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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

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PROJECT PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

PAKISTAN - MALARIA CONTROL, AMENDMENT I

AID-DLC/P-2073/1

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AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

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AID-DLC/F-2073/1

September 20, 1977

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Pakistan - Malaria Control, Amendment I

Attached for your review are recommendations for authorization of an amendment to A.I.D. Loan No. 391-U-163 to the Government of Pakistan ("Borrower") of not to exceed Four Million United States Dollars (\$4,000,000) to assist in financing the foreign exchange costs of goods and services required to support a multi-year program of malaria control in Pakistan.

No meeting is scheduled for this loan proposal. We would, however, appreciate your advising us of concurrences or objections as early as possible, but no later than the close of business on Tuesday, September 27, 1977. If you are a voting member, a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development Program
Review and Evaluation

Attachments:

Summary and Recommendations
Annexes 1 and 2

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ABBREVIATIONS

CDC	Communicable Disease Control
CY	Calendar Year
DOMC	Directorate of Malaria Control
EAT	External Assessment Team
FE	Foreign Exchange
FY	Fiscal Year
	a) U. S. - October 1 - September 30
	b) Pakistan - July 1 - June 30
GOP	Government of Pakistan
LC	Local Currency
MCP	Malaria Control Program
PCMC	Provincial Chief Malaria Control
RPO	Revised Plan of Operation
Rs	Pakistan Rupees
USAID	United States Agency for International Development
USCDC	United States Center for Disease Control
USPHS	United States Public Health Service
WHO	World Health Organization
ZC	Zonal Incharge
\$	U. S. Dollars

Summary and Recommendations

A. Summary

The Malaria Control Program is a five-year effort aimed at reducing the incidence of malaria in Pakistan to a level of less than 500 cases per 1,000,000 population.

The program began in CY 1975, but was not fully underway until CY 1976. Shortages of insecticide and sprayers delayed the start of the 1976 spraying season until June. Soon after spraying began, the toxicity problems with malathion curtailed the program. Despite these problems, approximately 75 per cent of the rural areas were sprayed, and recorded malaria cases dropped an estimated 40 per cent.

Early in CY 1977, political disturbances compounded the normal difficulties of shipping and unloading imported insecticides and equipment, and delayed the arrival of these materials in the field until late July. Because of the problems with toxicity in 1976 spraying was not permitted to begin until the recommended safety procedures were fully operational. As a result, spraying did not get underway until May. However, initial evidence indicates that the safety effort has minimized the toxic effects of the insecticides. The CY 1977 spraying effort is expected to cover an estimated 75 per cent of the rural areas of the country.

Looking ahead to CY 1978, much of what is required for a successful program has already been done. There is currently an adequate supply of sprayers, spare parts, and operational vehicles in country. A well conceived plan and proposed time schedule for the ordering of next year's insecticides has been developed. Safety procedures have been established and are expected to remain effective in limiting toxicity problems. There are well established Provincial malaria organizations capable of implementing the program. One possible exception is the Punjab province, where an effort to integrate the malaria and health organizations has been prematurely initiated.

The program will, however, continue to face some problems in CY 1978. The Federal Directorate of Malaria is still hindered by a shortage of professional personnel. An urban malaria program,

which has been encouraged in each of the past two annual reviews, has not yet been fully developed or implemented. This will require a more serious commitment at the federal and provincial levels in CY 1978. The integration of the malaria and health organizations, an important aspect of the original program implementation plan, has thus far taken place only at the administrative level. Efforts to integrate the two organizations effectively at the functional level will continue in CY 1978.

With regard to the financial support for the Malaria Control Program, the Mission recommendation for a \$55 million loan to finance 50% of the FX cost was approved by the Agency in March 1975, with the understanding that AID would authorize the maximum amount available from FY 1975 funds (not to exceed \$35 million) and then amend that authorization to provide the balance required for the project when additional funds became available. Accordingly, a loan of \$20 million was authorized on June 30, 1975. Of that amount \$7.8 million has been reimbursed in foreign exchange and an additional \$8.0 million will be approved for reimbursement following satisfaction of the 1977 conditions precedent, (expected to be met in late August.) Thus \$4.2 million remains of the \$20 million authorization. It is estimated that the Government of Pakistan will require a minimum of \$13.4 million in foreign exchange to finance 1978 operations under the malaria control program. In addition to the \$4.2 million available, \$3.8 to \$4.0 million will be required to fulfill AID's commitment to finance 50% of the foreign exchange costs of the first three years of the program.

