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AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

PROJECT PAPER
PAKISTAN - MALARIA CONTROL II EXTENSION
391-0472

SEPTEMBER, 1988

UNCLASSIFIED

PROJECT DATA SHEET

A | C = Change D = Delete | 2 | CODE 3

2. COUNTRY/ENTITY: PAKISTAN

3. PROJECT NUMBER: 391-0472

4. BUREAU/OFFICE: ANE

5. PROJECT TITLE (maximum 40 characters): MALARIA CONTROL II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 92

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 82 B. Quarter 3 C. Final FY 92

8. COSTS ($000 OR EQUIVALENT $1 = 18)

A. FUNDING SOURCE	FIRST FY 82 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	1,500		1,500	66,000	–	66,000
(Grant)	(1,500)	( )	(1,500)	(66,000)	(–)	(66,000)
(Loan)	(–)	( )	( )	( )	(–)	(–)
Other 1. (MONDALE RUPEE AT $=Rs.10.43)		2,103	2,103		2,103	2,103
U.S. 2.						
Host Country	2,400	7,411	9,811	–	72,989	72,989
Other Donor(s)	–	–	–	–	–	–
TOTALS	3,900	9,424	13,324	66,000	75,002	141,002

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ESF	510	542		41,000	–	25,000	–	66,000	–
(2)									
(3)									
(4)									
TOTALS				41,000	–	25,000	–	66,000	–

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
TNG
783

13. PROJECT PURPOSE (maximum 480 characters)

To assist Pakistan to contain and further reduce the incidence of Malaria and to foster national self reliance in Malaria control.

14. SCHEDULED EVALUATIONS
Interim MM 08 YY 89 | MM 08 YY 90 | Final MM 08 YY 92

15. SOURCE/ORIGIN OF GOODS AND SERVICES
[X] 000 [ ] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment)

To increase LOP fundings from $41 million and Mondale Rupee 21 million for Extension of project activities aimed at development of more efficient and effective system of malaria case detection through general health services.

17. APPROVED BY
Signature: James A. Norris
Title: Director, USAID/Pakistan.
Date Signed: MM 09 DD 28 YY 88

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM DD YY

AID 1330-4 (8-79)

C/FM

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LIST OF ABBREVIATIONS

ACD	Active Case Detection
APCD	Activated Passive Case Detection
API	Annual Parasite Incidence
BHC	Benzene Hexachloride (Insecticide)
BHU	Basic Health Unit
CDC	Communicable Disease Control
CHW	Community Health Worker
CS	Child Survival
DDT	Dichlorodiphenyl Trichloroethane (Insecticide)
DHO	District Health Officer
DOMC	Directorate of Malaria Control
EPA	Environmental Protection Agency
EPI	Expanded Program of Immunization
ERT	External Review Team
FP	Family Planning
GOP	Government of Pakistan
GR	Geographical Reconnaissance
HT	Health Technician
IHP	Integrated Health Program
LHV	Lady Health Visitor
MCP	Malaria Control Program
MDW	Midwife
MEP	Malaria Eradication Program
MO	Medical Officer
MT	Medical Technician
NIMRT	National Institute for Malaria Research and Training
NMTC	National Malaria Training Center
OP	Organophosphorus
ORT	Oral Rehydration Therapy
PCD	Passive Case Detection
PC-1	A GOP project document similar to A.I.D's Project Paper
PHC	Primary Health Care
PHD	Provincial Health Department
RHC	Rural Health Center
SPR	Slide Positivity Rate
UC	Union Council
ULV	Ultra-Low-Volume
UNICEF	United Nations Children's Fund
WAPDA	Water and Power Development Authority
WDP	Water Dispersable Powder
WHO	World Health Organization

GLOSSARY OF TERMS

Adulticide is any chemical pesticide used to kill the adult stage of mosquito or other insects. Insecticides used for this purpose are dispersed by specialized equipment which dispenses the material in micron-sized particles.

Active Case Detection is a part of surveillance activities in which malaria personnel actively search for malaria cases by visiting households or dwellings in an area/locality and through collecting blood slides and doing other epidemiological investigations.

Activated Passive Case Detection is a part of surveillance activity in which malaria personnel actively search for malaria cases by attending a health facility in an area through collection of blood slides from the patients visiting the facility.

Annual Parasite Incidence is the proportion of cases of malaria detected on an annual basis in relation to the unit of population in which malaria occurs. Current API in Pakistan is .97 cases per thousand population.

BHC is an abbreviation of the common name Benzene Hexachloride, a chlorinated hydrocarbon type of residual insecticide.

Biological Control is a method of controlling mosquitoes using living vertebrate or invertebrate predators, genetic control, or parasites.

DDT is an abbreviation of the common name Dichlorodiphenyl Trichlorethane, a chlorinated hydrocarbon type of residual insecticide.

Endemicity is a term applied to malaria when there is a constant measurable incidence in an area over a succession of years.

Epidemic is a term applied to malaria when the incidence of cases in an area rises rapidly and markedly above its usual level.

Epidemiology is the study of the environmental, personal, and other factors that determine the incidence of disease.

Fenitrothion is an organophosphorus residual insecticide.

Focal Spraying is residual insecticide house spraying only in the areas where malaria has been found.

IEC is a common abbreviation for Information, Education and Communication.

Incidence is the number of cases of disease occurring during a given time period in relation to the unit of population in which they occur.

Larvicide is a substance used to kill the aquatic larval stage of the malaria mosquito by ingestion, contact, or respiratory blockage.

Malaria Control is an operation aimed at reducing the prevalence of malaria to a level at which it is no longer a major public health problem.

Malaria Control Program refers to the national malaria control effort of the Government of Pakistan.

Malaria Eradication is the ending of the transmission of malaria and the elimination of the reservoir of infected cases in a time-limited campaign so effectively conducted that when it comes to an end, there is no resumption of transmission.

Malaria Focus is a defined and circumscribed locality situated in a currently or formerly malarious area and containing continuous or intermittent malaria transmission.

Malariogenic Potential is the degree to which an area is conducive to malaria based on cumulative epidemiological data collected from each area regarding the parasite load, vector density, water-logging, climatic conditions, population movement, and other factors.

Malathion is an organophosphorus residual insecticide.

Malaria Parasite is a colloquial term for any of the four protozoan organisms causing malaria infections.

Parasite Rate is the percentage of persons showing malaria parasites by blood smear examination.

Passive Case Detection is a part of the surveillance activities in which the public or private health facility staff (other than the regularly constituted malaria service) assist surveillance activities by the collection of blood slides from patients visiting the facility for treatment.

P. Falciparum Malaria is a (severe) type of malaria caused by *Plasmodium falciparum*, a species of malaria parasite.

Presumptive Treatment is initial drug treatment given to an expected malaria case at the time when a blood sample is taken for examination.

Radical Treatment is a prescribed drug regimen administered to a patient suffering from a laboratory-diagnosed case of malaria, designed to cure the disease and eliminate the causative parasites in the patient.

Residual Insecticide is an insecticide which when properly applied on a surface, maintains its insecticidal activity for a considerable period of time by either contact or fumigant action.

Slide Positivity Rate is the number of positive slides multiplied by 100 and divided by the total number of slides taken.

Stratification is division of malarious areas into strata having a similar level of incidence of malaria in its various forms.

Supplementary Control Practices include any methodology of malaria control used in addition to current control practices.

Surveillance is an activity of malaria program aimed at the discovery and investigation, of malaria cases including elimination of continuing transmission and the prevention and cure of infections.

Total Spray Coverage is the application of residual insecticide during one spraying cycle to all sprayable surfaces in all sprayable houses within a given operational area. (Irrespective of whether malaria has been found in the area. Also called "blanket coverage".)

Ultra Low Volume Spraying is a method of insecticide dispersion by special air or ground equipment using very small amounts of finely dispersed particles of insecticide.

Vector in malaria is any species of mosquito in which the malaria parasite completes its sexual cycle and which is thus able to transmit the disease.

Vector Density is the number of female Anopheline mosquitoes in relation to the number of specified shelters or hosts or to a given time period, specifying the method of collection.

Vector Susceptibility represents the degree to which a species of mosquito is subject to the effects of insecticides.

Water Management as it relates to malaria control involves the reduction or elimination of sources of mosquito breeding through filling, draining, digging, changing water levels, flushing, canal trimming, and other engineering methods.

I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. Funding

USAID/Pakistan recommends an ESF grant of $25 million for a four-year extension of the Malaria II Project. The extension has a Project Assistance Completion Date (PACD) of September 30, 1992.

2. Geographic Code

The project authorization should specify that, except as A.I.D. may otherwise agree in writing, goods and services financed by A.I.D under this project shall have their source and origin in countries included in A.I.D. Geographic Code 000 or Pakistan.

B. Summary Project Description

This project amendment will continue to provide the use of A.I.D. funds to assist the Government of Pakistan (GOP) with the implementation of the Malaria Control Program (MCP). A.I.D's annual contribution will assist structuring project activities in a way to facilitate, by end of project extension, development of self reliance of GOP in malaria cont ol operation.

1. Existing Project

With the annual parasite incidence rate (API) of .97 per thousand population in 1987, the existing project has been successful in maintaining an annual parasite incidence (API) level where malaria is not a major public health problem in Pakistan. Additionally, because quantities of insecticide used has declined steadily in 1986, 1987, and 1988, the Ministry of Health has been able to demonstrate a trend of reduced reliance on insecticidal spray for their malaria control operations.

While successful in averting an increase in the incidence of malaria, the existing project has not achieved major long term objectives formulated when the project was initially designed in 1982. These objectives were: (1) functional integration of malaria control program (MCP) with general health services and establishment of an integrated parasite control mechanism; (2) development of an operation research capacity; and, (3) development and implementation of cost effective vector control methods.

2. Project Extension

This extension will build on the success of the previous six years, but put a stronger emphasis on institution building particularly on the adoption of passive case detection in the general health services; and

operational research. Some other changes in emphasis include: (1) Augmentation of the capability of the health delivery system at the municipal, provincial and federal levels to provide malaria surveillance, treatment and case follow-up to assist in reducing parasite reservoir; (2) Hiring of new personnel to undertake urgently needed training and operational research; (3) Limiting of residual insecticide spraying in rural dwellings to areas in which epidemiological evidence clearly dictates its application; and, (4) Introduction of long range and more permanent control techniques to augment the current temporary control measures -- insecticide spraying, chemotherapy and reduction in the parasite reservoir. The project extension will specifically address the following:

a) Self Sufficiency of Malaria Control Program (MCP)

With heavy reliance on imported and donor-financed insecticidal spray for vector control operations until 1985, the malaria control program has been highly vulnerable to stoppage or reduction of foreign donors' assistance. More recently, the GOP has become more concerned about the dependence of program on donor assistance and has decided to emphasize other approaches such as passive case detection and treatment of malaria cases at general health facilities (PCD), in an effort to make Pakistan more self sufficient in malaria control operations. The project extension is designed to assist GOP to achieve self sufficiency through concerted efforts to establish a fully functioning, nationwide PCD system and limiting the insecticidal spray application only to epidemiological malaria positive areas. The project extension will also help Pakistan become self sufficient in malaria control expertise through long term participant training arranged and utilized under the extension.

b) Functional Integration of Malaria Control into General Health Services

Since 1976 the provinces have worked to integrate malaria control activity in the general h alth services. Administrative integration has been instituted in all four provinces but full functional integration has not been accomplished. However, in Punjab, in 1986, district malaria microscopic laboratories were decentralized and microscopists were assigned to rural health centers (RHCs) thus allowing the RHCs to operate as malaria microscopic centers and passive case detection posts or PCD posts. Although the National Institute of Malaria Research and Training (NIMRT) trained over 300 general health service laboratory assistants/attendants (LAs) in malaria microscopy during 1982-87, few of the trainees have been deployed to malaria case detection (PCD) posts and there is no plan to improve deployment. The project extension includes development of an action plan covering training and appropriate placement of the health personnel.

c) Development of Operational Research Capacity

The GOP established the National Institute of Malaria Research and Training (NIMRT) on May 16, 1985 by nationalizing the International Center for Medical Research (ICMRT) - a University of Maryland (USA) field research center for malaria research. The National Malaria Training Center (NMTC) was merged with the Institute, in March, 1987. The Institute is more than two years old, it is not yet fully staffed, and the personnel already hired need to improve their qualifications and capabilities. The Institute is in its third year and has now started working on three operational research protocols. The project extension will ensure that staff deficiencies are overcome. The post of Director has been filled with a suitable person since January 1988. The project extension will ensure that at the institute (i) an operational research capability is established, (ii) a system of developing protocols and carrying out operational research is established, and (iii) ongoing operational research on approved protocols is augmented.

The extension of Malaria Control II, like its predecessor, consists of four components: (1) Program Management: Short and long term technical assistance to strengthen the malaria control program in the areas of program management, entomology, epidemiology, safe handling of insecticides, evaluation, surveillance, urban malaria control, and environmental management; (2) Training: Short term technical assistance to strengthen the training capability of National Institute of Malaria Research & Training (NIMRT) to meet incountry needs in this field of the malaria control program; long and short term overseas training, fellowships and inservice training programs for malaria and general health services personnel in specific aspects of malaria control; (3) Operational Research: Short term technical assistance to strengthen the capabilities of NIMRT and provincial malaria control programs to conduct operational research and field studies, supplies and equipment for research and budget support for operational research and field studies; and, (4) Commodity Support: Residual insecticide, spray equipment, malaria control vehicles, ULV and fogging machines, adulticide, microscopes and other necessary commodities.

The project will also include funding for construction of a building for NIMRT provided the Government of Pakistan makes available a suitable piece of land and provides the GOP title to it. The funds can also be utilized to purchase and renovate a suitable existing building to house the institute.

C. Summary Findings

This project is socially, financially, and economically sound, and administratively and technically feasible, and is ready for implementation.

D. Project Checklists and Mission Director's Certification

1. This project meets all applicable statutory criteria. Appropriate checklists are included in Annex B.

E. Project Issues

1. Integration of MCP into General Health Services

The Malaria Control Program is being integrated into Pakistan's general health service system with the encouragement of support from donors, notably WHO and A.I.D. Although it is recognized that in the short run the merger of a vertical program into an established arm of government is often traumatic in terms of morale and performance, in the long run the benefits outweigh the initial difficulties. In Pakistan the difficulties are compounded since integration must take place in four large and administratively uneven provincial health services.

The benefits of integration come from having fixed health facilities as centers for malaria surveillance, capable of prompt laboratory confirmation of suspected cases, prompt and appropriate treatment for the identified infection, and follow-up to ensure completion of treatment and to detect any resistant strains.

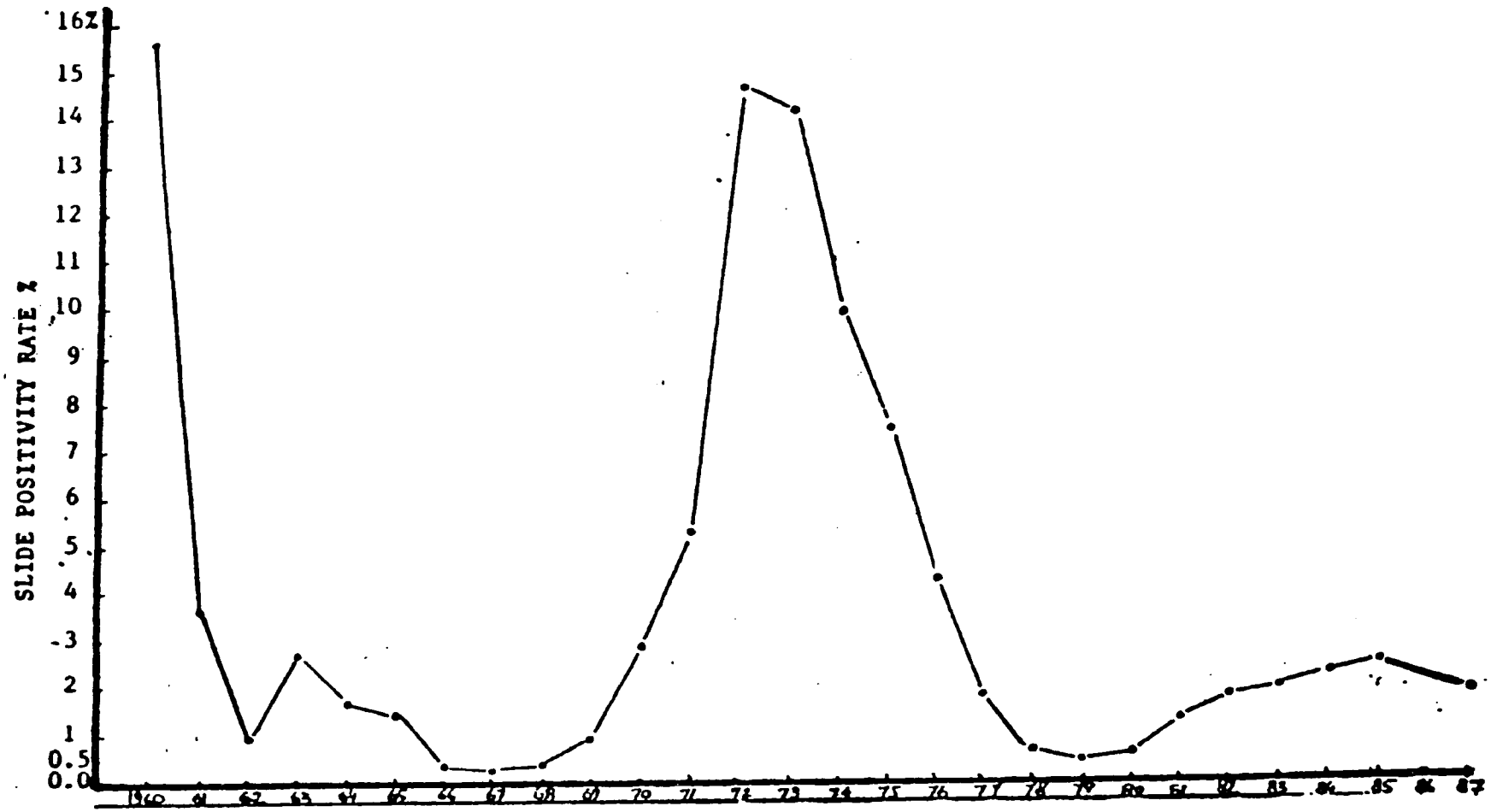
Progress towards integration has been satisfactory according to succeeding external evaluations of the program, but it is slow moving and not geared toward rapid output orientation. The GOP 7th Five Year Plan (1988-1993) addresses the need to increase significantly the number of health facilities at the Union Council level and below, and for each health facility to have a preventive program including malaria control as a normal function of the health facility. See Section below. During the 6th Five Year Plan period (1983-88), 86% of union councils were provided with a basic health unit (BHU) or a rural health center (RHU).

2. Sustainability

A small component of insecticidal spray of rural dwellings will continue to be a part of malaria control. The GOP realises spraying can no longer be the central effort in its malaria program, because it does not strike at the root of the malaria problem. The GOP is now directing its insecticidal spray operations mainly to malaria positive areas and encouraging case detection and treatment of malaria cases at the health facilities (PCDs) and thus reducing its reliance on insecticides for malaria control.

The project extension will consolidate this initiative and establish passive case detection posts at all health facilities to detect and treat malaria cases. Spray will be directed only to those areas where malaria has been found, to limit its spread, until reservoirs of the disease i.e. infected individuals, have been cured.

Figure -1-



Slide positivity rate Malaria Control Program: 1960 to1987.

The recurring costs of the Malaria Control Program (MCP) include salaries of personnel involved in control operations, equipment maintenance and repair, vehicle operation, maintenance and repair, expenditures on training and research, purchases of insecticides, larvicides and anti-malaria drugs. These costs do not include salaries of the staffs of the Rural Health Centers and Basic Health Units which constitute a large part of the surveillance mechanism of the MCP, or the construction, supply and equipment budgets for these facilities. With the exception of the insecticides, vehicles and some other equipment, all recurrent costs are local costs.

The GOP has shown its commitment to the MCP by allocating an adequate budget for local program costs over the past decade; the federal budget has been supplemented by annual inputs from the provinces totaling over $5 million equivalent.

The foreign exchange component is expected to decline over the four year project extension, but it is not expected that this component will disappear.

3. Choice of Insecticide

It has been suggested that fenitrothion be selectively phased into the MCP in places where the WHO diagnostic tests of malathion show more than 40% mosquito survival, and where the incidence of malaria transmission exceeds the norm for the district.

Before this suggestion is adopted, operational research will be required to identify the correct insecticide; preferably, non-chemical alternative control methods will be identified.

An unnecessary early reliance on fenitrothion would have serious consequences. Malathion is less toxic, and in comparative tests (admittedly limited and less than adequate in scope) was shown to be fully as effective in reducing malaria incidence as the more expensive and toxic fenitrothion. Also, once mosquitoes become resistant to fenitrothion, they are also resistant to all other organophosphorus (OP) insecticides, including malathion. The reverse, however, is not true. The strain of mosquito An. stephensi that apparently resists malathion has been found to transmit malaria parasite only in urban areas where the spraying of residences is not a control method. The role of An. stephensi in malaria transmission is currently under assessment at NIMRT. Results of the assessment were expected to be available by the end of July 1988 but were not possible due to reported non availablity of enough number of anoph. stephensi vector for the study. The study is now expected to be completed by October 31, 1988.

All tests indicate that the principal vector of rural malaria, An. culicifacies, continues to be susceptible to malathion. Conversion to fenitrothion might, therefore, have no beneficial effect in urban areas and no effect at all in rural areas, while increasing costs and the toxicity of the material.

4. Operational Research and Training

Operations research is needed to confirm these findings regarding insecticides' efficacy effectivity and to find most suitable method of alternative/supplementary malaria control. The study to find out the role of An. stephensi in malaria transmission has already been initiated at the National Institute of Malaria Research and Training (NIMRT).

As and when the operations research provides evidence that the mosquitoes have become resistant to currently used insecticides, it will be necessary to identify a third line of chemicals such as carbamates for use in the program.

With the urging of A.I.D. and WHO, the vertical structure which once permitted the Directorate of Malaria Control (DOMC) to plan independently and coordinate the implementation of Pakistan's Malaria Control Program (MCP) has been dismantled. This structure has now been integrated with general health services. Due to this integration functions critical to effective performance have now been devolved to the personnel of general health services which were untrained in malaria control and were not fully prepared for their role in malaria surveillance. Accordingly the program has suffered. Therefore it has become essential that an extensive training for the staff of the General Health Services be arranged to apprise this staff of their role in the functional integration. The training will incorporate malaria instructions and emphasize the importance of their role in the attainment of malaria control targets.

F. Contributors to the Project Paper

The following individuals contributed to the development of this project:

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II. BACKGROUND

A. USG-GOP Negotiations

In keeping with a strengthened effort to increase their economic and development cooperation, the United States and the Government of Pakistan (GOP) have negotiated a second six-year package of more than $4 billion in military and economic assistance.

The proposed economic assistance package of $2.2 billion over six years was designed not only to maximize development impact but also to produce as favorable balance of payments effect as possible. Shaped to assure the widest possible distribution of benefits, the six year package will:

- reactivate a long-term development assistance relationship which the US views as important because of Pakistan's size, poverty and strategic location;

- provide balance of payments support to address short and medium-term foreign exchange shortfalls, thereby reducing development constraints and strengthening the economy;

- address key economic problems that will help Pakistan to achieve self-sustaining growth and manage its debt burden; and,

- expand resources available for local cost financing.

In this context, A.I.D. agreed to finance a four year Malaria Control Project in 1982 to assist Pakistan to contain or further reduce malaria incidence. The collateral purpose was to do away with the debilitating effect of the disease to the agricultural economy of the country through reducing lost production due to the work days lost. To continue with the same objective and to provide assistance to Pakistan in its effort to control malaria through further period of 4 years (1988-92), US/GOP have agreed to extend the USAID malaria control (391-0472) project to FY 1992. The project extension, in addition to containing the malaria incidence, will assist GOP to become self reliant in controlling malaria beyond 1992.

The project extension will involve an additional ESF grant assistance of U.S. $25 million for the project extension.

B. Pakistan's Malaria Control Program

1. Brief History

Throughout history Malaria has been a serious health problem in the areas now comprising Pakistan. Epidemics in the Punjab (1908) and Sind (1929) exacted 300,000 and 40,000 deaths. Diverse topography, varying demographic situations, and nomadic habits of parts of the population

were but a few of the complicating factors. Then long-lasting insecticides against Anopheline malaria vectors were discovered and a new concept of attack against malaria began. This attack, later labeled "residual wall spraying", stimulated a global program to eradicate malaria. With the objective of control in the 1950's and eradication in the 1960's, Pakistan initially achieved a high level of success. Due to various administrative, operational, and technical problems, however, the Malaria Eradication Program (MEP), as the program was then called, met with increasing reverses throughout the world in the late 1960's. Pakistan was among those countries in which the mid-1970's found malaria occurring at high rates in large areas where the disease had been controlled.

The United States Agency for International Development (A.I.D.) began helping the Government of Pakistan (GOP) in 1961 as a part of the global eradication program. This assistance was terminated in 1970 when the Pakistan program appeared close to success. Indications of an increase of malaria in some districts of Punjab started even as early as 1967. The resurgence reached epidemic proportions with approximately 10 million cases estimated for 1974, and malaria once again was interfering with other development programs. This led in 1975 to a resumption of USAID assistance in a new program called Malaria Control Program (MCP). It was designed to overcome the epidemic and bring the incidence of the disease to a manageable level. Unfortunately, with the malaria vector having become resistant to the earlier used chlorinated hydrocarbon insecticides, the project turned to malathion, an insecticides of organophosphorus group. Results were spectacular and, as in the 1950's and 1960's, a 99% reduction in malaria cases was achieved.

But the major achievement of the 1975-80 MCP in the form of reduction of the Annual Parasite Incidence (API) to less than 0.5 cases/1,000 population, was shortlived. By 1981, there were again indications of increasing malaria transmission. This deterioration may have been caused by the sudden influx of Afghan refugees who, having a higher incidence of malaria among them, brought with them an unchecked reservoir of the parasite into Pakistan. In 1981 there were an estimated 2 million refugees and by May 1988 there are more than 3 million -- a fourth of the former population of Afghanistan.

To assist the GOP in maintaining a malaria API of 0.5 cases/1,000 or less, the Malaria Control II Project (1982-87) was conceived and approved in May 1982. Its major objective was to contain and further reduce the incidence of malaria by: (1) expanding the capacity and increasing the capabilities of the federal, provincial and municipal health services to effectively control malaria; and (2) moving MCP from a vertically organized program emphasizing total coverage house spraying and active case detection (ACD) surveillance methods to an integrated program using a selective mix of vector control measures and a better balance between active and passive case detection (PCD) and treatment methods.

2. Endemicity

Before the organization of a comprehensive national eradication program in 1961, malaria was estimated to infect 7 million people and to cause 100,000 deaths annually. Early investigations conducted during the 1920's and 1930's had extensively mapped the endemicity of the disease.

Beginning with the eradication effort in 1961, systematic case detection in operational areas (approximately 80% of Pakistan) was instituted. This unprecedented coverage continues to provide an annual record of malaria incidence expressed as the API.

The national malaria program was successful in keeping down the API, but made little or no impact on the underlying ecological conditions favorable to the disease. As a result, re-introduction of malaria was likely in most operational areas. Maintenance activities in many places were insufficient to prevent a resurgence, and the disease returned to widespread incidence at high levels of endemicity and epidemicity in both the rural and urban areas. Large-scale epidemics in 1973/74 stimulated another GOP effort in the 1975-80 period to combat the disease. Pakistan received the assistance of WHO, the Government of Japan, UNICEF, and A.I.D. Malaria was again brought within manageable limits, i.e. to a slide positivity rate (SPR) nearing 0.5/1,000 slides and an API as low as 0.32. Table II-1 shows the SPR and API from 1975-1987:

TABLE II-1
SLIDE POSITIVITY RATES (SPR) AND ANNUAL PARASITE INCIDENCES (API)
PAKISTAN MALARIA CONTROL PROGRAM

Year	Population at risk	No. Slides	No. Positive Slides	SPR*	API**
1975	48,305,324	3,205,689	238,315	7.43	4.93
1976	49,789,303	2,857,854	122,219	4.28	2.45
1977	51,279,670	2,667,315	47,571	1.78	0.93
1978	52,737,019	2,588,257	16,160	0.62	0.31
1979	53,929,411	2,682,351	12,304	0.46	0.23
1980	55,103,689	3,006,264	17,707	0.59	0.32
1981	56,934,577	2,523,426	13,629	0.54	0.67
1982	58,067,409	3,303,067	56,360	1.71	0.97
1983	58,468,028	2,587,920	51,596	1.99	0.88
1984	60,746,320	3,255,853	73,996	2.27	1.22
1985	62,133,283	3,119,695	77,607	2.49	1.23
1986	63,997,281	2,899,020	90,393	3.12	1.44
1987	65,925,771	2,948,912	63,948	2.17	0.97

* SPR (Slide Positivity Rate) $= \frac{\text{Total Positive Cases} \times 100}{\text{Total Slides}}$

** API (Annual Parasite Incidence) $= \frac{\text{Total Positive Cases} \times 1000}{\text{Population at Risk}}$

Source: DOMC

The program goal of obtaining a case load of less than 500 cases per million was achieved in 1979, but the case load has steadily risen since then. The increase in reported malaria cases over the period 1982-1987 from 56,360 to 63,948 reflects both an absolute increase in malaria incidence and an improvement in the reporting of malaria cases. The first possibility is of some concern as it would indicate that the current mix of antimalaria measures falls short of maintaining the status quo. The second would be a positive development caused by strengthening of PCD and the decentralization of malaria microscopy services, particularly in the last two or three years. In fact PCD's contribution to the number of slides taken has risen from 10.3% to 18.74% and the percentage of cases of malaria detected by PCD increased from 4.4% in 1982 to 18% in 1987.

3. Special Problems

a. Urban Malaria

Urban malaria has increased since the 1960's. Before then malaria was predominantly associated with rural areas. Later in the decade, control of malaria in the larger cities was considered a local responsibility. The urban centers, particularly Karachi, were unable to prevent the introduction and rising transmission of malaria and became an unexpected major source of infection for the transfer of the disease back into the rural areas. Urban areas therefore were included in the national malaria program. The development of malaria vigilance organizations in most of the major cities, notably in Karachi, brought urban malaria under control. Still, many aspects of the urban program need strengthening: i.e. monitoring of mosquito densities, use of an epidemiological system, training, entomological studies of the vector, and vector mosquito control management. The municipal corporations of Karachi, Lahore, Peshawar, Mardan, and Hyderabad established a case detection/surveillance system in a few of their health facilities. During the extension project, this initiative will be consolidated and a reliable reporting system established.

Problems also exist in smaller towns in potentially high malarious areas/districts. Wherever identified, these towns are sprayed indoors with malathion, but as the provincial MCP has no jurisdiction over the towns, their rural outskirts, which are probably as malarious as the adjacent rural localities, are not covered. Arrangements need be made for controlling malaria in these outskirts, which are estimated to produce several thousands of cases of malaria annually.

b. Malaria in Afghan Refugees

The reported incidence of malaria in Afghan refugees in the NWFP continues to be significantly higher than in the surrounding local population. The SPR among refugees attending their camp clinics in

the province was 22.2 in 1985, 25.1 in 1986 and 20.5 in 1987 whereas the SPR in people visiting government health posts (PCD) was 10.5 in 1985, 13.4 in 1986 and 5.09 in 1987. Even the lower malaria incidence figures for the local population are higher chan they might be because of refugees visiting nearby government health facilities.

The difference is surprising as the refugee camps are under indoor spraying coverage, whereas most houses of the local population are not sprayed. One reason for the higher refugee malaria incidence is the possibly higher endemicity in their places of origin. Confirming data are not readily available. Other reasons include:

1) Domestic animals act as a good screen for holding malaria vector from biting humans. Most camps do not have any cattle.

2) There may be different standards of malaria microscopy and/or indoor spraying as used by the Refugee Health Sector authority and the provincial health services. To verify this, cross checking blood smears collected under the Refugee Health Sector authority by the provincial MCP laboratory is suggested.

In Baluchistan the Refugee Health Sector microscopists have been trained by the provincial MCP. Whether the malaria incidence among refugees in this province is higher than in NWFP may be difficult to determine as Baluchistan is home not only to refugees but also to immigrants from Sind.

In the later part of 1987 and early 1988, there was increased collaboration between DOMC and UNHCR for malaria operation in Afghan refugee camps. With further collaboration during the project extension until such time as refugees are no longer in Pakistan, this collaboration will be fruitful.

4. Malaria Parasites and Vectors

Malaria infections in Pakistan occur in the three classic forms caused by *Plasmodium vivax*, *P. falciparum*, and *P. malariae*. The first is generally predominant, the last being much less common, but all three species may occur anywhere individually or in occasional mixed infections. *P. falciparum* infection is by far of greatest concern since it has the most severe clinical manifestations and the greatest fatality rate. As in other parts of Asia, this species has now shown resistance to chloroquine, the common drug for malaria treatment. During the next few years in Pakistan this drug resistance will require continuous monitoring and treatment with alternate drugs.

Of more than 40 species of anopheline mosquitoes recorded in Pakistan, relatively few are malaria vectors. The most important vector species in rural areas, *Anopheles culicifacies*, has shown widespread resistance to the insecticide of chlorinated hydrocarbon group but this vector remains

susceptible to insecticides of organophosphate group i.e. malathion and fenitrothion. The common urban malaria vector, A. stephensi, whose role in malaria transmission is currently under assessment at NIMRT, already resistant to chlorinated hydrocarbons, has now shown resistance to malathion in some districts of Punjab.

The development of resistance of the parasite P. falciparum to the commonly used treatment drug chloroquine, and malathion resistance by the confirmed vector Anopheles Stephensi of urban malaria in Pakistan are of recent origin and pose serious threats to the malaria control program.

5. Institutional Setting

Anti-malaria activities are implemented by the provinces, while policy, guidance, and resources support is provided by the Directorate of Malaria Control (DOMC) under the Federal Ministry of Health and Social Welfare. An organization chart of the DOMC is provided in Annex L. About 5,855 people are cumulatively involved in the malaria program at the federal and provincial levels. Staffing is generally adequate in the operational program, although some vacancies exist at the provincial level.

Reduction in staff over the past five years has been a result of integration of the vertical malaria program into the GOP integrated primary health care approach. Integration has been slow although administrative aspects have been transferred in all four provinces. Functional integration has been achieved only in the Punjab.

Three institutions were in place at the onset of the 1982-87 project: the National Malaria Training Center (NMTC), the Pakistan Medical Research Center (PMRC) affiliated International Center for Malaria Research and Training (ICMRT), and malariology section of the National Institute of Health (NIH). Their purpose, detailed in the Malaria Control II Project Paper, was to develop research and train new malariologists.

The NMTC has trained both malaria and general health personnel. The NMTC had expected to develop an operational research unit (ORU) but a shift in funding located the ORU at the International Center for Medical Research and Training (ICMRT) (the University of Maryland Research Group). Although the ICMRT had focused on malaria for some 20 years, working on population studies, mosquito genetics, immunology of plasmodium etc., new stress was paid under the project to the epidemiologic dynamics of malaria and operational research.

An evaluation committee determined that the majority of research carried out by ICMRT did not relate to malaria operation. This led to the withdrawal of funding for ICMRT. To fill the research and training requirements of the MCP, the National Institute of Malaria Research and Training (NIMRT) was created in May 1985 as an attached department of the MOH which incorporated the staffs of the NMTC and the ICMRT. This body is currently housed in Lahore at the former site of the ICMRT, is now

headed by an experienced malariologist. Although important professional posts at the new institute are still vacant, the institute has started limited operational research and is now preparing to provide extensive malaria microscopy training to health services personnel.

Administratively, the key elements of training and operational research of the national malaria control effort are in place now, but more is needed. For example, NIMRT still needs a permanent physical facility, to be constructed once the land is officially allocated to the institute.

6. Program Achievements and Setbacks

Pakistan organized its first country-wide malaria program in 1961 following the guidelines of the world-wide malaria eradication programs. The Pakistan Malaria Eradication Program (MEP) thus adopted a program of total coverage house-spraying in all malarious areas of the country followed by a nationwide program of surveillance and treatment.

The MEP's surveillance mechanism in 1967 detected about 9,500 malaria cases as compared to the estimated 7 million annual cases prior to the MEP. From the early to the late 1960's, malaria mortality had been similarly reduced from an estimated 100,000 deaths per year to nil.

As a result of both technical and administrative deficiencies some areas of the country began to experience serious outbreaks in 1973/74. The incidence progressively increased, calling for a revision of strategy. With the long term objective of malaria eradication deferred, a new major malaria control program was initiated.

Under this control program, however, in response to the heavy resurgence of the disease, total coverage spraying in potential areas was also successfully re-introduced. By the end of this program the annual parasite incidence (API) dropped from a height of 4.93 in 1975 to 0.23 in 1979. This rate rose again to 1.44 in 1986 but fell back to 0.97 in 1987.

C. Lessons Learned

The resurgence of malaria in 1973/74 was caused by technical and administrative failures, including manpower shortages, inadequate amounts of insecticides and other supplies, insufficient financial support, and complacency about the disease. The need to overcome these problems was recognized as early as the 70s, but has had to be relearned over and over again. A long series of internal and external evaluations of USAID's involvement in Pakistan's malaria effort has pointed out the need for properly phased activities, improved management systems and increased operational research and training. These lessons are reflected in the design of this amendment.

A well-known authority on public health has said[1/]:

1/ Maxcy-Rosenau, Public Health and Preventive Medicine, 12th edition, 1986.

"For most of the developing countries, the time needed for the control of malaria will not be measured in years but in generations.....

"To be useful, the affordable and persistent methods which are needed for malaria control must be chosen based on adequate knowledge of the local epidemiological factors. This type of data can only be collected if there is local expertise capable of gathering such information. The availability of local competence in malariology may be the key element to the future success of malaria control."

Strengthening local expertise is a primary component of Malaria II; the project amendment is designed to produce the people who will control malaria in the coming generations.

D. Other Donor Assistance

Other donors who have assisted the Pakistan MCP are the WHO, the Japanese Government, UNICEF, and UNHCR. These donor contributions have been primarily for commodities, training, and technical assistance while the GOP provides the local cost support required for such contributions. Anticipated future contributions follow:

1. World Health Organization (WHO)

The WHO Representative in Islamabad stated that WHO has a two-year malaria budget of $300,000 for training, supplies and support of evaluation. Their sanitary engineer left and will not be replaced. The WHO Regional Office in Alexandria, Egypt (EMRO) usually provides the regional malariologist for the annual reviews. WHO/Geneva has a residual technical capability and a malaria information base which may be tapped on occasion. WHO has been providing long and short term technical assistance, training fellowships and commodities including transport. Unfortunately, in the past two years except for local operational assistance services, WHO did not have funding for long term malaria advisory services to Pakistan's Malaria Control Program. Currently WHO is engaged in hiring new FSN operational assistants. The selection is likely to be completed by end October 1988.

2. United Nations Children's Fund (UNICEF)

In the 1975-80 period UNICEF provided anti-malaria drugs. UNICEF is no longer participating in malaria programs.

3. Government of Japan

Except for some insecticide in 1982, the Japanese government gave no assistance during the first phase of Malaria Control II. The DOMC PC-1 mentions possible assistance in 1988-92 from Japan in the form of fenitrothion and vehicles. To date, however, no commitments have been made or sought.

4. United Nations High Commission for Refugees (UNHCR)

The UNHCR is operating separate but coordinated malaria control activities in the Afghan refugee camps located in the NWFP and Baluchistan. Lately, there has been increased coordination between DOMC and UNHCR in planning and implementing malaria program in the Afghan refugee camps.

To date, the Pakistan MCP has been financed in roughly equal halves by A.I.D. (foreign exchange) and GOP (rupee inputs). At present there is no other significant donor.

E. Relationship to A.I.D. Strategy and Other A.I.D. Projects

The Malaria Control II Project Extension is consistent with A.I.D. strategy and will have a significant positive effect on other A.I.D. projects. It directly supports A.I.D.'s efforts to: (1) overcome low agricultural productivity and (2) reduce high rates of infant and child mortality.

Over 75% of Pakistan's rural areas are at risk of malaria. The Punjab is the most malarious province as well as the richest agricultural area. In general, malaria is more prevalent where water is abundant, i.e. in the most productive irrigated areas. About three-quarters of the population is engaged in agriculture.

Peaks of malaria transmission occur in Pakistan during heavy planting and harvesting periods. The project will therefore contribute to increased productivity by minimizing a major public health constraint to agricultural productivity and socio-economic development.

The Malaria Control Project is an important component of A.I.D's. child survival efforts. Most malaria mortality occurs in children, as they are less able to withstand the disease and have not developed any natural semi-immunity. Pregnant women who contract malaria lose their acquired immunity and are subject both to high fetal death rates and to higher mortality rates than the general population.

The GOP integrated health system is absorbing the once vertical MCP into an overall health delivery system with multipurpose staff at all levels from province through district with Rural Health Centers (RHCs), to the Union Councils with Basic Health Units (BHUs), to the village with Community Health Workers (CHW), Voluntary Collaborators (VCs), and Village Health Auxiliaries (VHAs) where available. Malaria control will be one of the areas of emphasis of the integrated health system, along with such other child survival activities as immunization, oral rehydration, nutrition and child spacing.

This development is crucial to the GOP's and A.I.D.'s goal of reducing reliance on insecticides as the primary instrument of malaria control. Another promising control technique is efficient malaria case finding and treatment. All the health staff of the integrated health system will be trained and indoctrinated to watch for fever cases, undertake or secure a prompt laboratory diagnosis and provide prompt radical treatment as required.

F. Project Rationale

Under the previous A.I.D.-supported Malaria Control Project, the GOP was successful in controlling malaria. Given the nature of the disease, however, with its capacity for resurgence, the ability of vectors to develop resistance, the likelihood of re-infection from neighboring countries and from significant population mobility within the country including the presence of Afghan refugees, control of malaria is a long-term proposition which requires continuous monitoring, surveillance, and, until more efficient and effective methods are identified, spraying with residual insecticides. The tremendous problems and significant costs associated with uncontrolled or inadequately controlled malaria alone provide sufficient justification for the project. In addition, this project is important to A.I.D.'s entire development effort in Pakistan since success in all the sectors in which A.I.D. will provide assistance depends, among other things, on a healthy and productive labor force.

The GOP's commitment to malaria is evidenced by the fact that approximately 12% of the federal health development budget is allocated for malaria control activities. The provinces together also contribute the equivalent of nearly $5 million annually. Since resistance developed to the locally manufactured insecticide of first choice, DDT, the GOP has been forced to import more expensive insecticides, using foreign exchange.

The proposed project extension is designed to reduce the recurrent and foreign exchange costs of the program by supporting:

1. The progressive reduction of malaria transmission by a geographically limited, epidemiologically and entomologically pinpointed spray application to control the vectors of malaria. This effort will reduce the insecticide requirement.

2. A major alteration in the pattern of malaria surveillance through which the MCP will identify malaria victims, provide radical treatment and case follow-up. This surveillance system will not only alleviate suffering but also reduce the infective parasite burden and thus malaria transmission.

3. Applied research to identify effective supplementary environmental and biological control measures to augment residual

insecticidal spraying.

