314               |
| 1        | 1.1          | Malariology & Environmental Health Maracay, Venezuela 10 mos. (Venezuela)                                   | 7                   | Not requested at this time | 3 x 20d ea. (20d x \$200) 2.000          | Registration N/C Stipend (1) 3.634<br>Supplementary stipend for ea. of 6 partic. 150 x 6 x month 9.000<br>Allowance/ea partic.:<br>Book allowance 300<br>Exc. baggage 100<br>Thesis 500<br>Travel <u>1.332</u><br>2.237x7 15.624 | 2.000                |                      |
|          |              | TOTAL   |                     |                            | 12.000                                   | 28.258   | 2.000                | 42.258               |
| 2        | 1.2          | Master of Science course on Medical Entomology, Panama<br>Course duration: 20 mos.<br>This budget 1st. year | 4                   | 2.000                      | 25 d x \$200 = 5.000                     | For ea. of the 4 CA participants<br>Registration 3.200<br>Stipend 11.100<br>Book allowance .300<br>Exc. baggage .100<br>Travel <u>.666</u><br>15.366   |                      |                      |
|          |              | TOTAL   | 2.000               |                            | 5.000                                    | 61.464   |                      | 68.464               |

| Item No. | Activity No. | Component   | No. of Participants | Local Costs | Consultants Temp. Advisors                               | Registration, Travel and Stipends of Participants   | Supplies & Equipment | Total Estimated Cost |
|----------|--------------|---|---------------------|-------------|--|---|----------------------|----------------------|
| 3        | 2.1          | Comprehensive Vector Control Short course, 6 weeks South Carolina | 6                   |             | 2 x 3d = 6<br>6d x \$200 =<br>1.200                      | For ea. of the 6 CA participants<br>Registration 1.200<br>Stipend 3.060<br>Book allowance .120<br>Job fees .100<br>Travel .660<br>Other travel .500<br><u>5.640</u> |                      |                      |
| TOTAL    |              |   |                     |             | 1.200  | 33.840  |                      | 35.040               |
| 3        | 2.2          | Insecticide Application Techniques Spraying equipment             | 6                   | 2.000       | 20d x \$200<br>4.000                                     | For ea. of the 6 CA participants<br>Per diem 1.152<br>Travel .666<br><u>1.818</u>   |                      |                      |
| TOTAL    |              |   | 2.000               |             | 4.000  | 10.908  |                      | 16.908               |
| 4        | 2.3          | Emergency Control of <u>A. Aegypti</u>                            | 6                   | 2.000       | 10d x \$200<br>2.000                                     | For ea. of the 6 CA participants<br>Per diem .672<br>Travel .666<br><u>1.338</u>  |                      |                      |
| TOTAL    |              |   | 2.000               |             | 2.000  | 8.028   |                      | 12.028               |
| 5        | 2.4          | Refresher course on Medical Entomology                            | 15                  | 5.000       | 2 TA x 5 = 10d<br>10 x 200=2.000<br>DT 2.000<br>CS 5.000 | For ea. of the 15 CA participants<br>Per diem 3.315<br>Travel 1.332<br><u>4.647</u>   |                      |                      |
| TOTAL    |              |   | 5.000               |             | 9.000  | 69.705  |                      | 83.705               |
| 6        | 2.5          | Management - Middle level personnel (Planning only)               |                     |             | 3 TA x 10 = 30d<br>30 x 200=6.000                        |   |                      |                      |
| TOTAL    |              |   |                     |             | 6.000  |   |                      | 6.000                |