The Capital Assistance Paper also provided for a grant of US-owned rupees totalling Rs. 250 million (US \$25.25 million) over the five years of the project to meet a portion of local costs. The first tranche of Rs. 65.8 million was allotted in June 1975, and has been disbursed.

E. Recommendations

The Mission therefore recommends that the 1975 loan authorization be amended to provide an additional \$4.0 million to support the Malaria Control program for the third year. A grant of US-owned rupees equivalent to \$12.12 million should also be allotted to finance a portion of local currency costs for the second and third years of operations.

Introduction and Background

The Malaria Control Program is part of an on-going effort started in 1961 and redesigned in 1974. The program was originally aimed at the total eradication of malaria in Pakistan by 1975. From 1961-67 the program was an outstanding success, reducing total malaria cases in rural areas from an estimated 7,000,000 in 1961 to 9,500 cases in 1967. The parasite rate (percentage of blood slides taken having malaria parasites) went from 15% to less than 0.1% during the same period of time.

Resurgence of malaria became evident, particularly in the Punjab and Sind provinces by 1969. This resurgence was caused mainly by four factors (1) increasing resistance by the vectors to DDT (2) unchecked urban malaria infiltrating back into malaria free rural areas (3) lack of an organization in the permanent health services responsible for the maintenance of areas free of malaria (4) severe reduction in the Malaria Eradication program budget and manpower.

This situation deteriorated to such an extent that by 1973 it was estimated that malaria had infected ten million people in Pakistan. Conditions were reported to be worse than in 1961 when the Malaria Eradication Program began. The positivity rate rose to 26.3%. Even more alarming was the increase in the rate of plasmodium falciparum infections in relation to total malaria cases. This virulent form of malaria* has a mortality rate of about 18% if not treated. Although no reliable statistics were available, it was estimated that thousands of Pakistanis died of malaria in 1974. The resurgence of plasmodium falciparum was of particular concern because of chloroquine resistant cases being reported as near as Eangladesh.

In 1973, partly as a result of devastating floods in that year, Pakistan experienced a major epidemic of malaria in the Sind and Punjab provinces. The CCP became greatly concerned and in the summer and fall of 1973 held a series of meetings with the Provincial officials to draw up a strategy and revise the 1961 original 'Plan of Cooperation'. These meetings, with the cooperation of the World Health Organization (WHO), Government of Pakistan (GCP), and provincial health officials, resulted in a five-year extension (1975-79), hereafter referred to as the Revised Plan of Cooperation (RPC) of the original fourteen year

*Pampana, Textbook of Malaria Eradication 1963

program. The program was renamed the Pakistan Malaria Control Program.

The CCP requested USAID assistance in financing the substantial foreign exchange and local currency support costs of the program. In the spring of 1974, USAID Mission to Pakistan invited a team of malaria experts* to review the strategy of Pakistan's revised Plan of Operation and evaluate its financial and administrative implications. The conclusion of the team was that "the program concept presented in the Extension to the Plan of Operations document is viable and reasonable -- given the widespread epidemic situation, and the limited resources available". The team felt that, if properly implemented, the activities described in the PPC would result in lowering the malaria rates to satisfactory control levels within three years.

In March 1975, A. I. D. approved a \$35 million loan to finance 60% of the foreign exchange costs of the first three years of Pakistan's Malaria Control Program. It was understood that A. I. D. would authorize the maximum amount available from FY 1975 funds (not to exceed \$35 million) and then amend the authorization to provide the balance required for the project when additional funds became available. Accordingly, a loan of \$20 million was authorized on June 30, 1975. In addition, a grant of U.S. -owned Rupees equivalent to \$25.3 million was approved. The original financial plan was as follows :

Financial Plan

(Five-year cost in millions of U.S. Dollars)

	<u>Foreign</u> <u>Exchange</u>	<u>Local Currency</u> <u>(Equivalent)</u>	<u>Total</u>
CCP/Provinces	27.4	8.2	35.6
AID Loan	35.0	--	35.0
US-owned Rupee Grant	--	25.3	25.3
	<u>62.4</u> <u>I/</u>	<u>33.5</u>	<u>95.9</u>

*The team was composed of Dr. E. F. Campbell, Consultant to APFA, Dr. Andre LeErum, Professor of Epidemiology, Med. College of Wisconsin and Mr. John Stivers, Technical Assistance Bureau, AID/W.