By the end of the project, foreign exchange costs will be reduced, but they can probably never be totally eliminated.

III. DETAILED PROJECT DESCRIPTION

A. Project Goal and Purposes

The overall goal of the project is to reduce morbidity and mortality from endemic diseases, especially malaria, through the establishment of a responsive, efficient, and effective nationwide health delivery system. The more specific purposes of the project are to assist the Government of Pakistan to contain and further reduce the incidence of malaria in the country, maintaining malaria incidence at a level where it does not constitute a major public health problem. A second major thrust of the project extension is to assist the GOP to develop greater self-reliance in malaria control so that after 1992 minimal or no donor inputs will be required. This will involve strengthening the general health services to detect and treat malaria cases, various measures to reduce reliance on expensive insecticides, strengtrhening the capacity for operations research and training a cadre of technical personnel to sustain the control program.

Specific objectives of the project include:

1. Support of GOP malaria control objectives to:

a. Maintain an annual parasite incidence at or below 0.5 cases per thousand.

b. Contain the infections of *P. falciparum* malaria to less than 20% of all cases of malaria in Pakistan.

c. Improve the malaria surveillance system through increasing the proportion and number of blood smear slides collected through a passive case detection (PCD) system to 70% of the total (i.e. passive and active) number of slides collected for the detection of malaria cases in Pakistan.

d. Reduce household spraying to less than 20% of all houses in the country by determining foci for spray on sound current epidemiological data; attainment of greater than a 95% spray coverage of the targeted housing.

2. Initiate and assist operational research at the NIMRT, targeting operational problems identified by the Directorate of Malaria Control and/or provincial programs.

3. Support the proposed network of village health auxiliaries (VHAs) and voluntary village health workers to more than double the number of static PCD posts.

The assumptions made for achieving the project goals include the following:

1. That the GOP and the provinces will continue to accord high priority to malaria control activities by providing additional administrative and budgetary support of the program.

2. That the technical problem of chloroquine resistance does not worsen significantly.

3. That the problem of resistance to the organophosphorus insecticides does not become a major deterrent to control of malaria.

4. That the federal and provincial Ministries of Health provide qualified participants for long and short-term training.

5. That the outreach portion of health system will be established as planned with 4,000 basic health units functioning at union council/equivalent level in the country.

B. Project Outputs/Inputs

1. Outputs

The project purpose will be achieved by:

a. assisting the GOP to continue its move from a vertically organized malaria control program to an integrated program in the total health care system;

b. assisting the GOP to establish a nationwide, comprehensive passive case detection system including case treatment and follow up at the general health facilities combined with necessary vector control methods;

c. providing for long and short-term offshore training (206 person-months) of the technical and non-technical personnel in support of the MCP comprehensive passive case detection system and the NIMRT; and,

d. expanding the capacity and increasing the capability of the federal, provincial, and municipal health services effectively to control malaria;

e. assisting the GOP in planning and carrying out the training and research essential to (a) and (b) above. The project is expected to produce the following specific outputs:

i. A fully functioning, nationwide, passive case detection system in place by 1992;

ii. An orientation training mechanism developed for training of all related categories of health manpower in the subjects of basic epidemiology, entomology, microscopy, and management of malaria;

iii. An annual house-spraying program specifically targeted to endemic areas based on refined epidemiological analysis;

iv. Full utilization of the epidemiological criteria for selection of appropriate areas for application of insecticides;

v. An appropriate and effective supplementary biological control method or methods, identified from field trials;

vi. Source reduction projects completed in the urban setting and field trials underway on projects in selected rural areas;

vii. Urban malaria control programs operating at an expanded level with reliable and accurate epidemiological reporting systems for programming and policy decision-making;

viii. An annual plan of operation for malaria control covering a period of at least three years following the completion of the A.I.D. supported project (September 30, 1992) prepared and adopted by the GOP;

ix. The new facility for the NIMRT staffed and fully functional;

x. Research and training programs at NIMRT which meet the priority needs of the GOP's Malaria Control Program;

xi. Senior and mid-level health personnel trained in malaria control participating in surveillance as a regular part of their duties, including taking blood smears, administering appropriate drug treatment, and conducting periodic epidemiological analysis;

xii. Health education activities expanded and achieving positive results in obtaining social acceptance of house spraying and surveillance activities.

These outputs are quantified in the table and in the bench marks that follow:

Specific target output indicators for the project years are given below:

	1987/88	1988/89	1989/90	1990/91	1991/92
a. Administration					
Maximum percentage of staff vacancies:					
1). Headquarters	5%	5%	5%	5%	5%
2). Provinces	5%	5%	5%	5%	5%
b. Program Planning					
1. Annual Plan of Action	1	1	1	1	1
2. Annual plan and schedule for insecticide safety training and testing	1	1	1	1	1
c. Transport					
1. % of total fleet off road at one time is less than:	10%	10%	10%	10%	10%
2. % fleet replacement	14%	11%	9%	7%	5%
d. Training (individuals)					
1. Long Term (outside)	1	3	8	0	0
2. Short Term (outside)	6	29	25	15	26
3. NIMRT	200	200	1200	1200	1200
4. Provincial	200	400	400	400	400
e. Spray Operations					
% of housing targeted	20%	20%	20%	18%	18%
% of targeted house sprayed	90%	92%	93%	94%	95%
f. Surveillance					
1. Passive Case Detection % total country slides	20%	29%	43%	56%	70%
2. Average turn around time from taking blood slide to treatment of positive malaria cases	14 days	12 days	10 days	8 days	7 days

	1987/88	1988/89	1989/90	1990/91	1991/92
3. Laboratory services error rate in cross check of slides examined remains under:	1%	1%	1%	1%	1%
g. Evaluation					
Annual Program-wide evaluation (External Review)	1	1	1	1	1

INTERMEDIATE BENCHMARKS OF ACHIEVEMENTS

The purpose of establishing intermediate benchmarks under Malaria Control II project Extension is to identify and implement important milestones leading Government of Pakistan to self reliance in the Malaria Control Program by the last year of project. Malaria surveillance or malaria case detection with (radical) treatment of identified malaria positive cases, and malaria operational research to find suitable methods of malaria control, are the two areas having the potential of leading Pakistan to self reliance in malaria control. Therefore, the project extension has selected these areas for establishing important benchmarks of achievement to be met during the project extension.

A. By December 1988

1. Malaria Surveillance Output:

a. Evidence of the total number of slides collected in the preceding one year in the four provinces of Pakistan through the Active Case Detection (ACD) and Passive Case Detection (PCD).

b. Evidence of total number of patients suffering from pyrexia of unknown origin (PUO) and suspected clinical malaria, attended/treated as outpatients in the preceding one year in the general health facilities .

2. Operational Research:

Operational research activities have been carried out principally at the National Institute of Malaria Research & Training (NIMRT), and at the provincial malaria control programs (MCPs).

a. Evidence of total number of research protocols completed and in publication form at the NIMRT, reported to the DG Health/Chairman Malaria Coordination Committee (MCCC) and reviewed by the MCCC.

b. Evidence of efforts made by NIMRT/MOH to increase professional staff positions filled, in the area of operational research at the NIMRT.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence of the MCCC having met at least one time to review the overall Malaria Control Program (MCP) and operational research activities, review the progress made in integrating the malaria control program with general health services, and plan future policies and actions for further progress toward integration.

b. Evidence that the MCCC has reviewed the completed operational research protocols and, if approved, circulated them to the provincial MCPs.

The GOP and USAID agree that the following benchmarks under B, C & D will be reached by the month of December of the respective years and, except as USAID may otherwise agree in writing, USAID will make for arrangements for an early termination of its support to the project if they are not met.

B. By December 1989

1. Malaria Surveillance Output:

a. Evidence that twenty five per cent or more of the outpatients suffering from PUO or suspected clinical malaria attended/treated at the health facilities of general health services in the rural areas, and five percent or more of the out patients suffering from clinical malaria who attended the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year.

2. Operational Research:

a. Operational research protocols: Evidence that at least four new research studies additional to those completed in 1987/88, initiated by the NIMRT and at least two completed reports have been submitted to the Director General (DG) Health/ Chairman of Malaria Control Coordination Committee (MCCC).

b. Evidence that 85 per cent of all professional posts at NIMRT have been filled with qualified staff actively participating in research activities.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice in the preceding one year to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

C. By December 1990:

1. Malaria Surveillance Output:

a. Evidence that fifty per cent or more of the outpatients suffering from PUO or suspected clinical malaria attending the health facilities of general health services in the rural areas, and twenty five percent or more of the outpatients suffering from suspected clinical malaria attending the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year.

2. Operational Research:

a. Operational research protocols: An evidence that at least four new research studies additional to those completed in 1988/89 initiated in 1989/90 by the NIMRT and at least three completed reports additional to those of 1989/90, in publication form, have been submitted to the Director General (DG) Health/Chairman MCCC, for review and approval by the MCCC.

b. Evidence that 85 per cent of all professional posts at NIMRT are filled with qualified staff actively participating in research activities.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

D. By December 1991

1. Malaria Surveillance Output:

Evidence that eighty five per cent or more of outpatients suffering from PUO or suspected clinical malaria attending the health facilities of general health services in the rural areas, and fifty percent or more of the outpatients suffering from suspected clinical malaria attending the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year.

2. Operational Research:

a. Operational research protocols: An evidence that at least four new studies additional to those completed in 1990/91 initiated by NIMRT and at least four completed reports in publication form, submitted to the Director General (DG) Health/Chairman MCCC, for review and approval by the MCCC.

b. Professional posts of NIMRT: An evidence of 85 per cent of professional posts of NIMRT continued to be filled with qualified staff and participating in research activities.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice in the preceding year to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

2. Inputs

The project will require the following inputs:

USAID:

a.	Long-Term TA	48 PM
b.	Short-Term TA	29 PM
c.	Offshore Training:	206 PM
	(Long-Term	92 PM)
	(Short-Term	114 PM)
d.	In-country Training	6,000 Trainees
e.	Local cost financing for operational research	
f.	Construction (alternative purchase and renovation) of a new building for NIMRT	See Sec.V-E
g.	Commodities including insecticides, spray equipment, vehicles, ULV fogging machine (space spray and equipment) research and training equipment and supplies, microscopes health education equipment and other essential commodities	See Sections III-C-4 and V-E

GOP/Provinces:

a. Personnel salaries and allowances.
b. Operating expenses.
c. Facility rental and maintenance.
d. Vehicle maintenance and repair.
e. Anti-malaria drugs and larvicides.
f. 6,000 in-country trainees.
g. Larvicides and insecticide for space spray.
h. Operational research expenses.

C. Project Components

The Malaria Control II Project extension, like the earlier project, consists of four components: (1) Program Management; (2) Training; (3) Operational Research; and (4) Commodity Support. The emphasis on these program elements has, however, been materially altered.

1. Program Management

To respond to a changing vector-human-insecticide environment, the GOP Malaria Control Program will require intensive surveillance and possible modifications in program strategy and activities over the life of the project. Since adoption of a functioning passive case detection system (PCD) is going to be the key element of project extension for reducing malaria parasite reservoir from the human system, special emphasis will be placed on systematic development of nationwide functioning PCD system during the project extension. A fully functioning, nationwide passive case detection system (PCD) will be in place by 1992. Putting such a system into place will require the following steps:

1. Establishment of an orientation and training program for all related health manpower.

Training in public health and clinical subjects to about 4,000 to 5,000 government doctors (through Primary Health Care Project) and laboratory assistants/technicians every year for a total of about 10,000 to 11,000 trained by 1992. A system of refresher training will be put into place.

2. Establishment of PCD posts in existing and new general health facilities.

(Suggestive lines to develop functioning PCD and refresher training are described under the implementation plan.)

This means putting to use the orientation and training just described, with one doctor and one laboratory assistant to be trained for each health facility. The training will be in taking, examining, and analyzing blood slides, radical treatment of patients found to have malaria, and reporting the incidence of malaria through District Health Offices to the Provincial Health Ministry. Doing so, mainly with existing staff, will establish PCD posts in existing health facilities. It is expected that two thousand such posts to be established each year until 10,000 fully functioning by 1992. Approximately 4,000 additional microscopes will be procured by GOP and 4,000 laboratory assistants appointed to reach the target total of 10,000 by 1992.

3. Blood slides taken, analyzed, and reports forwarded concerning the incidence of malaria.

4. Reporting system put into place.

Data from blood slides from health facilities will be forwarded to the District Headquarters (DHOs Office) and to the provincial Director Health Services; decisions on insecticide spraying be made on the basis of such data at the provincial headquarters, through the existing system of annual spray planning by experts from Ministry of Health, WHO and USAID.

5. Technical and administrative supervision of PCD posts institutionalized.

Provincial Directors of the Health Services will take the following decisions: (i) all laboratory assistants/technicians must learn and carry out malaria microscopy at all GOP health facilities; (ii) medical officers incharge of dispensaries, rural health centers, and BHUs, District Health Officers, Medical Superintendents, Divisional Deputy Directors of Health Services (DDHS) will be responsible for malaria case reporting and technical and administrative supervision of PCD work at the health facilities in the areas of their jurisdiction; (iii) there will be quarterly/periodic meetings of all DDHSs with Director Health Services (DHs) to review the status of PCD posts in the whole province.

6. Operational Research augmented.

Not less than four new studies will be undertaken each year; not less than two reports will be forwarded to DG Health (MOH), Chairman, Malaria Control Coordination Committee (MCC), and Director, Directorate of Malaria Control (DOMC). Changes to allow appropriate malaria control program strategies will be made on the basis of these reports.

A long-term malariologist-entomologist- epidemiologist, expert in establishing PCD at the health care delivery services will be hired to assist the Directorate of Malaria Control (DOMC) and provincial health departments in establishing fully functioning nationwide PCD system. The consultant will be provided for about 48 months to help the GOP establish an effective maintenance and control program. Technical assistance will be aimed primarily at development of passive case detection in general health services, epidemiological and entomological skill development, particularly at the provincial level, upgrading national and provincial training capabilities, ensuring that proper insecticide protection measures are followed, providing guidance in the conduct of operational research, and improving the overall management of the program as it moves through the prickly process of integration into the general health systems. The visits of the short-term expert consultants will assist the DOMC in such specific areas as the computerized processing of epidemiological and entomological malaria data to enable rapid and current stratification to direct spray operations, and the potential contribution of environmental engineering to the permanent solutions of malaria control. In addition, one short-term consultant will be provided each year for one month to participate as a member of the External Review

Team with representatives of the GOP, A.I.D. and WHO to conduct an annual evaluation of the program. One person-month of assistance will also be provided by an AID/W direct-hire malaria specialist who will participate in program evaluations, monitor field operations on a selective basis, and review the GOP's plans of operation.

2. Training

The shift from extensive insecticide spraying of houses to control malaria to a lower level of epidemiologically targeted spraying has already been initiated. The expansion of case detection and treatment to reduce parasite incidence in the human system which could further reduce insecticide spraying requirements, will depend on large numbers of health services staff who will be trained through establishment of massive malaria training program at NIMRT and at federal and provincial health institutions during the first year of project extension.

Reduction in the extent of insecticide spraying for mosquito vector control will be further refined by operations research originating at the National Institute for Malaria Research and Training (NIMRT) and field data generated by the DOMC and the provincial technical staff of the MCP. A.I.D. is providing a suitable new home for the NIMRT where the staff currently is inadequate both in numbers as well as in training (Annex K) for their task. The technical capability of the DOMC (Annex L) and the provincial MCP (Annex M) will also need to be strengthened during the project extension in view of the increased need for entomological and epidemiological expertise at both levels. The project will provide funds to train six long term and a large number of short term participants in entomology, epidemiology, malariology, vector control, health education, environmental engineering, and public health.

The parasite reduction effort will require all physicians and health workers of general health services to have training in the following aspects:

(1) Possibility of seriousness of malaria especially in pregnant women and young children;

(2) Insufficiency of clinical diagnosis of malaria against confirmation by a microscopic examination of blood smear;

(3) Indoctrination to make blood smears in all pyrexia of unknown origin (PUO) cases;

(4) Technique for preparing proper blood smears; and,

(5) Proper presumptive treatment, radical treatment and follow-up of positive cases.

The MCP has been administratively integrated into the general health services and malaria control activities along with EPI, PHC, ORT, FP,

Nutrition, etc., are currently being integrated into the general health services. This system will be a prime vehicle for malaria case detection and treatment. Some 10,000 doctors, medical officers (MO) will direct all health activities. They will supervise work in about 600 Rural Health Centers (RHC), of which more than half exist, to be staffed by 2,400 Health Technicians (HT) of whom 1,638 have been trained and 450 are still in training. HTs are trained in 27 schools at district hospitals for 18 months. At a lower level, about 4,000 Basic Health Units (BHU) will require one Health Technician (HT) or 8,000 people to be trained in the 13 MT/HT schools which will replace the 27 MT schools. In addition, there are thousands of Lady Health Visitors (LHV) to be trained at four schools and thousands of Midwives (MDW) to be trained at hospitals. Both of these categories deal with pregnant women and young children for whom malaria is very dangerous. In Punjab each BHU has a team of outreach workers consisting of the BHU-HT, Communicable Disease Control (CDC) supervisor (usually a former malaria supervisor) and an Expanded Program of Immunization (EPI) vaccinator. At the village level, the GOP is planning to replace the current cadre of voluntary Community Health Workers (CHW) who have not proved effective with a significantly larger group of paid village health auxiliaries. The Malaria Program is also looking into the possibility of using its staff to train and supervise voluntary village collaborators to supplement the HT efforts.

To help train these many thousands of health staff will require training for trainers and health educators. The project will ensure steps to establish orientation and training program of related health manpower of physicians, laboratory assistants/technicians and their periodical refresher training. These steps are illustrated in project implementation schedule illustrations in Table IV-C.

The project will fund one participant from NIMRT/DOMC and four participants from provinces in the field of health education. Short-term technical assistance in both training and health education will be provided. Returned participant trainees and technical assistance experts will assist the MCP to develop curricula, teaching methodologies and teaching aids. Because the doctors who become Medical Officers-in-charge (MO i/c), have a great influence on execution of health programs, one professor of medicine from each of the 17 departments of Community Medicine, one at each medical school, will receive short-term participant training in malariology. This is necessary because they will emphasize in their teaching those subjects of which they are confident because of recent exposure. One person could be sent for engineering training; on return this person will focus on malaria mosquito source reduction, protection of the environment and assisting the 17 short-term participants from DOMC/provincial MCPs and municipal corplorations in engineering who are responsible for malaria mosquito control and the environment in the urban areas cooperating with the DOMC.

Studies of health facilities utilization in Pakistan show that in 1983 less than 20% of people used the government health facilities for

curative care. With the new GOP emphasis on upgrading services, GOP planners anticipate utilization to reach 50% by the end of the project extension. But to reach the majority of sick people in order to detect and treat malaria, the 10,000 private doctors and some of the traditional practitioners (who constitute a major part of the nation's treatment system) need to participate. Their cooperation will be encouraged by making good laboratory services easily available for diagnosis of malaria and by providing up-to-date malaria information to doctors through all available information channels such as literature and medical meetings.

A critical training problem is the laboratory microscopic examination of malaria slides, of which some 3 million are taken annually. Currently there are about 400 trained malaria microscopists. The RHC will need about 500 and these can easily be trained before 1992. The time between the taking of a slide at a village and the radical treatment (needed to stop transmission) administered after laboratory- based diagnosis of infection is apt to be well over a week. Laboratory service availability at the BHU would reduce this to 1-3 days with a much greater probability of breaking the transmission chain. Currently laboratory technicians are trained for 1-1/2 years at one of four schools. These graduates can be trained to read malaria slides in three weeks. Without this background about three months are required. With about 100 laboratory technician graduates annually and 4,000 needed for the BHUs, these positions will have to be filled by people trained quickly, 2-3 months, who are competent to read malaria slides, although not competent in other laboratory techniques. The question of giving specific malaria training to HT or CDC (ex-malaria supervisors) to enable them to temporarily fulfil this function is under study. NIMRT recently has established a program of training malaria microscopists in three weeks. This program has been made in anticipation of GOP plan to train 4,000 persons from the same number of BHUs planned to be established in the next four years.

The Primary Health Care (PHC) Project and the planned, overlapping Child Survival Project will provide for the in-country training of the thousands of multipurpose health workers. Only the malaria contents of the training of multipurpose staff will be assisted by this project, through the provision of training materials and trainers. This project will pay costs for specific training courses for malaria control such as "safe handling of insecticides" programmed in accordance with the recommendation of the Environmental Assessment Report dated August 1988 and "malaria slide microscopy". During the Malaria Control II Project (FY 1982-87) about 1,000 MCP staff received short training courses, of which about half (580 staff) received A.I.D. support for travel, per diem or other costs. In the Extension the numbers trained are projected to be about five times greater. A.I.D. will again support such costs as training facilities and materials, transportation and per diem. During Phase I, the average cost per A.I.D.-assisted trainee was Rs 1,200.00. This amount for each of 1,000 trainees has been budgeted in the five-year extension although the duration and location of the specific courses is left to the discretion of the project implementors.

The training planned under the previous projects had been very limited and for short terms only. Except in the 1982-87 program it did not include any retraining of existing general health services personnel in the then current malaria strategies (eradication or control). Under the later part of 1982-87 project and during the project extension period the training is aimed at developing future malaria control expertise i) thru long term training in U.S. university to obtain Master degrees in Public Health with special credits in Malariology, Epidemiology, Entomology, and Laboratory Sciences including malaria microscopy, and ii) thru short terms to develop understanding and know-how in malaria operational workers, malaria control/health managers, entomologists, health educationists, environmental engineers, and urban malaria control managers, in the subjects of recent advances in vector control operations, malaria disease control, environmental management, health education technology, and public health management.

Through this modified training approach, it is expected that Pakistan will have in not too distant future and by later part of project extension its own cadre of malariologists, entomologists, epidemiologists and malaria control and operation research expertise replacing the meagre number of existing ones and to bring about self reliance in such expertise in the country.

3. Basic and Operational Research

a. Basic Research

The design and overall coordination of malaria research will be vested in the newly established National Institute of Malaria Research and Training (NIMRT). Although such a facility may in the future undertake basic research, the immediate need for operational research must take precedence.

b. Operational Research

In the past years limited malaria operational research was carried out by National Malaria Training Center (NMTC) and provincial malaria control programs (MCPs). In 1982-83, this activity was expected from the International Center for Medical Research and Training (ICMRT) - a University of Maryland satellite reseach program established at Lahore. This expectation led significant project funding in local currency from Malaria Control II Project funds, allocated to the ICMRT for malaria operational research. However, evaluation of the ICMRT research efforts by an External Evaluation Team later disclosed that no more than one third of the research of the ICMRT was relevant to MCP problems. As a result, USAID decided to cease funding the ICMRT. The Ministry of Health simultaneously decided to replace ICMRT with a new GOP institution which would include former ICMRT national staff who were willing to transfer.

The new institution was established on May 16, 1985 and was named by GOP as the National Institute of Malaria Research and Training (NIMRT). To maintain continuity of employment for former ICMRT national staff, the NIMRT was established with sanction of the Ministry of Finance. USAID paid the initial two years of cost of staff salaries and operations from MCP project local currency funds. Later from July 1, 1987 all the costs were adopted by the national (federal) Ministry of Health budget. The NIMRT is established as an independent part of the Ministry of Health and not as an element of the DOMC.

Training of technical personnel and supply of short-term T.A. for assistance in operational research will not only assist in the solution of emerging technical problems but will also assist in development of expertise, stimulate the GOP to adopt a more dynamic approach to malaria control, based on up-to-date assessment of the problems. This cadre will be the nuclear staff for the development of a responsive, flexible malaria strategy capable of rapid response to changing the epidemiology of the disease.

The project will fund the cost of operational research studies, research equipment, technical assistance for operational research, training of expertise in operation research and construction/purchase of a permanent facility for NIMRT.

Under operational research, the NIMRT will study:

1. Housing and administration of the operational research component of the MCP;

2. Improvement of malaria case detection, diagnosis and treatment;

3. A district-wide study of a Voluntary Collaborator System of malaria surveillance including a complete servicing system and follow up;

4. Country-wide distributional studies delineating the range of primary and incriminated secondary vectors of malaria in Pakistan;

5. Bionomic studies of primary and suspected secondary vectors of malaria in Pakistan including feeding and resting habits, breeding habits, seasonal densities, etc;

6. Field testing and evaluation of supplementary methods of appropriate vector control i.e. reduce mosquito breeding places through environmental management and introducing biological agents such as fish (that eat mosquito larva) and Bacillus thurigensis Israelis (BTI) and others;

7. Pilot studies of alternate insecticides;

8. Monitoring of the effectiveness of currently used insecticides;

9. Monitoring for drug resistant parasite strains and their distribution in Pakistan;

10. Studies of social acceptance and methods of working within the community.

4. Commodity Support

a. Insecticides

During the project extension the malaria control program will continue to have a gradually reduced component of residual insecticide house-spraying limited to rural malaria positive areas to control malaria transmission there in peak seasons. Widespread vector resistance has developed in Pakistan to DDT and BHC, the internationally recognized insecticides of first and second choice. The use of malathion and/or fenitrothion or other organophosphorus (OP) compounds is therefore indicated in Pakistan. Malathion is one of the least toxic of the residual organophosphate insecticides; fenitrothion, on the other hand, is one of the most toxic.

OP insecticide requirements are determined by the DOMC/GOP on the basis of an analysis of extensive field data in December/January each year; the formula includes the area of sprayable interior surfaces as well as the number of houses with epidemiological evidence of malaria incidence in the locality. Future operational research may restrict spraying to limited areas within each house. Under the selective spraying approach, until 1988, only villages with an API of 2.0 or more cases per thousand population and/or any incidence of falciparum malaria were targeted for spraying. Once the villages epidemiologically positive for spray are identified, the most effective insecticide to be used in each operational spraying area is chosen and the correct amount computed.

The GOP has again requested A.I.D. to provide all the insecticides required by the MCP for the extension of the project through FY 1992. Because of the need for comparative field studies in Pakistan of the use-effectiveness of malathion versus fenitrothion, the possibility of development of vector resistance to one or both of the insecticides during the project, and the cross-resistance factor which makes it impossible to return to malathion, once fenitrothion resistance has emerged, a precise calculation of the amounts and types of insecticides required for the life of the project is difficult. Total requirements projected for the LOP are set forth in Table V-6.

The Mission and GOP will formulate actual insecticide needs each year based on project long operational research and the planned annual MCP evaluations.

b. Spray Equipment

Insecticide leakage from obsolete or worn out pumps is not only potentially toxic to spraymen and to those whose homes are being sprayed, but also a waste of spray. Worn out or poorly manufactured nozzle tips also cause excessive insecticide use.

Over LOP, some $571,700 will be provided for spray pumps and nozzles.

c. Mosquito Adulticide Application Equipment

Under Phase I, A.I.D. financed 47 (7 heavy duty, 40 light duty) adulticide application machines for the GOP's urban malaria control program. In urban areas house-spraying is not feasible or effective, since populations are reluctant to allow inside spraying and houses are frequently closed during working hours. This necessitates spraying insecticides into the environment via fogging or ultra-low volume spraying machines which dispense tiny droplets that impinge upon the insect.

Today, about fourteen municipal areas are conducting control programs at different levels of effectiveness. During the second phase more towns will start control programs. Most of them do not have an adequate and timely system of epidemiological reporting and surveillance. Five of these corporations have established in 1987-88 a PCD system. An appropriate reporting system of malaria cases needs to be established as yet at those places.

Phase II will fund adulticide pyrethroids to be used also for training of operating personnel at a cost of about $172,600. Mosquito adulticiding is expensive, but it is unequalled for quick vector knockdown under epidemic conditions.

d. Mitigation Equipment

The project will purchase mitigation equipment including the cholinestrase testing kits, if the Government of Pakistan would not have funds to arrange those or through the W.H.O. Efforts will be made to ensure availability of one kit for each district to be brought under spray each year.

e. Vehicles

One hundred vehicles are programmed over the life of the project at a cost of $900,000 to replace a portion of the MCP's super-annuated vehicle fleet. By July 1987, 91 vehicles of the 333 prescribed in the official

provincial motorpool were deadlined and 120 others were considered beyond repair. Of the 211 operating or repairable vehicles, about 100 were over 10 years old and were not economically operable. Procured over the LOP, the mix of 45 pickups and 55 small jeeps is designed to maintain the ability of the program to function, and to make possible a highly optimistic limit of 10% of vehicles out of order at any time. No vehicles will be provided, however, to any province which fails to provide adequate funds for vehicle maintenance or daily allowance/travel allowance for all field personnel.

f. Microscopes

A major thrust of the proposed project extension is away from Active Case Detection (ACD) toward heavy reliance on Passive Case Detection (PCD). PCD involves taking a blood slide from each potentially malarious case and immediately treating for malaria. Such treatment can relieve symptoms but the infection will persist. After laboratory interpretation of blood slides, individuals found to be positive for malaria are given fully curative (radical) treatment and, if necessary, case follow-up for resistant infections. Too long a delay between slide taking and radical treatment permits the malaria-positive victim to be a reservoir of malaria parasite and hence a source of infection.

It is therefore important to be able to inspect the slides as close as possible to the patient. The present highly ambitious plans of the MOH to extend fixed facility health care down to the Union Council level, each facility staffed with a trained microscopist, will make possible a major reduction in the time between presentation and radical treatment.

Prior year funds are providing 500 binocular microscopes for MCP use in the Rural Health Centers.

g. Other Commodities

Over LOP, A.I.D. will provide some $150,000 to purchase research materials and audio-visual and training equipment, for use at the DOMC, provincial MCPs and at the National Institute for Malaria Research and Training (NIMRT).

h. Facility Purchase

To house the NIMRT, whose present facility is to be taken back by the Government of Punjab, A.I.D. will provide $825,000 for construction of a building for operational research and large-scale training programs. For consideration of construction of a new building, plans and specifications are already in hand.

i. Research Support

$300,000 is being provided to support the cost of the extensive operational research program. See Section III-C-3.

IV. IMPLEMENTATION PLAN

A. Implementation Schedule

Project activities are scheduled to occur over a five year period from the original completion date of the Malaria Control II Project (September 30, 1987). The new Project Assistance Completion Date (PACD) is September 30, 1992. The listing and proposed schedule of activities by year is presented in Table IV-1.

B. Administrative and Monitoring Arrangements

1. A.I.D. Responsibilities

The USAID/Pakistan Office of Health, Population and Nutrition (HPN) will assume overall responsibility for managing the project. As currently staffed, this office has, in addition to overall senior supervision, a FSN professional, a FSN program assistant, and adequate administrative support.

The Mission's Office of Engineering (ENG) has assigned an FSN engineer to monitor the purchase and renovation or construction of a new building to house the NIMRT. O/ENG, O/HPN and O/Contracts in USAID Islamabad will be responsible for approval of the site, contracts for renovation/construction which the GOP will enter into with local contractors. O/ENG will also monitor the actual renovation/construction work on behalf of the Mission.

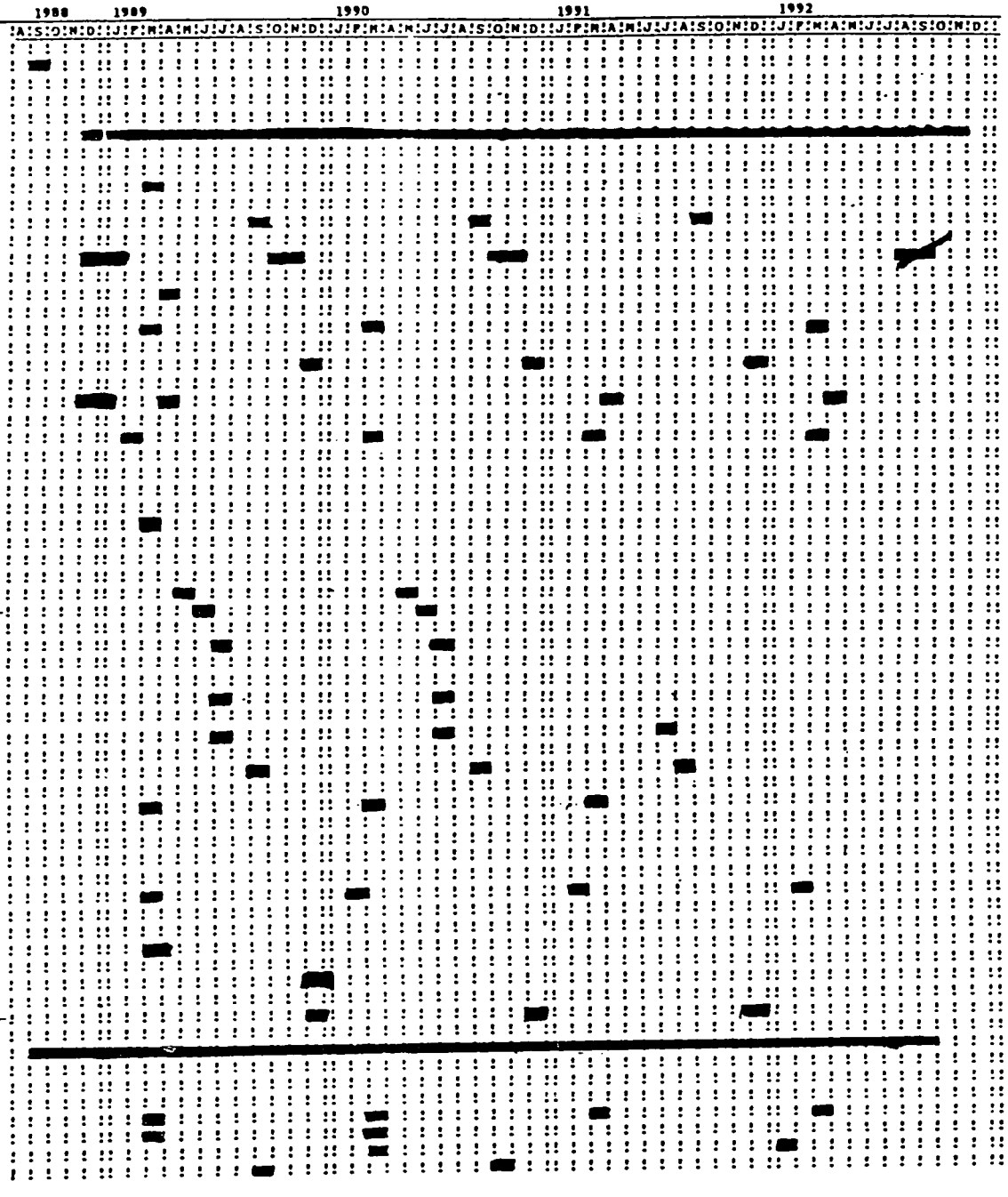
As the office responsible for environmental concerns in the Mission, the Office of Energy and Environment will assist HPN in ensuring the safe handling of insecticides in the light of Environmental Assessment Report dated August 1988, and if needed in reviewing the GOP's annual plans on this matter. The Office of Project Development and Monitoring (PDM), and the Office of Contracts and Commodities will assist HPN in all contracting and procurement actions under the project.

The Mission will also call upon the services of an AID/W malaria specialist to assist in reviewing program documentation, monitoring spraying operations, and participating in program reviews. In addition, the Mission will look to SER/COM, AID/W, and the Regional Commodity Management Advisor (RCMA) at USAID/Thailand for assistance in the procurement of insecticides and other project commodities.

A total of approx. 180 work months of Mission USDH and FSN staff time will be devoted to this project over its LOP.

These staff resources are considered adequate to handle USAID/Pakistan's administrative and monitoring responsibilities under the project.

PROPOSED IMPLEMENTATION PLAN



2. GOP Responsibilities

The Directorate of Malaria Control (DOMC), which is a division within the federal Ministry of Health, Special Education and Social Welfare, will be the Government of Pakistan implementing agency for many components of this project. The Director of DOMC as person responsible for policy guideline implementation of the MCP will continue to arrange and assist program evaluations and formulate annual safety plans for application of insecticides. The NIMRT, working independent of DOMC, will carry out the needed operation research in malaria control and would provide operational guidelines to the program. To ensure policy and operational coordination between DOMC, NIMRT, and provincial MCPs, the Secretary Ministry of Health on January 7, 1988, has constituted an interprovincial malaria control coordination committee consisting of directors of DOMC, NIMRT and provincial health services under the chairmanship of the Director General of Ministry of Health, Government of Pakistan. The committee is likely to meet shortly.

The DOMC will prepare annual and long-range plans including PC-1's, initiate requests for commodities and technical assistance, and allocate them to the provinces.

The DOMC will be the counterpart agency for all technical assistance, arrange all in-country training courses, and should have major role in selection of qualified participants for training while remaining in GOP system of selection of participant training.

Budgetary and staffing levels of the DOMC and the provincial authorities responsible for planning and implementing the federal MCP are considered adequate to handle the GOP's administrative and monitoring responsibilities under the project. See also Section V-B. Unsatisfactory status exists at the NIMRT as regards to its staff, both in numbers as well as capabilities.

C. Procurement Plan

1. Technical Assistance

This project will finance a total of 77 person-months (PM) of technical assistance consisting of one long-term advisor to the DOMC for 48 PM and 29 PM of short-term advisors, consisting of: one PM for accident contingency; one PM for ULV/fogging operation technology; six PM for operational research; five PM to improve training efforts at the NIMRT, DOMC and at provincial training centers; three PM in health education; three PM in computerized malaria data processing; three PM in entomological training; and three PM in environmental engineering. An additional four PM will bring outside experts to the annual program reviews. Details are shown in Table IV-2.

All technical assistance will be procured by direct A.I.D. contracting, since the DOMC has limited contracting experience and capability. The long-term advisor will be contracted under a PSC, initially for a period of 2-1/2 years. The same advisor may then be extended through the end of the project or another advisor may be contracted for the remaining period under a PSC. The short-term technical assistance will be obtained through PASAs with agencies such as the Center for Disease Control, or other contractual arrangements.

In addition AID/W will provide one person-month of a malaria specialists's time each year throughout the life of the project.

2. Commodities

Section III-C-4, above, identifies the commodities to be procured under the project. All commodities will have their source and origin in the United States or Pakistan, with the exception of vehicles which, in the interest of safety (Pakistan is a right-hand drive country) and availability of parts and maintenance, will be procured from Japan.

Program requirements in ensuing years are estimated at the following levels, in each instance for use in the following spray year:

Procurement Year	Total Malathion (MT)
1988	1,200
1989	2,000
1990	2,000
1991	1,800
1992	1,700

(Note: By March 1988, USAID was planning to purchase 100%, 83%, 60%, 42% and 26% of projected requirement in the years 1988, 1989, 1990, 1991, and 1992 respectively, but at the request of the Economic Affairs Division, Government of Pakistan, advising the financial constraints of the government to fund the purchase of insecticide in foreign exchange, USAID has now decided to agree to the GOP request provided the GOP presents in the form of concrete performance targets definite outputs in establishment of passive case detection and treatment system in all health facilities during the extension period.)

Procurement will be initiated each year in November to ensure the insecticide's arrival at the port of entry no later than April 30 each year to allow sufficient time for off-loading and inland transportation to the provinces. The GOP/DOMC will submit to A.I.D. by June 1 each year a plan detailing safety measures for the application of A.I.D. insecticides.

The Mission will handle all USAID-funded insecticide procurement with assistance from SER/COM, AID/W. The Mission will also procure the ultra-low volume (ULV) and fogging machines for adulticide activity. Several U.S. manufacturers produce such equipment. The Mission will issue an IFB and select one or more suppliers on the basis of competitive procurement. The GOP will procure local equipment and supplies for the operational research activities and for NIMRT. The Mission will arrange for foreign training and handle all off-shore procurement of equipment and supplies required for the NIMRT.

3. Construction

Funds were provided under the project for the purchase and renovation or for construction of a building to house the NIMRT, presently housed in a Government of Punjab building. The project provides funds for construction of the facility. $600,000 is budgeted in the project extension.

D. Training Plan

1. Participant Training

This amendment will provide for six long-term and 95 short-term participants (see Table IV-3) in training designed to strengthen the federal and provincial malaria control programs (MCPs), urban malaria control programs, and operational research capability of the National Institute of Malaria Research and Training (NIMRT). Long and short term training in engineering, public health, training and health education is scheduled as described in Table IV-3.

Short term participants will include professors of Community Medicine at the 17 medical schools. Their training will be in malariology sufficient to ensure adequate malaria content in the training of their medical students. Provincial participants will receive short courses in epidemiology and health education. Courses will also be provided on urban malaria control methods.

The long term participants will attend U.S. universities with schools of public health and special strengths in their chosen discipline. Most should receive a master's degree. The short-term participants will be trained at the Centers for Disease Control (CDC), or at a university with a special interest in malaria such as South Carolina or Tulane, or at a third country malaria institute.

A total of 206 person-months of participant training is planned. Table IV-3 presents details.

2. In-service Training

During the Malaria Control II Project over 1,000 provincial employees were trained in short courses by the NIMRT (Annex P). Of these over 500 were trained under the auspices of the Project in courses ranging from 2-15 days (Annex Q). These courses included entomology, urban malaria, supervision, safe use of insecticides, health education, alternative vector control, microscopy, blood smear collection, spray techniques, drug resistance and malaria program management. This type of training for malaria staff will be continued and expanded during Phase II. Some 2,000 trainees will be provided travel, per diem and course expenses while the GOP will arrange for another 4,000 to be trained locally with their own resources.

The integrated health system (described in Section V-B Administrative Analysis) will require many more staff to be trained in malaria work by the GOP at the province, district, Rural Health Center (RHC) and Basic Health Unit (BHU) levels.

Orientations/trainings are planned for general health services staff including physicians and laboratory technicians/asstts in malaria control strategy and malaria microscopy to facilitate development of PCD at all of the general health facilities and bring about complete understanding and participation of general health services staff in malaria control operations. Since the health staff to be trained will be multipurpose (FP, EPI, ORT etc), A.I.D. assistance for this activity will come from Primary Health Care (PHC) or Child Survival funds or Malaria Control Project funds. The MCP will provide technical assistance for the malaria control portion of this training.

The steps regarding the expeditious implementation of training of the health services delivery staff and PCD development, to facilitate functional integration and participation of general health services in the malaria surveillance/case detection and treatment, are proposed as follows:

1. Orientation training of the Deputy Directors (DDs), Assistant Directors (ADs), District Health officers (DHOs) and Medical officers (MOs) in Malaria Control Program and its strategies.

2. Malaria microscopic training of the laboratory/dignostic staff of general health facilities and their supervisors.

The orientation training of DDs, ADs, DHOs, and MOs is currently planned to be arranged and carried out by the Ministry of Health (MOH) through funding and participation of the Primary Health Care (PHC) Project- USAID Project No: 391-0475, and the Directorate of Malaria Control (DOMC) is proposed to follow up this training with despatch of orientation materials to the trained DHOs and MOs. The malaria microscopic training

on the other hand would be carried out by the provincial health departments, with coordination from DOMC and National Institute of Malaria Research and Training (NIMRT). Funds from the malaria control II project extension will be available for this training. The following is the proposed scenario for this training activity:

(i) Identification of number of general health services staff to be trained in malaria including the microscopy.
(Action: provincial malaria control programs (MCPs), and DOMC.).

(ii) Development of curriculum for malaria microscopy.
(Action: DOMC and National Institute of Malaria Research and Training (NIMRT).

(iii) Identification of federal and provincial master trainers (at least two persons from each of provincial MCPs). (Action: Provincial MCPs, DOMC and NIMRT).