| Item No. | Activity No. | Component   | No. of Participants   | Local Costs        | Consultants Temp. Advisors  | Registration, Travel and Stipends of Participants  | Supplies & Equipment   | Total Estimated Cost |
|----------|--------------|---|-----------------------|--------------------|---|--|--|----------------------|
| 7        | 3.1          | Occupational profiles and educational technology  | 18                    | 4.000              | 21d x \$200<br>4.200  | For ea. of the 18 CA participants<br>Per diem 1.575<br>Travel .666<br><u>2.241</u>       |  |                      |
| TOTAL    |              |   | 4.000                 | 4.200              | 40.338  | 48.538   |  |                      |
| 8        | 3.2          | Principles & Techniques for the preparation of teaching material, audiovisuals  | 18                    | 3.000              | 15d x \$200<br>3.000  | For ea. of the 18 CA participants<br>Per diem 1.125<br>Travel .666<br><u>1.791</u>       |  |                      |
| TOTAL    |              |   | 3.000                 | 3.000              | 32.238  | 38.238   |  |                      |
| 9        | 3.3          | Epidemiology & Control of Malaria<br>6 Natl. seminars x 20 participants ea.   | 20                    | 2.000              | Ea. course:<br>2 TA natl. 1.400<br>2x7x100 DT 1.500<br><u>2.900</u> | For ea. of the 20 CA participants<br>Per diem .350<br>Travel .50<br><u>.400</u><br>8.000 | .420   |                      |
| TOTAL    |              |   | 120                   | 12.000             | 17.400  | 48.000   | 2.520  | 79.920               |
| 10       | 3.4.1        | Updating voluntary collaborators in Malaria Control within the PHC Strategy (5 Workshops x ea. country x 6 countries) | ea. Work shop 20 x 30 | 400 x 30<br>12.000 | STC (60d x 200) 12.000<br>DT 5.000<br>CS 5.000                      | Per diem .300<br>Travel (300 x 30) 9.000   | Audiovisuals + projectors + reproductions of materials<br>25.000 |                      |
|          | 3.4.2        | Community participation in Malaria Control (10 courses x ea. country x 6 countries)                                   | ea. Work shop 20 x 60 | 400 x 60<br>24.000 |   | Per diem + travel (300 x 60) 18.000  | .300   |                      |
| TOTAL    |              |   | 1.800                 | 36.000             | 22.000  | 27.000   | 25.000   | 110.000              |

| Item No. | Activity No. | Component  | No. of Participants | Local Costs | Consultants Temp. Advisors                                 | Registration, Travel and Stipends of Participants | Supplies & Equipment | Total Estimated Cost |
|----------|--------------|--|---------------------|-------------|--|---|----------------------|----------------------|
| 11       | 4.1          | Development of teaching aids and manuals "Comprehensive Vector Control"                                  |                     |             | CS   | 20.000  |                      |                      |
|          |              | TOTAL  |                     |             |  | 20.000  |                      | 20.000               |
| 12       | 4.2          | "Manual on Clinical Parasitological & immunological diagnosis of malaria"                                |                     |             | CS   | 10.000  |                      |                      |
|          |              | TOTAL  |                     |             |  | 10.000  |                      | 10.000               |
| 13       | 5.1          | Project Coordinator University of Panama   |                     |             | STC (AUG 85-MAR 86)<br>(250d x \$150)<br>(Travel included) |   |                      |                      |
|          |              | TOTAL  |                     |             |  | 37.500  |                      | 37.500               |
| 14       | 5.2.1        | Management study (INAP Guatemala)  | 1.500               |             | STC 15d x 200 =<br>3.000<br>DT 1.500<br>CS 4.000           |   |                      |                      |
|          |              | TOTAL  |                     |             |  | 8.500   |                      | 10.000               |
| 15       | 5.2.2        | Epidemiological Surveillance & Information System (Development of Protocols & Testing of Questionnaires) |                     |             | 2 STC 90d x \$200 =<br>18.000<br>DT 3.500                  |   |                      |                      |
|          |              | TOTAL  | 1.500               |             |  | 21.500  |                      | 21.500               |
| 16       | 6.1          | Strengthening University of Panama   |                     |             |  |   | 40.000               | 40.000               |

| Item No.     | Activity No. | Component                               | No. of Participants | Local Costs | Consultants Temp. Advisors   | Registration, Travel and Stipends of Participants | Supplies & Equipment | Total Estimated Cost |
|--------------|--------------|---|---------------------|-------------|--|---|----------------------|----------------------|
| 17           | 6.2          | Strengthening PASSCAP                   |                     |             |  |   | 25.000               | 25.000               |
| 18           | 6.3          | Program support for regional activities |                     |             |  |   | 20.000               | 20.000               |
| 19           | 7            | 2 meetings<br>Advisory Committee        | 2.000               |             | TA 15.000<br>DT 4.500<br>6 Natl.<br>Coord.<br>Malaria<br>Program 12.000<br><u>31.500</u> |   |                      |                      |
| <b>TOTAL</b> |              |   |                     |             |  |   |                      | <b>33.500</b>        |

|                           |                          |
|---------------------------|--------------------------|
| <b>TOTAL</b>              | <b>784.913</b>           |
| 10% Contingencies         | <u>78.491.30</u>         |
| <b>SUBTOTAL</b>           | <b>863.404.30</b>        |
| 13% Program Support Costs | <u>112.242.55</u>        |
| <b>GRAND TOTAL</b>        | <b><u>975.646.85</u></b> |