I/ Does not include WFC \$1 million contribution for technical assistance.

The loan has been disbursed on a reimbursement basis : foreign exchange amounts required for each year's purchase of imported insecticides have been committed and expended by the Government of Pakistan; AID reimbursed the Government for AID's appropriate share following the borrower's satisfaction of annual conditions precedent.

As of the date of this paper, AID has reimbursed \$7.8 million for the foreign exchange costs incurred for the 1976 spraying season, and plans to authorize an additional \$8.0 million for reimbursement for the 1977 spraying season foreign exchange cost as soon as 1977 Conditions Precedent have been met (expected to be met in late August). Thus a balance of \$4.2 million remains of the \$20 million authorization. It is estimated that the Government of Pakistan will require \$13.4 million in foreign exchange to finance 1978 operations under the malaria control program. In addition to the \$4.2 million available , approximately \$3.8 million will be required to fulfill AID's commitment to finance 60 % of the foreign exchange costs of the first three years of the program. Therefore, the Mission is recommending that the authorization be amended to provide additional \$4.0 million.

Because of the delay in implementing the RPO in CY 1975 and CY 1976, and the decrease in actual cost of malathion, funds allocated for those years were not completely spent . The spraying period had to be extended two years if the target of control of malaria to an incidence of 500 cases per million population was to be met. In January 1977, the External Assessment Team recommended "that the GCP and USAID extend the period during which disbursements are made under the AID Loan 391-U-163 from three to five years i. e. , from 1975/76 through 1979/80." It is anticipated that additional documentation will be prepared for the extended period of 1978-79 and 1979-80.

The Mission is also recommending that an allotment of F.s. 120 million (US \$12.12 million) be made to the Mission, to be granted to the CCP, as reimbursement for part of the local costs incurred in CYs 1977 and 1978. This would be part of the Rs. 250 million (US \$25.3 million) approved in March 1975.

For details of Financial Data , see Annex. II.

Report on Safety Precautions

The original Capital Assistance Paper (Annex C, Environmental Assessment) provided a detailed description of the environmental and safety hazards to be expected from the pesticides being used for the control of malaria. The environmental assessment section quoted, the WHO Expert Committee on Insecticides: The Committee considered that insecticides of a toxicity similar to, or less than, that of fenitrothion could be used in such applications, even if repeated regularly at intervals of 2-4 weeks, without exposing applicators or those in the sprayed areas to any hazard from the insecticides. Since malathion is less toxic than fenitrothion its use is considered safe. Thus we may conclude that the risks involved from the use of insecticides in the proposed Malaria Control Program will be low and will decrease even further with the shift from DDT to malathion."

Because of the prevailing belief that malathion was less toxic than DDT (which did not require stringent safety measures), malaria personnel did not wear any personnel protective equipment nor use hygienic measures when malathion was introduced.

Within the first two weeks of the 1976 spray operations six workers died and many others became ill. Upon investigation, it was determined that these deaths and illnesses were attributable to malathion. WHO and CDC supplied experts to make a complete detailed investigation into the reasons for these unforeseen tragedies.

Those studies assessed the relative toxicities of the malathion supplied by three formulators and the work practices of spray personnel. Blood samples were taken for cholinesterase determinations and histories were compiled on the spray personnel to discover how many people had suffered from malathion intoxication. Air sampling and dermal exposure studies were performed to uncover the mode of entry.

The conclusions drawn from the study showed that:

(1) The malathion supplied by the Italian formulators (Snia Viscosa and Iunianca) was up to ten times as toxic as the malathion supplied by American Cyanamid.

(2) The concentration of iso-malathion supplied by the Italian firms was up to ten times as high as that of American Cyanamid.