(iv) Training of federal and provincial master trainers initiated and completed. (Action: DOMC and NIMRT)

(v) Provincial Microscopy Training Nuclei established at the provincial MCPs. (Action: provincial MCPs and DOMC)

(vi) Schedule of malaria microscopy training of provincial general health services laboratories staff, finalized. (Action: provincial MCPs, DOMC and NIMRT)

(vii) Training of lab. technicians/assistants of provincial general health services initiated at the provincial training Nuclei and completed along with the similar staff of federal health facilities also initiated and completed. (Action: Provincial MCPs and DOMC)

(viii) Trained personnel deployed and participating in PCD output.

PROPOSED PLAN OF ACTION FOR THE TRAINING SCENARIO

	Action	Target Date	Action Agency
1.	Identification of target numbers of existing MOs, microscopists, and other staff to be trained.	Oct.15, 88	MOH/DOMC/PHD
2.	Development of curriculum of training for microscopists/laboratory asstts, MOs, DHOs, and DDHSs in malaria microscopy, reporting system and supervisisory functions.	Oct.30, 88	NIMRT/DOMC/ MCCC
	Note: Actual training of physician staff to be carried out by MOH under the primary health care project.		
3.	Identification of master trainers for microscopic training, reporting system and supervision (at least 2 from each province)	Oct.30, 88	DOMC/MCP/PHDs
4.	Training of master trainers, at NIMRT, initiated and completed.	Dec. 30, 88	DOMC/NIMRT
5.	Provincial Training Nuclei established, preferably at the provincial MCPs or at the laboratory assistants training schools.	Jan. 30, 89	DOMC/PHDs/
6.	Schedule of training of existing provincial and federal laboratory assistants, laboratory technicians and dianostic staff.	Feb.28, 89	DOMC/NIMRT/ PHDs
7.	Training in malaria microscopy and reporting system initiated at NIMRT and Provincial Nuclei in batches.	Mar.15, 89	DOMC/NIMRT/ PHD

	Action	Target Date	Action Agency
8.	Monitoring mechanism of training programs established and monitoring visits initiated	Apr.2, 89	DOMC/NIMRT/ PHD
9.	Training of existing lab. assistants/techs. in microscopy and reporting system put under tests and results reviewed.	Apr.15, 89	NIMRT/DOMC
10.	Review results incorporated into the curriculum and training strategy	May 1, 89	NIMRT/DOMC
11.	Trained staff deployment:		
	i) Initiated	Apr.15, 89	PHD
	ii) Completed	continuous	PHD
12.	Monitoring of reporting/surveillance system established.	Feb.28, 89	MOH/DOMC/PHD/
13.	Analysis of surveillance data from newly developed PCD initiated and comparison made with the data of the same period of previous year.	May.15, 89	DOMC/PHD/ USAID
14.	Progress of training system of laboratory assistants/technicians reviewed/analyzed/ improvements made:		
	i) First Review	Apr.30, 89	DOMC/NIMRT
	ii) Second Review	Dec.1, 89	NIMRT/PHD/
	iii) Third Review	Apr.30, 90	USAID
	iv) Fourth Review	Dec.1, 90	-do-
15.	Trained staff fully participating in malaria case detection at PCDs.	Dec.30, 89	PHD
16.	Training of new incumbents and refresher training of the trained ones.	Continues	DOMC/PHD

TECHNICAL ASSISTANCE

Table IV-2

Long Term

Discipline	No.	Length of Service	Total Time	Workplace	# of TA each Project Year 1	2	3	4
Malariology/Entomology/ Epidemiology, expert in PCD Development	1	48 PM	48 PM	DOMC & Prov. MCP	1	1	1	1
Total	1		48 PM					

Short Term

Discipline	No.	Length of Service	Total Time	Workplace	# of TA each Project Year 1	2	3	4
Accident Contingency	1	MO.	1 PM	DOMC	0	1	0	0
Computer Data	3	MO.	3 PM	DOMC & NIMRT	0	1	1	1
Operations Research	3	MO.	6 PM	NIMRT	1	1	1	0
ULV/Fogging Operation	1	MO.	1 PM	DOMC	0	1	0	0
Health Education	3	MO.	3 PM	DOMC, NIMRT & MCP	1	1	1	0
Entomological Workshop	3	MO.	3 PM	DOMC & MCP	-	1	1	1
Training/Epidemiology	3	MO.	5 PM	DOMC, NIMRT & MCP	1	1	1	0
Environmental Engineer	3	MO.	3 PM	URB/M, NIMRT & MCP	1	1	1	1
External Evaluation	5	MO.	4 PM	DOMC/MCP	1	1	1	1
Total	23		29 PM					
Grand Total	24		77 PM					

PARTICIPANT TRAINING

Table IV-3

Long Term

Discipline	No.	Length of Training	Total Time	Workplace	Place of Training	No. of participants by Project Year 1	2	3	4
Epidemiology	2	2 Yrs.	44 PM	FED/PROV.	U.S.	2	1	1	0
Entomology	2	1 Yr.	24 PM	FED/PROV.	U.S.	1	1	0	0
Public Health-Admin.	2	1 Yr.	24 PM	FED/PROV.	U.S.	1	1	0	0
Total	6		92 PM						

Short Term

Discipline	No.	Length of Training	Total Time	Workplace	Place of Training	No. of participants by Project Year 1	2	3	4
Malariology	17	3 MO.	51 PM	Dept. of Commu. Med. of 17 Med. Schools	U.S.	8	9	0	0
Observ. Training US/ Third Country MCP	20	1/2 MO.	10 PM	Fed./Provl. MCP Staff	US/Third Country	8	6	6	0
Vector Control incl. Mosquito Abatement	12	1 MO.	12 PM	-do-	U.S.	6	6	0	0
Epidemiolo.y	4	2 MO.	8 PM	NIMRT/MCPs	Third Country	2	2	0	0
Health Education	6	1 MO.	6 PM	NIMRT/MCPs	-do-	2	2	1	0
Engineering (Environ.)	18	1 MO.	18 PM	Urban MCP	U.S.	6	6	6	0
Urban Malaria	18	1/2 MO.	9 PM	Mayors/ MMOHs of M.Cs.	Third Country	6	6	6	0
Total	95		114 PM						
Grand Total	101		206 PM						

E. Evaluation Plan

A program evaluation will be carried out each year of the project by a joint GOP/A.I.D./WHO team supplemented by one project-financed external consultant. Representatives of A.I.D. will include an AID/W malaria specialist, the A.I.D. project-financed long-term advisor, and one or two members of the Mission's Office of HPN. WHO representatives will include short term consultant (malariologist) from WHO regional office Alexandria in addition to the local WHO representative in Islamabad or his designee.

In view of the possible delay in full implementation of many critical aspects of the proposed program, including the nomination of key NIMRT personnel, acquisition and renovation of the NIMRT building, initiation of short-term TA recruitment and completion of arrangements for long and short-term training, the evaluation for FY 1988 should be deferred to September, 1989. Thereafter it should be moved forward one month each year; the in-depth final project evaluation should take place in May or at the latest June, 1992.

In addition to measuring progress achieved against the specific yearly output indicators and intermediate bench marks of achievement for the project (Section III-B), the annual evaluations will assess and provide recommendations on:

1. Staffing and administrative procedures at the federal, provincial, and municipal levels for malaria control operations;

2. Laboratory services for malaria case detection including a review of the number of locations providing PCD, number of blood slides collected and examined, number of qualified microscopists, mechanism of turn over of microscopists for training center and their deployment, number of slides examined per microscopist at regional, district and/or at an average PCD post laboratory, time lag between blood slide collection and receipt and examination by the laboratory, and cross-checking operations;

3. Drug distribution and fever treatment operations, including a review of the number of blood slides collected, fever cases treated, drugs administered and, by month, positive cases given radical treatment;

4. Condition and maintenance of vehicles, spray equipment, and other program equipment;

5. Surveillance operations by month for active case detection, passive case detection, epidemiological investigations; and progress towards establishment of passive case detection at the health posts including rural health centers, basic health units and municipal dispensaries;

6. Utilization of insecticides and anti-malarial drugs, including estimates of annual requiurements, beginning stocks, new receipts, actual use, and ending stocks;

7. Spray operations, including percent of coverage and efficiency, entomological studies and results, and resistance problems;

8. Larvicide and other vector source management methods in the urban areas;

9. Participation of urban municipal units in malaria surveillance and control operations.

10. Training of program personnel, including chief medical officers, district health officers, urban malaria control personnel, and spray personnel.

11. Maintenance of participant and in-country training schedules.

12. Health education and community participation programs; and,

13. Insecticide handling techniques and safety measures.

The evaluations will involve field trips, interviews with personnel at the federal, provincial, and municipal levels of the MCP, and review of administrative and technical reports available from the DOMC, provincial and municipal authorities, health facilities, and at WHO and USAID/Pakistan offices in Islamabad.

V. PROJECT ANALYSIS

A. Technical Analysis

1. General

A number of constraints continue to lie in the path of the National Malaria Control Program as it tries to discharge its responsibility of maintenance and reduction of the current level of malaria incidence. Although the resurgence of malaria as seen in 1973/74 is history and transmission was contained, the disease may again flare up. All factors are still present that are conducive to re-establishment of malaria as a major public health problem. The country's vulnerability to malaria remains generally high throughout the endemic malarious areas. Urban malaria has assumed importance as a persistent reservoir for reinfection back into rural areas. The problem of resistance to insecticides has advanced to a stage with complete resistance to the chlorinated hydrocarbons (DDT, BHC, etc.) and growing resistance to malathion, the safest and most widely used organophosphate (OP) insecticide. Should malathion fall to a non-susceptible status in the vector populations, additional compounds in the OP class are limited.

Further constraints on the achievement of the goals of the MCP are seen in the recent discovery of chloroquine-resistant strains of *P. falciparum*. The propagation of this type of malaria poses a significant threat to the control of malaria through chemotherapy. Administrative constraints are also critical: lack of support at the higher levels of country planning, apathy or inadequate consideration in overall health allocations, inadequate capacity to provide the foreign exchange for imported commodities, insufficient support in recruitment for trained technical manpower. Operational problems such as inadequate transport at national and provincial levels are relatively minor constraints which can be easily resolved.

Achievements in reduction of malaria remain impressive, despite indications of a slow increase in disease incidence in 1982-86. Accumulated knowledge through the years has enabled rough stratification of the malarious zones and permitted demonstration of effective methods of control in most parts of the country. The more recent adoption of a policy to reduce the total residual spray coverage to only the most critical areas as dictated by current epidemiological data represents a great stride toward the development of longer term alternate control strategies. Within the Directorate of Malaria Control (DOMC) it is heartening to see experienced staff present at some levels of administration which can form a nucleus for further development. As already noted, however, there is a dearth of technically trained professionals required for operational research and, to a lesser degree, training.

2. Project Components

The MCP is currently completing an extended plan of action initiated under the Malaria Control II Project, FY 1982-87. The proposed program will continue the same basic goals. Project stress is modified to reflect knowledge gained and experience derived from the previous programs.

a. Control Concept

One of the concepts of control of diseases transmitted through an insect is control of the vector species involved, and the major thrust of malaria control efforts world- wide has been predicated on this concept. In the face of emerging problems with the currently applied control practices, it is necessary to re-examine the options. Vector control applied to transmission of malaria involves control of one genus of mosquito. It follows, then, that to develop the most efficacious control strategy, the following two elements are vital: (1) a thorough and complete knowledge of the bionomics of the mosquito species involved, and (2) a knowledge of applicable control technology for control of the target species.

b. Current Vector Control Practices

It is generally accepted that as long as the vector species is susceptible to the insecticides used, residual spraying based on epidemiological stratification is the most cost-effective method of control in areas that are highly vulnerable. This is true even with more expensive insecticides.

Insecticides are applied in one or two rounds of coverage, as determined by the epidemiological data. Malathion and/or fenitrothion will be used during the project period, unless the vector becomes refractory to these insecticides as shown by entomological studies. It is generally considered that approximately 20 to 30 percent of the total area having potential of malaria in the past (see annex. U - Malarious Areas of Pakistan) will require residual spray protection; in Pakistan, the limit has been set at 25%. Focal spraying will be carried out as required around known foci of detected malaria.

The use of an API of 2.0 by DOMC as a spray operations trigger is the current policy because that level has been reached or exceeded (downward) in most sub-districts; the provinces are adequately staffed and equipped to spray in the remaining sub-districts with higher API's. Raising the API threshhold may be considered as a way of economizing on insecticide if the implications for malaria transmission are deemed acceptable. Resources required to support the spraying operations, including equipment, staff and operating costs will be provided in accordance with each province's annual plan of operation. However, epidemiological analysis must be expanded and improved in order to direct house-spraying

on a more selective basis than is currently the case in order to conserve insecticides and reduce other operating costs and the danger of causing insecticide resistance of the vectors.

The operations research component of the project and annual program reviews will guide the future choice and amount of insecticides on a more scientific basis, taking into consideration the development of resistance, the residual effect of the two types of organophosphates, benefit-cost ratio, and social factors.

3) Other Chemical Control: Application of other chemical control methods needs further operational investigation.

a) Larvicides: Larviciding has had limited use in malaria control programs. It cannot be considered as a substitute for residual spraying of houses in terms of bringing down malaria rates country-wide. However, there are water development/irrigation projects, urban areas and large towns or even villages where there are a limited number of vector mosquito sources -- all examples of situations where this approach could be successful in reducing the risk of malaria. It should be recognized that larviciding is not inexpensive.

In order to have an impact on malaria, however, only the most cost effective larvicides (based on operational field trials) should be used, and then only where pre-treatment inspection demonstrates the presence of anopheline larvae. Post-treatment inspection should also be carried out as a routine evaluation of effectiveness.

b) Space Spraying: Space spraying can be a valuable supplementary method of malaria control, but only when used in response to a demonstrated need, confirmed by entomological evaluation before and after spraying. Probably the greatest potential value of space spraying lies in responding to the threat of epidemics of malaria and other vector-borne diseases.

c) Evaluation of Applied Control Measures: One objective of the MCP will be the further development of a selective approach to spray coverage based on stratification. In the process of achieving this goal, reliance of the MCP on insecticides can be reduced without a significant increase in malaria. Success relies entirely on strengthening entomological and epidemiological surveillance; applying the data collected to stratification and, ultimately, to the operational spray plan.

1). Epidemiological: Epidemiological evaluation of the indoor spraying program needs to be an annual feature. In view of the cost involved in this program, the reporting of the number of malaria cases detected in the district, province and country through the various surveillance mechanisms need be recorded for sprayed and unsprayed localities separately.

As the malaria year in Pakistan starts around 1 July, cases found during the first half of the year are largely if not exclusively due to the transmission which occurred in the previous year, and should be listed as sprayed or unsprayed areas dependent on whether the locality was sprayed or unsprayed the preceeding year.

The more elaborate method of epidemiological evaluation of indoor spraying operations through serial parasite surveys in selected locations should be kept in reserve for areas where there is evidence that the spray operations are not producing the expected results.

2). Entomological: All current entomological surveillance methods, that is resistance testing, resting collections before and after spraying to estimate mosquito density, cone bioassay tests on sprayed walls, exit trap collections and collection/dissection of female mosquitoes to estimate parous-nulliparous ratios need be evaluated in light of achieving a selective approach to spraying coverage.

During the project extension, entomological surveillance will be improved by (1) taking repeated measures in selected index localities; (2) using sprayed and unsprayed areas of equal malariogenic potential to evaluate the impact of spraying on malaria (unsprayed areas with high malariogenic potential could receive increased PCD attention); (3) use of malariometric surveys in index villages to relate entomological operations directly to malaria transmission; and, (4) the investigation of all focally sprayed localities to determine if they should be included in the operational spray plan for the following year.

3). Supplementary Control Methods

In terms of providing protection from malaria to the population in highly malarious areas, there is no short-term cost effective method currently available to replace residual spraying. However, there are supplementary methods, some of which have been in use since the early 1900s and which in some cases substantially reduced malaria long before the introduction of residual insecticides. They are:

a). Source Reduction: The engineering methods of drainage, filling, water management and weed control were largely ignored during the "Eradication Era" yet most of the successful malaria control projects in the early 1900s were based on a combination of source reduction and larviciding. These programs were planned by teams which included physicians, engineers and entomologists.

Source reduction may well be a method of choice in certain situations in Pakistan, such as water development, irrigation projects and urban areas.

The MCP can provide the necessary expertise to advise on the mosquito breeding potential of water development projects and the danger of man-made malaria resulting from the work of other government agencies. However, the MCP would be in a much better position to push for a mosquito source reduction program in cooperation and collaboration with other government agencies if MCP could provide the services of a source reduction engineer who could advise on the solution of mutual problems of excess water which has a potential for producing malaria mosquitoes. The project has provided for short term consultantships for water management as well as for one year of long-term training for a Pakistani engineer to assist in development of expertise in the area.

Source reduction is not necessarily or even primarily restricted to major development projects or large-scale water management. A remarkably high percentage of vector breeding potential is a direct function of easily correctable inadvertent water catchments and empoundments: blocked drains, blocked irrigation laterals, water collections around village wells and, at the extreme, in urban settings, water run-off from air conditioners.

The participant training program makes provision for engineering training at the top levels to make possible technical backstopping of village-level as well as major source reduction efforts.

b). Biological Control: Mass rearing and distribution of larvivorous fish for control of mosquito larvae has been used as a biological control method since the early 1900s and has been utilized routinely as a supplementary method in malaria control programs in Iran, India and Thailand. The use of fish cannot be expected to bring about a substantial reduction of malaria when used as a sole method. However, restricted breeding habitats for the vector mosquito, ready

access of the fish to the larvae and a low level of malaria transmission create a combination of circumstances wherein use of larvivorous fish could reduce the risk of malaria.

Trials using larvivorous fish should be subjected to careful epidemiological and entomological evaluation and their use expanded operationally when demonstrated to be beneficial.

c). Other Biological Control Agents

Numerous other biological control agents are in various stages of research and development. Some have proven to be effective in controlling mosquito larvae in the same way as chemical larvicides but at a much greater cost.

d). Safety Measures for Insecticide Handling

A.I.D. has determined that the GOP follows proper and safe pesticide management practices from the initial formulation process to its application in villages and may be expected to continue to do so during the project period. The conclusion is based on the MCP's safety record and experience during the period 1976-1986. Safety measures for spray operations must include (1) documented cholinesterase testing for all spraymen; (2) proper protective equipment; and, (3) proper supervision. In August 1988 an environmental assessment of Pakistan malaria control program was conducted by a consultant team from AID/Washington. The team in their report advised that the current project personnel were sensitive to safety concerns and were adequately using many safety precautions. However, to enhance the safety concerns in some aspects the team advised a mitigation plan as follows:

i. Spray Uniforms: Each sprayman, maixer, malaria supervisory staff member, who routinely comes in contact with pesticide, be provided each year with a spray uniform package of two suits. Each uniform suit to include an appropriate sized long-sleeve shirt, trousers (shalwar), gloves (rubber for mixer, and cotton for sprayman) and a headcover (turban) whose long hanging piece would cover mouth and nose at the time of spray operations. During the next spray operation, a study will be carried out by DOMC/NIMRT or through hiring the services of a local consultant. The study will assess the feasibility of use of impermeable shoes and a mask in safe handling and as a protective measure to the over-exposure of insecticide. Another study would also be carried out to assess the feasibility of making available four suits of uniforms to the spraymen in those areas/districts which are going to be brought under fenitrothion spray.

ii. Accident Contingency Consultant: An expatriate accident contingency consultant will be hired for three weeks at the time of unloading of insecticide at the Karachi port for next spray operations. This consultant will supervise the unloading

operations of insecticide, review the safety precautions observed at the port and advise further safety precautions and make a report and develop an accident contingency plan for the purpose.

iii. Cholinestrase Testing Kit: Cholinestrase testing kit will be made available for every district brought under insecticide spray during the spray operations in the project extension and the cholinestrase level of spraymen, mixers, and supervisors will be measured regularly. The cholinestrase depressed personnel will be removed from the spray operations.

iv. An epidemiological study will be made of factors leading to cholinestrase depression in the spray squads.

v. Training in Safe Handling be continued every year for assistant entomologists, malaria superintendents, malaria supervisors, and malaria spraymen.

vi. Communications between the agriculturists and the vector control specialist of MCP must be enhanced particularly in regard to pesticide/insecticide use.

e. Urban Malaria

Urban centers, i.e. Lahore, Karachi etc., are carrying out limited entomological activities. However, the routine collection of entomological data to support control operations is not occurring. While malaria is normally a disease of rural areas, the Karachi epidemic of 1967 provides clear evidence that urban malaria can be a serious problem. Organized larviciding and ULV exterior space treatment could be effective deterrants to possible epidemic malaria. Additional support in terms of operational training (instruction use of space spray machinery, larviciding, control of urban mosquito problems), and commodity assistance (spray equipment, vehicles, insecticides) are planned for the major metropolitan corporations based on compliance with the CP on the establishment of functional systems to monitor the malaria parasite and vector/mosquito densities. Urban malaria control programs will promote source reduction and initiate entomological surveillance programs, using light traps and larval density counts as a part of the extended project.

f. Surveillance

Malaria incidence surveillance, upon which efficient residual insecticide spraying and drug treatment planning depend, includes active case detection (ACD), passive case detection (PCD), activated passive case detection (APCD) (as explained in glossery of terms), and periodic mass blood surveys. Active case detection (ACD), by which malaria program staff collect blood slides from all persons with recent or current fever in a designated area on a house-to-house basis, although is an important part of the program to delineate areas for selective spraying, especially

in remote areas of historical high incidence and in "silent" areas from which come few or no malaria slides but due to integration of MCP in health development of EPI outreach teams in Punjab its activities are grossly affected. Passive case detection (PCD) by which regular health services staff are expected to take blood smears from all fever cases presented at hospitals and health centers and examine them for malaria infection, will be an increasingly important component of surveillance, including in urban areas where ACD is not utilized and where positive slides from health facilities constitute the primary basis for selecting malaria control methodologies. Although ACD has been the backbone of the MCP surveillance system to date, PCD as a routine function of an integrated health system must be fully developed and relied on over the long-term and it can be sustained indefinitely as one component of an ongoing health system.

The training, motivation, and supervision required to carry out an effective surveillance and disease control operation are formidable. The ACD system, to be considered satisfactory, will require adequate support in the provision of transportation and daily allowances for supervisory personnel. The development of a comprehensive integrated health delivery system, with USAID assistance from the Primary Health Care Project and the proposed Child Survival Project, will provide more opportunities for women to receive acceptable health care, including microscopically analyzed blood smears from fever cases.

Several measures will be employed to expand and improve the collection of blood smears and analysis of slide positivity rates. Experienced ACD staff will continue to be assigned to health facilities in epidemiologically important areas in order to smooth out the still-spotty PCD system. Training of health services personnel in PCD surveillance techniques will be increased. The long-term malaria advisor provided by this project will devote a major portion of his time to this subject, supported as necessary by short-term consultants. Periodic mass blood surveys will also continue to be carried out to supplement ACD and PCD when more complete epidemiological data are required.

The important point is that the GOP for the first time is now seriously engaged in facilities construction and staff training for an integrated health system which will have malaria surveillance and treatment as an important function. When this system is fully developed, probably in 5-10 years, malaria surveillance can be primarily a function of this program rather than the MCP.

A foreseeable constraint on the expected large increase in PCD is the ability to read all the malaria slides generated. There are about 400 trained microscopists now or about enough to staff a laboratory at each RHC. At least another 4,000 will be needed at the BHU level to provide a more rapid diagnosis and treatment. This project will assist the GOP to train and equip the needed microscopists by providing technical assistance and participant training in support of this major training

effort and will provide 500 microscopes.

The objective of increasing PCD is important not only to increase the number of malaria slides, currently about 3 million annually, but also to increase the quality of the sample. Sick people who go to a fixed health facility for service and have fever are more likely to have blood smears positive for malaria. To date, the PCD slides have risen from 10 to 16% which reflects some development of the integrated health services. Meanwhile the proportion of total positives detected through PCD, 27% in 1982, rose to 42% in 1986.

The potential of early determination of positivity or negativity of a blood slide for malaria and early administration of curative treatment is available only in the PCD system and not in the ACD system, hence effectiveness of PCD over ACD established. ACD system although has a broader coverage of population than that provided by PCD through the general health services/integrated to health services, but the speedier reading of the slides and speedier administration of treatment in the PCD makes it more effective. The efforts to establish PCD system in all health facilities during the project extension, will be made through extensive training programs of health services staff, physicians, and microscopic workers described under Project Management. This will increase the popularity of health facilities amongst the general public who will increase their utilization of thus improved health services. It can safely be concluded, therefore, that adoption of PCD system/integrated into the health services will not only facilitate early reduction/treatment of malaria parasite reservoir but will also increase utilization rates of health facilities by the general public.

g. Operational Research

Operational research and training are matters of extreme importance to the malaria control efforts of the GOP. Emergence of populations of chloroquine-resistant *P. falciparum* parasites and increasing vector resistance to insecticides accentuate the realization that new and expanding operational problems are inevitable. The National Institute for Malaria Research and Training (NIMRT) when fully functional should improve the much neglected operation research. Annex T presents a list of some of the operational research problems which need immediate attention in the Pakistan Malaria Control Program. NIMRT staff deficiencies need to be rectified as soon as possible to have an effective operation research unit.

h. Health Education

Health education designed to increase the understanding, cooperation, and participation of the people in the program at the community level is as important as the technical operations of vector control, case finding, and treatment. The DOMC and provincial malaria officials recognize the importance of health education and have carried out health education

campaign on radio and TV to support provincial spray operation. As integration of malaria into provincial general health services proceeds, malaria education should become an important element of the overall health education program.

The provinces typically utilize radio, TV, leaflets and posters, newspaper articles, participation in village fairs and exhibitions, and direct contact by malaria field workers to communicate program objectives, procedures, and schedules to the community. The DOMC feels that these efforts have succeeded in creating villager under- standing of the program, but have not yet been able to elicit their cooperation, and especially, their participation.

The Directorate of Malaria Control (DOMC) has one health educator position on the staff (currently vacant) but the National Institute of Malaria Research and Training (NIMRT) has none. It is proposed that the project extension provide participant training for a health educator who could be assigned to the NIMRT.

The MCP has managed to make significant progress in reducing malaria incidence with only marginal health education activities. The project will provide a three-month consultant in the first year to assess health education needs, assist in the selection of the Pakistani candidate for participant training and assist in planning the health education content of the training necessary to staff the integrated health systems. The consultant will assist the returned participant who has been trained in health education (H/E) and develop appropriate H/E plans and monitor the ongoing one for its effectivity or propose replacement. Some project funds will be provided for audio-visual/teaching equipment needed to make the consultations effective.

i. Training

Specialized pre-service and in-service refresher courses for senior and mid-level provincial and urban health officers (malaria staff and general health staff working on malaria) have been provided regularly by the National Malaria Training Center (NMTC) since its establishment in 1961 and now NIMRT since April 1987 when NMTC was merged into NIMRT by GOP.

The building occupied by the NIMRT belongs to the Punjab provincial government. The project will provide funds for the construction and equipping of a new building or the purchase and renovation of an existing one to house the NIMRT. The project will also provide funds for audio-visual or teaching aids for the institute.

During Malaria Control II (FY 1982-87) 57 short-term participants were sent to Bangkok, Malaysia or South Carolina and ten long-term participants are scheduled from the remaining funds. Another six long-term and 95 short term participants are scheduled with Malaria Control II Extension funds.

From 1982-87 the MCP gave training to 1,043 staff in courses (Annex P) ranging from two days to three months. Subject matter included microscopy, blood smear collection, safe use of insecticides, entomology, drug therapy and sensitivity, supervision and management. In the Extension (FY 1987-92) short in-country courses are planned for 2,000 staff.

In addition to the courses for MCP staff, many thousands of multipurpose workers in the integrated health system will be trained. See Plan of Action of PCD development under Project Implementation Plan. Most of these courses will be organized by the GOP - possibly under Primary Health Care (PHC) Project or the follow-on Child Survival Project. However, NIMRT/MCP staff are expected to play an important role in assuring that the training has a significant malaria content, and in assisting in the preparation and teaching of the malaria content. The success of the parasite reduction effort through Passive Case Detection (PCD) and prompt treatment depends on the active cooperation of health staff of the comprehensive integrated health system.

3. Long-Term Sustainability and Impact

If successfully executed, the project will go substantially forward in its transition from a vertically organized program emphasizing total coverage house-spraying and active case detection surveillance methods to an integrated program utilizing selective vector control measures. Progressive reduction of malaria transmission by vector control and radical drug treatment for humans will reduce the geographical area requiring application of residual spray, thereby reducing the administrative and financial costs of the program.

From the standpoint of government administration, savings may result from reduction in the size of the separate malaria organizations in the provinces. Over time, the foreign exchange burden for imported insecticides should become more manageable. The long-term impact on social and economic development will continue to be substantial in terms of reduced morbidity, low rates of infant mortality and increased productivity.

4. Summary

The project is judged to be technically feasible and sound. The project design provides appropriate and sufficient technical assistance and training and includes an operational research component which will enable the GOP to implement innovative and technically sound approaches to malaria control.

B. Administrative Analysis

1. Organization

Program responsibility is shared among the DOMC at the federal level, the provinces, and numerous municipalities. The provinces implement their programs through district units. The DOMC is responsible for technical guidance, coordination with provinces and with international agencies; program planning, evaluation, training and research; and supply of vehicles, insecticides, and spraying equipment to the provinces. The Provincial Malaria Control Programs are responsible for actual implementation of program -- administrative as well as operational. The municipalities have the same responsibilities as the provinces and relate to the DOMC in the same way.

The DOMC staff in Islamabad is very small, considering the magnitude of the program under its direction. A limited number of technical staff concentrates on planning, coordination, and evaluation, while a large administrative unit handles financial, procurement, and reporting matters. The Directorate exerts its influence through technical guidance and through its control of provincial allocations of insecticides and equipment and its review and approval of provincial operation plans. DOMC does not control or oversee training and research activities. The staffing pattern of DOMC (Annex L) is adequate; 95% of the positions are filled. The difficulty of keeping senior positions filled with qualified persons is expected to be ameliorated by planned participant training.

Formerly the DOMC had direct control of the National Malaria Training Center (NMTC) which, since March 1, 1987 has been merged with the National Institute of Malaria Research and Training (NIMRT). Currently the NIMRT reports directly to the Ministry of Health and not through the DOMC. This will be preferred to assure that operational research is focused on problems of direct MCP concern.

The DOMC and NIMRT staff will be supplemented by A.I.D.-financed technical advisory services as described under Technical Assistance. These consultants will concentrate on program planning, management, operational research and training as per their assignments. An A.I.D.-financed short-term malaria engineer will also assist with urban malaria control programs (one month in each of the first three years) in environmental management who will also help initiate development of long-range substitutes for spray-related control. He will help select Pakistani engineers for participant trainings and to initiate feasible vector source reduction methodologies.

Although the administrative capabilities vary at the provincial and district level, the staffing positions are adequate (Annex M) and about 95% filled under the project extension. The technical training at the top echelons will be upgraded. During FY 1987 alone, A.I.D. has offered ten long-term and 22 short-term participant training opportunities (Annex

O) to overcome the deficiencies in technical expertise at the province, district, and municipal level. The proposed Malaria Control II Extension will provide short-term participant training in urban malaria control for 18 engineers, in health education for six provincial staff and in epidemiology for four provincial staff in addition.

During the project extension all provinces will be assisted to improve their supply and transport systems. Most vehicles are ten years old and are costly to maintain, and are often inoperable. Although repair shops were established and mechanics trained with A.I.D. assistance during the Malaria Eradication Campaign, MCP provincial offices now rely on health departments consolidated maintenance facilities. The bureaucratic procedures of this centralized vehicle maintenance system have caused maintenance delays. Under the project extension A.I.D. plans to provide 100 new vehicles since transport is essential for shift to epidemiology based spraying and institution of supervision of field operations by provincial and district supervisors. The new vehicles will provide mobility to the supervisors of spray operation and other malaria control activities. Provincial planning capability is considered satisfactory. The majority of the planning documents are well done.

The basic problem has been the lack of assured availability of certain commodities, especially insecticides that has helped in bringing about understanding on gradual reduced reliance on insecticide for vector control and increased interest in development of alternate control methods. The development of mosquito resistance to insecticides progressing from DDT, Dieldrin, BHC, and now to malathion, especially by An. stephensi (important in urban malaria but not necessarily in rural areas). This has complicated projecting insecticide needs and requirements.

Innovations have resulted in more cost-effective and efficient program operations. The two most important changes are: (1) selective residual spraying based on entomological-epidemiological data; and, (2) greater dependence on passive case detection (PCD) rather than primarily on active case detection (ACD). These changes of emphasis are already in motion and will be significantly improved by the activities proposed in this Project Extension.

The outlook for the development of the integrated health system is reasonably optimistic. An important foreseeable constraint on the PCD activity is the training and posting of a microscopist to each of the proposed 4,000 Basic Health Units (BHU).

Additionally, under the project extension the MCP will identify, train, supervise and provide supplies to voluntary village collaborators who will assist improving the malaria surveillance in the country.

The GOP Planning Commission proposes that at each of the country's 45,000 villages paid health auxilieries will be hired, trained and posted with

malaria as one of their concerns.

In sum, over the years, the MCP has functioned with considerable success and the DOMC and provincial health authorities are expected to continue to administer successfully the new program.

2. Integration of the Malaria Program into the General Health Services:

Pakistan is in the process of integrating the malaria control program into the general health services. The success of the project and MCP goal to reduce reliance on insecticide spraying depends on a satisfactory system of malaria case finding and treatment. Pakistan intends to establish such a system as one function of an integrated health system serving all the population, both urban and rural, by 1990. The system will be a layered system with referral hospitals in urban centers, districts and sub-districts (tehsils); less sophisticated health units using both professional and paramedical multipurpose staff at Rural Health Centers (RHC) and Basic Health Units (BHU); and outreach teams of paramedics to reach the village populations. (See Annex R).

The history of plans for rural or basic or primary health care in Pakistan from the days of the Bhore Report (1940s), the Massachusetts Contract (1950s) and the first five 5-Year Plans has not been of a complete success. With the current expressed support of the government at all levels, better performance is ensured. Also the health budget has been increased (to 5% of the total budget). A.I.D. is assisting basic health service development with a Primary Health Care (PHC) and a planned Child Survival Project which includes components for immunization, oral rehydration, nutrition, child spacing etc. as well as communicable disease control which subsumes malaria. These resources should go far to correct past deficiencies in management, transport, supervision, etc.

Considerable progress is being made toward implementing in the country, the new system designed to serve about 70 million of the rural and under-served urban people. Some 600 Rural Health Centers (RHC) are planned, each serving a population of 50,000-100,000. Punjab alone has 288 constructed and ten more coming. The doctor shortage which formerly made it impossible to staff rural health facilities has been overcome by more graduates from the nation's medical schools and returnees from oil-rich countries. Critical for malaria case detection is a laboratory in each center with a microscope and a laboratory technician competent to read malaria slides. Many RHC (236) have met this requirement and all are planned do so by 1990. Prospects are good for reaching RHC goals by 1992, the project PACD.

Present plans call for 4,000 Basic Health Units (BHU) with each serving about 10,000 people, but with at least one in each of the 4,112 Union Councils (UC), the lowest level political unit. In 1987 2,778 UCs had BHUs and 1,334 remained to be built; i.e., 68% of the 1990 goal had

already been attained. Staff includes a doctor, lady health visitor (LHV) or medical technician (MT)/or a health technician (HT), and a laboratory technician. A laboratory technician competent to read malaria slides at the BHU level as well as the RHC level could reduce the time for radical treatment of a malaria case from perhaps 7 days to 1-3 days and thus decrease the probability of continued involvement of the patient in transmission. Staffing of BHUs may well not be completed by 1990 (see Sec.IV-D, Training).

In the Punjab each BHU will have an outreach team going to each village house in its area once a month. This team consists of a Health Technician as leader, a Communicable Disease Control (CDC) worker (ex-malaria supervisor) and an EPI vaccinator. This team should identify all fever cases, give presumptive treatment for malaria and take blood smears to be read at the BHU or RHC. All microscopically confirmed cases will receive the radical treatment appropriate to the identified parasite and follow-up blood smears at 30-day intervals to check for parasite insensitivity to the drug treatment.

DOMC is doing initial training to embark on a trial in use of village voluntary collaborators in malaria control. If it proved successful, DOMC plan to replicate it in the villages and women will be recruited as VCs. When in place it will facilitate more indepth reach oflmalaria control program.

When the integrated health system is in place, the number of blood smears taken to detect malaria cases, (currently around 3 million annually), should be greatly increased. Moreover, the increase should be greater from the passive case detection (PCD) posts relative to the active case detection (ACD) slides. The percentage of PCD in 1986 has already increased from 10 to 16% giving a less biased sample for estimation of malaria incidence.

Even when this system is perfected, it will not detect all malaria cases. The majority of patients around a health unit area do not go to government/public health services. Still, for some time a majority of urban people will seek private medical practitioners services and rural people rely on private doctors, pharmacists, hakims and traditional practitioners of various types who diagnose malaria and prescribe treatment on the basis of unreliable clinical judgment rather than definitive laboratory confirmation. This usage of public health services by population is expected to increase as the expanded health system will provide more and better services. The MOH plan to provide laboratory services to private sector for malaria diagnosis and Mission will encourage that during the course of project extension through health education.

In the integration, the MCP will retain its national office, the DOMC, and some provincial staff. The DOMC will still be responsible for planning spray operation and determining the areas of needed operational

research. At the district level there will be a District Health Officer (DHO) who will have an Assistant District Health Officer (ADHO). The latter will be in charge of communicable disease control (CDC) including malaria control. From the district to the village level, staff will be multipurpose and under the direction of the MO. The project has provided for malaria training for the medical officer (MO) and his staff need a malaria content in their training and MCP staff must learn to coordinate and cooperate with the MO and his staff.

C. Social Soundness Analysis

1. Socio-Cultural Environment of Pakistan

a. Introduction

Pakistan is often viewed as a nation of four main ethnic groups, Punjabis, Sindhis, Baluchis, and Pathans, with Urdu-speaking Muhajirs sometimes added as a fifth. These groups populate four provinces, Punjab, Sind, Baluchistan, and the North West Frontier Province (NWFP). The Tribal Areas, located on Pakistan's northwestern borders with Afghanistan, have a special legal status emanating from the British colonial period and the inhabitants are culturally distinct from their neighbors. In reality, provincial boundaries provide only a rough indication of the distribution of the ethnic groups. Using linguistic identification as a proxy for ethnicity, the 1981 census figures show that Punjabis account for about 48 percent of Pakistan's households, followed by speakers of Pushtu (18 percent), Sindhis (12 percent), Siraiki (10 percent), Urdu (8 percent), Baluchi (3 percent), Hindko (2 percent) and Brahui (1 percent).

The ethnic map of individual provinces is at least as complex. According to the 1981 figures, less than 40 percent of Baluchistan's population is Baluchi; large Pathan and Brahui communities are also present. Hardly 50 percent of the households in Sind speak Sindhi as a first language, and in five of the NWFP's twelve districts languages other than Pushtu predominate. Even Punjab has a large Seraiki-speaking community in its southern districts. The national language Urdu is spoken in less than 8 percent of the country's total households. On the other hand, Urdu is the first language in nearly one-fourth of Pakistan's urban households.

b. Status of Women

Notwithstanding relative variations in the status of Pakistani women, which are primarily dependent upon their class and ethnicity, there is a widespread cultural devaluation of women. From the time of her birth, a woman's place in the household is at best, secondary. This is based on the belief that a woman is supposed to be born "with only a mouth, while a man brings two hands"; the former is a pure liability while the latter is an asset. The Pakistani woman's raison d'etre is as a member of a kin group rather than as an individual. Most events in her life - her

schooling, marriage, number of children she has, whether she works, whether she is allowed to visit a doctor when ill - are greatly influenced by the attitudes of her immediate relatives.

According to the 1981 census, less than 4 percent of women aged 15 to 29 are in the formal workforce while of the 10 to 24 age group just over 11 percent are in school. Hardly 6 percent of women living in the rural areas can read or write. Expectancy of life at birth is estimated at 51.8 years for females and 52.9 years for male. The crude death rate is higher among females than males. For ages one to four, mortality rates were about 29 and 15 per 1000 for females and males respectively; 3.5 and 2.4 for females and males aged 5 to 9; and 2.8 and 1.8 for those aged 10 to 14. The higher mortality among female children is a result of differential patterns of child care, nutrition, general health care and immunization.

Purdah, or the seclusion of women, carries a high positive value in Pakistan. Purdah observance serves as a symbol of the family respectability, religiosity and status. The norms of purdah demand a clear segregation of sexes, for example, separate workplaces, schools, the absolute lack of contact between women and men who are not members of the same kin group. These moral and social codes of behavior have a profound affect on the status of women. They will also affect project implementation and the ability of women to benefit from the project.

c. Existing Health Belief System

A prerequisite to understanding how Pakistan's people will react to the proposed project, is knowledge of the health belief systems that exist in the country. Of particular importance is the identification of the causes which are believed to be the source of malaria, and the common methods employed by the population to counteract the disease.

In Pakistan traditional medicine largely takes the form of greco-arab or tibb-e-unani medicine, though there are practicing homeopaths and vaids. Traditional practitioners co-exist with allopathic doctors and from the Pakistani perspective, there is no ideological conflict between traditional and modern medical systems. It is also quite common for people to resort to a wide variety of both traditional and modern therapeutic measures. There is however, a trend of increasing use of allopathic drugs by traditional healers.

Traditional illness beliefs reflect a variety of ideas including the importance of maintaining a proper balance and order in the body, malevolent activities of spirits or jinns and forces of nature. Beliefs surrounding malaria however, appear to be somewhat unique. Many Pakistanis have been exposed to an intensive public education program with respect to malaria. Efforts to combat malaria have been ongoing since the early 1960s. Many people recognize a relationship between mosquitos and malaria and many also believe that the spraying of their

homes with insecticides can act as a preventative measure against the disease. The prevalence and geographical spread of these beliefs with regard to malaria is, however, unknown. The present USAID supported malaria project is about to embark on a study on rural attitudes towards malaria whose data will be used in the implementation of the project extension.

2. Social Feasibility of the Project

a. Ethnicity

Pakistan's diversity has given rise to ethnic disunity and ethnic tensions which have been exacerbated in recent months, especially in urban areas. Furthermore, in the large tribal areas, with orthodox tribal norms, often lead to animosities being perpetuated through generations.

The proposed extension of Malaria Control II will face ethnic and linguistic challenges. Compatability of project inputs with the socio-cultural environment will be critical for project success.

The present malaria control project not only must draw upon coordinated inputs from three Federal agencies and each of the provinces, it assures that its workers are compatible with the neighboring environment. This positive and culturally appropriate approach will continue in the extension of the Malaria Control Project.

b. Women

Because of purdah, access to certain households for purposes of either spraying or the taking of blood slides and the ability of women to seek medical treatment in Government Health Units when they suspect malaria, could be impossible, and the success of the project affected.

Experience shows that in Punjab, a sprayer known by the community is able to enter households relatively easily. In areas where orthodox purdah is strongly enforced, such as the Tribal Areas, Sind and parts of Baluchistan, access for purposes or spraying will have to be done in the presence of a senior male relative or a respected village elder.