CA = Central America  
 STC = Short Term Consultant  
 TA = Temporary Advisor  
 CS = Contractual Services  
 DT = Duty Travel

Table No. 4

## ESTIMATED COSTS FOR THE MALARIA PROGRAMME FOR CENTRAL AMERICA AND PANAMA

| Item No.    | Activity No. | Local Cost (030) | STC (040) | Duty Travel (230) | Sub-contracts (390) | Equipment (550) | Fellowships (810) | Training (820) | TOTAL     |
|-------------|--------------|------------------|-----------|-------------------|---------------------|-----------------|-------------------|----------------|-----------|
| 0           | 1.0          | -                | 14,572.-  | 11,742.-          | -                   | -               | -                 | -              | 26,314.-  |
| 1           | 1.1          | -                | 12,000.-  | -                 | -                   | 2,000.-         | 28,258.-          | -              | 42,258.-  |
| 2           | 1.2          | 2,000.-          | 5,000.-   | -                 | -                   | -               | 61,464.-          | -              | 68,464.-  |
| 3           | 2.1          | -                | 1,200.-   | -                 | -                   | -               | 33,840.-          | -              | 35,040.-  |
| 3           | 2.2          | 2,000.-          | 4,000.-   | -                 | -                   | -               | -                 | 10,908.-       | 16,908.-  |
| 4           | 2.3          | 2,000.-          | 2,000.-   | -                 | -                   | -               | -                 | 8,028.-        | 12,028.-  |
| 5           | 2.4          | 5,000.-          | 2,000.-   | 2,000.-           | 5,000.-             | -               | -                 | 69,705.-       | 83,705.-  |
| 6           | 2.5          | -                | 6,000.-   | -                 | -                   | -               | -                 | -              | 6,000.-   |
| 7           | 3.1          | 4,000.-          | 4,200.-   | -                 | -                   | -               | -                 | 40,338.-       | 48,538.-  |
| 8           | 3.2          | 3,000.-          | 3,000.-   | -                 | -                   | -               | -                 | 32,238.-       | 38,238.-  |
| 9           | 3.3          | 12,000.-         | 8,400.-   | 9,000.-           | -                   | 2,520.-         | -                 | 48,000.-       | 79,920.-  |
| 10          | 3.4.1        | 12,000.-         | 12,000.-  | 5,000.-           | 5,000.-             | 25,000.-        | -                 | 9,000.-        | 68,000.-  |
| 10          | 3.4.2        | 24,000.-         | -         | -                 | -                   | -               | -                 | 18,000.-       | 42,000.-  |
| 11          | 4.1          | -                | -         | -                 | 20,000.-            | -               | -                 | -              | 20,000.-  |
| 12          | 4.2          | -                | -         | -                 | 10,000.-            | -               | -                 | -              | 10,000.-  |
| 13          | 5.1          | -                | 37,500.-  | -                 | -                   | -               | -                 | -              | 37,500.-  |
| 14          | 5.2.1        | 1,500.-          | 3,000.-   | 1,500.-           | 4,000.-             | -               | -                 | -              | 10,000.-  |
| 15          | 5.2.2        | -                | 18,000.-  | 3,500.-           | -                   | -               | -                 | -              | 21,500.-  |
| 16          | 6.1          | -                | -         | -                 | -                   | 40,000.-        | -                 | -              | 40,000.-  |
| 17          | 6.2          | -                | -         | -                 | -                   | 25,000.-        | -                 | -              | 25,000.-  |
| 18          | 6.3          | -                | -         | -                 | -                   | 20,000.-        | -                 | -              | 20,000.-  |
| 19          | 7.0          | 2,000.-          | 15,000.-  | 4,500.-           | -                   | -               | -                 | 12,000.-       | 33,500.-  |
| Sub - Total |              | 69,500.-         | 147,872.- | 37,242.-          | 44,000.-            | 114,520.-       | 123,562.-         | 248,217.-      | 784,913.- |

10% Contingencies 78,491.30  
Sub-total 863,404.30  
13% Program Support Costs 112,242.55

TOTAL 975,646.85  
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