(3) The toxicity of iso-malathion was higher than malathion by a factor of thirty.

(4) All of the deaths as well as a great majority of intoxications caused by malathion were attributed to the Italian formulated insecticides.

(5) Practically no precautionary safety measures were taken by spray personnel.

The following recommendations were made

- (1) Laboratories are to be established for the determination of cholinesterase levels by the Malaria Control Program.
- (2) Workers having low cholinesterase levels are to be removed from the job until it is determined that cholinesterase levels have returned to normal.
- (3) Education and training on safe handling and use of malathion are to be given to all malaria operation and spray personnel.
- (4) Safety equipment is to be supplied to spray teams to provide additional protection from contact with the pesticide.
- (5) The Italian malathion is not to be used for malaria control purposes.

As sequel to these recommendations, in March 1977, Dr. Jesse Hobbs of the Center for Disease Control conducted a training course for Zonal Superintendents and Sector Chiefs regarding the safe handling and usage of malathion. Prior to the spraying cycle these men were used to train over 5,000 malaria supervisors on safety procedures for malathion usage and identification of malathion intoxication symptoms. These malaria supervisors, in turn, were responsible for the training of their respective spray teams, distribution of protective clothing, equipment and soap, and recognition of possible intoxication of team members. In addition, supervisors were expected to take necessary action in possible cases of intoxication including: (a) removal of the suspected cases from the job; (b) providing injectable atropine and (c) notifying higher authorities so that blood cholinesterase examinations could be made for confirmation

and further treatment if necessary. Supervisors were also made responsible for (1) assuring that the protective clothing is washed and changed daily; (2) assuring that the spray team members bathe daily and wash prior to eating or smoking; (3) checking the condition of the spray pumps and repairing them as needed; (4) assuring the proper preparation of houses prior to spraying; (5) selecting mixing stations so as not to present a possibility of malathion pollution of drinking water or a hazard to children and animals; (6) supervising the spraying activities and ascertaining that the spraymen are wearing their protective clothing and are spraying in a safe and correct manner; (7) burning of the cartons and liners in areas where they will not become a hazard to the general population.

In June and July 1977, teams consisting of representatives from GCP, WFC and the USAID made extensive field trips in Punjab, NWFP and Sind provinces to evaluate compliance with safety procedures. Each team was to: (1) observe spray operations; (2) stop operations if any spray team was found not to comply with the safety procedures as outlined above; (3) make a report of their observations to the Director of Malaria Control, the Provincial Chief of Malaria Control in the region and to the Director of the AID Mission in Pakistan so that he could inform AID Washington as to the status of the safety situation.

As of July 15, 1977, 1,503 men working in squads were observed. On the basis of symptoms, there were 22 cases of possible malathion intoxication. Ten of these were shown to have normal cholinesterase levels, and three were recorded at 50, 62.5 and 65% respectively. Nine cases did not have blood tests done. None of the cases was clinically serious.

Laboratory facilities for cholinesterase analysis and training of personnel to operate these laboratories were initiated by Dr. S. Miller of CDC, USPHS, Atlanta, Ga. These facilities, at Lahore, Quetta, Hyderabad and Peshawar, were equipped to perform both the Michel and tintometric blood analysis tests. Dr. Baker of CDC presented a plan for pre-testing selected spray workers with periodic follow-up in Peshawar and Lahore. Unfortunately because of time, personnel and equipment limitations the plan was not fully implemented. There has been some utilization of the

tintometric method, but very little use of the Michel method which was to be used for the confirmation of possible malathion intoxication cases analyzed by the field tintometric method. Five additional tintometric kits have been purchased and will be distributed in August. It is reasonable to expect that in subsequent years, laboratory and field testing procedures will be more efficiently organized and utilized in order to accurately monitor the potential dangers of organo-phosphorous compounds.

The urban malaria control program, in CY 1978 and subsequent years, will use ultra low volume spraying of 96% liquid malathion for Larval control. Although this is a higher concentration than that used in indoor spraying, the ultimate concentration at the contact level will be less. All spraying is done down wind over breeding places. The spraymen will be given specific training on safe clean-up and maintenance procedures. All other safety measures will also apply.