Most women, whether in or out of purdah, will visit traditional practitioners and many of these practitioners will prescribe allopathic medicines, particularly for fever. Such treatment may alleviate symptoms but does not necessarily clear the patients blood of parasites.

The integration of the Malaria Program with the Health Services System and the proposed change from active case detection to passive case detection, include plans to employ lady health visitors who will take blood samples from female patients and a greatly expanded number of microcopists (many of whom will be women) in rural health centers. This is a positive and culturally adaptive feature.

c. Class

There is a strong correlation between variables of class and acceptance of household spraying. In general, the lower the economic status of a particular household, the more willing they are to accept the spraying of insecticides in their homes. As wealth and education increases, people are increasingly reluctant to have their houses treated, for fear of improper spraying practices. Recently, investigative teams have been regularly checking spraying practices. Malaria supervisors are given safety training, refreshed annually, and are equipped with test kits (atropine and other equipment) to detect and treat insecticide intoxication. The effectiveness of their investigative visits could be enhanced if the spray teams were unaware of the schedule of the investigative visits.

3. Social Impact/Beneficiaries

Since malaria tends to attack the poor more frequently than the wealthy, and since there is less probability of infection in cities than in rural areas, the project is expected to have a measurable and positive impact on the health of many poor households, particularly in rural malaria areas.

Settled rural communities will benefit more than nomadic or semi-nomadic populations. In areas where there is seasonal migration or transhumance, such as Baluchistan, there is reduced coverage. However most transhumants move to higher elevations in the summer, thereby reducing their risk of contacting malaria. More at risk are the nomadic populations. In the early 1960s, these groups were monitored for malaria. However, when the malaria program was split into provinces, the tracking of nomads rapidly decreased. Today, Pakistan's nomads are largely ignored in the campaign against malaria.

The project's impact on women is expected to be favorable. Women who reside in areas where residual spraying or draining of vector breeding sites is undertaken will receive health benefits.

The project plans to train over 4,000 doctors, malaria supervisors, community health workers and health technicians a significant proportion of which will be women. The presence of female professionals at health clinics will encourage village women to seek treatment there.

4. Conclusions

The project has been appropriately designed for Pakistan's social conditions. Community participation will be key; village participation will be the most cost-effective means to implement the project. Unless local people are drawn into the process, the project is not likely to be sustainable. The Malaria Control II extension will therefore collect base line data on the willingness of villagers to participate in the

project and then implement programs of self-help malaria control methods.

D. Economic Analysis

The benefits of this project to Pakistan are several times its costs. The project is both effective and cost-effective, since there are no currently available, proven lower-cost methodologies or technologies.

1. Benefits

The estimates provided below are indicative of orders of magnitude. Precision is not claimed. However, the implicit rate of return and benefit-cost ratio are obviously high. The investment is econcmically sound.

Table V-1 shows that without the proposed malaria program, malaria cases from FY 1988 to 1992 would exceed 26 million. With the program, over 24 million of that number would be avoided. The value of benefits from the program, which is shown in Table V-2 and is estimated at $324 million, is derived by calculating the value of lost production and the value of avoided treatment costs. This calculation probably understates benefits because value added by workers generally exceeds wage costs. Table V-3 compares the costs and benefits of the malaria control program over the next four years, and shows a net benefit of over $247 million.

The above calculations assume as given the benefits of the 1982-87 control program and begin with a 1987 incidence of controlled proportions, i.e. 45 cases per 10,000 population. If there had been no control program prior to 1987, the malaria incidence at the beginning of this extension period would likely have been 1000 cases per 10,000 population or more. If one calculated based on this high initial incidence, the benefit/cost ration would be even higher than estimated in this analysis.

2. Cost-effectiveness

Table V-4 shows that the per capita cost of malaria prevention during the four-year period is approximately $0.73. The annual per capita cost is about $0.15. Looked at from another perspective, the program, which will total $80 million will avoid 24.1 million cases of malaria at a cost of $3.32 per case avoided. In the absence of feasible alternative approaches to malaria control, these outlays are not only modest, but cost-effective.

3. Sectoral Impact

Although urban malaria will be attacked in this project, the impact of the program will primarily be experienced in the rural or agricultural sector. Thus, the positive economic impact of the Malaria Control Project will be on agricultural production, which is the mainstay of Pakistan's economy.

Malaria is particularly prevalent in irrigated areas. It is also a seasonal disease, and the height of its prevalence coincides with the time when winter crops are sown and summer crops are harvested. The peak of the malaria season, therefore, occurs when the rural population needs to be most active in productive agricultural operations.

TABLE V-1

MALARIA CASE PROJECTIONS WITH AND WITHOUT THE PROGRAM

Year	Without the Program			With the Program		Cases Avoided
	Population a/ (mill.)	Malaria Case b/ Rate per 10,000	Total Cases (mill.)	Malaria Case c/ Rate per 10,000	Total Cases (mill.)	
1988	103.0	82	0.84	45	0.46	0.38
1989	106.1	156	1.66	45	0.48	1.18
1990	109.3	305	3.33	45	0.49	2.84
1991	112.6	606	6.82	45	0.51	6.31
1992	115.9	1200	13.91	45	0.52	13.40
Total			26.56		2.46	24.10

a/ Based on an annual rate of increase of 3 percent.

b/ Malaria incidence was projected on the basis of the disease trends of the 1973 malaria epidemic in Pakistan. The estimated case rates are considered conservative and would continue to climb for several years, although at a slower rate. The 1992 case rate of 1,200 per 10,000 population without a program is derived from the estimated case rates of the 1973 epidemic. During this epidemic, an estimated 6 million to 10 million cases of malaria occurred in a population of 67 million. A mid-range value of 8 million cases gives a case rate of 1,200 per 10,000 population.

c/ The malaria case rate with the program was derived by using 45 cases per 10,000 population for the year 1987 and for each subsequent year with a malaria program in place. This fairly conservative rate, which is over three times the estimated 1987 level of nearly 15 cases per 10,000 population, was chosen on the assumption that the actual number of cases is approximately three times the reported number of cases.

TABLE V-2

MALARIA CONTROL PROGRAM BENEFITS
(In $ million)

Year	Number of a/ Cases Avoided (mill.)	Value of Lost b/ Production Due to Workdays Lost	Value of Lost c/ Production Due to Debilitation	Value of d/ Treatment Cost Avoided	Total Benefits
1988	0.38	1.14	2.38	1.57	5.09
1989	1.18	3.55	7.39	4.90	15.84
1990	2.84	8.54	17.79	11.80	38.13
1991	6.31	18.97	39.52	26.22	84.71
1992	13.40	40.28	63.92	55.68	179.88
Total	24.10	72.48	150.99	100.14	323.85

a/ The total number of cases avoided was estimated by comparing the projected number of cases with and without a malaria control program. An incidence rate of 45 cases per 10,000 population was taken for the year 1987 and for each subsequent year with a program in place. This rate is three times the estimated 1987 rate per 10,000 population. This rate was chosen on the assumption that the actual number of cases is three times the reported number of cases. (See table 3.)

b/ Value of lost production due to workdays lost was estimated by assuming that each case of malaria results in six days of lost production time for the 30% of the population in the labor force. A daily wage of Rs 30.00 or the equivalent of $1.67 (exchange rate of $1.00 = Rs 18.00) was used.

c/ Value of lost production due to debilitation was estimated by assuming that each case of malaria resul s in 25 days of 50% reduced effectiveness for the 30% of the population in the labor force being paid a daily wage of $1.67.

d/ The average daily cost for treatment of malaria per patient is estimated to be Rs 5.00 or $0.277. The number of days a patient is ordinarily treated for malaria is 15.

TABLE V-3

COMPARISON OF THE COSTS AND BENEFITS OF THE MALARIA CONTROL PROGRAM
(In $ million)

Year	Total Costs a/	Total Benefits b/	Net benefits
1988	16.7	5.09	- 11.61
1989	16.2	15.84	+ 0.36
1990	16.0	38.13	+ 22.13
1991	15.7	84.71	+ 69.01
1992	15.4	179.88	+ 164.78
Total	80.0	323.85	+ 243.95

a/ Includes the AID dollar contribution and the contributions of the GOP federal and provincial programs. (See Financial Analysis Section.)

b/ Taken from Table 4.

TABLE V-4

PER CAPITA COSTS OF THE MALARIA CONTROL PROGRAM

Year	Population (mill.)	Total Program Costs ($ million)	Per Capita Program Costs ($)
1988	103.0	16.7	0.16
1989	106.1	16.2	0.15
1990	109.3	16.0	0.15
1991	112.6	15.7	0.14
1992	115.9	15.4	0.13
Total		80.0	0.73

E. Financial Analyses

1. General

This project provides additional assistance to support the GOP Malaria Control Program. As shown in Table V-6, the additional program over the next four years is estimated to cost just over $63 million. The GOP will provide the equivalent of some $36 million during the program, consisting of about $3.1 million for DOMC and NIMRT salaries, some $6.2 million for other commodities and $26.4 million from provincial budgets in support of provincial malaria programs. The foreign exchange requirement of about $26.3 million represents approximately 8% of the total costs of the entire program over the next four years. The A.I.D. input in foreign exchange for project extension will be about $25 million and GOP input will be nil.

Three summary tables are provided on the following pages. Table V-6 provides summary of project costs by expense categories and source funding. Table V-7 summarizes project costs by fiscal year and kind of funding; Table V-8 A.I.D. funding in foreign exchange by expense category and kind of funding. Project costs are defined as anticipated commitments of funding through, e.g., PIOs, contracts, or purchase orders. Inflation was calculated on the basis of 5 percent for U.S. salaries and for all other foreign exchange costs, all compounded annually. A contingency fund of all projected costs is designed to cover, among other things, the possibility that operational research findings may require the substitution of a more expensive insecticide for malathion. Rupees where shown are expressed as dollar equivalents at the exchange rate of $1.00 = Rs 18.00.

2. Summary Cost Estimate and Financial Plan

a. The project was initially structured in a way to gradually shift the burden of purchase of insecticide for vector control/spray operations to GOP. In the first year (1988) of the extension project, USAID was funding the total estimated requirements of insecticide. In the following years USAID was planning to purchase 83%, 60%, 42% and 26% of the projected requirements of insecticide estimated by design team, for GOP vector control operations, but on March 7, 1988, in a USAID/EAD/DOMC/MOH meeting, EAD expressed GOP's inability to purchase any quantities of insecticide during the project extension period due to the GOP's budgetary constraints. EAD requested USAID to fund the purchase of insecticide during extension period not only as a budgetary support but also as a support for development of passive case detection system at all health facilities which will need a large expenditure of Government of Pakistan. EAD also advised that during the project extension the GOP's share of project cost will grow yearly and that with the extensive passive case detection system developed at all health facilities, it will increase manifold. EAD also advised that with PCD development and functioning Pakistan will be heading towards self

reliance in malaria control program. USAID, with the concurrence of AID/W received on May 12, 1988, will now purchase the total requirements of insecticide each year, provided GOP, MOH and provincial MCPs meet the laid down conditions precedent in the form of yearly performance targets. Important amongst the performance targets will be passive case detection (PCD) system established at general health facilities, functioning and producing appropriate outputs of blood slides obtained from fever cases reporting to PCD post/health facilities. It is expected that by 1992, with PCD system well developed and functioning, the GOP would improve the parasite control through health services system and thus greatly reduce the requirement of insecticide for vector control operations to an extent it becomes easier for GOP to purchase the required insecticide from its own foreign exchange resources and utilize the donor assistance funds to more direct developmental programs instead.

3. Economic Justification for Grant Funds Obligations for Project Extension

The utilization of grant funds to malaria control operation till 1992, at hopefully a gradually reduced level, is justified due to the fact that the malaria control operations will effect, not only the morbidity status of children and working manpower, but also will assist in maintaining the productive capacity of rural agriculturist manpower and in maintaining the gross national product of the country. The children who are 45% of the population are also protected from the debilitating malaria which often proves fatal to a good percentage of infected children, (those fatalities are not recorded due to inadequate health surveillance system in the country). The use of grant funds for malaria control therefore meets the current AID/W mandate for assistance for child survival.

b. Foreign Exchange Requirement

The total cost of the extension of the Malaria Control II Project is $63 million, of which the foreign exchange requirement consists of $26.3 million (including $25 million additionally obligated for project extension). This input represents 42% of project extension costs. The A.I.D. contribution for project extension is $25 million.

The foreign exchange input will finance long and short-term technical assistance, long and short-term third country training, commodities including vehicles, insecticides, and training/research equipment, and consultants for the annual program evaluations. Of these, the largest budget item is insecticides costing $19.24 million, which accounts for 73 percent of the total foreign exchange requirement. The availability of insecticides is essential for vector control operations over the next four years.

Foreign exchange will also finance some local costs associated with the long and short-term technical assistance, in-country training, the international travel costs for participant training, locally procured

training and research equipment, local costs associated with operational research and the scheduled annual program evaluations and studies.

The foreign exchange obligations are scheduled as follows:

FY 1989	7,000,000
FY 1990	7,000,000
FY 1991	7,000,000
FY 1992	4,000,000
	$25,000,000

a. GOP Funds

Funds provided by the GOP cover personnel salaries and allowances, operating costs, and local purchase of anti-malaria drugs and larvicides, exclusive of building rental costs.

The GOP contribution to the project comes from two sources: the budget of the DOMC and the NIMRT, and the budgets of the provincial malaria control programs. The provinces together contribute approximately 71% of the total costs borne by Pakistani sources. The federal and provincial budgets for the Malaria Control Program have risen steadily over the last three years. In discussions with federal and provincial officials it has been advised that continued support at an adequate level will be maintained over the life of the project.

The GOP estimates do not include urban malaria control program costs borne by municipal corporations. The adequacy of funding for urban malaria control activities by the cities and towns varies considerably and represents a potential constraint to program operations in some locations. Careful attention will be paid to this aspect of the program during the project.

TABLE V-5

SUMMARY OF PROJECT COSTS a/
BY FISCAL YEAR AND SOURCE OF FUNDING
($000 and $000 equivalent)

Source of Funding	Fiscal Year					
	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	Total
1. Foreign Exchange b/	3,163.5	6,151.7	6,543.9	5,467.8	5,023.8	26,350.7
(of which A.I.D.)	(3,163.5)	(6,151.7)	(6,543.9)	(5,467.8)	(5,023.8)	(26,350.7)
2. GOP Rupee Costs c/,d/	7,103.8	7,159.9	7,099.9	7,128.8	7,196.6	35,689.2
3. Other Donors e/	150.0	150.0	150.0	150.0	150.0	750.0
4. Total	10,417.3	13,461.6	13,793.8	12,746.6	12,370.4	62,789.9

a/ Defined as anticipated obligations, earmarking or commitments of funding.

b/ All foreign exchange components calculated on basis of compounded annual 5% inflation factor.

c/ Expressed as dollar equivalents at exchange rate of U.S. $1.00 = Rs 18.00.

d/ Combines federal and provincial malaria budgets. Includes inputs from both development and non-development budgets. Figures projected from data supplied by DOMC. See Annex H.

e/ WHO is expected to provide a small amount of unidentified and unquantified training, and will provide without charge for salary the services of one or more members of external evaluation teams.

Note: The summary of costs includes cost of initial one year extension i.e. FY 1988.

TABLE V-6

SUMMARY OF PROJECT COSTS[a]/
BY EXPENSE CATEGORY AND SOURCE OF FUNDING
(in $000 equivalent)

Expense Category[b]/	Life of Project Funding		
	Foreign Exchange USAID	Rupees[c]/	Total[e]/
1. Technical Assistance			
a. Long-Term	544.7	-	544.7
b. Short-Term	356,3	-	356.3
Sub-total	901.0	-	901.0
2. Training			
a. Offshore			
1) Long-Term	207.2		207.2
2) Short-Term	281.0		281.0
b. In-country	950.0		950.0[e]/
Sub-total	1,438.2		1,438.2
3. Commodities			
a. Insecticide	19,236.4	-	19,236.4
b. Microscopes	-	-	-
c. Vehicles	902.8	-	902.8
d. Urban Malaria Equip. (ULV & Fogging Machines etc	900.0	-	900.0
e Env./Mitigation Equipment	67.0	-	67.0
f. Spray Pumps	571.7	-	571.7
g. Pyrethroid	172.6	-	172.6
h. Audio-Visual/Training Equipment	150.0	-	150.0
i. Research Equipment	150.0	-	150.0
j. Drugs	-	1,838.9	1,838.9
k. Protective Equipment	-	597.8	597.8
l. Larvicides	-	2,411.1	2,411.1
m. Others	-	1,338.9[e]/	1,338.9
Sub-total	22,150.5	6,186.7	28,337.2

4. Other Costs/Operational Research			
a. Construction of building for Operational Research and Training (NIMRT)	825.0	-	825.0
b. Evaluation	100.0	-	100.0
c. Research Support	300.0	-	300.0
d. Health Education	90.0	-	90.0
e. GOP Staff Salaries and Related Costs	-	29,502.5 f/	29,502.5
Sub-total	1,315.0	29,502.5	30,817.5
5. Contingencies	546.0		546.0
GRAND TOTAL	26,350.7	35,689.2	62,039.9

a/ Proposed budget funds.

b/ All components calculated on basis of compounded annual 5% inflation.

c/ Expressed in dollar equivalents at exchange rate of U.S. $1 = Rs 18.0.

d/ Plans to train 1,000 employees at NIMRT and provincial training centers are to be funded from general health budgets.

e/ Both inflation and contingency factors are included.

f/ Combines federal and provincial malaria budgets for salaries and related costs, from both development and non-development budgets, plus local currency commodity budget. Salary figures projected from 1986-87 data provided by DOMC. See Annex H.

Note: Summary of project costs includes cost of initial one year extension i.e. FY 1988.

TABLE V-7

SUMMARY OF FOREIGN EXCHANGE FUNDING[d]
BY EXPENSE CATEGORY AND FISCAL YEAR
(In 000)

Expense Category[b]	FY 88	FY 89	FY 90	FY 91	FY 92	Total
1. Technical Assistance						
A. Long Term	-	122.2	139.9	134.7	147.4	544.2
B. Short Term	73.0	17.5	90.4	52.9	123.0	356.8
Sub-Total, TA	73.0	139.7	230.3	187.6	270.4	901.0
2. Participant Training						
a. Offshore						
(1) Long-term						
(a) U.S.	-	81.1	99.1	27.0	-	207.2
(2) Short-term						
(a) U.S.	100.0	115.0	27.6	-	-	242.6
(b) Third Country	-	24.4	14.0	-	-	38.4
b. Incountry Training	10.1	116.4	116.4	116.4	-	359.3
c. Safe Use of Insecticide Trg.	-	196.9	196.9	196.9	-	590.7
Sub-Total Training	110.1	533.8	454.0	340.3	-	1438.2
3. Commodities[c]						
a. Insecticide:[c] Total Cost:	2390.8	4184.0	4393.2	4151.5	4116.9	19236.4
b. Microscopes	-	-	-	-	-	-
c. Vehicles	242.6	216.3	186.0	154.9	103.0	902.8
d. Urban Malaria Eqp.	-	200.0	500.0	200.0	-	900.0
e. Env./Mitigation Equip. (Cholinest.)	-	67.0	-	-	-	67.0
f. Spray Pumps and Nozzle Tips	-	16.7	284.0	14.8	256.2	571.7
g Pyrethroid	33.0	34.7	36.4	28.2	40.3	172.6
h. Audiovisual & Training Equip.	25.0	25.0	80.0	20.0	-	150.0
i. Res. Equip.	-	45.0	40.0	55.0	10.0	150.0
Sub-Total: Total Costs	2691.4	4788.7	5519.6	4624.4	4526.4	22150.5

4. Other Costs

a. Construction of Building (NIMRT)	100.0	500.0	100.0	125.0	-	825.0
b. Evaluation	19.0	19.5	20.0	20.5	21.0	100.0
c. Research Support	50.0	50.0	100.0	50.0	50.0	300.0
d. Health Education	20.0	20.0	20.0	20.0	10.0	90.0
Sub-Total	189.0	589.5	240.0	215.5	81.0	1315.0
Contingency	100.0	100.0	100.0	100.0	146.0	546.0
Grand Total: Total Costs (FX)	3163.5	6151.7	6543.9	5467.8	5023.8	26350.7

a/ Proposed budget funding.

b/ All components calculated on basis of compounded annual 5% inflation.

c/ Insecticide costs estimated at the following quantities and rates:

Fiscal Year	Quantities for 1988-92
1988	1200 MT (Actuals)
1989	2000 MT
1990	2000 MT
1991	1800 MT
1992	1700 MT

The cost of the insecticide in the subsequent years was estimated at the following rates:

1988 @ $1,992.39 MT
1989 @ $2,092.00 MT
1990 @ $2,196.60 MT
1991 @ $2,306.43 MT
1992 @ $2,421.75 MT

Note: 1. The total quantities of insecticide required each year will further be estimated in/around the month of December/January through spray planning exercises carried out each year. These estimation will be based upon epidemiological status of the localities to be sprayed.

Note: 2. The budget includes cost of initial one year extension i.e. for 1988 and therefore exceeds the $24 million authorized by this extension.

F. Environmental Analysis

The draft environmental assessment report, August 1988, is attached as Appendix I. The project design incorporates all AID/W comments on this draft assessment. Upon final approval of the draft report by AID/W, it will be incorporated into the PP in lieu of the present draft.

G. Women in Development

The project will impact beneficially on the status of women. Direct benefits will accrue to female malaria and general health workers, researchers, health educators, and malaria program administrators, who will improve their knowledge and skills as a result of the technical assistance and training provided under the project. Women have received only 3 percent of the training given since 1967; efforts are being made to increase this proportion through recruitment and training of female microscopists, lady health visitors, and village level health workers.

Women will also, increasingly, benefit as the recipients of services. As more local facilities are built and staffed with women, more females with the disease will have access to appropriate diagnosis and treatment.

H. Narcotics Impact Statement

The Malaria Control II Project extension, being basically humanitarian in nature, does not lend itself to specific actions or policies relative to narcotics suppression. It is one of the projects in the proposed economic assistance program to Pakistan which, because of its basic thrust and mechanism for implementation, cannot be meaningfully connected to the U.S. Government's continued efforts, in conjunction with the GOP, to curtail opium poppy cultivation and the processing of opium into heroin in Pakistan.

Current malaria control strategy dictates the interruption of malaria transmission by application of control measures in epidemiologically identified malaria foci. To withhold the use of such measures for any area for reasons other than successful interruption of transmission would invite spread of the disease throughout the area or areas of the surrounding country. The very nature of the malaria problem argues against denying application of control measures or the provision of malaria control services in poppy growing areas. Accordingly, no poppy clause will be included in the Project Agreement.

VI. CONDITIONS PRECEDENT

A. Conditions Precedent to Signing of the Project Agreement between Government of Pakistan and United States of America under Malaria Control

Except as AID may otherwise agree in writing prior to signing of the project grant agreement between Government of Pakistan and United States of America for Malaria Control II Extension, the grantee shall furnish or have furnished to AID, in form and substance satisfactory to AID the following:

1. A statement to the effect that the Government of Pakistan has established a formal high level mechanism, e.g. a malaria control program coordination committee (MCC) chaired by the DG with participation by the DOMC Director and provincial DHSs, NIMRT to assure coordination of all GOP inputs into the MCP and to assure participation of all involved parties in timely implementation of actions needed for functional integration of MCP into the general health services.

The Secretary to the MCC (preferably to be the Director, Directorate of Malaria Control, Ministry of Health, Government of Pakistan) to be responsible for organizing the meetings at least twice yearly to overview the program implementation progress and discuss and solve the implementation bottlenecks faced by any or all provinces towards malaria control activities, for functional integration into general health services.

2. An evidence that a detailed Plan of Action of Pakistan Malaria Control Program (including provinces) has been developed in the light of GOP PC-1 for the program, either approved/or in approval status, and USAID project paper for Malaria Control II Project Extension. The Plan of Action to include steps GOP plans to take, with their time schedule, leading to complete functional integration of malaria control activities into general health services.

3. An evidence that an experienced malariologist with intimate knowledge of current problems of malaria control program has been hired and is in place as director of National Institute of Malaria Research and Training (NIMRT), Lahore and that concrete actions with documentary evidences are in process to recruit professional staff on the vacant posts at the NIMRT.

Note: The GOP has met the above cited CPs. and hence these CPs are not mentioned in the Project Agreement.

New conditions precedent to disbursements for procurement of insecticides in US Fiscal Years of project extension i.e. US FY 1989 through US Fiscal

Year 1992 are added to the original Project Grant Agreement. They are as follows:

"SECTION 4.2A: Conditions Precedent to Disbursements for Procurement of Insecticides in United States Fiscal Year 1989 through United States Fiscal Year 1992

Except as A.I.D. otherwise agrees in writing, prior to a specific disbursement in each year under this Grant component, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, from United States FY 1989 through United States FY 1992, for the procurement of insecticides, the Grantee shall, within 90 days from the commencement of each United States fiscal year, provide to A.I.D., in form and substance satisfactory to A.I.D., the following:

1. Evidence that the insecticides procured by A.I.D. for the preceding years program have been effectively utilized for the program in the preceding spray operations;

2. A statement furnishing the quantities of insecticide required for the next spray operations program, the scientific basis for calculating those quantities, and the specifications of the insecticide required;

3. A certification/letter from the office of Secretary Health of each provincial government, that, for the next insecticidal spray operations in the respective province, the provincial governments will allocate sufficient local currency budget to utilize the entire quantity of insecticide, being provided by the Directorate of Malaria Control (DOMC);

4. Evidence that the previous external review has certified that satisfactory progress was achieved towards program objectives, set forth in the project extension with respect to implementation of last spray operations, malaria surveillance, functional integration, and operational research;

5. Intermediate Benchmarks:

Evidence that sets of intermediate benchmarks have been met on a United States fiscal year (FY) basis as follows:

a). For United States FY 1989 Insecticide Procurement

1. Malaria Surveillance Output:

a. Evidence of the total number of slides collected in the preceding one year, in the four provinces of Pakistan, through Active Case Detection (ACD) and Passive Case Detection (PCD).

b. Evidence of total number of patients suffering from pyrexia of unknown origin (PUO) and suspected clinical malaria, attended/treated as outpatients in the preceding one year, in the general health facilities of the rural and urban areas separately.

2. Operational Research:

Operational research activities have been carried out principally at the National Institute of Malaria Research & Training (NIMRT), and at the provincial malaria control programs (MCPs).

a. Evidence of total number of research protocols completed and in publication form at the NIMRT, reported to the DG Health/Chairman Malaria Coordination Committee (MCCC), and reviewed by the MCCC.

b. Evidence of efforts made by NIMRT/MOH to increase professional staff positions filled, in the area of operational research at the NIMRT.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence of the MCCC having met at least one time to review the overall Malaria Control Program (MCP), malaria operational research activities, progress made in integrating the malaria control program with general health services, and plan future policies and actions for further progress toward integration.

b. Evidence that the MCCC has reviewed the completed operational research protocols and, if approved, circulated them to the provincial MCPs.

b). For United States FY 1990 Insecticide Procurement

1. Malaria Surveillance Output:

a. Evidence that twenty five per cent or more of the outpatients suffering from PUO and suspected clinical malaria, attended/treated as outpatients at the health facilities of general health services in the rural areas, and five percent or more of the outpatients suffering from suspected clinical malaria who attended the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year period.

2. Operational Research:

a. Operational research protocols: Evidence that NIMRT initiated at least four new research studies additional to those completed in 1987/88, and submitted at least two completed reports to the Director General (DG) Health/ Chairman of Malaria Control Coordination Committee (MCCC).

b. Evidence that 85 per cent of all professional posts at NIMRT have been filled with qualified staff actively participating in research activities.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice in the preceding one year period to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

c). For United States FY 1991 Insecticide Procurement

1. Malaria Surveillance Output:

a. Evidence that fifty per cent or more of the outpatients suffering from PUO and suspected clinical malaria attending the health facilities of general health services in the rural areas, and twenty five percent or more of the outpatients suffering from suspected clinical malaria attending the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year period.

2. Operational Research:

a. Operational research protocols: Evidence that at least four new research studies additional to those completed in 1988/89 initiated in 1989/90 by the NIMRT and at least three completed reports additional to those of 1989/90, in publication form, have been submitted to the Director General (DG) Health/Chairman MCCC, for review and approval by the MCCC.

b. Evidence that 85 per cent of all professional posts at NIMRT are filled with qualified staff actively participating in research activities.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

d). For United States FY 1992 Insecticide Procurement

1. Malaria Surveillance Output:

Evidence that eighty five per cent or more of the outpatients suffering from PUO and suspected clinical malaria attending the health facilities of general health services in the rural areas, and fifty percent or more of the outpatients suffering from suspected clinical malaria attending the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year period.

2. Operational Research:

a. Operational research protocols: Evidence that at least four new studies additional to those completed in 1990/91 initiated by NIMRT and at least four completed reports in publication form, have been submitted to the Director General (DG) Health/Chairman MCCC, for review and approval by the MCCC.

b. Professional posts of NIMRT: Evidence of 85 per cent of professional posts of NIMRT continued to be filled with qualified staff and participating in research activities.

3. Meeting of Malaria Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice in the preceding year to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services."

2. Section 4.3 of original Project Grant Agreement is amended to add the following new section:

"SECTION 4.3A: Conditions Precedent to Construction of a Facility for the National Institute of Malaria Research and Training (NIMRT)

Prior to any disbursement under this Project component or to the issuance by A.I.D. of documentation pursuant to which such disbursements will be made, the Grantee shall provide evidence, in form and substance

satisfactory to A.I.D. that:

1. The title deed of the land allocated for National Institute of Malaria Research and Training (NIMRT) has been obtained from the relevant authority;

2. A certification that the land is free from all legal encumberances;

3. The Ministry of Health has taken action to fill the vacant professional staff positions at the NIMRT and that the incumbents selected have or are likely to join the posts in the very near future; and

4. The Grantee has agreed to cover all operating and maintenance charges relating to maintenance of the building to be constructed."

3. A new Section 4.6A is hereby added after Section 4.6 as follows:

"SECTION 4.6A: Notification

When A.I.D. has determined that the conditions precedent specified in each of Sections 4.2A and 4.3A have been met, A.I.D. will promptly so notify the Grantee.

4. New subsections to Section 4.7 are added as subsections 4.7(f), 4.7(g), and 4.7(h) to read as follows:

"(f) If all of the conditions specified in Section 4.2(A) as amended, have not been met by the dates specified or such later date as A.I.D. may agree to in writing; A.I.D., at its option, may terminate this Agreement by written notice to the Grantee.

(g) If all of the conditions specified in Section 4.3(A) have not been met by December 1989, or such later date as A.I.D. may agree to in writing; A.I.D. at its option, may cancel the then undisbursed balance of the grant funds, to the extent not irrevocably committed to third parties, by notice to the Grantee.

(h) If all the conditions specified in Section 4.5, as previously amended, have not been met by December 1990, or such later date as A.I.D. may agree to in writing; A.I.D., at its option, may cancel the then undisbursed balance of the Grant to the extent not irrevocably committed to third parties, and may terminate this agreement by written notice to the Grantee."

All other terms and conditions of the original Project Grant Agreement shall remain in full force and effect.

G. Negotiating Status

The above Conditions Precedent and Covenants have been cleared by the Government of Pakistan and have been incorporated in the Project Agreement for project extension.

ANNEX-A

Page 1

VZCZCILOGIB
PP RUEHIL
DE RUEHC #1871 1332310
ZNR UUUUU ZZH
P 120903Z MAY 88
FM SECSTATE WASHDC
TO AMEMBASSY ISLAMABAD PRIORITY 9497
BT
UNCLAS STATE 151871

12-MAY-88 TOR: 08:08
CN: 42834
CHRG: AID
DIST: AID
ADD:

AILAC

E.O. 12356: N/A
TAGS: N/A
SUBJECT: MALARIA CONTROL II PROJECT AMENDMENT (391-0427)

REF: (A) STATE 268145 (B) ISLAMABAD 06935

OFFICIAL FILE	ACTION	OFFICE	INFO
		AD	
		DD	
		PRO	
		RLA	
		FSC	
		PCM	
		EAD	
		FNS	
		RFM	
		HRM	
		ARD	
		OPM	
		EAD	
		ASD	
		PERM	
		PROC	
		DMS	
		ASP	

RF

1. AID CONCURS WITH APPROACH OUTLINED BY REF (B).

2. WE BELIEVE YOU ARE ON THE RIGHT TRACK. OUR INTENT IN ANPAC GUIDANCE WAS NOT DIRECTED PRIMARILY AT FX COSTS BUT INTENDED TO MAINTAIN LEVERAGE AND ENSURE THAT GOP COMMITMENT TO MALARIA CONTROL DOES RESULT IN NOT ONLY GREATER INSTITUTIONAL AND BUDGET SUPPORT (LOCAL AND FX) BUT ALSO INCREASED PROGRAM EFFECTIVENESS. SUGGEST THE FOLLOWING BE CLEARLY DELINEATED IN THE PP AMENDMENT:

A. INDICATORS, PROXIES, AND INTERMEDIATE BENCHMARKS FOR MEASURING PROGRESS,

B. CONDITIONS PRECEDENT OR COVENANTS WHICH REQUIRE THAT A.I.D. AND THE GOP JOINTLY EVALUATE PROGRESS IN IMPLEMENTING THE TARGETED PANOPLY OF MALARIA CONTROL INTERVENTIONS, OPERATIONAL STUDIES, AND PLANNED ORGANIZATIONAL IMPROVEMENTS. THESE REVIEWS SHOULD SERVE AS DECISION POINTS FOR THE MISSION, WITH CONTINUED

A.I.D. SUPPORT DEPENDENT ON MEETING AGREED UPON TARGETS FOR INDICATORS AND INTERMEDIATE BENCHMARKS.

C. ADMINSTRATIVE AND TECHNICAL MONITORING AND SUPERVISION SYSTEMS FOR PINPOINTING AREAS OF WEAKNESS AND TAKING CORRECTIVE ACTION,

D. GOP OPERATIONAL RESEARCH PLAN WITH DETAILED ANNUAL ACTIVITIES TO INCLUDE ENTOMOLOGICAL BEHAVIOR OF VECTORS, PARASITE RESISTANCE, INSECTICIDE SUSCEPTIBILITY BY REGION AND DISTRICT, COMMUNITY PARTICIPATION, AND USE OF COMMUNITY VOLUNTEERS, FOR POD.

E. DESCRIPTION OF THE ENTOMOLOGICAL AND EPIDEMIOLOGICAL SURVEILLANCE SYSTEM, THE BASIS FOR STRATIFYING THE POPULATION AT RISK AND TARGETING MALARIA CONTROL INTERVENTIONS AND APPROPRIATE TARGETS AND GOALS BY REGION AND DISTRICT DURING THE AMENDMENT PERIOD.

RECEIVED MAY 12 1988

PH UNCLASSIFIED STATE 151871

2. SINCE THE CABLE DOESN'T ADDRESS IT, WE ASSUME FUNDING FOR THE AMENDMENT IS STILL PLANNED AT DOLS 25.0 MILLION. ARMACOST
BT

92

ANNEX - A
Page 2

VZCZCILI *
PP RUEHC
DE RUEHIL #6935/01 091 **
ZNR UUUUU ZZH
P 310555Z MAR 88
FM AMEMBASSY ISLAMABAD
TO SECSTATE WASHDC PRIORITY 0569
BT
UNCLAS SECTION 01 OF 02 ISLAMABAD 06935

CLASS: UNCLASSIFIED
CHRGE: AID 03/29/88
APPRV: DIR:ESSTAPLES
DRFTD: PDM:RWNACHTRIE
CLEAR: 1. PDM 2. PRO
DISTR: AID AMB DCM
ECON 4
ORGIN: OCR

AIDAC

E.O. 12356: N/A
SUBJECT: MALARIA CONTROL-II AMENDMENT (391-0472)

REF: (A) 87 STATE 265145, (B) 87 ISLAMABAD 13692

OFFICIAL FILE	ACTION	OFFICE	INFO
		D	
		DD	
		PRO	
		RLA	
		C&C	
		PDM	
		E&E	
		ENG	
		HPN	
		HRT	
		ARD	
		OFM	
		EXO	
		GSO	
		PER	
		PROC	
		BIMS	
		AOP	

1. IN RESPONSE TO REFTEL, MISSION HAS PUT TOGETHER A PP AMENDMENT INCORPORATING A PHASED TAKEOVER OF FOREIGN EXCHANGE FINANCING FOR INSECTICIDES BY THE GOP, WITH FULL ASSUMPTION BY GOP OF FX COSTS BY 1993.

2. WE DID THIS LARGELY ON OUR OWN CONVICTION, BUT ALSO IN RESPONSE TO OUR READING OF REFTEL PARA 2A.

3. THAT REFERENCE WAS SILENT ON DISTINCTION BETWEEN FOREIGN EXCHANGE AND LOCAL COSTS AND THERE ARE, OF COURSE, SUBSTANTIAL LOCAL COSTS IN THE MALARIA CONTROL EFFORT. NEVERTHELESS, IN RECENT YEARS, A.I.D. INPUT HAS BEEN MAINLY DOLLAR FINANCED INSECTICIDES FULLY FINANCED BY A.I.D. IN THE 1970S, FX INSECTICIDE COSTS WERE SHARED BY A.I.D. AND GOP.

4. OUR PRINCIPAL OBJECTIVE IN CONTINUATION OF SUPPORT TO PAKISTAN'S MALARIA CONTROL PROGRAM IS TO MOVE PAKISTAN TOWARD PASSIVE CASE DETECTION, AGGRESSIVE TREATMENT OF INDIVIDUALS FOUND WITH MALARIA, AND SPRAYING OF INSECTICIDES ONLY IN AREAS WHERE MALARIA HAS BEEN FOUND. ALL PARTIES AGREE THAT AN EFFECTIVE PROGRAM DOING THESE THINGS WOULD REQUIRE SUBSTANTIALLY LESS INSECTICIDE, ALL OTHER THINGS REMAINING EQUAL.

5. PAKISTAN'S INSECTICIDE REQUIREMENT FOR ITS MALARIA PROGRAM HAS GONE DOWN SUBSTANTIALLY IN RECENT YEARS, DUE TO LOWER INCIDENCE OF MALARIA, RECENT MORE SHARPLY TARGETED SPRAYING, AND LOW RAINFALL LAST YEAR. WE CANNOT SAY WITH ANY CERTAINTY THAT A FULLY FUNCTIONING, NATIONWIDE PCD BASED MALARIA CONTROL PROGRAM WOULD NEVER REQUIRE MORE INSECTICIDES THAN THOSE NOW USED; HEAVY RAINS COULD INCREASE THE COUNTRY'S CROP OF MOSQUITOS, AND MALARIA COULD MIGRATE ACROSS THE BORDER FROM INDIA AS IT HAS IN THE PAST. INCREASED SPRAYING MIGHT WELL BE INDICATED IN SUCH CIRCUMSTANCES.

MAR 31 1988

6. THE GOP IS BALKING AT OUR INSISTENCE ON A PHASED

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TAKEOVER OF INSECTICIDE FINANCING. THEIR REASONS ARE THAT (A) THEIR GOVERNMENT IS FACING A GROWING BUDGETARY CRISIS; (B) THE USAID PROGRAM HAS A LARGE BUDGETARY SUPPORT ELEMENT, AND IN OTHER SECTORS, ESPECIALLY ENERGY AND AGRICULTURE, WE PUSH THE PROCUREMENT OF U.S. COMMODITIES; THE SAME REASONING MAKES SENSE IN HEALTH; (C) THE GOVERNMENT IS NOW CONVINCED OF THE MERIT OF PCD AND INTENDS AGGRESSIVELY TO PUT A PCD SYSTEM INTO PLACE. THEY SAY IF THEY SUCCEED IN PUTTING A PCD SYSTEM IN OPERATION, WITH OUR HELP, OUR INSISTENCE THAT THEY ASSUME FX FINANCING FOR INSECTICIDES DOESN'T REALLY GET US WHAT WE WANT TO ACHIEVE, IF OUR OBJECTIVES ARE ADOPTION OF PCD AND A.I.D. SUPPORT FOR COMMODITY IMPORTS FROM THE U.S.

7. WE THINK THEY HAVE A POINT.

8. ASSUMING THAT INSECTICIDE REQUIREMENTS REMAIN STABLE OR DECLINE, THE GOP WILL REPEAT WILL ASSUME AN INCREASING SHARE OF THE FINANCIAL RESPONSIBILITIES FOR THE TOTAL PROGRAM, ALL COSTS CONSIDERED. THIS MEANS WE CAN MEET THE CONDITION YOU IMPOSED ON US IN REFTEL (A) PARA 2B AND STILL AGREE TO FINANCE 100 PERCENT OF INSECTICIDE REQUIREMENTS. THIS SITUATION WOULD NOT HOLD, OF COURSE, IF INSECTICIDE REQUIREMENTS SHOOT UP DRASTICALLY. WE DO SEE OUR MAIN OBJECTIVE TO BE THE ADOPTION OF PCD. IT IS NOT AN EASY TASK. IT REQUIRES MASSIVE INCREASE IN THE COLLECTION OF BLOOD SLIDES, THEIR COMPETENT ANALYSIS, AN EFFECTIVE REPORTING SYSTEM IN PLACE, AND AN EFFECTIVE TREATMENT PROGRAM. SUBSTANTIAL INCREASES IN RUPEE OUTLAYS WILL BE REQUIRED TO ACHIEVE IT. THERE DOES, HOWEVER, APPEAR TO BE A TURNAROUND ON THE PART OF THE GOVERNMENT REGARDING PCD: EVERYONE CONCERNED (IN HEALTH, MALARIA PROGRAM, AND IN FINANCE AND PLANNING) AGREE THAT THE PCD APPROACH MUST BE PUT INTO PLACE, AND THAT CONTINUED RELIANCE SOLELY ON INSECTICIDES GETS PAKISTAN NOWHERE IN THE BATTLE AGAINST MALARIA.

BT
#6935

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9. WE WOULD LIKE TO SUPPORT THE GOP'S NEWLY ACQUIRE DESIRE TO MOVE INTO PCD. WE THINK WE CAN DO IT WITH THE CARROT OF FULL FINANCING FOR INSECTICIDES. MORE IMPORTANTLY, WE THINK IF WE HOLD FIRM TO OUR INSISTENCE ON PHASED TAKEOVER, WE MIGHT LOSE THE WHOLE GAME TO THE PURVEYORS OF FENITROTHION.

10. WE REQUEST YOUR CONCURRENCE WITH AN APPROACH THAT LEVERAGES FULL AND GENUINE COMMITMENT TO PCD BY THE GOP NOW WITH FULL AID FINANCING OF INSECTICIDES LOP.
RAPHEL

BT
#6935

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OFFICIAL

ACTION AID INFO AMB DCM ECON AREP

ANNEX A
Page 3

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AIDAC

E.O. 12356: N/A
TAGS: N/A
SUBJECT: MALARIA CONTROL II PROJECT AMENDMENT (391-0472)

REF: ISLAMABAD 13692

1. AD HOC REDELEGATION OF AUTHORITY TO MISSION DIRECTOR PER REFTEL REQUEST TO AMEND THE PAKISTAN MALARIA CONTROL II PROJECT (391-0472) EXTENDING THE PROJECT TO 1992 AND INCREASING LIFE-OF-PROJECT FUNDING BY DOLS 25 MILLION IS REDELEGATED BY A/AA/ANE.

2. BUREAU REQUESTS MISSION TO CLEARLY DELINEATE IN THE PROJECT PAPER THOSE ACTIONS WHICH THE GOP WILL CARRY OUT FOR A PHASED APPROACH TO A GOP TAKEOVER OF THE MALARIA CONTROL EFFORT. AMENDMENT DESIGN SHOULD GIVE SIGNIFICANT EMPHASIS TO GOP INSTITUTION BUILDING AND POLICY DIALOGUE RELATED TO FULL ASSUMPTION BY GOP OF BUDGET AND STAFFING NEEDS TO SUPPORT MALARIA PROGRAM WITHOUT U.S. ASSISTANCE. GIVEN AID'S LONG TERM INVOLVEMENT WITH PAKISTAN MALARIA CONTROL, IT IS APPROPRIATE AT THIS TIME TO MAKE CLEAR THAT:

ACTION
Due Date: 8/2
Action Taken:
Date:
Initial:

--A. THE TRANSITION TO GOP INSTITUTIONAL AND BUDGET SUPPORT IS TO OCCUR GRADILY DURING THE PROJECT, NOT AT THE END.

-B. THE PROJECT SHOULD BE STRUCTURED SO THAT OUR ANNUAL SUPPORT IS CONDITIONAL UPON THEIR ANNUAL INPUTS.

RECEIVED AUG 26 1987

WE LEAVE IT TO THE MISSION'S JUDGEMENT WHETHER THESE GOP ASSURANCES SHOULD BE EITHER A CONDITION PRECEDENT AND/OR A COVENANT. HOWEVER, WE BELIEVE WRITTEN AGREEMENTS TO THIS EFFECT SHOULD BE REACHED PRIOR TO SIGNING.

3. ADDITIONALLY, MISSION IS REQUESTED TO JUSTIFY THE USE OF FUNDS FOR THIS ACTIVITY RATHER THAN FOR DIRECT CHILD SURVIVAL INTERVENTION AS MANDATED IN THE AGENCY HEALTH ASSISTANCE POLICY (REVISED DECEMBER 1987).

4. FINALLY, MISSION IS REQUESTED TO PREPARE AN AMENDMENT TO THE PREVIOUSLY PREPARED ENVIRONMENTAL ASSESSMENT IN ORDER TO BE IN COMPLIANCE WITH THE REQUIREMENTS OF 22 CFR 216, QUOTE A.I.D. ENVIRONMENTAL

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PROCEDURES UNQUOTE. THE AMENDED ENVIRONMENTAL
ASSESSMENT IS TO BE SUBMITTED TO THE BUREAU
ENVIRONMENTAL COORDINATOR FOR REVIEW AND APPROVAL.
WHITEHEAD
ET
#5145

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RJ UNCLASSIFIED STATE 255145

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

MISSION-TO PAKISTAN

ANNEX A
Page 7

Cable: USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

August 23, 1987

Mr. A. Ghafoor Mirza, Joint Secretary
Economic Affairs Division
Ministry of Finance and Economic Affairs
Government of Pakistan
Block C, Room 403
Pakistan Secretariat
Islamabad

Subject: Malaria Control-II Project
A.I.D. Project No. 391-0472
Project Implementation Letter No. 32

Dear Mr. Mirza:

The purpose of this Project Implementation Letter (PIL) is to extend the Project Assistance Completion Date (PACD) of the subject project by one year from September 30, 1987 to September 30, 1988. This will provide time to complete various project activities including preparation of a Project Paper Amendment.

If you have any questions, please feel free to call me or Dr. Rifaq A. Ismail of HPN, USAID/Islamabad.

Sincerely,

Robert W. Nachtrieb, Chief
Project Development and Monitori

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ACTION MEMORANDUM FOR THE USAID/PAKISTAN MISSION DIRECTOR

From: Rifaq A. ~~Ismail~~, Project Officer

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Page 8

Thru: Robert W. Nachtrieb, Chief/PDM

Subject: Malaria Control-II Project (391-0472)

I. Problem: Your approval is requested to extend the Project Assistance Completion Date (PACD) of the subject project for a period of one year from September 30, 1987 to September 30, 1988.

II. Discussion: The Malaria Control-II project was authorized by the Administrator on May 11, 1982 with LOP funding of $41 million and U.S. owned Pakistani Rupees 21 million in grant funds. The original PACD was September 30, 1987. On August 28, 1986 the project authorization was amended to modify a Condition Precedent (CP) relating to release of Urban Malaria Control vehicles and equipment.

The Government of Pakistan and USAID have now agreed to extend the project activities with anticipated additional AID-funding for a further period of five years. The design team for preparing the project paper amendment is expected to arrive o/a August 15, 1987. In order to complete the necessary documentation for the project amendment, a period of three to four months beyond the current PACD is required. To accommodate that and for continuation of various current project activities, the PACD needs to be extended. No additional funds beyond the authorized amount are required for this extension.

III. Authority: Under Delegation of Authority No. 652, dated October 10, 1986, you have the authority to amend project authorizations in the manner being requested.

IV. Recommendation: That you approve a one year extension in the Project Assistance Completion Date (PACD) from September 30, 1987 to September 30, 1988.

[✓] Approved [ ] Disapproved

Eugene S. Staples
Mission Director
USAID/Pakistan

8/11/87
Date

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ORIGIN AID INFO AMB DCM ECON AREP

ANNEX A
Page 9

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TO SECSTATE WASEDC 9027
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UNCLAS SECTION 01 OF 02 ISLAMABAD 13692

RECEIVED JUN 23 1987

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APPRV: DIR:ESSTAP
DRFTD: EPN:RAISMA
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ORGIN: CCR

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E.O. 12356: N/A
SUBJECT: PROJECT DESIGN ACTIVITY - MALARIA CONTROL II PROJECT 391-0472

REF: RIFAQ-MARTIN TELCON JUNE 16, 1987

1. THIS CABLE IS TO NOTIFY AID/W OF MISSION INTENT TO AMEND SUBJECT PROJECT. MISSION ALSO REQUESTS THE SERVICES OF A PROJECT DESIGN TEAM TO DEVELOP THE DRAFT PROJECT PAPER (PP) AMENDMENT AND EXTEND THE PACD OF THE CURRENT MALARIA CONTROL II PROJECT (391-0472) WHICH IS SEPTEMBER 30, 1987. MISSION ALSO REQUESTS REDELEGATION OF AUTHORITY TO AUTHORIZE THE AMENDMENT IN THE FIELD.

2. WITHOUT CHANGING THE GOAL AND PURPOSE OF THE ORIGINAL MALARIA CONTROL II PROJECT, MISSION PLANS TO EXTEND THE ACTIVITY BY FIVE YEARS, I.E. TO MAY 17, 1992, AND TO INCORPORATE MODIFICATIONS IN THE STRATEGY ALONG THE LINES DESCRIBED IN PARA 3. THE EXTENSION FOLLOWS THE RECOMMENDATIONS MADE DURING PROJECT REVIEW CONDUCTED IN APRIL 1987.

3. MISSION ANTICIPATES DOLS 25 MILLION WILL BE REQUIRED FOR THE EXTENDED PROJECT. THE PROPOSED STRATEGY UNDER THE AMENDMENT WILL BE TO EXPEND FUNDS AT A LOWER RATE THAN THE CURRENT PROJECT. THE BREAKDOWN OF EXPENDITURES WILL OCCUR AT A RATE OF MILLION DOLS 8, 6, 5, 3, AND 3 RESPECTIVELY FOR EACH OF THE FIVE YEARS. THIS EXPENDITURE PLAN WILL ALSO ENCOURAGE THE GOP TO:

(A) REDUCE THEIR RELIANCE ON THE US OF EXPENSIVE INSECTICIDE; (B) INCREASE MALARIA SURVEILLANCE OPERATIONS AT GENERAL HEALTH FACILITIES; (C) DEVELOP AND APPLY ALTERNATE METHODS OF MALARIA CONTROL; AND (D) PROMOTE CONCERTED INTEGRATED HEALTH APPROACHES TO PARASITE CONTROL.

4. THE DESIGN TEAM SHOULD CONSIST OF THREE PERSONS:

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1) A CONSULTANT/EXPERT IN THE FIELD OF ENTOMOLOGY/ MALARIOLOGY WITH EXPERIENCE IN MALARIA CONTROL PROGRAMS IN DEVELOPING COUNTRIES; 2) MALARIA CONTROL EXPERT WITH EXPERIENCE IN DEVELOPMENT AND IMPLEMENTATION OF MALARIA SURVEILLANCE OPERATIONS THROUGH PASSIVE CASE DETECTION POSTS STABLISHED AT THE HEALTH FACILITIES; AND 3) AN INSERVICE OR RETIRED AID/W OFFICIAL, WITH EXPERIENCE IN WRITING PROJECT PAPERS ESPECIALLY HEALTH AND MALARIA PROJECTS AND WHO IS CONVERSANT WITH AID REGULATIONS PERTAINING TO PROJECT DESIGN/DEVELOPMENT.

ANNEX A
Page 1c

5. IN REFERENCE TO RIFAQ-MARTIN TELCON, MISSION AND DIRECTORATE OF MALARIA CONTROL (MOH) CONCUR WITH THE PROPOSED (A) CONSULTANT MR. JESSE HOBBS - A SENIOR ENTOMOLOGIST/ MALARIOLOGIST WITH EXPERIENCE IN DEVELOPING COUNTRIES INCLUDING PAKISTAN, D (B) MR. AL FARWEL - A RETIRED AID/DIRECTOR HAVING EXPERTISE IN WRITING PROJECT PAPERS IN HEALTH AND MALARIA PROJECTS. MISSION SOLICITS AID/W IDENTIFY THIRD MEMBER OF TEAM (MALARIA CONTROL EXPERTISE) REQUESTED IN PREVIOUS PARAGRAPH. HOWEVER DR. IMTIAZ SHAH, DIRECTOR, DIRECTORATE OF MALARIA CONTRO P HIS PREFERANCE FOR A U.S. NATIONAL TO B TEAM MEMBER, IN CASE SUCH U.S. NATIONAL EXPERTISE IS NOT AVAILABLE, ANY OF THREE PERSONS PROPOSED IN THE REFERRED TELCON IS ACCEPTABLE TO HIM.

6. DESIGN OF THE PP AMENDMENT TO BEGIN ASAP BUT NO LATER THAN AUGUST 15, 1987 AND SHOULD END IN FOUR WEEKS BUT NLT SEPTEMBER 15, 1987.
7. THE DESIGN TEAM WILL DEVELOP THE AMENDMENT ALONG LINES PROPOSED IN PARA 3. A BRIEF SCOPE OF WORK FOR THE AMENDMENT DESIGN EFFORT IS AS FOLLOWS:

(A) REVIEW EXISTING PROJECT/PLANNING DOCUMENTS (E.G. PROJECT PAPER, PROJECT EVALUATION REPORTS, GOP PLANNING DOCUMENTS (PC-1) FOR GOP PLANNED 1987 - 1993 MALARIA CONTROL PROGRAM). (B) GIVE SPECIAL CONSIDERATION TO PROJECT ISSUES AND MISSION PRIORITIES SUCH AS: ENCOURAGING LESS RELIANCE ON INSECTICIDE FOR VECTOR CONTROL, ESTABLISHMENT OF EFFECTIVE MALARIA SURVEILLANCE ASSISTANCE AT THE GENERAL HEALTH SERVICES POSTS (RCD), OPERATION RESEARCH FOR MALARIA CONTROL, CONCURRENT DEVELOPMENT OF MALARIA CONTROL EXPERTISE, REFINED USE OF

EPIDEMIOLOGICAL CRITERIA FOR PROGRAM PLANNING AND IMPLEMENTATION, AND ALTERNATIVE APPROACHES TO MALARIA CONTROL INCLUDING EFFECTIVE PARASITE CONTROL THRU HEALTH FACILITIES.

8. THE COST OF TRAVEL, PER DIEM AND CONSULTING FEES, IF ANY, WILL BE CHARGED TO PDIF WITH THE FOLLOWING FISCAL DATA:

- APPROPRIATION NO.72-11M1037.
- BPC : HESA-82-27391-KG13.
- PIO/T NO.391-0470-3-20548 - DOLS 38,865.00.
- PROJECT NO.391-0470

DETAILED BUDGET OF THE ACTIVITY FOR THREE CONSULTANTS AS FOLLOWS:

(A) CONSULTANT FEE AT THE RATE OF (E) - DOLS 6,500 PER PERSON	19,500.00
(B) INTERNATIONAL TRAVEL PER DIEM AT - DOLS 400 PER PERSON	1,200.00
(C) PER DIEM (DOLS 94 X 30 DAYS) = - DOLS 2,820 PER PERSON	8,460.00
(D) ADDITIONAL RELATED COST AT - DOLS 790 PER PERSON	2,370.00
(E) INCOUNTRY AIR TRAVEL ISLAMABAD TO - VARIOUS PLACES IN PAKISTAN AT - DOLS 145 PER PERSON	435.00
(F) INTERNATIONAL TRAVEL WASH/ISL/WASH - AT DOLS 2,300 PER PERSON	6,900.00
- TOTAL	38,865.00

PLEASE BE ADVISED THAT THE INTERNATIONAL TRAVEL TICKET AND INCOUNTRY PER DIEM WHILE IN PAKISTAN WILL BE PAID IN LOCAL CURRENCY. ON ADVICE FROM AID/W A PREPAID TICKET ADVISE (PTA) WILL BE SENT FOR ISSUE OF TICKET FOR THE CONSULTANTS.

ACTIONS REQUEST: AID/W TO DEVELOP PIO/T COVERING THE BUDGET AND FISCAL DATA FUNDED PARA 8.

9. YOUR ASSISTANCE IS HIGELY APPRECIATED. PLEASE ADVISE. RAPHEL

BT
#3692

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UNCLASSIFIED ISLAMABAD 013692/02

PROJECT CHECKLIST

CROSS-REFERENCES:	IS COUNTRY CHECKLIST UP TO DATE?	Yes
	HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS CHECKLIST?	Yes

A. GENERAL CRITERIA FOR PROJECT

FY 1986 Continuing Resolution
Sec. 524; FAA Sec. 634A

(a) Describe how authorizing and appropriations Committees of Senate and House have been or will be notified concerning the project;	(a) Congressional Notification and Congressional Presentation
(b) Is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that amount)?	(b) Yes, assistance is within the 1988 operational year budget

2. FAA Sec. 611 (a) (1)

Prior to obligation in excess of $500,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to U.S. of the assistance?	Yes

3. FAA Sec. 611 (a) (2)

If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	No further legislative action is required.

4. FAA Sec. 611 (b); FY 1986 Continuing Resolution Sec. 501

If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and	N.A.

Related Land Resources, dated October 25, 1973?

5. FAA Sec. 611(e)

If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

Yes, the Mission Director has signed a FAA 611 (e) certification.

6. FAA Sec. 209

Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development

The World Health Organization will finance a small component of training for the GOP Malaria Control Plan as a separate project, and Government of Japan may finance a portion of the insecticide requirements if vector resistance makes the present insecticide unsuitable. Assistance will not encourage regional development programs.

7. FAA Sec. 601 (a)

Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and completion; and

(c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of

No significant effect in these areas is expected. This is a malaria control control project.

industry, agriculture and commerce; and (f) strengthen free labor unions.

8. FAA Sec. 601 (b)

Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	Aside from a limited amount of goods and services to be procured in Pakistan, all A.I.D.-financed goods and services procured under this project will have their source and origin in the United States and will be procured in accordance with A.I.D. competitive procurement procedures. Through the reduction in the incidence of malaria, the labor force has become more productive and foreign investment has been ecouraged.

9. FAA Sec. 612 (b), 636 (h); FY 1986 Continuing Resolution Sec. 507

Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.	The GOP will contribute the equivalent of approximately $21.3 million in local currency during the life of the project which is approximately 33% of the total cost of the project. U.S.-owned Pakistan rupees are no longer available.

10. FAA Sec. 612 (d)

Does the U.S. own excess foreign currency of the country and, if	No

so, what arrangements have been made for its release?

11. FY 1986 FAA Sec. 601 (e)

Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

Yes

12. FY 1986 Continuing Resolution Sec. 522

If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. procedures of the same, similar or competing commodity?

N.A.

13. FAA 118 (c) and (d

Does the project comply with the environmental procedures set forth in AID Regulation 16? Does the project or program take into consideration the problem of the destruction of tropical forests?

Yes. See IEE

14. FAA 121 (d)

If a Sahel Project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds?

N.A.

15. FY 1986 Continuing Resolution Sec. 533

In disbursement of the assistance conditioned solely on the basis of the policies of any multilateral institution?

No

16. ISDCA OF 1985 Sec. 310

For development assistance projects, how much of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans or Native Americans, or who are economically or socially disadvantaged (including women)?

This is an ESF-financed project.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

This is an ESF project.

a. FAA Sec. 102 (b), 111, 113, 281 (a)

Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage domestic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies

N.A.

of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105 106, 107

Is assistance being made available: (including only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.) N.A.

(1) (103) for agriculture, rural development or nutrition; if so (a) extent to which activity is specifically designed to increase productivity and income of rural poor; 103A if for agricultural research, full account shall be taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made; (b) extent to which assistance is used in coordination with programs carried out under Sec. 104 to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value, improvement of planning, research, and education with respect to nutrition, particularly with reference to improvement and expanded use of indigenously produced foodstuffs; and the undertaking of pilot or demonstration of programs explicitly addressing the problem of malnutrition of poor and vulnerable people; and (c) extent to which activity increases national N.A.

food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the poor, through measures

encouraging domestic production, building national food reserves, expanding available storage facilities, reducing post harvest food losses, and improving food distribution.

(a) (104) for population planning under sec. 104 (b) or health under 104 (c); if so, (i) extent to which activity emphasized low cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical peronnel, clinics and health posts, commercial distribution systems and other modes of community research.

N.A.

(4) (105) for education, public administration, or human resources development; if so, extent to which activity strengthens non-formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development; and (ii) extent to which assistance provides advanced education and training of people in developing countries in such disciplines as are

N.A.

required for planning and implementation of public and private development activities.

(5; (106); ISDCA of 1980; Sec. 304) for energy, private voluntary organizations, and selected development activities; if so, extent to which activity is: (i) (a) concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test new methods of energy production; (b) facilitative of geological and geographical survey work to locate potential oil, natural gas, and coal reserves and to encourage exploration for potential oil, natural gas, and coal reserves; and (c) a cooperative program in energy production and conservation through research and development and use of small scale, decentralized, renewable energy sources for rural areas; (ii) technical cooperation and development, especially with U.S. private and voluntary or regional and international development, organizations; (iii) research into, and evaluation of, economic development process and techniques; (iv) reconstruction after natural or manmade disaster; (v) for special development problems, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance; (vi) for programs of urban development, especially small labor intensive enterprises marketing systems, and financial or

N.A.

	other institutions to help urban poor participate in economic and social development.	
c.	(107) is appropriate effort placed on use of appropriate technology? (relatively smaller), cost-saving, labor using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor..	N.A.
d.	FAA Section. 110 (a)	
	Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least developed" country)?	Not technically applicable; however, recipient country will provide more than 25% of activity costs.
e.	<u>FAA Sec. 110 (b)</u>	
	Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?	N.A.
f.	<u>FAA Sec. 281 (b)</u>	
	Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.	N.A.

g. FAA Sec. 122 (b)

Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Not technically applicable; however, answer is yes.

h. FAA Sec. 128 (b)

If the activity attempts to increase the institutional capabilities of private organizations or of the country, or if it attempts to stimulate scientific and and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?	Not technically applicable. However, the project is so designed and will be so monitored.

i. FAA Sec. 281 (b)

Describe extent to which program recognizes the particular needs, desires and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in government processes essential to sub-government.	N.A.

2. Development Assistance Project Criteria (Loans Only) — This is an ESF project.

a. FAA Sec. 122 (b)

Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.	N.A.

b. FAA Sec. 620 (d)

If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?	N.A.

3. Project Criteria Solely for Economic Support Fund

a. FAA Sec. 531 (a)

Will this assistance promote economic or political stability? To the extent feasible, is this assistance consistent with the policy directions, purposes and programs of Part I of the FAA?	Yes, the Project will improve the GOP's capability and capacity to control malaria in Pakistan, contribute to the reduction of morbidity and mortality from malaria, increase worker productivity, and thereby facilitate the achievement of the GOP's development goals as they relate to economic stability.

b. FAA Sec. 531 (c)

Will assistance under this chapter be used for military, or paramilitary activities?	No

c. ISDCA of 1985 Sec. 207

Will ESF funds be used to finance the construction of, or the operation of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such country is a party to the Treaty on the Non-	No

Proliferation of Nuclear Weapons or the Treaty for the Prohibition of Nuclear Weapons on Latin America (the "Treaty of Tlateloco"), cooperates fully with the IAEA, and pursues non-proliferation policies consistent with those of the United States?

d. FAA Sec. 609

If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? — N.A.

5(C)(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund source: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481(h) (1); FY 1986 Continuing Resolutioin Sec. 527

Has it been determined or certified to the Congress by the President that the government of the recipient country has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971) which are cultivated, produced or processed illicitly, in the whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States — It has not been so determined.

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Government personnel or their dependents or from entering the United States unlawfully?

2. FAA Sec. 481(h)(4)

Has the President determined that the recipient country has not taken adequate steps to prevent (a) the processing, in whole or in part, in such country of narcotic and psychotropic drugs or other controlled substances, (b) the transportation through such country of narcotic and psychotropic drugs or other controlled substances, and (c) the use of such country as a refuge for illegal drug traffickers?

It has not been so determined.

3. ANTI-DRUG ABUSE ACT OF 1986

Is this assistance within that 50% to be withheld pursuant to the Anti Drug Abuse Act of 1986 (i.e. 50% of all assistance excluding AID financed Food or Medicine, AID programs provided by the Interamerica foundation and FAA 104(c)(2) child survival funds) until Presidential certification has been submitted to Congress prior to March 1 and and Congress has passed a Congressional resolution of approval).

No

4. FAA. Sec. 620(c)

If assistance is to a government, is the government liable as debtor or unconditioinal guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is

We are aware of no such liability.

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not denied or contested by such government?

5. FAA Sec. 620(e)(1)

If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

We are aware of no such liability.

6. FAA Sec. 620(a), 620(f), 620(D); FY 1986 Continuing Resolution Sec. 512

Is recipient country a Communist country? If so, has the President determined that assistance to the country is important to the national interests of the United States? Will assistance be provided to Angola, Cambodia, Cuba, Iraq, Syria, Vietnam, Libya, or South Yemen? Will assistance be provided to Afghanistan without a certification?

Recipient is not a Communist Country. Assistance will not be provided to other countries cited.

7. FAA Sec. 620(j)

Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property?

It has not.

8. FAA Sec. 620(l)

Has the cou8ntry failed to enter into an agreement with OPIC?

It has not.

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9. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5

(a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?	It has not.
(b) If so, has any deduction required by the Fishermen's Protective Act been made?	N.A.

10. FAA Sec. 620(q); FY 1986 Continuing Resolution Sec. 518

(a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country?	(a) It has not.
(b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill (or continuing resolution) appropriates funds?	(b) It has not.

11. FAA Sec. 620(s)

If contemplated assistance is development loan or from Economic Support Fund, has Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual "Taking Into Consideration" memo: "Yes, taken into account by the Administrator at the time	Yes, taken into account at the time of approval of FY 1987 OYB and expect no change.

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of approval of Agency OYB."
This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

12. FAA Sec. 620(t)

Has the country served diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

It has not.

13. FAA Sec. 620(u)

What is the payment status of the country's U.N. obligations? If the country is in arrears were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)

U.N. has not determined country to be in arrears.

14. FAA Sec. 620A

Has the government of the recipient country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an action of international terrorism?

We are aware of no such action.

ISDCA OF 1985 Sec. 552(b)

Has the Secretary of State determined that the country is a high terrorist threat country after the Secretary of Transportation has determined, pursuant to section 1115(e)(2) of the Federal Aviation Act of 1958, that an airport in the country does not maintain and administer effective security measures?

It has not.

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16. FAA Sec. 660

Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

It does not.

17. FAA Sec. 669, 670

Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)

FAA Section 620 E permits a special waiver which exists in Pakistan.

18. FAA Sec. 670

If the country is a non-nuclear weapon state, has it, on or after August 8, 1985, exported illegally (or attempted to export illegally) from the United States any material, equipment, or technology which would contribute significantly to the ability of such country to manufacture a nuclear explosive device?

It has not been so determined.

19. ISDCA of 1981 Sec. 720

Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. of September 25 and 28,

It was so represented, but it disassociated itself from the Communique.

1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)

20. FY 1986 Continuing Resolution Sec. 541

Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions? — No

Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilizations? — No

Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as means of family planning? — No

21. FY 1986 Continuing Resolution

Is the assistance being made available to any organization or program which has been determined as supporting or participating in the management of a program of coercive abortion on involuntary sterilization? — No

If assistance is from the population functional account, are any of the funds to be made available to family planning projects which do not offer, either directly or through — No

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referral to or information about access to, a broad range of family planning methods and services?

22. FY 1986 Continuing Resolution Sec. 513

Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States?

No

23. FY 1986 Continuing Resolution Sec. 513

Has the duly elected Head of Government of the country been deposed by military coup or decree?

No

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

FAA Sec. 116

Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy?

No

2. Economic Support Fund Country Criteria

FAA Sec. 502B

Has it been determined that the country has engaged in a consistent pattern of gross violations of

It has not been so determined.

internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest?

5C (3) - STANDARD ITEM CHECKLIST

A. Procurement

1. FAA Sec. 602

Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed?

Yes

2. FAA Sec. 604 (a)

Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?

All offshore procurement financed by USAID will be from U.S.

3. FAA Sec. 604 (d)

If the cooperating country discriminates against U.S. marine insurance companies, will commodities be insured in the United States against marine risk with a company or companies authorized to do a marine insurance business in the U.S.?

N.A.

4. FAA Sec. 604 (e); ISDCA of 1980 Sec. 705 (a)

If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably procured in U.S.)

N.A.

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5. FAA Sec. 604 (g)

Is the geographic code for the project 941? If it is, is the construct and/or engineering to be procured from a firm in an advanced developing country?

No, the geographic code for this project is 000 and Pakistan.

6. FAA Sec. 603

Is the shipping excluded from compliance with requirement in section 901 (b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates?

No

7. FAA Sec. 621

If technical assistance is financed, to the fullest extent practicable will such assistance, goods and professional and other services be furnished from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

Yes

N.A.

8. International Air Transport, Fair Competitive Practices Act 1974

If air transportation of persons or property is financed on grant basis will provision be made that U.S. carriers will be utilized to the extent such services is available?

Yes

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9. FY 1982 Appropriation Act Sec. 504

If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?	Yes

B. Construction

1. FAA Sec. 601 (d)

If capital (e.g. construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interests?	N.A.

2. FAA Sec. 611 (c)

If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	N.A.

3. FAA Sec. 620 (k)

If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million?	N.A.

C. Other Restrictions

1. FAA Sec. 122 (b)

If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?	N.A. This is a grant.

2. FAA Sec. 301 (d)

If fund is established solely by U.S. contributions and administered by an international	N.A.

organization, does Comptroller General have audit rights?

3. FAA Sec. 620 (h)

Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-block countries? Yes

4. Will arrangements preclude use of financing:

a. FAA Sec. 104 (f)

To pay for performance of abortions as a method of family planning or to, motivate or coerce persons to practice abortions: to pay for performance of involuntary sterilization as a method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization? To pay for any biomedical research which relates, in whole or in part, to methods or to the performance of abortions or involuntary sterilizations as a means of family planning, or to lobby for abortion. Yes

b. FAA Sec. 620 (g)

To compensate owners for expropriated nationalized property? Yes

c. FAA Sec. 660

To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes

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d. FAA Sec. 662

For CIA activities? Yes

e. FAA Sec. 636 (i)

For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained Yes

f. FY 1986 Continuing Resolution Sec. 503

To pay pensions, annuities retirement pay, or adjusted service compensation for military personnel? Yes

g. FY 1986 Continuing Resolution Sec. 505

To pay U.N. assessments, arranges or dues. Yes

h. FY 1982 Continuing Resolution Sec. 506 Yes

To carry out provisions of FAA section 209 (d) (Transfer of FAA funds to multilateral organizations for lending.) Yes

i. FY 1986 Continuing Resolution Sec. 510

To finance the export of nuclear equipment fuel, or technology or to train foreign nationals in nuclear fields? Yes

j. FY 1986 Continuing Resolution Sec. 511

To aid the efforts of the government of such country to repress the legitimate rights of the population of such country Yes

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contrary to the Universal Declaration of Human Rights?

k. <u>FY 1982 Continuing Resolution Sec. 515</u> — Yes

To be used for publicity or propaganda purposes within U.S. not authorized by Congress?

ANNEX C

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

MISSION TO PAKISTAN

18 - Sixth Avenue, Ramna 5, Islamabad
Post Office Box 1028

Cable : USAIDPAK
Telex : 82-5427 PK
Telephone : 824071-79

THE DIRECTOR

September , 1988

Malaria Control II Project Extension
FAA Section 611 (e) Certification

I, James A. Norris, the principal officer of the Agency for International Development in the Islamic Republic of Pakistan, having taken into account, among other things, the maintenance and utilization of projects in the Islamic Republic of Pakistan previously financed or assisted by the United States, do hereby certify, pursuant to Section 611 (e) of the Foreign Assistance Act of 1961, as amended, that, in my judgment, the Islamic Republic of Pakistan has both the financial capability and the human resources capability effectively to maintain and utilize the proposed Malaria Control II Project.

The judgment is based upon the project analyses as detailed in the Project Paper for the extension of Malaria Control II and is subject to the conditions imposed therein.

James A. Norris
USAID/Pakistan
Mission Director

Sept 28/1986
Date

ANNEX - D

OFFICIAL FIL

No. 1(6)US-I/81.
Government of Pakistan
MINISTRY OF FINANCE AND
ECONOMIC AFFAIRS
(ECONOMIC AFFAIRS DIVISION)

Islamabad the, 21st Sept., 19

Telegram : ECONOMIC
Telex : ECDIV No : 05-634

JOINT SECRETARY.
Phone: 821437

Log # 4398

OFFICIAL FILE	ACTION	OFFICE	DATE
		D	✓
		JD	✓
		PRO	✓
		RLA	
		C&C	
✓	✓	PDM	
		E&E	
		ENG	
		HPN	
		NAT	
		ISD	
		OFM	
		EXO	
		OSO	
		RLP	
		PROC	
		GHS	
		AP	

Subject: US ASSISTANCE FOR MALARIA CONTROL PROGRAMME ON THE PERIOD 1988 TO 1992.

ACTION
Due Date: 10/2
Action Taken.....
Date: .....
Initial .....

Dear Mr. Norris,

USAID have provided grant assistance of $ 41 million to the Malaria Control Programme during previous Aid Package. Due to the usefulness of US assistance in eradicating malaria in Pakistan, USAID are requested to kindly consider provision of additional funds of $ 25 million to this programme from the current aid package.

With best regards,

Yours sincerely,

(A. GHAFOOR MIRZA)

Mr. James A. Norris,
Director,
USAID
Islamabad.

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SEP 22 1988

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23 SEP 1988
PDM
No. 144

Life of Project : FY 1988-FY 1992
PACD Date : Sept. 30, 1992
Total Dollar Funding: $41.6 million
Date Prepared : Sept. 1987

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Program Sector Goal: The broad objective is: To reduce morbidity and mortality from endemic diseases, especially malaria, through the establishment of a responsive, efficient, and effective nationwide health system. Note, however, that the health system is in fact centrally planned but is operated and largely financed by the provincial governments.	- Measurable reductions in morbidity and mortality from endemic disease which are directly attributable to specific health interventions. - Increased utilization of the national health services delivery system by the general public.	- Morbidity and mortality data from the federal and provincial health ministries. - Health facility service statistics and treatment records.	- Sustained economic growth to support national health services. - Continued GOP and provincial commitment to supporting health services. - Adequately staffed, equipped and supplied health facilities which are able to attract clients.
Project Purpose: (Upper level purpose) To control or further reduce the incidence of malaria maintaining API at a level where it does not constitute a serious public health problem and to foster national self reliance in malaria control.	Conditions that will indicate purpose has been achieved. End of project - Annual parasite incidence (API) of 0.5 or less cases per 1000 population on a national basis. - Reduction in the incidence P. falciparus to 2% of all the cases of malaria.	- Annual and EOP program evaluations. - Federal and provincial malaria control program administrative and technical reports. - On-going monitoring by long and short-term advisors	Assumptions for Achieving Purpose: - Continued GOP and provincial commitment to malaria control as evidenced by adequate budget support. - Vector resistance does not develop to point where residual insecticides can no longer control malaria incidence. - Parasite resistance does not develop to point where drug treatment of malaria is ineffective.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
(Lower Level) To improve spray operations by restricting use of residual insecticide to epidemiologically determined locations and less than 25% of houses.	- Annual operating plans; adequate supervision.	- Same as above, plus DOMC annual reports.	The Ministries of Health at the federal and provincial levels provide qualified participants for the proposed programs of long and short-term training.
- To institutionalize effective malaria surveillance within the general health services.	- Functional as well as administrative integration of MCP into general health services.		- Firm instructions from top levels to accelerate pace of integration. - Increased cooperation and participation of general health services staff in malaria control activities.
To create a system of static voluntary PCD posts from presently unsupervised Community Health Worker system.	- Regular case reporting by supervisory staff.		- Active support of voluntary system of CHWs by MOH; systematic supervision and resupply of CHWs by ACD personnel.
To increase PCD to 70% of blood slide taken. To initiate major operational research capacity to guide selection of control activities.	- Number of blood slides taken. - Staff appointments made; training initiated and completed.		

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Project Outputs			
1. House spraying with residual insecticides targeted and stratified to provide coverage where needed while reducing total use of insecticides; 95% completion of targeted spraying.	Annual spray plans calling for coverage of maximum of 20% of houses, adequately implemented and monitored.	- DOMC annual plans - Annual evaluations - On-going monitoring by long and short-term advisors.	- Continued availability of effective residual insecticide - Household acceptance of insecticide spraying will be improved through health education.
2. Functioning, effective and continuous epidemiological, parasitological and entomological surveillance system.	- All blood slides (including those from CHW network) examined and reported within 10 days of collection. - Minimum of four intensive field investigations for parasite resistance each year. - Existing microscopic examination increased to all Regional Health Centers. - Micro computer and data storage and retrieval systems on place with trained operators by end of 1990.	Same as above.	- Available trained staff - Malaria education improved - MOH actively participates.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
• Appropriate and effective supplementary biological and control method or methods, identified from field trials, implemented.	- Operational research of at of at least two methods, to test feasibility under Pakistani conditions. - Continued vector census systems installed in each pilo' area.	Same as above.	Suitable methodology available which can be adapted to Pakistan conditions.
• Malaria education and information program in place and serving all levels of MOH promotors, educators and potential beneficiaries.	- Appropriate information materials designed by end of second year, printed and distributed. - Three annual workshops completed and publicized. - KAP research instituted in DOMC and extended to provinces; completed by EOP. - Monthly annual media placements concerning malaria in exiscing MOH education program.	Same as above.	Full support within MOH, from MOH, from top down.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
6. Revised, intensified and continued malaria training programs for all elements of general health services (including physicians) who participate in surveillance, treatment and case follow-up.	- Annual training workshops covering all phases of malaria control. - Component on social marketing included in annual workshops and NIMRT courses.	Same as above.	Full support within MOH.
7. Creation of fully staffed, operational research and training facility at NIMRT which meets the priority needs of the MCP.			DOMC is accorded line control over appointments to and determination of activity pattern of NIMRT.
7. Creation of fully staffed, operational research and training facillity at MIMRT which meets the priority needs of the MCP.	- U.S. long term training of epidemiological, entomological, administrative and operational research personnel: 92 person month (PM)	Same as above.	Appropriate candidates can be identified.
8. Upgrading province and urban MCP staff; initiating malaria content in curriculum of 17 medical colleges.	In-country training: 6000 US and 3rd country short-term training: 114 PM short term.	Same as above.	Same as above.
9. Source reduction project completed in urban setting and field trials under way on projects in selected rural areas.	Annual plan of action prepared and approved.	- DOMC annual plans. - On-going monitoring by long and short term advisors.	

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
10. Increased participation by women as both recipients and providers of malaria control services.	- Annual training records. - Creation of positions adapted to or exclusively for filling by women, e.g., microscopists; Lady Health Visitors.	Same as above.	Implementation of present MOH plans.
11. Effective program planning, management and evaluation.	- Yearly plan of action. - Evaluations initiated and and completed. - Indicators for outputs 1-10 achieved.	Same as above.	GOP/Provincial announced priority for malaria is backed by action.
Project Inputs			
A. Government of Pakistan	GOP	GOP	GOP
1. Provision of salaries and other local currency costs for operations.	- GOP/Provincial budget provides $35.7million equivalent in rupees over LOP.	- Annual GOP/Provincial budgets.	- Adequate political and executive support.
2. Full complement of administrative, technical, operational research, and training personnel, plus field spray personnel.	- DOMC/NIMRT/Provincial Malaria staff vacancies reduced to less than 5% by EOP.	- Staffing patterns.	- Adequate funding over LOP. - Priority decisions concerning critical staffing.
3. MOH primary health care facilities available for surveillance.	- MOH health facilities taking slides and administering appropriate treatment and follow-up.	- Field visitations.	- Full support within MOH, from top down.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
3. USAID	USAID ($000)	USAID	
1. Technical Assistance			
a. Long-term - 48 PM	544	- A.I.D. and GOP project records and financial documents.	- Availability of funds.
b. Short-term - 29 PM	356		
2. Training		- Annual program evaluation.	- GOP meets conditions precedent to project implementation.
a. Off Shore -			- Appropriate overseas training programs can be identified and scheduled.
1) Long-Term - 92 PM	207		
2) Short-Term - 114 PM	218		
b. In-country 1000 courses1/			
3. Operational Research Materials	150		
4. Purchase and renovation of building for NIMRT	825		- A physically adequate and fairly priced building can be located for the NIMRT.
5. Commodities including insecticide, vehicles, microscopes, research and training equipment and supplies, spray equipment and other essential commodities.	24,422		
6. Evaluation	100		

1/ Excluding additional 1000 courses fully financed from MOH and provincial indigenous resources.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
7. Contingencies	546		
8. Total	26,350		
	See financial analysis, implementation schedule, and commodity, technical assistance, training and evaluation plans in Project Paper.		

Project Authorization Amendment

Name of Country: Pakistan
Name of Project: Malaria Control - II
Project No. : 391-0474

1. The Malaria Control II Project for Pakistan was authorized by the Administrator, AID/W, on May 11, 1982 with an LOP funding of not to exceed US Dollars Forty-One Million ($41,000,000) and Twenty-One Million United States owned Pakistani Rupees (Rs. 21,000,000) in grant funds over a five (5) year period from the date of authorization. The Authorization was amended on August 28, 1986 to delete a Condition Precedent which was considered no longer useful to Project goals.

2. Pursuant to Section 531 of the Foreign Assistant Act, as amended, the original Project Authorization is hereby amended as follows:

(A) I hereby authorize additional planned obligations of not to exceed U.S. Dollars Twenty-Five Million ($25,000,000) in ESF grant funds, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to assist in financing foreign exchange costs and local currency costs for this Project. The total planned obligations for this Project shall not exceed U.S. Dollars Sixty-Six Million ($66,000,000) and Twenty-One Million United States owned Pakistani Rupees (Rs. 21,000,000) over a ten (10) year period from the date of the original Project Assistance Completion Date (PACD).

(B) Conditions Precedent to Disbursements for Procurement of Insecticides in United States Fiscal Year 1989 through United States Fiscal Year 1992

Except as A.I.D. otherwise agrees in writing, prior to a specific disbursement in each year under this Grant component, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, from United States FY 1989 through United States FY 1992, for the procurement of insecticides, the Grantee shall, within 90 days from the commencement of each United States fiscal year, provide to A.I.D., in form and substance satisfactory to A.I.D., the following:

1. Evidence that the insecticides procured by A.I.D. for the preceding years program have been effectively utilized for the program in the preceding spray operations;

2. A statement furnishing the quantities of insecticide required for the next spray operations program, the scientific basis for calculating those quantities, and the specifications of the insecticide required;

3. A certification/letter from the office of Secretary Health each provincial government, that, for the next insecticidal spray operations in the respective province, the provincial governments will allocate sufficient local currency budget to utilize the entire quantity of insecticide, being provided by the Directorate of Malaria Control (DOMC);

4. Evidence that the previous external review has certified that satisfactory progress was achieved towards program objectives, set forth in the project extension with respect to implementation of last spray operations, malaria surveillance, functional integration, and operational research;

5. Intermediate Benchmarks:

Evidence that sets of intermediate benchmarks have been met on a United States fiscal year (FY) basis as follows:

a). For United States FY 1989 Insecticide Procurement

1. Malaria Surveillance Output:

a. Evidence of the total number of slides collected in the preceding one year, in the four provinces of Pakistan, through Active Case Detection (ACD) and Passive Case Detection (PCD).

b. Evidence of total number of patients suffering from pyrexia of unknown origin (PUO) and suspected clinical malaria, attended/treated as outpatients in the preceding one year, in the general health facilities of the rural and urban areas separately.

2. Operational Research:

Operational research activities have been carried out principally at the National Institute of Malaria Research & Training (NIMRT), and at the provincial malaria control programs (MCPs).

a. Evidence of total number of research protocols completed and in publication form at the NIMRT, reported to the DG Health/Chairman Malaria Control Coordination Committee (MCCC), and reviewed by the MCCC.

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b. Evidence of efforts made by NIMRT/MOH to increase professional staff positions filled, in the area of operational research at the NIMRT.

3. Meeting of Malaria Control Coordination Committee (MCCC):

a. Evidence of the MCCC having met at least one time to review the overall Malaria Control Program (MCP), malaria operational research activities, progress made in integrating the malaria control program with general health services, and plan future policies and actions for further progress toward integration.

b. Evidence that the MCCC has reviewed the completed operational research protocols and, if approved, circulated them to the provincial MCPs.

b). For United States FY 1990 Insecticide Procurement

1. Malaria Surveillance Output:

a. Evidence that twenty five per cent or more of the outpatients suffering from PUO and suspected clinical malaria, attended/treated as outpatients at the health facilities of general health services in the rural areas, and five percent or more of the outpatients suffering from suspected clinical malaria who attended the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year period.

2. Operational Research:

a. Operational research protocols: Evidence that NIMRT initiated at least four new research studies additional to those completed in 1987/88, and submitted at least two completed reports to the Director General (DG) Health/Chairman (MCCC).

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b. Evidence that 85 per cent of all professional posts at NIMRT have been filled with qualified staff actively participating in research activities.

3. Meeting of Malaria Control Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice in the preceding one year period to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

c). For United States FY 1991 Insecticide Procurement

1. Malaria Surveillance Output:

a. Evidence that fifty per cent or more of the outpatients suffering from PUO and suspected clinical malaria attending the health facilities of general health services in the rural areas, and twenty five percent or more of the outpatients suffering from suspected clinical malaria attending the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year period.