In summary, the implementation and continuous implementation of CDC recommended safety measures and cholinesterase testing will minimize the possibility of serious malathion intoxication recurrence.

Report of the Malaria Control Program - CY - 1977

As stated in the summary, the CY 1977 malaria control program has been behind schedule. Other facets of the CY 1977 program are identified below:

A. Spraying Operation

The primary control effort this year continues to be widespread spraying of insecticides in the rural areas. Malathion has been extensively used, and appears to be the most effective in malaria control, as shown by the epidemiological data collected in 1976. BHC and DDT have been reserved for limited areas. Spray operations have started in all areas scheduled for spraying according to the provincial plans of action. Baluchistan is not scheduled to begin until early September. All spraying should be finished by late September.

It is too early to make any forecast as to how spray operations will comply with the plans of action this year. An evaluation of the spray operations will be made immediately following completion of the first cycle, which will be between August 15 and September 1st, depending on the date that spraying started in each particular area. The second cycle of spraying (where scheduled), will start immediately following the first spray cycle assessment.

B. Safety Program

This matter, which was of extreme importance this year, is fully discussed under a separate heading.

C. Research

Although research is consistently identified as a necessary adjunct to a malaria control program, there has been little if any research undertaken as an integral part of this program.

In 1971, with the creation of Bangladesh the GOP lost the services of the Malaria Institute in Dacca. Interim efforts for the establishment of a research institute have not been successful, and at present, the MCP has no facilities for carrying out research in malaria control.

On July 31, 1977, the CCP approved plans for the establishment of a Malaria Research Unit (MRU) at the National Malaria Training Center in Lahore. This unit will be under the overall supervision and direction of the DCMC who will be responsible for the design of research projects in consultation with the Pakistan Medical Research Center (PMRC), VHC and the Unit staff.

Some of the objectives of the Malaria Research Unit are as follows :

- (1) To determine the most effective type, dosage and timing of insecticides spraying which may be economically and safely used in Pakistan.
- (2) To monitor the susceptibility of the vectors to the insecticides being used and anticipated to be used in the MCP.
- (3) To assess vector densities in representative areas of the country so as to determine seasonal trends and insecticide impact.
- (4) To develop and assess the sensitivity and specificity of serological and other methods of malaria control.

D. Urban Malaria

In the original Plan of Operation for Malaria Eradication in 1961, urban centers of over 40,000 population were excluded from the program. This exclusion in planning arose because of the erroneous impression that malaria transmission does not occur in large urban areas.

In the early stages of the Malaria Eradication Program the problem of urban malaria was overshadowed by the higher malaria incidence in rural areas. However, by 1967, when transmission was interrupted in the rural areas and spraying was withdrawn, urban malaria turned out to be the major source of new cases, and was responsible for the renewal of transmission in rural, consolidation phase areas. The malaria epidemics in Karachi in the late sixties were the worst known for urban malaria. In 1967, 300,000 cases of malaria were reported in Karachi. Since Karachi has large number of migrants from every part of the country, there was a large movement of population from and to the city. Karachi was not in a position to cope with this situation

with the result that transmission was reestablished in consolidation phase areas. Malaria cases were even exported to foreign countries.

To prevent a recurrence of this situation the Revised Plan of Operations intended to include the municipalities' efforts to control malaria.

The main objectives of these efforts are:

(1) Substantial reduction in the incidence of malaria by (a) larviciding (b) adulticiding (c) minor engineering works for resource reduction (d) case detection and treatment (e) biological and predator control of mosquitos (f) limited indoor residual spraying.

(2) Long-term control measures of improvement of sanitary facilities to eliminate the sources of mosquito breeding.

On July 31, 1977 the GOP approved the plan for urban malaria control presented by the DCMC. This plan will be implemented in 90 municipalities throughout the country in FY 1978 Plans of Action

The main responsibility for execution and funding of malaria control operations will still rest as before, with the municipal authorities concerned. The provincial authorities will provide technical assistance and facilitate coordination of operations. A post of Urban Malaria Control Officer will be established in each province. The DCMC will provide larvicides, insecticides and ultra low volume spray machines as well as some transport.