2. Operational Research:

a. Operational research protocols: Evidence that at least four new research studies additional to those completed in 1988/89 initiated in 1989/90 by the NIMRT and at least three completed reports additional to those of 1989/90, in publication form, have been submitted to the Director General (DG) Health/Chairman MCCC, for review and approval by the MCCC.

b. Evidence that 85 per cent of all professional posts at NIMRT are filled with qualified staff actively participating in research activities.

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3. Meeting of Malaria Control Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

d). For United States FY 1992 Insecticide Procurement

1. Malaria Surveillance Output:

Evidence that eighty five per cent or more of the outpatients suffering from PUO and suspected clinical malaria attending the health facilities of general health services in the rural areas, and fifty percent or more of the outpatients suffering from suspected clinical malaria attending the health facilities of general health services in the urban areas, have been screened for malaria during the preceding one year period.

2. Operational Research:

a. Operational research protocols: Evidence that at least four new studies additional to those completed in 1990/91 initiated by NIMRT and at least four completed reports in publication form, have been submitted to the Director General (DG) Health/Chairman MCCC, for review and approval by the MCCC.

b. Professional posts of NIMRT: Evidence of 85 per cent of professional posts of NIMRT continued to be filled with qualified staff and participating in research activities.

3. Meeting of Malaria Control Coordination Committee (MCCC):

a. Evidence that the MCCC has met at least twice in the preceding year to review the MCP with particular regard to its operational research activities and its progress made in integrating the malaria control program with general health services.

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(C) I further authorize an extension in the Project Assistance Completion Date (PACD) by four years, i.e. from September 30, 1988 to September 30, 1992.

3. All other terms and conditions of the original Project Authorization and Amendments thereto shall remain in full force and effect except as hereby amended.

[X] Approved [ ] Disapproved

James A. Norris
Mission Director
USAID/Pakistan

Sept 28, 1988
Date

Clearances:

HPN: RMartin/RIsmail:
PDM: RWNachtrieb:
PRO: FWTate:
FM: ADPratt:
(A)DD: PDavis:

RLA:TBCartzer/KFMKassim:mh:9/22/88
2027R

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ANNEX G.

(TO BE PUBLISHED IN WEEKLY GAZETTE OF PAKISTAN PART-I).

No.F.30-1/85-PH
Government of Pakistan
Ministry of Health
Special Education & Social Welfare
(HEALTH DIVISION)

...

Islamabad, the 11th March, 1986.

NOTIFICATION

Subject:-CREATION OF NATIONAL INSTITUTE OF MALARIA RESEARCH AND TRAINING, LAHORE AS AN ATTACHED DEPARTMENT OF THE MINISTRY OF HEALTH, SPECIAL EDUCATION & SOCIAL WELFARE (HEALTH DIVISION) GOVERNMENT OF PAKISTAN, ISLAMABAD.

In terms of Establishment Division U.O. No.5/2/85-R.I, dated 8-12-1985, the National Institute of Malaria Research and Training, Lahore is created and declared as an Attached Department of the Ministry of Health, Special Education and Social Welfare (Health Division) with effect from 16-5-1985.

(DR. ~~MRS.~~ S. B. AGHA)
DEPUTY DIRECTOR GENERAL HEALTH/
DEPUTY SECRETARY.

...

The Manager,
Printing Corporation of
Pakistan Press,
ISLAMABAD.

Distribution.

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Pakistani Inputs into the Malaria Control Program

The GOP practices of dividing the financing of activities between the development and non-development budgets, of segragating salaries from commodity costs, and of maintaining a total separation of federal from provincial budgets make any estimate of Pakistani inputs into any project somewhat open to question. In the case of the MCP, the problem is compounded by the fact that virtually all case detection, initial treatment, slide interpretation, radical treatment and case follow-up are performed by the general health services into which the MCP has been integrated. There is no longer a line item in a provincial budget which shows the total provincial input into malaria control.

Two days of discussions with the provincial malaria directors elicited the conclusion that the share of the provincial health budget devoted to malaria ranged from about 7.5% in the NWFP to as little as 3% in Sind; on average, the estimated malaria share was somewhat over 5%, influenced by the Punjab, which has at its disposal about 45% of the combined health budgets of the provinces. The best estimate of provincial input, based on this rule-of-thumb calculation, was "about Rs. 90 million" for 1986/87, but the provincial malaria directors agreed to reexamine their original budget requests for 1986/87 to provide a more precise figure. While acknowledging that requests are not synonymous with allocations, it is instructive to note that allocations against requests appear to have been Rs.94.7 million, or $5.26 million equivalent. This figure compares with $4.61 million equivalent in 1984/85 and $5.04 million equivalent in 1985/86.

The combined development and non-development budget for DOMC, NIMRT and NMTC for 1986/87 was Rs.11.3 million, or $627,700 equivalent. Thus, the total malaria budget, federal and provincial, development and non-development, would appear to have been about $5.9 million equivalent. Further, this figure appears to have risen steadily over the period of three years, at a rate which exceeded the rate of inflation. Thus, a projection of the $5.9 million equivalent figure over the life of this project extension would appear conservative. The anticipated Pakistani input from all sources would therefore appear to be $29.5 million equivalent -- apart from the commodity budget.

The DOMC projection of rupee-financed commodities for the proposed extension of the MCP calls for Rs.111.36 Million ($6.2 million equivalent) for the period 1987/88 through 1991/92. Adding this commodity component to the essentially salary-related $29.5 million already noted, the projected total GOP/Provincial input for the five-year extension is $35.7 million equivalent.

But this understates the Pakistani input. It does not include vehicle maintenance and operating costs, equipment repairs, training expenses which are incorporated in other budgets, and some additional unidentified costs which have not yet been pinned down. This additional input is not insubstantial, but it is at this time unmeasured. These projections also exclude urban malaria control program costs borne by municipal corporations. The somewhat artificial imputed value of building rentals and office space has been excluded on the grounds that the once-vertical MCP no longer commands an identifiable share of such space.

Using the somewhat tenous but clearly understated figure of $35.7 million equivalent, the "all-Pakistan" input into the MCP for the five-year extension of Malaria Control II would represent nearly 42% of the anticipated $63.3 million in project costs from all sources.

ANNEX I

DRAFT REPORT

ENVIRONMENTAL ASSESSMENT OF PESTICIDES USED IN THE PAKISTAN MALARIA CONTROL PROJECT II EXTENSION

391-0472

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN
ISLAMABAD, PAKISTAN

AUGUST, 1988

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LIST OF ACRONYMS AND ABBREVIATIONS

ACD	Active Case Detection
AID	Agency for International Development
API	Annual Parasite Incidence
CD	Communicable Disease
CICP	Consortium for International Crop Protection
DOMC	Directorate of Malaria Control
EA	Environmental Assessment
EC	Emulsifiable Concentrate
EE	Energy and Environment (Division, AID/Pakistan)
EPA	Environmental Protection Agency
GOP	Government of Pakistan
HPN	Health, Population and Nutrition (Division, AID/Pakistan)
IEE	Initial Environmental Examination
IPM	Integrated Pest Management
MCP	Malaria Control Program (AID Project)
MCOP	Malaria Control Program (generic)
MT	Metric Ton
NIMRT	National Institute of Malaria Research and Training
NWFP	North West Frontier Province
OP	Organophosphate
PACD	Project Assistance Completion Date
PCD	Passive Case Detection
PID	Project Identification Document
PP	Project Paper
RHC	Rural Health Center
ULV	Ultra Low Volume
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
VBCP	Vector Biology and Control Project
WHO	World Health Organization
WDP	Water Dispersable Powder
WP	Wettable Powder

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1.0 EXECUTIVE SUMMARY

USAID/Pakistan intends to continue to support malaria control efforts in the Islamic Republic of Pakistan for a 4-year extension of the Malaria Control Project II. USAID's assistance will include funds for the purchase of insecticides, spray equipment, and safety gear. The extension will, at the same time, emphasize adoption of malaria survey procedures which should lead to more focused insecticide applications, which in turn should decrease the overall amount of pesticides needed in follow-on projects (5.0).

This environmental assessment (EA) was prepared as a critical element of the project design, in compliance with AID's Environmental Procedures 22 CFR 216. The EA identifies and analyzes the health/safety and environmental issues specific to the proposed project. The requirement for this EA stems from both the need to update the findings of previous programmatic and by-country assessments as well as from the increased concerns for worker safety and environmental protection associated with the possible use of more toxic insecticides in the Malaria Control Project II extension (2.0).

The preferred alternative among candidate technical approaches was determined to be chemical (insecticide) control managed in a judicious and safe manner (4.0).

The anticipated negative impacts of project extension pesticides are considered minimal and will be mitigated by continued safe transport, use, storage and disposal. Human exposure to pesticides remains the more critical area of concern (5.3, 7.0).

The following insecticides should be approved for AID-funded procurement and/or use in the Pakistan Malaria Control II Project extension: malathion and fenitrothion. Approval for use of pyrethoids and larvicides should be subject to review (6.0).

The GOP has in place a strong institutional structure, developed over several years, for managing malaria control operations. Both malathion and fenitrothion have been safely and successfully employed by the national malaria control program since 1982. With relatively few improvements and inputs by a technical expert at the time of insecticide unloading will continue the program to operate safely and in full compliance with AID environmental regulations (6.8, 6.10).

Required mitigative measures under the project include provisions for: 1) adequate types and numbers of protective uniforms for spray squads, 2) additional test kits for monitoring worker exposure, 3) a continuation of safety training, 4) an accident contingency short-term consultant to provide guidance on pesticide handling, 5) research directed at helping to minimize worker exposure and 6) input of malaria specialists in agricultural and engineering projects in order to minimize increases in malaria and the subsequent use of pesticides (8.0).

2.0 APPLICABLE ENVIRONMENTAL PROCEDURES AND PURPOSE OF ASSESSMENT

The Malaria Control II Project Extension will provide technical advisory services, commodities, equipments and insecticides to assist the GOP in controlling malaria. The findings of this environmental assessment are an important element of project design in that they indicate ways of improving the already in place pesticide safety procedures.

This section describes the procedures under which the EA was conducted, describes why the EA was necessary, and describes project conditionalities already in place that address safe use of pesticides.

2.1. AID ENVIRONMENTAL PROCEDURES

It is AID's policy to ensure that environmental consequences of AID - financed activities are identified and considered by AID and the host country before the decision to proceed with the project is made, and that appropriate safeguards and mitigative actions are adopted. This policy is stated and discussed in title 22 of the Code of Federal Regulations, Part 216, "AID Environmental Procedure" (22 CFR 216).

This EA of pesticide usage in the Malaria Control Project II extension is based on the requirements of 22 CFR 216.3(b), "Pesticide Procedures." The EA identifies and evaluates probable environmental impacts of the proposed usages, provides recommended mitigative actions to minimize negative impacts, and examines the probable impacts and feasibilities of alternative approaches to malaria control.

2.2 GOVERNMENT OF PAKISTAN PESTICIDE LEGISLATION

The Pesticide Ordinance, 1971 and the rules adopted for implementing the Ordinance (1973) provide the central government of Pakistan with ample authority to regulate most all aspects of the sale and use of pesticides

including registration, import, cancellation, and adulteration. The Ordinance and its rules do not, however, include regulations regarding the environmental impacts of pesticides. No such regulations are known to exist.

2.3 PREVIOUS ASSESSMENTS AND NEED FOR CURRENT ASSESSMENT

At the time of initial project authorization in 1982, USAID prepared an initial environmental examination (IEE) which recommended a negative determination based on the conclusions of a previously prepared programatic Environmental Impact Statement for use of insecticides in malaria control projects as well as on the results of earlier environmental studies of USAID-assisted malaria control programs in other Asian and Latin American countries. The requirement for the current EA stems from both the need to update the findings of the previous studies as well as from continued concerns for environmental protection and worker health and safety associated with possible use of higher toxicity insecticides such as fenitrothion in the Malaria Control II Project extension.

2.4 CONDITIONS PRECEDENT TO DISBURSEMENT, AND COVENANTS

The Project Paper (PP) for the Malaria Control II extension contains 5 conditions regarding pesticide usage in the extension that must be anually addressed by the appropriate Pakistan Agency before disbursement of funds for purchase of pesticides can be made (page 116 of PP). If satisfied, the conditions will help ensure that pesticides are used effectively, are ordered in appropriate quantities and are used as part of an integrated approach to malaria management.

Project covenants (page 119 of PP) require that the grantee annually assures AID that pesticides are being used safely and that pesticide quality is monitored.

This EA should assist both AID and the Government of Pakistan (GOP) in the monitoring and fulfilling of these conditions and covenants.

5.0 SCOPING PROCESS

AID Environmental Procedures, 22 CFR 216.3 (a) (4), describe the scoping process to be used in identifying the significant issues to be addressed in the environmental assessment. Critical elements of the scoping process include: a determination of the scope and significance of the issues to be analysed in the EA, and identification of and elimination from detailed study of those issues that are not significant or have been covered by earlier environmental reviews.

Based upon both field visits and meetings with GOP, AID, VBCP and personnel involved in the MCP, the EA team prepared a scoping statement according to 22 CFR 216.3(a) (4) (a)-(d) which was submitted in draft to USAID at the conclusion of the field work. The scoping statement is included in Annex B of this EA.

5.1 CONDUCT OF ENVIRONMENTAL ASSESSMENT

This environmental assessment was performed by Dr. Jesse Hobbs and Dr. Hiram Larew (see Section 9.0 for qualifications).

The effort consisted of a 2-day briefing (July 19-20, 1988) in Washington, a 21-day in-country visit (July 31-August 20) and a 3-day debriefing (August 22-24) session in Washington.

The briefing and debriefing sessions were held with staff from AID/ST/H, VBCP and AID/ANE/PD/ENV.

The in-country trip included interviews with staff from the HPN and E&E offices of AID/Islamabad, and numerous GOP officials (see Annex A). During the trip, the EA team visited the Punjab Province for 4 days (August 5-8) with inspections of 3 district malaria control spray operations (Gujranwala, Sheikhupura and Lahore Districts). The team also visited the North West Frontier Province (NWFP) for 2 days (August 10-11) and saw 2 operations, both in the Peshawar District. Storage facilities and health units were also visited.

4.0 ANALYSIS OF ALTERNATIVES TO THE PROPOSED PROJECT

4.1 NO ACTION (DISCONTINUE EXISTING PROGRAM)

The Malaria Control Project II Extension is consistent with AID strategy and will have a significant positive effect on other AID projects. It directly supports AID's effort to (1) overcome low agricultural productivity and (2) reduce the high rates of infant and child mortality. The development of this project is crucial to AID's goal of reducing reliance on insecticides as the primary instrument of malaria control and the complete integration of malaria control activities within the framework of the general health services.

The discontinuation of the present program would not only be inappropriate but prejudicial to the public health of Pakistan. Through the cooperative efforts of AID and GOP, malaria will be reduced to low and manageable levels. Without these control efforts, parts of Pakistan would undoubtedly return to a condition of high malaria endemicity with devastating periodic epidemics.

4.2 USE OF ALTERNATIVE INSECTICIDES AND/OR ENVIRONMENTAL MANAGEMENT MALARIA CONTROL METHODS

4.2.1 Description

The use of residual insecticides for house spraying, beginning with DDT in the early 1960's, has served very well in Pakistan for the control of malaria. With the appearance of DDT resistance in the malaria vectors in the mid 1970's, houses were sprayed with HCH in limited areas. In the mid 1970's, the Malaria Eradication Program changed its operation to the use of malathion in all malarious areas, with satisfactory results in terms of reduction of malaria transmission. With the detection of malathion resistance in one of the vectors An. stephensi in the early 1980's, some limited spraying was carried out with fenitrothion, another organophosphate insecticide. Malathion, however, remains the insecticide of choice in house spraying in malarious localities, and has continued to be effective in rapidly reducing

the transmission. A system of entomological and epidemiological monitoring is in place and functioning, to indicate when a substitute insecticide such as fenitrothion, is required. It is planned that the change to fenitrothion be made only in localities where resistance to malathion, as registered by the WHO diagnostic test, exceeds 40 per cent, and the incidence of malaria exceeds the norm for the localities.

Should it be necessary to change to another alternative insecticide in the future, due to a high resistance in the vectors to fenitrothion and malathion, substitutes of the carbamate group of insecticides would be available for use. Both bendiocarb (Ficam) and propoxur (Baygon) have been field tested in Pakistan, and it is felt that they would be alternative insecticides to use should the need arise, through the development of high levels of resistance to insecticides of the organophosphate group.

The environmental management approach to malaria control through improved water management and permanent engineerng works of drainage and filling have not been considered viable or economic substitutes for residual house spraying in the malarious areas of rural Pakistan, mainly because of the vast extent of static water collections during the rainy season, and the scattered nature of the many small villages. These methods, however, are appropriate and cost effective in urban areas and should be considered in future projects of urban malaria control.

Bacillus Thuringiensis Israelensis, a microlinal insecticide, has proven in recent years to be a highly effective larvacide for the control of malaria vector, particularly in situations where breeding places are restricted in size, and more concentration of houses. The use of this material will be evaluated in the future, for its appropriateness in selected malarious localities.

4.2.2 Presumed Environmental Impact

The presumed environmental impact of the alternative insecticides would be no greater in degree than the currently used intradomiciliary insecticides. They

would be applied to inside wall surfaces, at low dasages, in a manner consistent with long term practices.

4.3 MALARIA CONTROL THROUGH CHEMOTHERAPY ALONE

Malaria control through chemotherapy alone is already in practice in the low malaria incidence and low risk areas in Pakistan. House spraying is withdrawn when the annual parasite incidence is reduced to 2 cases per 1000 population, and from localities where falciparum malaria has disappeared. Spraying in 1988 was carried out in 63 districts or tribal agencies, but not in all localities of these districts. In the unsprayed localities, malaria is dealt with by case detection and radical treatment.

The objective of antimalaria drug therapy is not only the prompt clinical cure of malaria patients, but also the reduction of the infective reservoir. When the objectives are met enabling the efficient treatment of malaria cases, the combined case detection and treatment activities may serve as a useful malaria control method, particularly in areas where the malariogenic potential is not high.

4.4 CONCLUSION

Based upon consideration of currently available options, the EA team believes that the ongoing MCP which uses residual house spray insecticides in combination with chemotherapy is the most balanced approach to environmentally acceptable economic and efficient malaria control. The EA team encourages research at NIMRI into biological and environmental management methods of vector control.

5.0 PROJECT DESCRIPTION

5.1 BACKGROUND, GOALS, PURPOSE AND OUTPUTS

Malaria has historically been a major health problem in areas now included in Pakistan. Periodic severe epidemics causing high mortalities have occured in the past, particularly in the Punjab and in Sind. In the years prior to 1961, malaria infected an estimated 7 million people, causing some 100,000 deaths annually. Diverse topography, varying demographic situations and population movements were all contributing factors to this high level of endemicity.

With the discovery of long acting insecticides, such as DDT in the early 1940's, a new strategy of malaria control became feasible in many countries, including Pakistan. This strategy was based on the intradomiciliary application of residual insecticides at regular intervals.

AID began assisting the GOP in anti-malaria work in 1961, as a part of the global malaria eradication program. This assistance was terminated in 1970, when the Pakistan program appeared close to success.

A resurgence of the disease occured, however, and malaria reached epidemic proportions with an estimated 10 million cases in 1974. This public health emergency led to a resumption of AID assistance in a new program designated the Malaria Control Program (MCP). It was designed to control the epidemic and bring the incidence of the disease to a managable level. With the malaria vector having become resistant to DDT, it was necessary to change to malathion in the house spraying program. Results were spectacular, and, as in the 1960's a 99 percent reduction in malaria cases was achieved. (Annex D).

The major achievement of the 1975-80 MCP, the reduction of the Annual Parasite Incidence (API) to less than 0.5 cases per 1000 population was shortlived. By 1981 there were clear indications of increasing malaria transmission (Annex-D). This deterioration may have been caused, in part, by the sudden

influx of Afghan refugees who brought with them a large reservoir of malaria. In 1981 there were an estimated 2 million refugees, and by May 1988 there were more than 3 million.

To assist the GOP in maintaining API of 0.5 or less, the Malaria Control II Project was approved in May 1982. The major objective was to contain and further reduce the incidence of malaria by expanding the capacity of the Federal, Provincial and municipal health services to control malaria and transform MCP from a vertically organized program to an integrated program using a selective mix of vector control measures and a better balance between active and passive case detection.

In 1987, USAID/Pakistan recommended an extension of the Malaria Control II Project, with a project assistance completion date (PACD) of September, 1992. This extension will build on the success of Malaria Control II, but put a stronger emphasis on institutional building, particularly on the adoption of passive case detection and treatment of malaria cases by the general health services.

5.1.2 Impact of Agricultural and Engineering Activities on Incidence of Malaria

Agricultural and engineering programs are normally conducted completely separate from and without regard to malaria control programs (MCOPs). Program designers in each field are usually not sensitive to the impacts that activities in one sector have on another. The impacts, however, are striking. Four are described below:

5.1.2.1 Pesticides: The use of insecticides in agricultural pest management schemes may lead to pesticide resistance in mosquitoes before the pesticides are ever used in an MCOP, or may hasten development of resistance during an MCOP. "Pre-resistance" in anopheline mosquitoes caused by application of agricultural pesticides has been documented in Africa, Central America and Asia (WHO, 1986).

In Pakistan a wide variety of pesticides are used over large areas in agriculture. For example, in 1987, 3000 MT of organophosphates, carbamates, chlorinated hydrocarbons and pyrethroids were imported for use on 10 million hectares of crops in the Punjab. About 80 per cent of these were applied to cotton. In the NWFP, 10,000 hectares of sugarcane are aerially sprayed each year with a variety of insecticides.

Most all of the sprayed farm lands are irrigated. Irrigation systems may provide breeding habitats for mosquitoes. By spraying crops, farmers are also spraying mosquitoes either directly, or indirectly by run off into irrigation canals.

Susceptibility trials conducted during 1988 in the Punjab indicate that both An. culicifacies and An. stephensi, known and suspected malaria vectors, respectively are tolerant to fenitrothion in several districts. This OP was used in a limited way for 3 years in MCOPs in the early 1980's but since 1984 has been used only in agricultural programs. The steps leading to tolerance in this case are not clear, but agricultural use has most likely contributed to it. The fall out of such tolerance is critical; the option of using fenitrothion (Georghiou, 1986), one of the few insecticides available to MCPs, may have been compromised in the Punjab before it was ever fully used in an MCOP.

Similar cases of "pre-resistance" have led certain countries, such as Sri Lanka, to reserve certain pesticides for use in public health programs only. Use in agricultural programs has been banned.

5.1.2.2 Dams: Damming projects, a favorite in the quest for energy self-sufficiency, by design, bring running water to a standstill and thus may provide vast areas year round of potential mosquito breeding habitats where there once were few if any.

Dams, on the other hand, facilitate flood control activities and may thus decrease the periodic outbreaks of malaria caused by increased breeding pools that result from floods.

There are 7 major, and several smaller dams in Pakistan

More research is needed before cause and effects can be ascribed to the relationship between dams and malaria, but in the meantime, proposals to construct dams in areas of high malariogenic potential should be studied carefully by both engineers and public health specialists. Methods used by the Tennessee Valley Authority for managing dam water levels to decrease mosquito infestations should be considered (TVA, _____).

5.1.2.3 Irrigation: Irrigation schemes are often the first step in turning non-arable land to farms. In many developing countries the commonest method of irrigation is by canals or channels that distribute water to, and sometimes, throughout the field. There are 30,000 miles of irrigation channels in Pakistan.

Actively used, well maintained (weed-free) irrigation canals are not active breeding grounds for mosquitoes; actively moving water or channels that are drained frequently do not provide the stable aquatic environment needed for mosquito development.

If, however, as is often the case, canals become clogged with vegetation or are damaged and leak into standing side pools, the created environment may be perfect mosquito habitat. Lining canal with brick may help decrease mosquito infestations.

Design of irrigation schemes should be a joint effort between engineers and public health specialists. Malariologists may be able to suggest methods of design such as brick lining that would decrease liklihood of canals serving as mosquito habitats. And as with dams, the malariogenic potential of an area should be considered as irrigation systems are proposed.

5.1.2.4 Farm Productivity: Farm productivity in developing countries relies heavily on vigorous human labor. Malaria delibitates. Thus above certain levels of infestation, the work force available and the vitality of that work force will be affected by malaria.

When projecting agricultural output planners must factor in disease incidence. Clearly agricultural planners have a stake in and should take an interest in the success of MCOPs.

5.1.3 Project Goals, Purpose and Output

The specific purpose of the project is to assist the GOP to continue and further reduce the incidence of malaria in the country, maintaining malaria incidence at a level where it does not constitute a major health problem, and to train a cadre of technical personnel to sustain the control program without, or with only minimal, requirements for external assistance.

Specific objectives include:

1. Support of the GOP malaria control objectives to:
   a. Maintain an annual parasite incidence at or below 0.5 cases per thousand.
   b. Contain the infections of P. falciparum malaria to less than 20% of all cases of malaria in Pakistan.
   c. Improve the malaria surveillance system through increasing the proportion and number of slides collected through a passive case detection (PCD) system to 70% of the total (i.e. passive and active) numbers of slides collected for the detection of malaria cases in Pakistan.
   d. Reduce household spraying to less than 20% of all houses in the country by determining foci for spray on sound current epidemiological data; attachment of greater than 95% spray coverage of the targeted housing.

2. Initiate and assist operational research at NIMRT, targeting operational problems identified by the Directorate of Malaria Control and/or provincial programs.

5.2 OTHER DONOR ACTIVITIES

Other donors who have assisted the Pakistan MCP are WHO, the Japanese Government, UNICEF and UNHCR. These donor contributions have been primarily for commodities, training, and technical assistance, while the GOP provides the local cost support required for such contributions. Anticipated future contributions are:

5.2.1 World Health Organization

The WHO representative in Islamabad stated that WHO has a two-year malaria budget of $300,000 for training, supplies and support of evaluation. WHO/Geneva has a technical capability and information base which may be utilized on occasions. WHO has been providing long and short term technical assistance, training fellowships and commodities including transport. In the past two years, however, WHO did not have funding for long term malaria advisory services to Pakistan MCP.

5.2.2 United Nations Children's Emergency Fund (UNICEF)

In the 1975-80 period UNICEF provided anti-malaria drugs. UNICEF is no longer participating in malaria programs.

5.2.3 Government of Japan

Except for some insecticide in 1982, the Japanese Government gave no assistance during the first phase of Malaria Control II. The DOMC mentions possible assistance in 1988-92 from Japan in the form of fenitrothion and vehicles. To date, however, no committments have been made or sought.

5.2.4 United Nations High Commission for Refugees (UNHCR)

The UNHCR is operating separate but coordinated malaria control activities in the Afghan camps located in NWFP and Baluchistan. In 1988, there has been increased coordination between USAID, DOMC and UNHCR in planning and implementing the malaria program in the Afghan refugee camps.

To date the Pakistan MCP has been financed in roughly equal halves by ADB (foreign exchange) and GOP (rupee inputs). At present there is no other significant donor.

5.3 AFFECTED ENVIRONMENT

The Islamic Republic of Pakistan lies in the south eastern section of Asia, and is bordered on the east by India and China, on the north and west by Afghanistan, on the southeast by Iran and on the south by the Arabian Sea. Pakistan covers approximately 796,095 square kilometers, including the disputed territories of Jammu and Kashmir. The northern fourth of the country is mountanious with elevations of 4500 m. The southeast is lowland deserts and the central and southwest contain flat, but mesic lowlands. South centrally, the Brahin mountain range rises to approximately 2000 m.

5.3.1 Land Utilization and Agricultural Resources

Most of the agricultural crop and livestock production occur in the eastern and south eastern region of the country with relatively little production in the mountainous and desert areas. Cotton, wheat, rice and sugarcane are primary crops, with maize, grain, jowar, bajra, barley, tobacco, oilseeds and purses being secondary in importance. Buffalo, sheep, goats, camels, horses and mules are the common livestock. A total of approximately 11 million hectares are under cultivation.

Large coal reserves occur in Sind, Baluchistan and the Punjab.

5.3.2 Forestry Resources

According to an article that appeared in an August, 1988 issue of a Pakistan newspaper, Pakistan presently has 5% of its land covered in forests. A plan to reforest vast areas has been proposed by the President with the goal of 25% reforestation.

5.3.3 Parks and Protected Areas

Lists of all Pakistan national parks, wildlife sanctuaries and game reserves were assembled in April, 1988 by Dr. Waldemar Albertin, Environmental Advisor, Office of Energy and Environment, AID/Islamabad.

Pakistan has 7 national parks, 69 wildlife sanctuaries, and 73 game reserves. Parks, sanctuaries and reserves are found in all provinces and vary in size from a few hectares to 2.7 million hectares. A variety of animal wildlife is found in all of these areas.

5.3.4 Rare and Endangered Species

According to a survey completed in April 1988 by Dr. Waldemar Albertin, Environmental Advisor, Office of Energy and Environment, AID/Islamabad, 31 species of mammals, 2 species of birds and 5 species of reptiles are presently considered by the Wildlife Enquiry Committee as endangered. The International Union for Conservation of Nature and Natural Resources lists 5 additional animal species as threatened with extinction in Pakistan. Each Province contains endangered species.

No information is available on endangered plants or insects.

5.3.5 Human Population

The 1988 population of Pakistan is estimated to be 100 million with the largest concentration of people in the south eastern and north central regions of the country corresponding to the Indus River Basin. Karachi, Lahore, Peshawar and Islamabad-Rawalpindi are the four major centres of population.

The annual growth rate is apporoximately 3.0%.

6.0 PESTICIDE USE ASSESSMENT

This section addresses the questions listed in AID Regulation 216.3 (b)(1) regarding the use of insecticides. The focus of this section is on the use of the organophosphate (OP) insecticides malathion and fenitrothion (Sumithion) as residual house sprays aimed at interrupting transmission of malaria by killing of infective An. culicifacies, the major mosquito vector of malaria in Pakistan.

In addition to these two OPs, the project extension will provide funds for the purchase of adulticide pyrethroids in the amount of $172,600, and ULV and fogging mechines ($900,000) for applying pyrethroids in urban settings. The extension also includes GOP contributions of Rs.2,411,100 for larvicides. The types of pyrethoids and larvicides are not indicated in the PP, and project personnel indicated to the EA team that selection of the materials had not been made. The EA team did not see these pesticides and did not review their use. Thus the EA team is not in a position to judge the appropriateness, safe use or environmental impact of the pyrethroids or larvicides.

6.1 U.S.EPA REGISTRATION STATUS OF THE SELECTED INSECTICIDES

6.1.1 Malathion

Malathion is a widely used organophosphate (OP) insecticide which is registered by the US EPA for mosquito control. Malathion used in the extension will be 50 per cent water dispersable powder (WDP) formulated for residual house spray application. The pesticide will be manufactured by US firms. A copy of the malathion 50 WP label is included in Annex C of this report

(More particulars to be added in Washington)

6.1.2 Fenitrothion (Sumithion)

Sumithion, an OP insecticide, is registered with the EPA under various numbers depending upon the formulation. The active ingredient is O,O-Dimethyl O-(4-nitro-m-tolyl) phosphorothioate. A copy of the Sumithion 40 WP label is included in Annex C of this report. This wettable powder is the most commonly used formulation in malaria control programs worldwide. Sumithion is manufactured by Sumitomo Chemical Company, Ltd of Japan. A technical manual fully describing the use of Sumithion, its formulations, toxicity, environmental fate, safety precautions, etc. is on file at VBCP and USAID/Islamabad/HPN.

The material in a 40% wettable powder formulation expecially designed and packaged for residual wall spraying is registered by the EPA (EPA Reg. No.39398-9). A 50% EC (emulsifiable concentrate) used for residual wall spraying of painted walls only is also registered (EPA Reg. No. 39398-2).

6.2 BASIS FOR SELECTION OF INSECTICIDES

Although DDT was the insecticide used in the early years of the Malaria Eradication Program, malathion spraying was substituted where widespread resistance to DDT was detected in the 1970's. Susceptibility tests carried out by the DOMC in 1987 and 1988 clearly indicate that there is no prospect in sight that DDT will be of use in anopheline mosquito control in Pakistan in the foreseeable future.

Malathion has traditionally been considered the chemical of choice as an alternative for indoor residual application due to its low mammalian toxicity, relatively low cost compared with other non-chlorinated insecticides and most importantly, due to the unique mechanism of resistance to it. This mechanism, based on the enzyme carboxylesterase, is highly specific for malathion, thus insects becoming resistant to it by this means are not cross-resistant to other insecticides.

In the early 1980's, evidence, based on the WHO susceptibility test, began to accumulate that certain populations of An. stephensi, a proven malaria vector in parts of Pakistan, were developing resistance to malathion. Fenitrothion was considered to be the logical alternative insecticide for house spraying, but it was important that the transition to fenitrothion be gradual and that it be made only where there was clear evidence of substantial resistance to malathion.

In view of the importance of establishing sound criteria for the change to spraying of fenitrothion, USAID/Pakistan contracted a world authority on insecticide resistance in mosquitoes, Dr. George Georghiou, of the University of California at Riverside, to analyse the available data and make recommendations. Georghiou (1986) made the following recommendations:

a. The insecticide fenitrothion may be phased gradually into the malaria control program on a district by district basis where there is clear evidence that high malathion resistance in An. stephensi is prevalent.

b. The criteria for replacement of malathion will be (1) 60 per cent or less average mortality of An. stephensi in susceptibility tests conducted in several localities during the preceding two years according to the standard WHO procedures, and (2) an unacceptably high level of malaria transmission relative to the norm for the district.

c. The replacement of malathion by fenitrothion in 1987 should be considered only for districts of the Punjab Province, in view of their ability to conduct spray operations with relative efficiency. In subsequent years, individual districts in other provinces may also be considered, i.e. NWFP in 1988, Sind in 1989 and Baluchistan in 1990.

d. Since fenitrothion possesses higher toxicity to mammals than malathion, districts changing to fenitrothion must intensify their staff training program at all levels on the safe use of this insecticide, in addition to excercising increased field supervision during spray operations.

6.3 INTEGRATED PEST MANAGEMENT AND MALARIA CONTROL IN PAKISTAN

Integrated Pest Management (IPM) leads to a reduction in the use of synthetic pesticides for two reasons. One is that pesticides are used only when a predetermined threshold level of pest incidence or damage is exceeded. Below the threshold no pesticides are applied because their cost would not be recovered in increased profits. The other reason is that all useful non-pesticidal methods of control are brought to bear to keep pest populations below the threshold.

Determination of a threshold level requires considerable field study. Field monitoring also is required on a continuous basis so that the level of infestation can be determined. Thus IPM is generally a training-and labor-intensive method.

The proposed project uses an IPM approach to effect malaria control. For example, DOMC project personnel will base their decision to use or not use insecticides on whether infections in a locality exceed an API threshold of 2.0 for Plasmodium vivax or when any P. falciparum (a more deadly agent) is detected. Thus the project will use responsive spraying based on epidemiological data, not broadscale preventative spraying.

The project will use chemotherapy to help maintain low APIs. This alternative to pesticide control of the vector has proven useful in Pakistan and elsewhere in decreasing malaria transmission.

No other alternatives to pesticides such as source reduction or biological controls are contemplated for use in the extended project, but research in these areas is to be conducted.

In the last 3 years, the quantity of pesticide used has been reduced from a recent peak of 3,700 MT in 1985 to 1,200 MT in 1988 (Annex E). The program has moved from one in which attempts were made to spray all localities to one in which only 20% of all localities are now sprayed. Use of an API threshold has undoubtedly contributed to this decrease.

It is clear, however, that the amount of pesticides used is also weather-dependent. 1986 and 1987 were very dry years in Pakistan and this surely contributed to decreased APIs and thus decreased need for pesticides. With the heavy rains in 1988, the pressure to use more pesticides, and to ignore API thresholds ("spray every where") may increase.

6.4 APPLICATION METHODS AND EQUIPMENT

The insecticides will be applied to the inside wall surface of houses by the use of portable hand pressure sprayers (Fig. 2). The objective is to achieve a total coverage of all inside wall surface. Spraymen are trained to control the movement of the lance, and the distance of the nozzle tip from the wall to ensure the delivery of this dosage to the wall. Pump pressure is maintained by a specified number of strokes per pump charge. Training in the correct spraying technique, and filling and pressurizing the pump, is given to all spraymen at the start of the spraying season.

The only spraying equipment to be used in this project is the Hudson X-pert sprayer, of 4 gallons capacity, fitted with a T-JET 8002 hardened stainless steel nozzle tip, and delivering a flat, fan-shaped spray pattern.

6.5 ACUTE AND LONG-TERM ENVIRONMENTAL AND TOXICOLOGICAL HAZARDS

6.5.1 Malathion

The acute and long-term environmental and toxicological hazards of malathion are summarized in Tables 1 and 2, respectively. They have recently been thoroughly reviewed as part of the Environmental Impact Statement on the Mediterranean Fruit Fly eradication program in Guatemala (CICP, 1988).

Based upon its relatively low mammalian toxicity and its long history of use in agricultural and public health programs, malathion is considered one of the safer, more benign synthetic pesticides.

Symptoms of overexposure can be treated with intramuscular injections of atropine sulfate. This antidote should be available to project personnel. Blood cholinesterase levels of all personnel who come in frequent contact with malathion should be monitored before and during the spray season to detect any suppresion.

Accidental or suicidal ingestion of malathion can cause illness or death. Thus malathion should be stored in a secured location, should not be provided to householders, and should be kept away from the public when brought out in bulk for use.

In the mid 1970's a series of accidental deaths in Pakistan were attributed to a shipment of malathion which was contaminated with highly toxic by-product iso-malathion (Baker et al, n.d.). Thus monitoring of product purity is an essential component of safety procedures. Currently, malathion purchased by the project is certified as pure by the manufacturer, and the project can send samples for analysis to the Centers for Disease Control in Atlanta if contamination is suspected.

6.5.2 Fenitrothion

The environmental and toxicological properties of fenitrothion are summarized in Tables 1 and 2 respectively. The environmental fate of fenitrothion is discussed in detail in Gordon (1981).

Fenitrothion is a more toxic material than is malathion and thus all procedures to minimize environmental impact and human exposure engrained in project personnel for application of malathion must be strictly and carefully enforced if fenitrothion is used.

TABLE 1: SUMMARY OF ENVIRONMENTAL FATE ATTRIBUTES OF MALATHION AND FENITROTHION

PESTICIDE	BIRDS	FISH	OTHER ANIMALS	PLANTS	WATER	SOIL
Malathion	(To be added in Washington)					
Fenitrothion	Moderately toxic	Toxic	Toxic to bees and livestock, game and wild animals.	Phytotoxic: Brassica spp, flowering and orchard crops, should not be applied to grains.	Half-life in river water of 50 hrs. In lake and sea water: 1 day.	Half-life of 12-28 days. Migrates in sandy soils. Inactivated by soil bacteria.

SOURCES: WHO Data Sheet on Pesticides No. 30.
Sumithion Technical Manual (Sumitomo Chemical Co., Ltd)

SECTICIDES FOR MOSQUITO CONTROL

are efficient mosquito control insecticides,
cides inside houses. The anopheline vectors of
An. stephensi are known to enter houses at
rest on inside surfaces of houses for varying
n. Contact with surfaces sprayed with the
al to potentially infective mosquitoes, thereby
ransmission. Residual activity of these
nths, depending on the type of wall
praying in Pakistan, when properly timed in
nsmission season, has been demonstrated to
the disease, and in some cases, eliminate it

nd fenitrothion, have been successfully used in
many countries for the past 20 years,
control projects in Ecuador, India, Sri Lanka

ssed successfully through the strict screening
Organization, and are cleared for use in
ded that the proper use practices are followed.

ICIDES ON NON-TARGET ORGANISM AND NATURAL

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TABLE 2: SUMMARY OF TOXICOLOGICAL ATTRIBUTES OF MALATHION AND FENITROTHION

PESTICIDE	LD_{50} ORAL[1]	LD_{50} DERMAL[1]	CUMULATIVE EFFECT	CUMULATION	INHALATION	CARCINOGENECITY	TERATOGENECITY	NEUROTOXICITY
Fenitrothion	504	3,500	Depressed cholin. levels. Severe may require 30 days	Does not accumulate in body tissues	Depressed cholin. levels. 7 days recovery	No effect	No effect	No nerve damage
Malathion								

safe use practices for these materials. The spray team consists of five spraymen (Fig. 1) and one mixer, all working under a team leader who is the Malaria Supervisor. The mixer stays in a fixed spot in the village, where he measures the insecticide (water wettable powder) directly from the cardboard shipping carton into a mixing bucket, one pump charge at a time. He then adds a small amount of water to make a thick slurry, then adds more water to a line which indicates one pump charge (Fig. 3). Spraymen return to the mixing station for refilling the pumps when necessary througout the day.

Householders are notified in advance as to when the house is to be sprayed, and what is to be done to prepare the house for spraying. They are told to remove all food from the house and move furniture away from walls (Fig. 4). They are also instructed to remain outside the house for at least one hour after spraying, to then sweep the floors, and to bury the sweepings. Instructions are also given about keeping domestic animals outside during the spraying, and for the waiting period after the spraying.

Spraymen are assigned a pre-determined number of houses to spray per day, and their work is frequently checked by the Malaria Supervisor. He, in turn, is periodically supervised by the Malaria Superintendent and the District Medical Officer. Daily records are kept of houses sprayed and insecticides used. Insecticide stocks, in their original shipping cartons, are kept in a locked room in the village (Fig. 5), and access is controlled by the Malaria Supervisor.

AID has prepared several hundred larinated cards which describe in Urdu the treatment for pesticide poisoning and the doser for chemotherapy. These have been distributed widely to all levels of malaria workers. An example is given in Annex H.

6.9 AVAILABILITY AND EFFECTIVENESS OF OTHER INSECTICIDES AND/OR NON-CHEMICAL CONTROL MEASURES

For reasons already discussed in section 6.2, it is advisable to continue using malathion until such time that it becomes operationally ineffective, and

then to gradually phase in the use of fenitrothion. A third line of chemicals, suitable for indoor use, are available, and might be considered for use in the future should fenitrothion fail. Candidates for consideration include bendiocarb, propoxur, pirimophos methyl, and a pyrethroid (possibly Permethrin). These insecticides are available commercially, but any decision to use them in the future should be based on careful analysis of results of field trials carried out in Pakistan, as well as in other countries.

Non chemical malaria control methods involving source reduction by drainage and improved water management are available and appropriate for use in urban settings. Efforts to introduce non-chemical control measures into rural areas of Pakistan are at present non-existent, but should be considered for selected localities in the future.

6.10 ABILITY OF THE GOVERNMENT OF PAKISTAN TO REGULATE OR CONTROL THE DISTRIBUTION, STORAGE, USE AND DISPOSAL OF PESTICIDES

Although legislation may exist in Pakistan which regulates the transport, storage, use and disposal of hazardous materials such as pesticides (see section 2.2), the EA team believes that safety procedures have been and will continue to be exercised primarily through the GOP's Directorate of Malaria Control and the offices of the Provincial Directors of Health. The following describes the team's findings as they visited ongoing project operations in which malathion is used.

The EA team was unable to visit Karachi where the shipment of malathion is received and unloaded from ship to trucks. In the past, both AID and DOMC have sent technical officers to oversee the unloading of insecticides in Karachi. This input should continue so that potential problems may be corrected. The pesticide accident contingency consultant could be of assistance in these inspections (See 8.2.1.6).