E. Conditions Precedent

The terminal date for meeting the 1977 conditions precedent was February 9, 1977, but this date was extended twice. It is anticipated that all of the conditions will be met by the end of August, 1977. In part, the delays were due to unsettled conditions in the country which complicated field operations. The need to develop and adopt stringent safety measures to avoid a repetition of the 1976 malathion intoxications was also a factor as it required a major investment of time and effort by the already overextended DCMC staff. Finally, the original date of February 9 did not allow the Government of Pakistan sufficient time to analyze the results of the previous year's spraying operations; assess

progress during the annual meeting with the External Assessment Team, and incorporate the resulting conclusions and recommendations in plans for the next year's malaria control activities. For this reason the GCP has requested -- and we have agreed -- that the terminal date for meeting 1972 conditions precedent be changed to May 10, 1973.

The specific steps which have been taken by the Government of Pakistan to meet the important conditions precedent and covenants are described elsewhere in this section. These include the development of research activities, measures to control urban malaria, the integration of malaria control and health activities, the adoption of safety measures, and revisions in the annual plans of action.

F. Integration

Integration of the malaria control program has been started with the administrative action of conferring permanent civil service status to the provincial malaria control workers. However, administrative integration in the Punjab province, except for putting the malaria control staff on permanent civil service status, has not improved the operation or management of the malaria control program. For example, in the new organizational staffing pattern, because of the additional officials in the chain of command needed to approve payment, delays have occurred in the payment of salaries and wages. It is expected that authorization of equipment and supplies will follow the same pattern. Unless the Punjab Department of Health streamlines its present administrative procedures, there will be serious repercussions on the morale and effectiveness of the program.

Plans for the 1978 Malaria Program

The funds under consideration for the U.S. F.Y. 1978, and the subject of this paper, are actually concerned with the malaria program for the calendar year 1978. Because of the disparity in timing, certain data that are desirable for complete evaluation are not available, such as the complete epidemiological data, and entomological data for the calendar year 1977. Nonetheless, plans have been developed which follow the general program outlined in the capital assistance paper, but with some change in emphasis. A projected budget for foreign exchange requirements for the F.Y. 1978 is included.

A. Spraying Operation (Rural Areas)

As in the two previous years, there will be extensive spraying of rural and village homes, using DDT, BHC and malathion. The precise amounts of each of these chemicals will depend on the reports coming out at year end, but it is expected that malathion will be widely used again. It is anticipated that the spraying season will begin at least two weeks earlier than in 1977, assuming that the insecticides will be available in time. The amount of malathion required is projected at 6260 MT, which is 740 MT less than in CY 1977, and reflects the expectation that less spraying may be necessary in some areas next year, particularly the NWFP.

B. Safety Program

During the past two years, the spray pumps have been a difficult problem. In CY 1976 many of the pumps used were from previous programs, and were either leaking or functioned poorly. Some of the toxicity problems in CY 1976 were attributed to the defective pumps, and a concerted effort was made to repair and/or replace the malfunctioning equipment. As a result, spray pumps were ordered both from incountry sources and foreign sources. These have been arriving throughout the summer, and are gradually replacing and augmenting the existing inventory. With the purchase of 1100 new pumps, and spare parts, there should be a plentiful supply to enter the CY 1978 spraying season.

C. Research

This issue was discussed under the CY 1977 report. Beginning implementation is expected this year.

D. Urban Malaria

Control of urban malaria has been identified as a special covenant, and is recognized as critical to the success of the nationwide Malaria Control Program. Efforts in the first two years have been inadequate and sporadic, but the CY 1978 plan pays particular attention to this matter, and provides chemicals for specific use in urban areas. This emphasis will enhance the likelihood of control of malaria in urban areas which, because of unusually heavy rains, has flared up once again. Karachi, especially is now faced with malaria of epidemic proportions.

The DOMC will make available, through the provincial Malaria Control Units of the Municipalities, transport, insecticides, larvicides and other supplies to support the ongoing efforts of the municipalities in the control of malaria. The provincial malaria control organizations will also give guidance and technical assistance to Municipal anti-malaria activities.