Contract truckers distribute the pesticides. Each truck carries 7 MT so that approximately 175 trucks were needed to distribute the 1,200 MT of malathion received in 1988. The ability of these truckers to react appropriately if an accident occurs en route should be determined. (See 8.2.1.6).

Thus, the team believes that the distribution system, particularly in regard to safety at the port and en route should continue to be examined.

The system of pesticide distribution to be used in the project will minimize handling and secondary transport. No large provincial or district distribution centers are planned. Instead, pesticides are taken directly from Karachi to a rural health centre (RHC) close to the intended site of use. Most RHCs have an empty room available for use which is away from frequented areas. The team visited 3 of these sites in the Punjab. All were secured with locks, solidly constructed, neatly maintained and inventoried. Pesticide boxes were placed on dry floors (usually soil) (Fig. 5), and the rooms were passively ventilated with windows. Rain was prevented from entering by window overhangs and elevated door sills.

Oldest pesticides (at most 1 year old) were used first. In most instances stores are empty much of the year because supplies are depleted in August and not resupplied until March. Only project malathion was stored in these facilities. Otherwise they were empty.

Small numbers of boxes are removed as needed from the RHC store and transported by small trucks to the spray site. The team did not see this last leg of transport.

Sometimes 4-5 boxes of pesticides will be stored at the spray site for one week while the locality is sprayed. The team saw one of these storage rooms in the NWFP. It was a locked room in an infrequently used "guest house." Two beds were in the storage room, and small amounts of malathion were spilled on the floor. The room had been recently sprayed with malathion - an indication that it was considered a sleeping room.

Wheel barrows were used to move boxes from this store to the mixing area in the village.

The use of project pesticides is discussed in section 6.8.

Disposal of unused pesticides should not be necessary during the project; all pesticides will be used either the year they are purchased or the following year. Amounts of pesticides purchased are, to the extent possible, based upon predicted need (see section 2.3). Thus supply is matched to use.

Malathion is delivered to the project in plastic lined cardboard boxes. Each box holds about 30 kg of pesticide and measures roughly 80 cm X 40cm X 40cm. When empty, the cartons are flattened and burned. Cardboard boxes are more easily disposed of than are metal drums; if fenitrothion is purchased, it should be packaged in cardboard containers.

Disposal of rinsate from mixing buckets and spray tanks was sometimes in dug holes away from water sources and sometimes into open water/sewage channels that ran through the village.

6.11 PROVISION FOR TRAINING OF MALARIA CONTROL INSECTICIDE USERS

Specialized pre-service and in-service refresher courses for senior and mid-level provincial and urban health officers (malaria staff and general health staff working on malaria) are provided regularly by the NIMRT in Lahore. The courses offered are designed to meet the current malaria control program needs. Pre-service courses include 12-14 week courses for physicians, malaria superintendents and entomologists, and 10 week courses for junior field supervisors. A part of the curriculum is instruction in insecticide application technologies, formulations, safe use practices and the use of cholinesterase test kits. In addition, a USAID-financed 3-day workshop is given annually for entomologists, malaria superintendents and health education officiers in each province, the subject being safe use of insecticides. The objective is to give refresher training to these trainers, who will in turn give instructions to all malaria supervisors who will serve as spray squad leaders.

When spraymen and mixers are employed for the spraying season each year, they are given a one week training period by the malaria supervisors who will be their squad leader. This training includes the proper mixing and spraying techniques, as well as safety precautions to protect employees as well as householders.

6.12 PROVISION FOR MONITORING THE USE AND EFFICACY OF THE SELECTED INSECTICIDE

The regular system of supervision of spraying operations within the framework of the Malaria Control Program is described in section 6.8. In addition to this, AID has its own system of safe use monitoring. A foreign service national employee of the Division of Health, Population and Nutrition has the responsibility of making visits to localities where spraying is is going on to check on the insecticide handling and storage practices. These responsibilities are included in this employee's job description. During these site visits he checks spraymen for adequate protective clothing, and the spray equipment for proper maintenance. He also observes and reports on spraying techniques and record keeping. An inspection check list has been developed to assist him in his inspection, and an example of this list is given in Annex F.

As for efficacy of the selected insecticide, the final test for this is whether the API is reduced in a locality sprayed with the insecticide. These values are calculated at the end of each year and may be compared with the API for previous years in the same locality. In addition to this, entomological techniques are available for testing the efficacy of the spray. These include bio-assays of sprayed surfaces, and indoor captures of resting vector mosquitoes before and after spraying. Both of these techniques are routinely employed by the Malaria Control Program.

7.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

The following section highlights probable impacts of the Malaria Control Project II Extension. Further discussions are found in Sections 6.5 and 6.7 of this EA.

7.1 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Because of the contained nature of the intradomiciliary application of insecticides and the threshold method upon which spray decisions are based, the impact of insecticides on the outdoor environment should be negligible. Indoor spraying may effect the environment if arthropods killed by the sprays indoors are consumed by predators. Sweeping and burying insects killed by insecticides should minimize this possibility. Contamination of water with use from spray mixing buckets and tanks will be minimized if rinse water is buried in a hole away from water sources.

Impact on humans is unavoidable. Spraymen will be exposed. This EA indicates methods of decreasing such exposure.

The proposed use of ULV applied pyrethoids in urban settings should be reviewed for possible adverse impacts. This EA does not cover this use.

7.2 THE RELATIONSHIP BETWEEN SHORT-TERM IMPACTS AND LONG-TERM PRODUCTIVITY

Major benefits would accrue as a result of the program if malaria was suppressed to or maintained at low levels (below 2.0 API). Human welfare and vigor would be enhanced.

Complete eradication of malaria is probably not possible in Pakistan both because of the large population and the mobility of that population. Cases are always entering the country from abroad. Thus there will probably always need to be surveillance and treatment (medical and entomological) to combat low levels of malaria in Pakistan. The cost of such activities is undoubtedly outweighed by the benefits.

Additional costs, although difficult to estimate, must, however, be factored in. For example, the cost of accidents during the transport, storage or use of project pesticides could be considerable. This EA recommends ways of preparing for such eventualities to decrease the severity of potential accidents (8.2.1.6).

7.3 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed project would result in the irretrievable consumption of petro-chemicals in the form of pesticides and motor fuel.

In the unlikely event that insecticide application was to permanently alter some aspect of the affected ecosystem, this would represent an irreversable change. Given the contained nature of intradomicilary pesticide application in the project, this is not expected to occur.

8.0 ENVIRONMENTAL IMPACT MITIATION PLAN

The following section describes a prioritized plan of action that should assist project personnel in maintaining and improving the safety aspects of pesticide use in the project.

The EA team feels that current project personnel, from administrator to sprayman, are sensitive to safety concerns and are adequately using many safety precautions. This level of safety awareness is expected to continue through the extension. In certain aspects, it should be enhanced. The recommendation that follow are necessary for the safe use of malathion. They are critically necessary with the anticipated use of fenitrothion.

8.1 PRIORITIES

The EA team believes that the primary pesticide hazard in the extension will be to humans exposed to spray, not to the outdoor environment. Safe handling should minimize the chances of contaminating the outdoors. Thus safety protocols are considered of highest priority. Appropriate protection, monitoring, treatment, handling and training are important parts of the protocols. Accident contingencies should also be considered. The necessary level of each will be described (8.2.1).

Next in importance is research that should be conducted in direct support of establishing safety protocols (8.2.2).

Thirdly, means to monitor project performance and compliance in safe handling of pesticides are given (8.2.3).

Lastly, cooperative/coordinated planning between vector control, agricultural and engineering projects will be encouraged (8.2.4).

8.2 SAFETY PROTOCOLS

8.2.1 Protection

8.2.1.1 Spray Uniforms. The most critical adjustment that must be made regards protective clothing. Each sprayman, each mixer, each supervisor and each administrative inspector who routinely comes in contact with pesticides must be provided each year with a spray uniform package consisting of 4 suits of clothing that include a long sleeve shirt, pants, high top shoes, ~~rubber gloves~~, a disposable mask (one for each day of exposure) and a cloth head covering. Additionally ~~50~~ extra uniform packages should be available in each province to replace worn out, torn or otherwise useless uniforms. The shirts and pants should be made from good quality, durable fabric that withstands frequent wear and washing.

Presently spraymen and supervisors are provided 1 or 2 suits of poor quality easily-torn material, no gloves, no footwear (Fig. 1), and they use turban cloths as face masks. Mixers have the same gear plus gloves. Provision of 4 suits should enable spraymen to wear a clean suit every day. Such a change in clothing should be required by the supervisor. Gloves, shoes and daily disposable masks will decrease exposure to pesticides.

The estimated cost of spray uniforms packages is given in Annex G.

The EA team recommends that pesticides not be applied under the extension until spray uniform packages as described above are provided.

Soap should be provided as it currently is, at the rate of 1 bar/week/sprayman. Provisions for spray tank equipment and replacement parts are adequate as planned for the extension.

To minimize mistakes in measuring out pesticides, each mixer should be provided a standard, calibrated container.

8.2.1.2 Householders: The best method of protecting householders from exposure to spray is to enforce the follow protocol:

1) Remove all items from the house.
2) Keep people and pets away from the house as it is sprayed.
3) After spraying, close all doors to prevent entry, but open all windows to hasten ventilation and drying.
4) Prohibit reentry for 1 hour.
5) Sweep floor and bury sweepings in a hole away from house.
6) Post house cards in each house to record visits, inspections and sprays.

8.2.1.3 Overexposure

8.2.1.3.1 Monitoring: Each province should be provided with enough blood cholinesterase monitoring kits such that each spray district in each province has a new kit available at least 2 months before spraying begins.

All members of the spray squad (supervisor, mixer, sprayman) should have levels tested before the spray season and at least once during the spray season -- 2 to 3 weeks after spraying starts. Thus each district must schedule the time needed for trained manpower to conduct this monitoring program.

People with levels of cholinesterase lower than 70% of normal should not be allowed to spray for 1 week, and then only if levels have returned to above 70% of normal.

The estimated cost of kits is given in Annex G.

8.2.1.3.2 Treatment: Currently each spray squad supervisor is aware of the symptoms of over exposure, is equipped with vials of atropine sulfate and syringes, and knows how to inject. The EA team feels that this level of preparedness is appropriate and should be continued.

At the same time, the team recommends that all squad members should be instructed to ~~take overexposed individuals immediately to the nearest health facility~~ seek medical attention for poisoned victim after completing atropine treat ~~(before spraying, squad members should be told where this is) with atropine and syringes so that initial or follow up injections and observations can be made by the medically trained.~~

The squad's key role should be to detect overexposure and to deliver cases and medication quickly to a health unit. This recommendation should be reviewed by the Accident Contingency Consultant. (see 8.2.1.6)

As part of the project extension, health unit personnel should be trained in the recognition and treatment of pesticide overexposure and all health units particpating in the project should be supplied with atropine sulfate. See Annex G for estimated costs of atropine sulfate kits.

8.2.1.4 Transport, Storage and Disposal: Each driver transporting pesticides from Karachi to the storage sites should be provided with instructions (written or oral) on the nature of the hazardous material being transported, safety precautions needed in handling and transporting the materials and procedures that should be followed in the case of an accident en route. Such instructions should be developed by the Accident Contingency Consultant (see 8.2.1.6).

Storage should be in a secured, solidly constructed, clean, otherwise empty facility that is away from frequented areas. Rain-protected windows that can be opened for ventilation should be available. Inventories should be kept current and a first-in, first-out use pattern should be employed. The decentralized storage system whereby shipments are transported direct from port to site of use should be continued. It decreases handling.

Most of the storage conditions described above are met by the ongoing project. The following are recommended:

1) Under no circumstances should living quarters, temporary or otherwise, be used for storage sites. This requirement may complicate storage at localities being sprayed, but it must be followed to minimize human exposure.

2) Based upon recommendations by the Accident Contingency Consultant, provisions for preventing fires in stores should be made.

Disposal of unused pesticides presumably will not be required because all pesticides will be used. If this situation changes, project personnel should immediately seek advise on current methods of disposal in Pakistan.

Empty pesticide boxes should be collapsed, collected, moved away from inhabited areas and burned.

At the end of each spray day clean up of mixing buckets and spray cans should be conducted away from inhabited areas and water sources. Present practice ~~Rinsate should be~~ buried to continue ~~in a hole~~, never to continue poured in a water source or channel.

8.2.1.5 Safety Training: In 1988, a 3 day workshop was held in each Province on the safe use of pesticides. All Assistant Entomologists and CD officers involved in malaria control attended the workshops. Participants were expected to pass safety information on to each Malaria Supervisor. In this way safety procedures were communicated throughout the malaria control program system.

The same workshop should be held annually during the extension. Costs of such workshops are provided in Annex G.

8.2.1.6 Accident Contingency Consultant: Accidents with pesticides are a common concern. They can cause serious damage, program set backs, and loss of life. Although not totally unavoidable, accidents can be minimized through careful observation of safety precautions. When they occur, their impact can be decreased if contingency plans are in place and observed.

Pesticide accidents can occur at any time between receipt at port to disposal of empty containers, but times of greatest danger are handling at port, transportation, storage and use. It was done in Mali The proposed project will, through distribution of atropine sulfate, be prepared for overexposure accidents at the site of use. No other contingency plans are in place for accidents at other times.

Strengthening of

It is recommended that a 3-week Accident Contingency Consultant be contracted to observe project operations, advise on safety aspects of port handling and transportation of pesticides, and develop accident contingency plans for all aspects of the extension project.

A scope of work for such a consultant is given in Annex G.

8.2.2 Research

The proposed project extension includes $300,000 for research support and $150,000 for research equipment. The research will be conducted at the NMRT and is to stress operational, applied research. Ten areas of study have been outlined in the PP including pilot studies of alternate insecticides, monitoring of the effectiveness of currently used insecticides, bionomic studies of vectors, and use of mosquito control alternatives such as fish, bacteria, or source reduction.

The EA team recommends that an epidemiological study be made of factors leading to cholinesterase depression in spray squads. When depression is detected, follow up research should be conducted by way of interviews to determine what conditions such as age, overall state of health, protective clothing, spray practices, etc. mostly likely led to the depression. Researchers should refer to WHO's standard protocol (1981) for field surveys of exposure to pesticides as they conduct this research.

Results from such research will enable project personnel to avoid future incidences of overexposure.

8.2.3 Monitoring Project Performance and Compliance

A program evaluation will be carried out each year of the project by a joint GOP/AID/WHO team supplemented by one project-financed external consultant.

Included in the evaluation team's assessments will be the utilization of insecticides, spray operations and insecticide handling techniques and safety measures.

The EA team recommends that all recommendations made in this EA be reviewed by a qualified member of the evaluation team. The degree to which compliance with the recommendations has been achieved should be assessed.

8.2.4 Cooperative/Coordinated Planning

To the extent possible, AID/Islamabad should encourage the participation of staff from HPN, E&E and ARD in the review of PIDs and PPs for projects involving dam construction or irrigation schemes. Malariogenic potential of agricultural and engineering projects should be assessed. The Mission's Environmental Advisor may be best positioned to coordinate such reviews.

Communication between agriculturalists and vector control specialists must be enhanced, particularly in regards to pesticide usage. The Mission Environmental Advisor should stay advised of the types of pesticides being used and the pattern of use in each sector. The incidence of resistance to insecticides should be followed in each sector. Resistance in vector control programs should constitute grounds for considering banning the use in agriculture of alternative vector control pesticides.

9.0 LIST OF PREPARERS

Hobbs, Jesse (b. 1925, U.S. citizen), Sc.D., Johns Hopkins; recently Long-Term Malaria Advisor 1985-87 USAID/Ecuador, Retired CDC (1965-1985) as Medical Entomologist; formerly Chief, Training Activities VBC Division, CDC; Colombia, Brazil, Peru; A.I.D.: Jamaica, Philippines, Guatemala; CDC: Brazil, El Salvador. A.I.D. Assessments and Evaluations in Haiti and Pakistan (1984 and 1985); Red Cross: Thailand; World Bank: Brazil. Areas of experience include malariology, vector biology and control, project management, logistics, testing and safe use of pesticides and training in all above areas. Numerous publications and training manuals on above subjects. Languages: Spanish and Portugese S3, R3.

Larew, Hiram G. (b.1953, U.S.citizen), PhD., Oregon State University; currently American Association for the Advancement of Science Fellow in A.I.D's Bureau for Science and Technology, Office of Agriculture, Pest Management. On leave from USDA, Agricultural Research Service, as a Research Entomologist. Has conducted A.I.D evaluations of pesticide use in Domincan Republic, Guatemala and Pakistan. Areas of experience include: agricultural pest maagement, agricultural research, safe use of pesticides and alternatives to pesticides. Numerous research publications on agricultural pest management.

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ANNEXES

ANNEX A: PERSONS CONTACTED

GOVERNMENT OF PAKISTAN

1. Choudhary Mujahid
   Director
   Directorate of Malaria Control
   Islamabad

In Lahore District

2. Dr. Z. A. Khan,
   Director Health Services, Punjab

3. Dr. D. Tirmizi
   Deputy Director Health Services, Punjab

4. Dr. I. H. Shah
   Director, NIMRT

5. Mr. Mateen ul Haq
   CDCO

6. Mr. Javed Iqbal Malik
   Assistant Entomologist

7. Mr. M. Iqbal
   Admin Assistant
   DHS

8. Dr. Arshad Awan
   Assistant Director Malaria, DHS, Punjab

9. Mr. Abdul Qayyum Khan
   Director Agriculture, Punjab

10. Choudhary M. Shafi
Deputy Director Agriculture
Lahore Zone

11. Dr. Mohammad A. Raees, DHO

12. Sardar A. Shaikh
Assistant Entomologist

13. Shaikh M. Ehsan, CDCO

14. Manzoor H. Shah
Senior Microscopist

15. Mr. M. Sharif Bhatti
Microscopist

16. Talib Hussain
CDC Inspector

17. Abdul Ghafoor

18. Mohammad Ashraf

19. Dr. Akhtar M.O.I

20. Israr ul Haq
M.O.II

<u>In Shaikhupura District</u>

21. Dr. Munnawar Jussain Bhutta
DHO

22. Shaikh Naseer
Assistant Entomologis

23. Mr. Azam Azhar
CDCO

24. Mr. Mohammad Azeem
Senior Microscopist

25. Mr. Manzoor Ali
Microscopist

26. Dr. Noor ul Haq Hassan
Medical Officer I

27 Dr. M. Ashiq Hussain
Medical Officer II

28. Mr. Mushtaq
Microscopist

In Gujranwala District

29. Dr. S. M. Nasir
Deputy Director
Gujranwala Division

30. Dr. Ahmad Saeed
D.H.O, Gujranwala

31. Dr. Tajjamul Hissain
ADHO, Gujranwala

32. Mr. Rafi
CDCO

33. Shaikh Saleem
Assistant Entomologist

34. Choudhary Mohammad Ashraf
CDCO

In Peshawar District

35. Dr. Sardar Ali
Director Health Services, NWFP

36. Dr. Iqbal A. Khan
Assistant Director Malaria, NWFP

37. Mr. Aziz Khan
Malaria Superintendent
NWFP & UNHCR

38. Dr. Abdul Rahim
Assistant Entemologist
DHO, Peshawar

39. Mr. Fazal-e-Raziq
Assistant Entomologist
Provincial NCP Office
Peshawar

40. Mr. Sardar Ali
Deputy Director Agriculture

41. Mr. Abdul Murad
Assistant Director Agriculture

42. Mr. Mohammad Naeem
Plant Protection Officer

USAID/WASHINGTON

1. Mr. Glenn Rutanen-Whaley
ANE/PD/ENV

2. Dr. Clive Schiff
ST/H

3. Dr. Dennis Long
ST/H

USAID/ISLAMABAD

1. Dr. Rifaq Ismail
HPN

2. Dr. Ray Martin
HPN

3. Mr. Babar Hussain
HPN

4. Dr. Robert Nachtrieb
PDM

5. John R. Morgan
E&E

OTHERS

1. Dr. Peter Okoye
   United Nations High Commission for Refugees
   Islamabad

2. Richard Nesbit
   United Nations High Commission for Refugees
   Islamabad

3. Dr. Nobill Taweel
   WHO Country Representative
   Islamabad

4. Dr. Andrew Arata
   VBCP
   Washington DC

ANNEX B: SCOPING STATEMENT

SCOPING STATEMENT FOR THE ENVIRONMENTAL ASSESSMENT OF PESTICIDE USE IN THE MALARIA CONTROL II PROJECT EXTENSION

1. INTRODUCTION

This scoping statement was written as a result of briefings held in Washington DC and Pakistan, and a field visit in Pakistan in August 1988. It was written by the EA team in accordance with 22 CFR 216.3 (a) (4) (a)-(d). Its purpose is to identify the issues that will be analysed in the EA of pesticide use in the Malaria Control II Project extension and to describe how the EA will be conducted.

2. PROJECT DESCRIPTION AND PROPOSED PESTICIDE USE IN THE MALARIA CONTROL II PROJECT EXTENSION

The extension of Malaria Control II will, like its predecessor, consists of four components: (1) Program Management: Short and long term technical assistance to strengthen the MCOP in the areas of program management, entomology, epidemiology, safe handling of insecticides, evaluation, surveillance, urban malaria control, and environmental management; (2) Training: Short term technical assistance to strengthen the training capability of the National Institute of Malaria Research and Training (NIMRT) to meet in-country training needs of the MCOP, i.e., long and short term overseas training, fellowships and inservice training programs for malaria and general health services personnel in specific aspects of malaria control; (3) Operational Research: Short term technical assistance to strengthen the capabilities of NIMRT and provincial malaria control programs to conduct operational research and field studies, to obtain supplies and equipment for research and to provide budgetary support for operational research and field studies, and, (4) Commodity Support: Residual insecticide, spray equipment, malaria control vehicles, ultra low volume (ULV) spray and fogging machines, adulticide, microscopes and other necessary commodities.

A limited amount of insecticide spraying of rural dwellings will continue to be a part of malaria control in Pakistan. The GOP recognizes that spraying can no longer be the central effort of its malaria control program, because it does not strike at the root of the malaria problem. The GOP is now directing its insecticidal spray operations mainly to malaria positive areas and encouraging passive case detection (PCD) and treatment of malaria cases at health facilities, and thus the project extension will consolidate this initiative.

Spraying will continue to be directed to those areas where malaria has been found to limit its spread. In recent years spraying operations have been mounted in 35 - 40 of Pakistan's 59 districts. Given the development in Pakistan of widespread vector resistance to DDT and BHC (the internationally recognized malaria control insecticides of first and second choice, respectively), the use of malathion and/or fenitrothion or other organophosphorus (OP) compounds is indicated in Pakistan. Malathion is one of the least toxic of the residual OP insecticides; fenitrothion, on the other hand, is one of the more toxic.

Future operational research may restrict spraying to limited areas within each district. Under the MCP selective spraying approach only villages with an annual parasite incidence (API) of 2.0 or more cases per thousand population and/or any incidence of falciparum malaria are targeted for spraying. DOMC and USAID have estimated that 1200 MT of insecticide will be needed in the current season for selective spraying of those areas with an API of 2.0 or more cases per thousand population. Currently, DOMC is contemplating the use of fenitrothion during the next spraying season in two districts of Punjab (Bahawal Nagar and/or Okara) in which resistance to malathion appears likely.

3. SCOPE AND SIGNIFICANCE OF ISSUES

The proposed use of pesticides in the project extension include:
(1) intradomicilary sprays of malathion or fenitrothion in rural settings and,
(2) the application of synthetic pyrethroids through ULV apparatus and larvicides in urban settings. All pesticide applications are to be limited to

sites in which the incidence of malaria exceeds a predetermined threshold level of 2.0 API. In other words, pesticide applications will be focused and limited in range. No broadscale area-wide applications are envisioned.

Although detrimental impact of malathion or fenitrothion on the environment is possible, the EA team believes that it should be minimal both because of its focused nature and because house spraying limits outdoor impacts. (See further comments on ULV application and larvicides, Section 3.1)

The EA team believes the greatest potential negative impact is to humans associated with the pesticide program, i.e. the applicators, the storage managers, and public in treated areas. Thus the following issues were identified for further assessment.

1) Determine what pesticides are or might be used in the extension project. Discuss appropriateness of each.

2) Determine what the current safety procedures are for house spray operations. If they are adequate, provide recommendations for maintaining current levels of safety. If they are inadequate, provide recommendations for improving safety practices.

3) Determine what the current safety procedures are for pesticide storage, distribution and disposal operations. Provide recommendations for maintaining or improving these operations.

4) Determine proposed level of cholinesterase monitoring for pesticide poisoning in the extension. Provide recommendations for maintaining or improving this monitoring.

5) Determine the extent to which drug treatment will be used in conjunction with insecticides or will be used alone in combating malaria in the extension, and suggest if and when a continued or single-tactic approach would be appropriate.

6) Determine the extent to which means other than synthetic pesticides will be used for insect control in the extension and suggest, as appropriate, ways in which these methods can be incorporated into the extension.

7) To the extent possible, determine impact of agricultural pesticide use in Pakistan on malaria control efforts and suggest methods to mitigate negative impacts.

8) Determine level of malaria control effort in Afghan refugee camps and, if appropriate, suggest ways in which this effort could interact with the extension project.

9) Determine current level of research effort and projected outcome of efforts of NIMRT and, as appropriate, identify critical research apportunities.

10) Suggest ways that the response and reaction to EA teams recommendations can be monitored during extension, to ensure sustained safety awareness after completion of extension.

4. ISSUES ELIMINATED FROM DETAILED STUDY

It is the EA team's opinion that, like many other malaria control efforts, the Pakistan MCP II extension would not be of detriment to the non-human environment. Effects of pesticides used in the extension on non-target organisms will be outlined in the EA but development of mitigative actions in this regard is not warranted.

The importance of storage safety and appropriate disposal will be stressed to minimize these potential sources of environmental contaminants. Use of buffer zones around sprayed areas, or set asides, however, will not be covered, as they are not pertinent.

5. TIMING AND PLANNING

The EA will be written as a result of a 2 person team review of the ongoing malaria control effort in Pakistan. The team will visit Pakistan in August, 1988 for 3 weeks. They will discuss pertinent issues with key project personnel in the GOP and AID, and will visit field sites in the Punjab and the NWFP to observe spray application and storage operations.

Before leaving Pakistan the team will submit a draft EA to AID/Pakistan and will brief Mission personnel on EA recommendations. Upon returning to the US the team will complete the EA for submission to AID/ANE/PD/ENV.

No variations on procedural EA guidelines are foreseen.

6. CONDUCT OF ANALYSIS AND TEAM COMPOSITION

The analysis will be conducted as per the statement of work (Attachment 2 of PIO/T No. 391-0472-3-50353), and in accordance with 22 CFR 216.

EA recommendations involving costs to the project will be analyzed by the EA team to provide an estimate of project funds needed for addressing the recommendations. Estimates will be included in the EA.

The EA team will be composed of a malariologist with wide experience in the conduct of malaria control programs, and an agricultural pest management specialist with expertise in pesticide safety, in the impact of agricultural projects on malaria control efforts, and in AID pesticide environmental regulations.

ANNEX C: PESTICIDE LABELS

ANNEX D: SLIDE POSITIVITY RATE AND API, 1975-1986

TABLE II-1

SLIDE POSITIVITY RATES (SPR) AND ANNUAL PARASITE INCIDENCES (API)

PAKISTAN MALARIA CONTROL PROGRAM

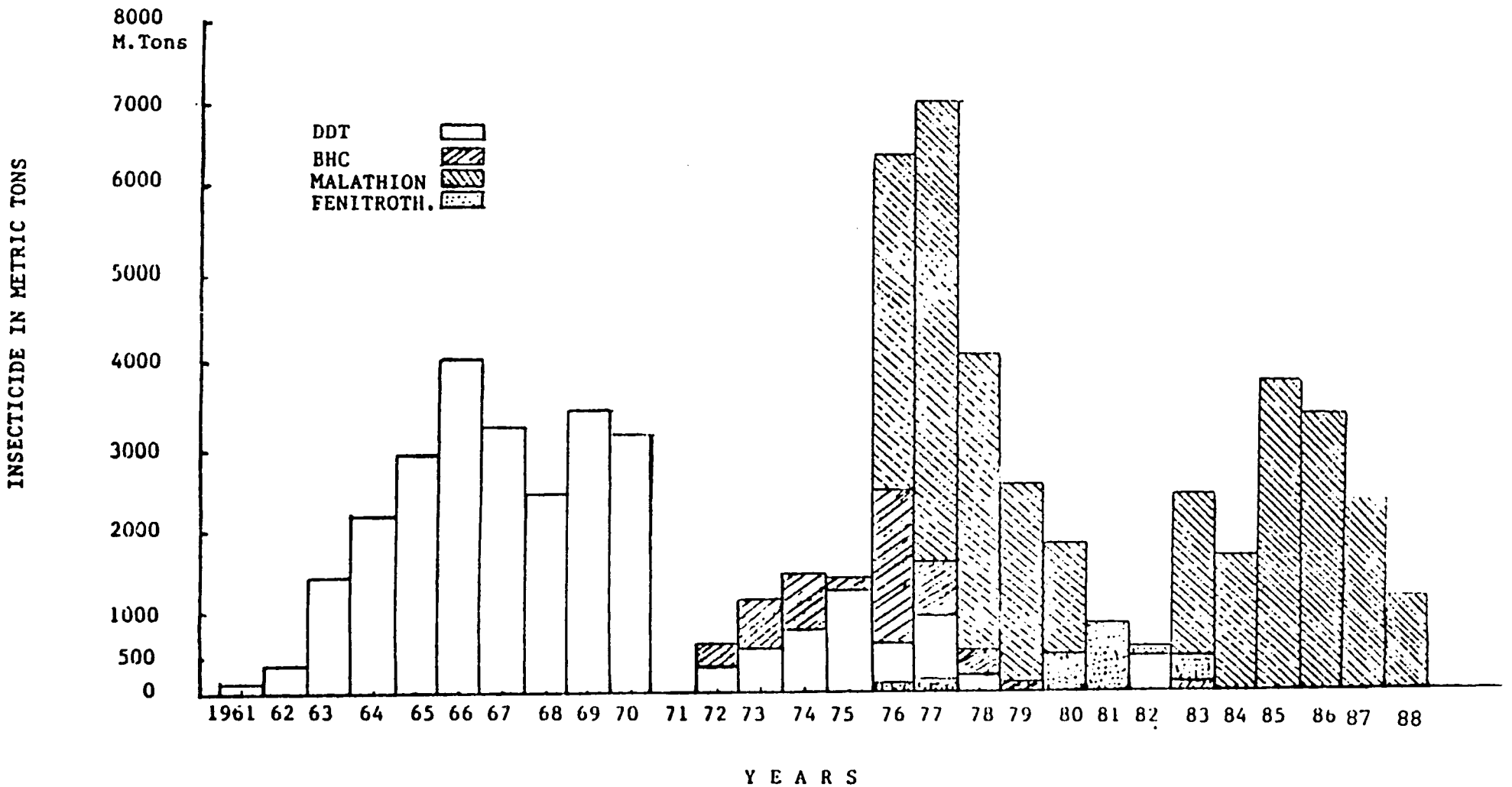
Year	Population at risk	No. Slides	No. Positive Slides	SPRs*	APIs**
1975	48,305,324	3,205,689	238,315	7.43	4.93
1976	49,789,303	2,857,854	122,219	4.28	2.45
1977	51,279,670	2,667,315	47,571	1.78	0.93
1978	52,737,019	2,588,257	16,160	0.62	0.31
1979	53,929,411	2,682,351	12,304	0.46	0.23
1980	55,103,689	3,006,264	17,707	0.59	0.32
1981	56,934,577	2,523,426	13,629	0.54	0.67
1982	58,067,409	3,303,067	56,360	1.71	0.97
1983	58,468,028	2,587,920	51,596	1.99	0.88
1984	60,746,320	3,255,853	73,996	2.27	1.22
1985	62,133,283	3,119,695	77,607	2.49	1.23
1986	63,997,281	2,899,020	90,393	3.12	1.44

* - SPR (Slide Positivity Rate) = $\frac{\text{Total Positive Casess} \times 100}{\text{Total Slides}}$

** - API (Annual Parasite Incidence = $\frac{\text{Total Positive Cases} \times 1000}{\text{Population at Risk}}$

Source: DGMC

ANNEX E: INSECTICIDE USAGE IN MCP'S IN PAKISTAN 1961-1987



Procurement of insecticides by the Malaria Eradication/Control Program, Pakistan, 1961-1986.

ANNEX F: U.S.A.I.D. HOUSE SPRAY OBSERVATION FORMS

ANNEX F

House Spraying Observation Form

Locality _____ |_|_|_|_|_| Tehsil _____ Dist _____ Province _____

Completed by _____ Date _____ Time _____

Locality projected spray schedule: Date started _____ Completed _____

Previous day's coverage: No. of house scheduled _____ Sprayed _____

1. Supervisor's Name _____

	Yes	No	How Long?
Refresher training with certification	|_|	|_|	_____
Training for spray	|_|	|_|	_____
" " safety	|_|	|_|	_____

2. No. of spraymen in squad: _____

3. Safety precautions:

	Yes	No	Qty
a. Clothing issued	|_|	|_|	_____
b. Rubber Gloves to Mixer	|_|	|_|	_____
c. Soap (one cake/man/week)	|_|	|_|	_____
d. 3 buckets	|_|	|_|	_____
e. Atropine, syringes available	|_|	|_|	_____
f. Supervisor know when to use it	|_|	|_|	_____
g. House Cards available	|_|	|_|	_____

4. Houses checked: sprayed previous days _____ Current _____ Total _____

5. Discrepancies in reporting: spray form (SPR 1) being filled on the spot: Yes _____ No _____

Houses shown totally sprayed: _____ but unsprayed, _____ or partially sprayed _____

SPR 1 data tally with actual count of No. of rooms: Yes _____ No _____

6. Streaky/patchy spray, approximate % of Rooms _____

7. No. of Houses where preparation is poor _____ Average _____ Good _____

8. Spraying procedure:

	Yes	No	Specify
a. Spraymen and mixer observing safety precautions	|_|	|_|	_____
b. Mixing at least 5 meters from water source	|_|	|_|	_____
c. Leaky sprayers	|_|	|_|	_____
d. Availability of spare parts	|_|	|_|	_____
e. Deposits on walls approximate proper dosing	|_|	|_|	_____
f. Door of sprayed houses properly marked (T,P,X)	|_|	|_|	_____

9. Insecticide storage in locality: Adequacy _____ Amount remaining _____

Amount issued _____

10. Cases of poisoning:

Name of patient _____ Occupation _____

Date of onset _____ Date of recovery _____ How Treated _____

Symptoms:	Yes	No		Yes	No
Blurred vision	|_|	|_|	Vomiting	|_|	|_|
Excessive sweating and salivation	|_|	|_|	Abdominal cramps	|_|	|_|
			Nausea	|_|	|_|
Muscle weakness	|_|	|_|	others _____		

Tintometric Test Performed: Yes |_| No |_| Date: _____ Result: _____

Comments: _____

Annex F

INSECTICIDE BALANCE PERFORMA

DATE OF VISIT: _____

1. DISTRICT _____, INSECTICIDE STORED AT _____

2. STOREKEEPER'S NAME _____

3. BALANCE SHOWN ON THE REGISTER FOR 19___ IS _____

4. ACTUAL NUMBER OF INSECTICIDE CARTONS AVAILABLE IN THE STORE _____ = _____ KGS.

5. BALANCE OF INSECTICIDE FROM 19___ WAS _____

6. TOTAL AMOUNT OF INSECTICIDE AVAILABLE _____

7. TOTAL AMOUNT OF INSECTICIDE ISSUED TO _____

8. ARE THE CARTONS STACKED PROPERLY: YES NO

9. IS STORE AREA SAFE FOR THE STORAGE OF INSECTICIDE : YES NO.

10. NUMBER OF DAMAGED CARTONS _____

11. RECORD CONTROL SYSTEM OF DISTRICT HEALTH OFFICE. SATISFACTORY. UN-SATISFACTORY

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

_____

INSPECTION CONDUCTED BY: _____

ACCOMPANIED BY 1. _____, 2. _____

3. _____ 4. _____

ANNEX G: ESTIMATED COSTS OF RECOMMENDATIONS

I. Estimated cost of spray uniform packages.

II. Cost of soap.

III. Cost of standard calibrated containers.

IV. Cost of cholinesterase monitoring kits.

V. Cost of atropine sulfate kits.

VI. Statement of Work for Accident Contingency Consultant.

VII. Cost of safety training workshop.

I. ESTIMATED COST OF SPRAY UNIFORM PACKAGES

Shirt, pants, turban	Rs.150.00 X 4	Rs.600.00
Rubber gloves		Rs. 65.00
High top shoes		Rs. 50.00
Mask		Rs. 10.00
	Total	Rs.725.00

Number of packages needed:

Spraymen, Mixers, Supervisors, Inspectors:	9,000
Replacements, 80/Province X 4:	320
Total	9,320

Total cost of spray uniform packages:

9,000 X Rs.725.00 = Rs. 6,525.000 annually

= $362,500 annually

II. COST OF SOAP

Soap required for 6 persons of the spray squad and 1 malaria supervisor = 7 per week.

Estimated quantity of soap required for 1,500 squads = 1500 X 7 = 10,500 soaps per week.

Spray operations are carried out for approximately 6 weeks = 6 X 10,500 = 63,000 soap cakes for entire spray operations.

Total cost of soap @ Rs.3 per soap cake = 63,000 X 3 = Rs.189,000 annually

= $10,500.00 annually

III. COST OF STANDARD CALIBRATED CONTAINERS

Container = Rs.10.00

Need 1,500 (1/Mixer)

Total cost = Rs.15,000

= $834.00

IV. COST OF CHOLINESTERASE MONITORING KIT INCLUDING EXPENDABLE ITEMS

Cost of 70 complete kits at $900.00 = $67,000

V. COST OF ATROPINE SULFATE KITS

10,000 Atropine Sulfate ampules @ Rs.1.00 each = Rs.10,000.00
Disposable 2 ml syringes @ Rs. 2.00 each = Rs. 20,000
Total cost = Rs. 30,000
= $1,667.00

VI. STATEMENT OF WORK FOR ACCIDENT CONTINGENCY CONSULTANT

A. OBJECTIVE

The objective of this procurement is to contract a consultant to provide expert technical assistance to the Government of Pakistan (GOP) in the development of accident contingency plans for the use of pesticides in the Malaria Control II Project extension. The ongoing project involves the use of insecticides throughout Pakistan in many localities, with approximately 9,000 workers directly involved in pesticide application and transport. The technical services provided by the consultant will assist the GOP in minimizing the occurance of pesticide related accidents and in decreasing the impact of accidents when they occur.

B. QUALIFICATIONS AND EXPERIENCE

The consultant will be a qualified public and occupational health and safety specialist with direct experience in the identification, analysis and mitigation of public and occupational hazards and health risks associated with use of insecticides in vector control programs. The consultant will have knowledge of and experience in safe pesticide management practices including the transport, handling, use, storage and disposal of pesticides. The consultant will be capable of advising the GOP on contingency plans for accidents that may occur in the extension program involving any aspect of pesticide usage. Developing country experience is highly desirable.

C. STATEMENT OF WORK

The consultant will have primary responsibility for advising the GOP Directorate of Malaria Control and the provincial Directors of Health Services on the potential for pesticide-related accidents, procedures to decrease chances of such accidents occuring, and procedures to follow in the event of an accident. In order to observe important aspects of pesticide operations the consutant will need to travel to at least 3 Provinces. Of highest priority will be a visit to the Sind to observe off-loading of pesticides at the Karachi port and to observe the supervision of drivers transporting the pesticides.

Specifically, soon after project implementation the consultant will:

1) Perform a two-day official pre-departure TDY in AID/Washington to receive briefings on the current malaria control program in Pakistan and to confer with AID/Washington on current safety procedures used in the program.

2) Upon arrival in-country prepare a detailed work plan and schedule for Mission review, setting forth the principal tasks under the scope of work, and how they will be implemented, including identification of all Mission and GOP support and/or coordination which will be required.

3) Analyze the project's current practices which decrease the chances of pesticide related accidents from occuring.

4) Analyze from observation the safety procedures in place and needed in Karachi as pesticides are received, loaded into trucks and transported to use sites. Identify unrecognized potential causes for accidents and prepare descriptions of realistic measures to decrease likelihood of accidents. Prepare description of measures to be taken in the event of such accidents.

5) Analyze from observation the safety procedures in place and needed at pesticide storage sites. Prepare description of measures to be taken to minimize chances of accidents occurring, and procedures in the case that they occur.

6) Analyze from discussions the safety procedures used during spray applications. Describe any additional precautions that should be made and develop procedures for reacting to an accident.

7) Summarize all data, observations, analysis, and recommendations resulting from the analysis of pesticide safety procedures in a report to be prepared and finalized prior to departure from Pakistan. The report will include a separate section which fully describes all recommended procedures, including methods of implementation, duration, training requirements, estimated costs of implementing recommendations and agencies responsible for implementation. All recommendations shall be realistic given the conditions in Pakistan, and will focus on measures in which USAID can assist, particularly in regards to project management modifications.

D. LEVEL OF EFFORT

The estimated level of effort for the consultant is two days in AID/Washington and 20 days in Pakistan (six day work week).

E. TIMING OF EFFORT

The consultant should be in-country at the time when pesticides arrive in Karachi and are off-loaded for transport distribution.

Total estimated cost for providing 1 week training to approximately 4000 malaria supervisors:

TA/DA Allowances, all included	Rs 5,600,000.00
Cost of resource/trainers	22,000.00
Cost of Stationery	150,000.00
Cost of POL	30,000.00
W/TEA	300,000.00
Miscellaneous costs	45,000.00
Total	Rs.6,147,500 annual
Equivalent US $	$341,527.00

NOTE:

Due to the large number of Malaria Supervisors, it will not be possible to train them at provincial headquarters. The most feasible plan would be to have the training held at Divisional level. Trainers could be the CD officers and assistant entomologists. Disbursements could be made to participants at the Divisional level.