On 30th July 1977, the proposed plan for Urban Malaria control was approved by the national Central Working Development Party (CWDP). The plan included 98 urban areas in the Urban Malaria Control Plan of Operations. Plans of Action for these municipalities will be prepared by the respective Provincial Health Departments in collaboration with the local authorities.

Prior to assistance given to the municipalities, the Provincial Health Departments will obtain commitments from the municipalities that they will fully implement the anti-malaria program with the required staff.

E. Integration

Integration of the Malaria Control Program into their respective provincial Health Departments will be extended in the coming year. The NWFP is expecting that some zones will no longer need internal house spraying in CY 1978. If epidemiological data confirms this contention, the malaria workers involved will be given training in other public health measures. Basic health workers will be given training in malaria control. These workers will then be assigned to specific areas, similar to the present malaria control sub-sectors and will be responsible to maintain the control of malaria and additional health assignments as the new training and proficiency permit.

As the individual zones in other provinces reach the criteria of malaria

control, the above scheme will be extended to them. This functional integration will continue over the years until all the zonal malaria control personnel will have been functionally integrated into the provincial Public Health Departments.

The provincial Health Department of the Sind is considering a similar scheme.

The provincial Health Department of the Punjab in the hasty implementation of its plan for a Communicable Disease Center, has caused some morale and administrative problems as noted before.

Purchase of new uniforms, and other supplies concerned with the safety measures, which are available within Pakistan, will be made from the third year rupee grant of P.s. 56.62 million. The strict safety control measures of spray operations, put into effect in CY 1977 and monitored by the international agencies, will be part of the safety program.

F. External Assessment Team

The present timing for the External Assessment of the Malaria Control program is considered to be inappropriate by members of the team. The first meeting with the External Assessment Team was held in December 1975, and the second in January 1977. The EAT recommends that the MCP staffs be given ample time to collect, compile and analyze the data for the several work activities conducted during the past calendar year and suggested that the next Annual Assessment be held in the month of February, 1976.

ANNEX. 1

MALARIA CONTROL PROGRAM BUDGET, CY 1978

I. Foreign Exchange

		<u>Amount in</u> <u>\$ U.S. (000)</u>
A.	<u>Rural Program</u>	
1.	6,200 M./Tons of malathion 50% WDP at an estimated C&F cost of Rs. 19,700/= (\$1,939.90) per M./Ton.	12,337
2.	16 Nos. vehicles at the rate of Rs. 48,160/= (\$4,964.65) per unit.	78
3.	1,100 Nos. Sprayer Pumps at the rate of Rs. 600/= (\$60.61) per unit.	67
	Sub-Total :	<u>12,482</u>
E.	<u>Urban Program</u>	
1.	734 gallons of Abate 500 at the rate of Rs. 500/= (\$50.51) per gallon.	37
2.	70,000 gallons of malathion 96% at the rate of Rs. 100/= (10.10 US\$) per gallon.	707
3.	60 Nos. ULV Machines at the rate of Rs. 35,000/- (\$3,535.35) per machine.	212
	Sub-Total :	<u>956</u>
	Total: 13,438	
C.	Total, of which : USAID (60%)	8,063
	GCP (40%)	5,375

II. Local Currency

		<u>Rupees in</u> <u>Million</u>
A.	<u>Rural Program</u>	
1.	700 m./tons DDT @ Rs. 22,050/- per m./ton.	15.435
2.	992 m./tons EHC @ Rs. 15,435/= per m./ton.	15.312
3.	Transportation of DDT @ Rs. 1,000/- per truck	0.148

	<u>Rs. (000)</u>
4. Sales Tax @ 10% a on malathion.	12.214
5. Clearance and transportation charges for malathion.	14.836
6. Sales tax, transportation and other charges for vehicles	0.637
7. Sales tax transportation and other charges for sprayers.	0.136
8. Clearance and transportation charges of WHC supplies.	0.060
9. WHC Advisors PCL, stationery, etc.	0.012
10. Salaries, TA and other expenses for Cell at Karachi.	0.043
11. Anti-malaria drugs.	8.067
12. Atropine sulphate injection antidotes (40,000 Nos.)	0.100
13. Protective material (shirts, shalwars, and turbans).	3.000
Sub-Total :	<u>70.050</u>