3 Day Workshop to be held in Islamabad for 60 Entomologists

Cost of 60 participants @ Rs.500.00/day Flat rate for 3 days = 60PX3DXR500	= Rs.90,000.00
Cost of travel to/from Islamabad for 60 participants	= Rs.40,000.00
Cost of stationery	= Rs. 2,500.00
Cost of POL	= Rs. 3,000.00
Cost of hiring hall for holding the workshop for three days @ Rs.500 per day	= Rs. 1,500.00
W/Tea and lunch @ Rs.85 per day per head for approximately 80 participants = R85X80PX3D	= Rs.20,400.00
DOMC charges for resources 7 persons	= Rs. 6,000.00
Total estimated cost	= Rs.163,400.00
Miscelleneous/other direct costs	= Rs. 5,000.00
Total	= Rs.168,400.00

3 Day Workshop held in Islamabad for 70 Malaria Superintendents

Cost of 70 Malaria Superintendents @ Rs.500.00/day for 3 days = 70PX500x3D	= Rs.105,000.00
Cost of travel=	= Rs. 40,000.00
Cost of stationery	= Rs. 2,500.00
Cost of POL	= Rs. 3,000.00
Cost of hiring hall @ Rs.500/day X 3 days	= Rs. 1,500.00
Cost of w/tea & lunch @ Rs.85 per head per day for approximately 85 persons = R85X3DX85P	= Rs. 21,675.00
DOMC charges for resource persons	= Rs. 6,000.00
Miscelleneous/other direct costs	= Rs. 5,000.00
Total	= Rs.185,675.00

3 Day Workshop held in Islamabad for 45 Health Education Officers

Cost of 45 participants @ Rs.500/day X 3 days = 45X500X3	= Rs. 67,500.00
Travel Cost	= Rs. 20,000.00
Cost of stationary	= Rs. 1,500.00
Cost of POL	= Rs. 3,000.00
Cost of hiring hall @ Rs.500/day for three days	= Rs. 1,500.00
Cost of w/tea and lunch @ Rs.85/head/day for 55 participants for 3 days = 85X55X3	= Rs. 14,025.00
DOMC charges for resources persons for 3 days	= Rs. 6,000.00
Miscelleneous/direct costs	= Rs. 5,000.00
Total	= Rs.118,525.00

a. Total estimated cost for training 60 Entomologists for 3 days in Islamabad	= Rs.168,400.00
b. Total estimated cost for training 70 Malaria Superintendents for 3 days in Islamabd	= Rs.184,675.00
c. Total estimated cost for training 45 H.E.O's for 3 days in Islamabad.	= Rs.118,525.00
General Total	= Rs.471,600.00
Equivalent to US $	= $26,200.00

E&E: HLarew: AAhmad
Mal/Hiram Larew

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EPIDEMIOLOGICAL DATA 1982 TO 1986 BY PROVINCE

1982

Province	A. C. D			P. C. D.			Other Sources			TOTAL						
	Slides	+ve.	SPR%	Slides	+ve.	SPR%	Slides	+ve.	SPR%	Slides	+ve.	V	F	M	Mix	SPR%
PUNJAB	1502496	16369	1.09	92033	3649	3.96	182208	4367	2.40	1776737	24385	18164	6289	3	71	1.37
SIND	364108	3544	0.97	110131	2549	2.31	46679	859	1.84	520918	2951	4604	2389	-	42	1.33
N.W.F.P	622301	8158	1.31	118753	8161	6.87	155756	7001	4.49	896810	23320	22538	820	-	38	2.60
BALUCHISTAN	66217	521	0.79	20302	783	3.86	22083	400	1.81	108602	1704	1380	347	-	23	1.56
PAKISTAN:	2555122	28592	1.12	341219	15142	4.44	406726	12626	3.10	3303067	56360	46686	9845	3	174	1.71

1983

PUNJAB	1272858	19953	1.57	75843	3972	5.24	131785	5693	4.32	1480486	29618	19773	9927	4	86	2.00
SIND	184939	2578	1.39	197004	7219	3.66	64130	2668	4.16	446073	12465	8379	4154	-	68	2.79
N.W.F.P	487690	2956	0.61	58528	3189	5.45	65777	2010	3.06	611995	8155	7219	957	-	21	1.33
BALUCHISTAN	24201	369	1.52	15675	729	4.65	9490	260	2.74	49366	1358	748	658	-	48	2.75
PAKISTAN:	1969688	25856	1.31	347050	15109	4.53	271182	10631	3.92	2587920	51596	36119	15696	4	223	1.99

1984

Province	A. C. D			P. C. D			Other Sources			TOTAL						
	Slides	+ve.	SPR%	Slides	+ve.	SPR%	Slides	+ve.	SPR%	Slides	+ve.	V	F	M	Mix	SPR%
PUNJAB	1702930	30881	1.81	151606	11562	7.63	229689	11380	4.95	2084222	53823	34275	19648	-	100	2.58
SIND	275527	4738	1.72	128090	4368	3.41	360893	428	1.19	439706	9534	5996	3611	-	73	2.17
N.W.F.P.	541394	5069	0.94	79120	3431	4.34	48378	1265	2.61	668892	9764	8784	1083	-	67	1.46
BALUCHISTAN	27499	236	0.86	15175	488	3.22	20359	151	0.74	63033	875	520	366	-	11	1.39
PAKISTAN:	2547350	40923	1.61	373988	19849	5.13	334515	13224	3.95	3255853	73996	49539	24708	-	251	2.27

1985

PUNJAB	1694917	24415	1.44	181614	11674	6.43	253562	9327	3.68	2130093	45416	28527	16979	-	90	2.13
SIND	292120	6689	2.29	115867	5204	4.49	57800	2372	4.10	465787	14265	5988	8417	-	140	3.06
N.W.F.P.	346337	5855	1.69	90716	9100	0.10	36140	1773	4.91	473193	16728	13616	3139	-	27	3.53
BALUCHISTAN	26365	363	1.38	16540	620	0.37	7717	215	2.79	50622	1198	425	792	-	19	2.49
PAKISTAN:	2359739	37322	1.58	404737	26598	6.57	355219	13687	3.85	3119695	77607	48556	29327	-	276	2.49

1986

Province	A. C. D.			P. C. D.			Other Sources			TOTAL						
	Slides	+ve.	SPR%	Slides	+ve.	SPR%	Slides	+ve.	SPR%	Slides	+ve.	V	P	M	Mix	SPR%
PUNJAB	1483997	27107	1.83	207882	13286	6.39	196642	6694	3.40	1888521	47087	32051	15091	-	55	2.49
SIND	289025	7237	2.50	118068	7050	5.97	66970	2802	4.18	474063	17089	6775	10444	-	130	3.60
N.W.F.P.	304992	5948	1.95	137338	17521	12.77	62326	2003	3.21	504656	25472	21872	3684	-	84	5.05
BALUCHISTAN	15551	168	0.11	11964	565	4.72	4265	12	0.28	31780	745	409	339	-	3	2.34
PAKISTAN:	2093565	40460	1.93	475252	38422	8.08	330203	11511	3.49	2899020	90393	61107	29558	-	272	3.12

ORGANIZATIONAL CHART OF NATIONAL MALARIA TRAINING CENTRE, LAHORE:

(FEDERAL GOVERNMENT)

A Section of National Institute for Malaria Research and Training Since 1985

SENIOR SCIENTIFIC OFFICER - 1
(Grade - 18)

- Administration Officer (Grade-16) - 1
- Accountant (Grade-8) - 1
- Stenographer (Grade-15) - 1
- Stenotypist (Grade-12) - 1
- UDC (Grade-7) - 1
- LDC (Grade-5) - 1
- Storekeeper (Grade-7) - 1
- Senior Mechanic (Grade-8) - 1
- Drivers (Grade-4) - 6
- Naib Qasid (Grade-1) - 4
- Chowkidar (Grade-1) - 2
- Khakroob (Grade-1) - 1

- Assistant Scientific Officer (Entomology) (Grade-16) - 1
- Scientific Assistant (Grade-8) - 4
- Insect Collector (Technician) (Grade-5) - 2
- Laboratory Technician (Grade-6) - 2
- Laboratory Attendant (Grade-2) - 2

- Assistant Scientific Officer (Malariology) (Grade-16)
- Senior Malaria Inspector (Grade-8)
- Malaria Inspector (Grade-6)
- Senior Draftsman (Grade-9)

No. F. [illegible]
Government of Pakistan
Ministry of Health, Special Education and Social Welfare
(Health Division)
***

[illegible], the [illegible] July, [illegible]

The Accountant General
Pakistan Revenues,
Lahore.

SUBJECT:- CONTINUATION [illegible]
LAHORE - SANCTION [illegible]

Sir,

In continuation to the [illegible] letter of even number dated 16th March [illegible] and [illegible] January [illegible] respectively, I am directed to convey [illegible] sanction of the President to the continuation of [illegible] post from 1st June, 1987 to 31st May, [illegible] following temporary post in the National Institute of [illegible] Research and Training (NIMRT) Lahore.

Sr. No.	Name of Post	[illegible] Scale	No. of Posts
1.	Senior Medical Officer	18	[illegible]
2.	Scientific Research Officer	17	[illegible]
3.	Trainee Physician	17	1
4.	Administrative Officer	16	2
5.	Research Assistant	11	[illegible]
6.	Senior Laboratory Technician	11	4
7.	Field Assistant	9	4
8.	General/Charge Nurse	14	1
9.	Surveyor	9	1
10.	Office Superintendent	14	1
11.	Data Machine Operator	12	2
12.	Receptionist-Cum-Typist	7	1
13.	Gardener	1	1
14.	Assistant Accountant	11	1
15.	Store Assistant	11	1
16.	Maintenance Supervisor	12	1
17.	Airconditioning Mechanic	11	1
18.	Maintenance Assistant	11	1
19.	Carpenter	6	1
20.	Senior Animal Care Taker	6	1
21.	Accountant	14	1
22.	Maintenance Technician	7	1
23.	Animal Field Supervisor	2	1
24.	Laboratory Technician	9	10
25.	Data Control Supervisor	14	1
26.	Machine Operator	4	1
27.	Upper Division Clerk	7	1
28.	Driver	4	2
29.	Attendant	1	1
30.	Chowkidar	1	2
31	Naib Qasid	1	3

ANNEX

ORGANIZATIONAL CHART OF DIRECTORATE OF MALARIA CONTROL
(FEDERAL GOVERNMENT)

DIRECTOR (Grade - 19)

- Stenographer (Grade-15) -1
- Naib Qasid (Grade-1) -1
- Driver (Grade-4) -1

Epidemiological Section

- Epidemiologist - 1 (Grade-18)
- Assistant - 2 (Grade-11)
- Stenographer - 1 (Grade-15)
- Naib Qasid - 1 (Grade-1)
- Driver (Gd-4) - 1

Entomological Section

- Senior Scientific Officer - 1 (Grade-18)
- Assistant - 2 (Grade-11)
- Stenographer - 1 (Grade-15)
- Naib Qasid - 1 (Grade-1)
- Driver (Gd-4) - 1

Statistical Section

- Statistical Officer - 1 (Grade-17)
- Assistant - 1 (Grade-11)
- Draftsman - 1 (Grade-8)
- Naib Qasid - 1 (Grade-1)

Health Education Section

- Health Education Officer - 1 (Grade-18)
- UDC (Grade-7) - 1
- Duplicating Machine Operator - 1 (Grade-4)

Budget & Accounts Section

- Assistant Accounts Officer - 1 (Grade-16)
- Assistant - 1 (Grade-11)
- Stenotypist - 1 (Grade-12)
- UDC-cum-Cashier - 1 (Grade-7)
- Naib Qasid - 1 (Grade-1)

Supply & Transport Section

- Transport Officer - 1 (Grade-16)
- Assistant-in-Charge - 1 (Grade-12)
- Assistant - 1 (Grade-11)
- Stenotypist - 1 (Grade-12)
- Carpenter - 1 (Grade-5)
- Naib Qasid - 1 (Grade-1)

Administration Section

- Assistant Director - 1 (Grade-17)
- Office Superintendent - 1 (Grade-16)
- Assistant - 1 (Grade-11)
- Stenotypist - 1 (Grade-12)
- UDC (Grade-7) - 1
- LDC (Grade-5) - 2
- Driver (Gd-4) - 4
- Daftry (Gd-1) - 1
- Naib Qasid - 1 (Grade-1)
- Guards (Gd-1) - 3
- Mali (Gd-1) - 1
- Sweeper - 1 (Grade-1)

PROPOSED ORGANIZATIONAL SET UP OF DIRECTORATE OF MALARIA CONTROL
(FEDERAL GOVERNMENT)

DIRECTOR (Grade-20) - 1

- P.A. to Director - 1 (Grade-16)
- Stenotypist(Gd-12)-1
- Naib Qasid(Gd-1) - 1

Epidemiological Section

- Chief Scientific Officer (Epidemiology) (Grade-19) - 1
- Senior Scientific Officer (Epidemiology) (Grade-18) - 1
- Stenographer (Grade-15) - 1
- Stenotypist (Grade-12) - 1
- Assistant (Grade-11) - 2
- UDC (Grade-7) - 1
- LDC (Grade-5) - 1
- Naib Qasid (Grade-1) - 2

Entomological Section

- Chief Scientific Officer (Entomology) (Grade-19) - 1
- Senior Scientific Officer (Entomology) (Grade-18) - 1
- Stenographer (Grade-15) - 1
- Stenotypist (Grade-12) - 1
- Entomological Assistant (Grade-14) - 1
- Assistant (Grade-11) - 1
- LDC (Grade-5) - 1
- Naib Qasid (Grade-1) - 2

Statistical Section

- Chief Statistical Officer (Grade-18) - 1
- Statistical Officer (Grade-17) - 1
- Stenotypist (Grade-12) - 1
- Statistical Assistant (Grade-11) - 1
- Draftsman (Grade-11) - 1
- UDC(Grade-7) - 1
- Naib Qasid (Grade-1) - 2

Health Education Section

- Health Education Officer (Grade-18) - 1
- Stenotypist (Grade-12) - 1
- Assistant (Grade-11) - 1
- Gestetner Operator (Grade-4) - 1
- Naib Qasid (Grade-1) - 1

Budget & Accounts Section

- Accounts Officer (Grade-17) - 1
- Accountant (Grade-14) - 1
- Stenotypist (Grade-12) - 1
- Assistant (Grade-11) - 1
- LDC (Grade-5) - 1
- Naib Qasid (Grade-1) - 1

ADMINISTRATION SECTION

- Assistant Director/Admn-cum-Supply Officer (Grade-17) - 1
  - Office Superintendent (Grade-16) - 1

SUPPLY

- Assistant Incharge Supply (Grade-15) - 1
- Stenotypist (Grade-12) - 1
- Assistant (Grade-11) - 2
- UDC (Grade-7) - 2
- LDC (Grade-5) - 1
- Driver(Gd-4) - 8
- Naib Qasid (Grade-1) - 1

ADMINISTRATION

- Assistant Incharge Admn. (Grade-15) - 1
- Stenotypist (Grade-12) - 1
- Assistant (Grade-11) - 2
- UDC-cum-Cashier (Grade-7) - 1
- UDC (Grade-7)-1
- LDC(Grade-5)- 1
- Daftry(Gd-1)- 1
- Naib Qasid (Grade-1) - 2
- Guard(Gd-1) - 3
- Mali(Gd-1) - 1
- Sweeper (Grade-1) - 1

DIFFERENT CATEGORIES OF STAFF AT FEDERAL AND PROVINCIAL LEVEL FOR MALARIA CONTROL PROJECT

S.No.	Name of Post	DOMC*	PUNJAB	SIND	NWFP	BALUCHISTAN	TOTAL
1.	Director	1	-	-	-	-	1
2.	Provincial Chief	-	-	1	-	1	2
3.	Deputy Director (CDC)	-	1	-	1	-	2
4.	Senior Scientific Officer (Entomology/Malariology)	2	-	-	-	-	2
5.	Epidemiologist	1	-	1	-	-	2
6.	Assistant Director(Malaria)	-	1	-	1	-	2
7.	Public Relation Officer	1	-	-	-	-	1
8.	District Health Officer/ District Malaria Control Officer	-	29	13	12	2	56
9.	Entomologist	-	1	1	1	-	3
10.	Assistant Entomologist	1	29	12	12	2	56
11.	Senior Malaria Superintendent	-	-	1	1	1	3
12.	Health Education/Admn.Officer	-	21	2	16	2	41
13.	Malaria Supdt./CDC Officer	-	41	13	4	6	64
14.	Parasitologist	-	1	-	-	-	1
15.	Senior Evaluator	-	-	1	-	-	1
16.	Non Medical Evaluator	-	-	11	-	-	11
17.	Accounts Officer	1	2	2	2	1	8
18.	Statistical Officer	1	-	-	-	-	1
19.	Transport Officer	1	1	1	1	1	5
20.	Personnel Officer	-	1	-	-	-	1
21.	Office Superintendent	1	1	1	1	1	5
22.	Assistant Incharge	1	-	-	-	-	1
23.	Assistant	8	3	4	2	1	16
24.	Stenographer	4	3	1	1	1	10
25.	Stenotypist	3	7	-	-	-	10
26.	UDC/UDC-cum-Cashier/Sr.Clerk	4	34	37	30	12	117
27.	Accountant	1	21	13	8	2	45
28.	Store Keeper	1	24	13	10	2	50
29.	Draftsman	2	1	1	3	1	8
30.	Tin Smith	-	3	1	1	-	5
31.	Foreman	-	1	-	-	-	1
32.	Mechanic	1	34	15	16	5	71
33.	Auto Electrician	-	5	1	1	1	8
34.	Black Smith	-	1	-	-	-	1
35.	Painter	-	1	-	-	-	1

S.No.	Name of Post	DOMC	PUNJAB	SIND	NWFP	BALUCH-ISTAN.	TOTAL
36.	Turner	-	1	-	-	-	1
37.	Welder	-	1	1	1	-	3
38.	Trimer	-	1	-	-	-	1
39.	Carpenter	1	1	1	1	-	4
40.	Workshop Boy	-	6	2	3	2	13
41.	Guard	5	52	27	23	6	113
42.	Mali	1	1	1	1	-	4
43.	Qasid	2	25	12	9	2	50
44.	Naib Qasid	10	63	29	26	6	134
45.	Laboratory Attendant	2	47	13	17	3	82
46.	Gestetner Operator	1	-	-	-	-	1
47.	Daftry	1	-	-	-	-	1
48.	Microscope Repair Technician	-	1	1	-	-	2
49.	Microscopist/Scientific Assistant.	5	231	88	76	16	416
50.	Ento. Technician	-	8	1	2	-	11
51.	Insect Collector	2	58	24	36	10	130
52.	Assistant Malaria Supdt.	-	97	66	43	40	246
53.	Malaria Inspector/Assistant Malaria Inspector	-	-	61	43	-	104
54.	Malaria Supervisor/CDC Supervisor	-	2053	591	655	212	3511
55.	Sanitary Patrol/Badrages	-	84	62	51	33	230
56.	Drivers	13	60	44	54	24	195
	T O T A L : -						

NB: Temporary labour are also engaged during spraying operation on daily wages basis according to areas to be sprayed.

* Federal Directorate of Malaria Control including Malaria Training Centre.

Participant Training under Malaria Control Project 391-0472

Sr. No.	FY	Place	Duration	Course Title	# of Participants	Doctors	Non-doctors	Total
1	(Sep 83)	S.Carolina	2 weeks	Vector Control	4	4	0	4
2	85(Nov 84)	Bangkok	2 weeks	Obs. Visit	6(2B,1Ak,3S)	3	3	6
3	85(Jul 85)	Bangkok	2 weeks	Obs. Visit	4(2F,1P,1S)	3	1	4
4	86(Nov 85)	Bangkok	2 weeks	Obs. Visit	4(2F,1NWFP,1B)	4	0	4
5	86(Dec 85)	Bangkok	2 weeks	Obs. Visit	4(2S,1B,1NWFP)	4	0	4
6	87(Oct 86)	Bangkok	2 weeks	Obs. Visit	6(3P,1F,1Ak,1B)	3	3	6
7	87(Dec 86)	Bangkok	2 weeks	Obs. Visit	5(3P,1F,1Ak)	5	0	5
8	87(Feb 87)	Malaysia	2 weeks	Obs. Visit	6(2F,2S,2NF)	3	3	6
9	87(Jun 87)	Bangkok	2 weeks	Obs. Visit	5(5P)	5	0	5
10	87(Aug 87)	Malaysia	2 weeks	Obs. Visit	4(2P,2S)	2	2	4
11	87(Aug 87)	Bangkok	4 weeks	Invitro Course	4(1P,2F,1NWFP)	0	4	4
						36	16	52

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UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable: USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

August 27, 1987

Mr. Ghafoor Mirza
Joint Secretary
Economic Affairs Division
Ministry of Finance & Planning
Government of Pakistan
Pakistan Secretariat - Block 'C'
Islamabad

Subject: Malaria Control II Project
AID Project No.391-0472
Long Term Participant Training

Dear Mr. Mirza:

In response to Ministry of Health, Special Education and Social Welfare (Health Division) letter No.F.30-8/86-PH(PT), dated, Islamabad June 16, 1987, USAID Mission is pleased to inform you that sufficient funds are available under the "Training" component of the subject project, to provide (i) 10 long term (upto two years) participant training courses, and (ii) 22 short term (upto 4 months) training opportunities in the US/Third Country, for suitable nominees, for developing malaria control expertise in Pakistan.

The training courses are in the field of malariology, epidemiology, entomology, laboratory sciences, and public health and are for the serving federal and provincial Health Department officials. The long term courses will be at the EMORY University, Atlanta and at Tulane University, New Orleans (USA) for MPH and Master's degrees in the fields of malariology and entomology. The short term courses could be at any of the institutes in U.S./third country, specially offering short courses in subjects related to malaria control. These universities are being approached to arrange training courses suited to the needs of manpower development for the Pakistan Malaria Control Program.

The participant training courses offered are as under:

A. Long Term

Course/Degree Identification	Suggested number and distribution of nominations/course participants
1. Master Public Health (MPH) Degree in Tropical Health/ Epidemiology	Four - one from federal MOH and one each from the provinces of Punjab, Sind and NWFP

2.	Master of Science Degree in Entomology	Two - one from Punjab and one from Sind
3.	MPH Degree in Malariology/Medical Administration	Two - one from Baluchistan and one from Punjab
4.	MPH Degree in Laboratory Sciences	Two - one from Baluchistan and one from NWFP

B. Short Term

1.	Comprehensive Vector Control Course at Institute of Medical Research (IMR) Kuala Lumpur, Malaysia	Five - one from federal MOH and one each from four provinces
2.	Mosquito Abatement Training Program, Lusiana State, U.S.A. Louisiana	Eight - one Entomologist from federal MOH, one from Azad Kashmir, four from provincial MCPs (one each from each province) and one municipal health officer from two major Municipal Corporations
3.	Health Education Planning Implementation Course for Physicians for Malaria Control at Development Training and Communication Planning Unit (UNDP/DTCP), Bangkok	Five - One Malaria Control official (doctor) from each provincial MCP headquarters/directorates of Health Services
4.	Training in advanced In-vitro Techniques of Assessment of Drug Sensitivity in Falciparum Malaria at Malaria Control Division of the Government of Thailand at Bangkok	Four Senior Microscopists, Parasitologists, one each from four provinces and one from federal MOH

USAID agrees to finance the training costs of the GOP nominees/ participants from Malaria Control II Project funds, including the cost of tuition, travel, boarding and lodging in accordance with AID rules and rates governing such participant training.

Criteria of Selection Proposed

GOP officials/workers nominated for training must be or will be involved in malaria control/health delivery services and have an aptitude and intention of serving in the Pakistan malaria control program/activities

1984									
1. 30th Junior Course	12/11/83-29/01/84	20	16	10	-	1	-	5	16
2. 57th Microscopist Cr.	21/01/84-05/04/84	19	18	11	2	4	-	1	18
3. 3rd Cr. in Mal. Epid. and Field Supervision for District Health Officers	11/02/84-16/02/84	18	18	15	3	-	-	-	18
4. Refresher Cr. on Safe use of Organophosphorus Insecticides for DHOs/Entomologists/CDC Officers Mal. Supdts/Asst. Entomologists (at Lahore & Hyderabad)	23/02/84-26/02/84	58	50	58	-	-	-	-	58
	27/02/84-28/02/84	35	35	14	-	21	-	-	35
	21/04/84-22/04/84	46	46	-	34	-	12	-	46
5. 4th Entomological Tech. Course	24/03/84-17/04/84	16	7	-	1	1	1	4	7
6. Training of Lab. Techs./Assistants	05/05/84-17/05/84	10	10	10	-	-	-	-	10
7. Training for in-vitro micro. tests for the detection of Chloroquine resistance in *P. falciparum*	24/10/84-01/11/84	5	5	5	-	-	-	-	5
	09/12/84-13/12/84	6	6	6	-	-	-	-	6
	22/12/84-27/12/84	8	8	-	8	-	-	-	8
		241	227	129	48	27	13	10	227
1985									
1. 31st Junior Course	23/12/84-12/03/85	30	28	23	-	-	2	3	28

3. 58th Microscopist Cr.	30/12/85-04/04/85	17	14	11	-	2	-	1	14
4. Refresher Course on Safe Use of Organophosphorus insecticides for MCP officers (2 batches)	25/06/85-26/06/85 03/07/85-04/07/85	60 31	60 31	46 -	- 22	10 -	- 9	4 -	60 31
5. 4th Cr. in Mal. Epid. and Field Supervisions for DHOs/ADHOs	14/07/85-18/07/85	8	8	8	-	-	-	-	8
6. 3rd Refresher Cr. for in-service Microscopists.	28/07/85-08/08/85	8	8	8	-	-	-	-	8
7. Refresher Course for Lab. Assts/Technicians (3rd.)	29/09/85-17/10/85	18	16	16	-	-	-	-	16
8. Refresher Course for Lab. Assts/Technicians (4th.)	27/10/85-14/11/85	23	20	20	-	-	-	-	20
9. Training Course in Chloroquine Resistance Studies	11/11/85-19/11/85	6	6	6	-	-	-	-	6
10. Training Course in Chloroquine Resistance Studies at Peshawar (NWFP)	24/11/85-02/12/85	14	14	-	-	14	-	-	14
11. Refresher Course for Laboratory Assts/ Technicians (5th)	24/11/85-15/12/85	26	23	23	-	-	-	-	23
		262	256	184	24	28	11	9	256

COURSES CONDUCTED AT MALARIA TRAINING CENTRE, LAHORE DURING THE YEAR 1986 - (JANUARY TO DECEMBER)

Name of Course	Duration	Parti-cipated	Quali-fied	Punjab	Sind	NWFP	Balu-chistan	A.K.	Total
1. 6th. Refresher Course for Lab. Assistants/ Technicians	26/01/86-13/02/86	24	20	20	-	-	-	-	20
2. 32nd. Junior Course	02/02/86-14/04/86	32	25	25	-	-	-	-	25
3. 7th. Refresher Course for Lab. Assistants/ Technicians	23/02/86-13/03/86	23	16	16	-	-	-	-	16
4. 10th. Refresher Course in Entomology	24/03/86-03/04/86	34	34	20	5	7	-	2	34
5. 8th. Refresher Course for Lab. Assistants/ Technicians	04/05/86-22/05/86	26	22	22	-	-	-	-	22
6. 59th. Microscopists Course	11/05/86-13/06/86	13	13	9	-	4	-	-	13
7. Refresher Course on Safe Use of Insecti-cides for Punjab	04/06/86-05/06/86	55	55	55	-	-	-	-	55
8. -do- for NWFP	15/06/86-16/06/86	40	40	-	-	40	-	-	40
9. -do- for Sind	18/06/86-19/06/86	46	46	-	46	-	-	-	46
10. First Workshop on Malaria for Distt. Health Officers at	15/07/86-17/07/86	18	18	-	-	18	-	-	18

11. Second Workshop on Malaria for Distt. Health Officers at Peshawar Club	19/07/86-21/07/86	30	30	-	-	30	-	-	30
12. Third Workshop on Malaria for Distt. Health Officers at Peshawar Club	27/07/86-29/07/86	23	23	-	-	23	-	-	23
13. Ninth Refresher Cr. for Lab. Assistants/ Technicians	27/08/86-21/09/86	7	5	5	-	-	-	-	5
14. Tenth Refresher Cr. for Lab. Assistants/ Technicians	16/09/86-02/10/86	6	5	5	-	-	-	-	5
15. Advanced Malaria Trg. Course for Senior Health Officers of Baluchistan (Quetta)	21/09/86-23/09/86	16	16	-	-	-	16	-	16
16. 23rd Senior Course	21/09/86-18/12/86	19	14	12	-	-	2	-	14
		412	382	189	51	122	18	2	382
WHO Regional Workshop for Monitoring P.f. response to Anti-malaria drugs	03/08/86-20/08/86	14	14						14
Total		426	396	189		122	18	2	396
GRAND TOTAL 1982-86		1,103	1,043	521	144	201	52	49	1,043

In-Country Training under Malaria Control Project # 391-0472 PIL No. 12 & 12A

Sr. No.	Date	Place	Title of Course	Duration	Doctors	non-doctors	Total
1	6/9/84 - 6/14/84	Rawlapindi	Advanced Entomology	6 days	0	18	18
2	9/23/84 - 9/25/84	Rawlapindi	Urban Malaria Workshop	3 days	10	17	27
3	6/25/85 - 6/26/85	NMTC - Lahore	Trng f/ Malaria CDC Supers.	2 days	0	62	62
4	7/3/85 - 7/4/85	MCP - Sind	Safe use of Insecticide	2 days	0	32	32
5	7/14/85 - 7/15/85	NMTC - Lahore	WHO's Trng in Malaria	5 days	8	0	8
6	10/19/85 - 10/20/85	Rawlapindi	External Review Workshop	2 days	5	12	17
7	3/26/86 - 3/27/86	Rawlapindi	Health Education Meeting	2 days	0	8	8
8	6/4/86 - 6/5/86	NMTC - Lahore	Safe use of Insecticide	2 days	0	55	55
9	6/15/86 - 6/16/86	Peshawar	Safe use of Insecticide	2 days	0	40	40
10	6/19/86 - 6/19/86	MCP - Hyderabad	Safe use of Insecticide	2 days	0	47	47
11	7/15/86 - 7/17/86	Peshawar	Malaria Trng f/ Sr Health Officials	3 days	23	0	23
12	7/19/86 - 7/21/86	Peshawar	Malaria Trng f/ Sr Health Officials	3 days	30	0	30
13	7/27/86 - 7/29/86	Peshawar	Malaria Trng f/ Sr Health Officials	3 days	24	0	24
14	9/21/86 - 9/23/86	Quetta	Malaria Trng f/ Sr Health Officials	3 days	16	0	16
15	9/28/86 - 9/30/86	Quetta	Malaria Trng f/ Sr Health Officials	3 days	18	0	18
16	10/15/86 - 10/22/86	NMTC - Lahore	Urban Malaria Training	15 days	0	9	9
17	12/8/86 - 12/10/86	Islamabad	Alternative Vector Control	3 days	11	34	45
18	2/14/87 - 2/16/87	Lahore	Malaria Trng f/ Sr Health Officials	3 days	35	1	36
19	2/17/87 - 2/19/87	Lahore	Malaria Trng f/ Sr Health Officials	3 days	39	1	40
20	3/25/87 - 3/26/87	Rawalpindi	Urban Malaria Workshop	2 days	17	9	26
				Total	236	345	581

BHussain
05-Apr-87

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BASIC PLAN FOR PRIMARY HEALTH CARE
FROM
RURAL HEALTH PROGRAM OF PAKISTAN 1986-1990
BY
PLANNING AND DEVELOPMENT DIVISION OF GOVERNMENT OF PAKISTAN

Level	Population	Health Facilities
Village	1,000	2 community health workers - one male and/or one female.
Basic Health Units (BHUs)	10,000	4-6 health auxiliaries for preventive work and out-patients.
Rural Health Centres (RHCs)	40,000 to 100,000	2 doctors, 8 auxiliaries and 10-12 beds.
Tehsil/Taluka Hospitals	380,000	Surgical, medical and laboratory, X-ray facilities.
District Hospitals	1,600,000	As for tehsil/taluka hospitals plus some specialization.
Teaching Hospitals and other institutions	Province-wise Basis	All modern facilities

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable : USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

THE DIRECTOR

USAID/PAKISTAN MISSION DIRECTOR'S WAIVER FOR A.I.D. PAYMENT OF INTERNATIONAL PARTICIPANT TRAVEL COSTS

A.I.D. Handbook 10, Chapter 15B1, provides that the cost of international travel, including incidental costs en route as well as the cost of travel between the participant's city and the points of departure and return in the participant's home country, shall be paid by the host government or other sponsor unless, in the case of Mission-funded programs, the Mission Director has justified and authorized full or partial waivers and has so notified S&T/IT.

Training and institution-building are important components of the $1.625 billion economic assistance program negotiated between the Governments of the U.S. and Pakistan. USAID/Pakistan's experience, however, has been that the Government of Pakistan (GOP), due to serious foreign exchange and budgetary constraints, has been historically unable to fund international travel costs for both short and long term training programs. The consequence has been that Pakistani participants have, on numerous occasions, been denied worthwhile and much needed training, inhibiting the achievement of project targets. Provinces and the Federal Government have been developing, or not developing, training priorities and nominations on the basis of availability of travel funds rather than on a basis of future projected, anticipated, and objective human resources development needs and requirements.

I have carefully reviewed the advisability of requiring full GOP funding for travel costs for participant training and the alternative of funding such travel with grant and loan funds provided through USAID/Pakistan to the GOP. Recognizing the objectives of many of our projects and the fact that project success will be enhanced by encouraging opportunities for both short and long term training, I have determined that it would be prejudicial to U.S. development interests to require at this time that the GOP pay the international participant travel costs for GOP/USAID program training. Other donors in Pakistan, including the UK, CIDA, UN, IBRD, Germany, etc., pay round-trip transportation costs for their long and short term participants.

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Therefore, on all Mission-funded training programs, USAID/Pakistan shall be responsible for the cost of the round-trip economy class air ticket and other necessary incidental costs en route. Where a PIO/P has been originally written for a program of one year or less, but, after the participant has initiated his or her program, the program is extended so that it exceeds one year in total, USAID/Pakistan shall also fund the round-trip ticket. The justification for funding programs that are extended is to minimize administrative problems which are otherwise likely to occur.

On the basis of the above justification and pursuant to Handbook 10, Chapter 15B1a, I, Donor M. Lion, principal officer of the Agency for International Development in Pakistan, do hereby waive the requirement that the host government fully fund international travel for training courses and authorize payment with USAID/Pakistan loan and grant funds for travel costs as specified above for all USAID-financed projects in Pakistan.

Donor M. Lion
Director
USAID/Pakistan

4/24/84
Date

7/8

ACTION AID INFO AMB DCM ECON AREP

ANNEX S

Page 3

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26-MAR-87 TOR: 05:40
CN: 44669
CHRG: AID
DIST: AID
ADD:

RECEIVED MAR 26 1987

OFF,FILE: RLA/CON
ACTION: RLA/CON
INFO:D,DD,PRO,PDM
RF,CH.

ADM AID

E.O. 12356: N/A
TAGS: N/A
SUBJECT: BLANKET SOURCE/ORIGIN WAIVER FOR CERTAIN MOTOR VEHICLES FOR PROJECTS

1. THE ADMINISTRATOR HAS APPROVED A BLANKET SOURCE/ORIGIN WAIVER AND A WAIVER OF SECTION 636(I) OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED, TO ALLOW PROCUREMENT FROM GEOGRAPHIC CODE 935 COUNTRIES OF THE FOLLOWING TYPES OF VEHICLES:

A. RIGHT-HAND DRIVE, LIGHT DUTY VEHICLES OF 11,000 POUNDS GROSS VEHICLE WEIGHT RATING OR LESS

B. ONE WHEEL DRIVE MOTORCYCLES OF 125 CUBIC CENTIMETERS DISPLACEMENT OR LESS

C. OTHER RIGHT-HAND DRIVE VEHICLES AND MOTORCYCLES THAT ARE NOT AVAILABLE FROM THE UNITED STATES, AS DETERMINED CASE-BY-CASE BY THE COMMODITY SUPPORT DIVISION OF THE OFFICE OF PROCUREMENT (M/SER/OP/COMS); AND

D. SPARE PARTS PURCHASED WITH THE ABOVE VEHICLES.

2. LIMITATIONS:

A. THIS WAIVER COVERS ONLY SUCH VEHICLES THAT ARE PROCURED UNDER AID-FINANCED PROJECTS. EITHER ADMINISTRATIVE, NOR NONPROJECT VEHICLES ARE INCLUDED.

B. THIS WAIVER COVERS ONLY RIGHT-HAND DRIVE VEHICLES AND MOTORCYCLES WHICH ARE NOT MANUFACTURED IN THE UNITED STATES. OTHER REQUIREMENTS FOR NON-U.S. VEHICLES WILL HAVE TO BE JUSTIFIED AND APPROVED UNDER SEPARATE WAIVER AUTHORITY.

C. THIS WAIVER IS LIMITED TO VEHICLES PURCHASED DURING THE PERIOD 7 MARCH 1987 THRU 6 MARCH 1988.

3. PROCEDURES:

UNDER THE BLANKET WAIVER APPROVED BY THE ADMINISTRATOR, THERE ARE TWO DIFFERENT PROCEDURES - ONE FOR VEHICLES WHICH HAVE ALREADY BEEN SPECIFICALLY IDENTIFIED AS NOT

List of Subjects for Operational Research 1/ by the NIMRT

The following is a short, listing of some of the aspects of the MCP operation needing specific studies. The list has not arranged to reflect priorities as to current needs of the operating program. Past research needs have been met through the NMTC and the provincial operational program with limited field trials. These studies represent however, only a token of the research study requirements. The creation of the NIMRT will provide a vehicle for meeting the needs of the program and is off to a start with several new research proposals. Protocols have already been written for the following studies:

Protocol: NIMRT-87-1	"The evaluation of the malaria vectorial status of Anopheles stephensi in rural Pakistan."
Protocol: NIMRT-87-2	"The development of Alternative Malaria Control Methods feasible for use through community participation."
Protocol: NIMRT-87-3	"An evaluation of the effect of an increased use of primaquine on the transmission of falciparum malaria."
Protocol: NIMRT-87-4	"An evaluation of the effective of various primaquine radical treatments against vivax infections in Pakistan."

1/For this paper, operational research is defined as:

research into or investigation of any subject which has an immediate applicability to the operational aspects of the Malaria Control Program. Such research must be clearly defined, carried out within the framework of the operational organization, and demonstrate potential for improvement in one or more aspects of operational practices, i.e. effective control of the vector or parasite, more effcacious use of man, money or material.

For the near future other specific research should be directed or designed to:

1. clearly delineate the distribution of each of the primary as well as secondary anopheline vectors on an ecological and geographical basis.

2. provide seasonal information on prevelance of all vector species as determined by metorological factors.

3. clearly define larval habitat types and composition for acknowledged vector species where not already known.

4. identify and test the use of selected permanent control techniques to habitats of vector species illucidated in the studies in 3 above.

5. review and reaffirm the present knowledge of resting habits of target anophelines with application of new as well as old control techniques keeping in mind i.e. repellants, mechanical barriers, etc.

6. review and reaffirm existing knowledge of the vectorial role as well as the vectoral capacity of all suspected vector amophelines.

7. test the response of all target vector species to chemical pesticides to be used in the program. Such tests must be: extensive enough to permit evolution in an operational setting; monitored for its success or failure to: 1) control of the vector(s) 2) provide safty in use by the MCP applicator as well as be safe for the inhabitants of the ecology into which the chemical is applied, 3) interrupt the transmission of malaria.

8. monitor the severity of the problems of insecticide resistance restricting testing to currently used insecticides and baseline controls.

9. field test biological control using larvivorous fish in representative ecologies throughout Pakistan.

10. monitor the distribution and severity of the problem of chlorquine resistance in p. falciparum.

11. test the efficacy of the passive case detection system as it develops in the Basic Health Services.

12. test, district wide, a system or systems of, volunteer collaborators for rapid case detection and treatment.

13. improve on current data reporting handling and analysis, with the thought of better utilization of epidemiologic data in operational decisions.

14. overcome resistance in the community to the acceptance of control techniques being used.

15. test the hypothesis that a knowledgable community can and will assist in the malaria control effort through community participation.

16. test the efficiency of the administration and supervision of the operational organization keeping in mind the constraints imposed by entry into the total health services system.

17. evaluate the accuracy of clinical diagnosis among the medical practitioner of Pakistan.

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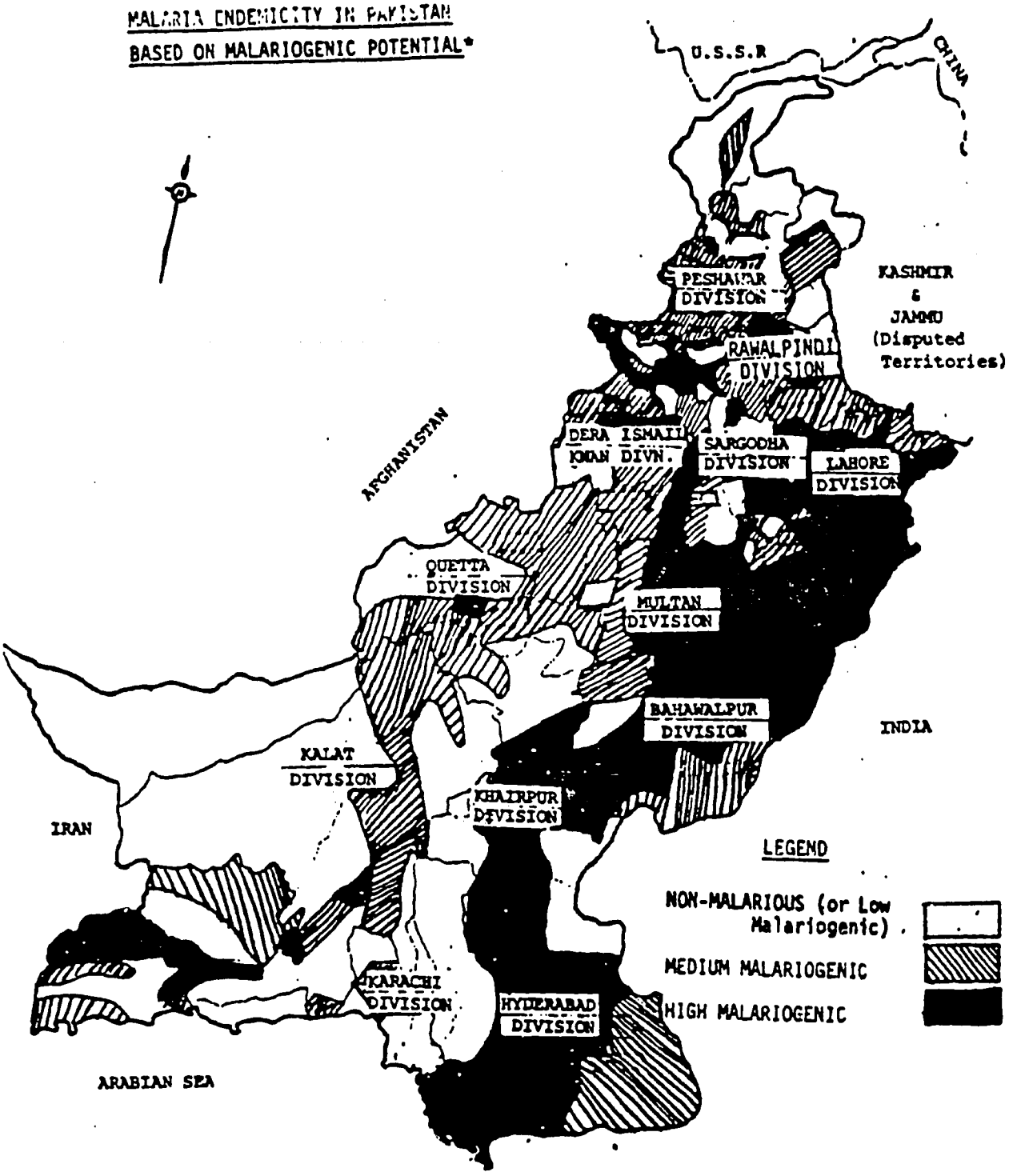
MALARIA ENDEMICITY IN PAKISTAN
BASED ON MALARIOGENIC POTENTIAL*



* Malariogenic Potential is the degree to which an area is conducive to malaria based on cumulative epidemiological data collected from each area regarding the parasite load, vector density, water-logging, climatic conditions, population movement, and other factors.