I. Urban Program

1. 123,150 lbs. of Faytax/Abate 5% Cr. @ Rs. 4/= per lb.	0.732
2. 1,250,934 gallons of malarial @ Rs. 5/- per gallon	6.294
3. 113 m/tons Malathion 50 WDP @ Rs. 20,000/- per M./Ton.	2.260
4. 1,394 sprayer pumps @ Rs. 550/- per sprayer.	0.767
Sub-Total :	<u>10.054</u>

Annex 1

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<u>C. Administrative Costs</u>	<u>Rupees in Million</u>
i) Punjab	26.690
ii) Sind	9.550
iii) NWFP	9.600
iv) Baluchistan	3.808
v) Directorate of Malaria Control	781
	<u>Sub-Total: 50.429</u>
D. Total	130.533
	=====
of which:	
USAID	<u>56.620</u>
GOP	<u>73.913</u>
III <u>Total Budget (\$ U. S. (000) Equivalent)</u>	
A. Rural Program	19.558
B. Urban Program	1.972
C. Administrative Costs	5.094
D. Total	<u>26.624</u>
	=====
of which:	
USAID	<u>13.783</u>
GOP	<u>12.841</u>

MALARIA CONTROL PROGRAM FINANCIAL DATA - PAKISTAN FY 1975-1978

Annex 2

**All amounts in Thousands,
FY 1977 - 78**

COSTS	FY 1974-75			FY 1975 - 76			FY 1976 - 77			FY 1977 - 78		
	FX \$	Local Cost Rs.	Total Cost Rs.	FX \$	Local Cost Rs.	Total Cost Rs.	FX \$	Local Cost Rs.	Total Cost Rs.	FX \$	Local Cost Rs.	Total Cost Rs.
Insecticides	2,967	73,909	103,282	10,578	152,751	257,473	13,383	102,093	234,585	13,435	130,529	263,536
Equipment	-	-	-	-	9,701	9,701	816	580	8,658	357	12,822	16,356
Others (Admin.)												
i. Punjab	-	23,821	23,821	-	23,900	23,900	-	25,000 ^{1/}	25,000	-	26,690	26,690
ii. Sind	-	3,686	3,686	-	5,050	5,050	-	5,361 ^{2/}	5,361	-	9,550	9,550
iii. NW/FP	-	9,328	9,328	-	10,590	10,590	-	9,600 ^{3/}	9,500	-	9,600	9,600
iv. Baluchistan	-	NA	NA	-	2,453	2,453	-	3,103 ^{4/}	3,103	-	3,808	3,808
v. Etc. of M/Control-		591	591	-	472	472	-	675	675	-	781	781
Sources												
GOP Budget												
Amount	Rs. 29,373	73,909	103,282	104,722	152,751	257,473	132,492	102,093	234,585	133,007	130,529	263,536
of which UEAF:												
Authorized (Local)	20,000	-	-	-	-	-	-	-	-	-	-	-
Allotted (UE Rs.)	-	65,338	-	-	-	-	-	-	-	-	-	-
Actual Dis-												
Planned/Future												
Authorization	-	-	-	-	-	-	-	-	-	4,000	120,000 ^{8/}	-
Planned/Future												
Disbursement	-	-	-	-	-	-	-	-	-	16,178 ^{7/}	120,000	-

^{1/} This is allocated amount. Expenditure up to May 1977 is Rs. 24,184.

^{2/} This is allocated amount. Expenditure up to November 1976 is Rs. 2,670.

^{3/} This is allocated amount. Expenditure up to March 1977 is Rs. 5,816.

^{4/} This is allocated amount. Report from Baluchistan for actual expenditure was awaited until writing of this paper.

^{5/} Disbursed in September 1976 for the 60% foreign exchange incurred by GOP in 1974-75 and 1975-76.

^{6/} Disbursed in January 1977 for the 1975-76 local currency program cost.

^{7/} About \$8 million to be disbursed in fall of 1977 against 1976-77 FX costs, balance in spring of 1978 for 1977-78 FX costs.

^{8/} Allotment being requested; for FY 1976-77, Rs. 63,380; for FY 1977-78, Rs. 56,620.

CDE, Irshad:wky