PDABL425 MAL10

PC-I FORM

GOVERNMENT OF PAKISTAN

PLANNING COMMISSION

PROFORMA FOR DEVELOPMENT PROJECT

MALARIA CONTROL PROJECT PAKISTAN

FOR

1987-88 TO 1992-93

UNDER

AN EXTENSION OF ON GOING

MALARIA CONTROL PROJECT

REVISED: JUNE, 1987

DIRECTORATE OF MALARIA CONTROL

Ministry of Health, Special Education & Social Welfare

Government Of Pakistan

P R E F A C E

Historically malaria has been the major public health problem of Pakistan and it continues to pose a potential threat to the health and happiness of millions of our countrymen. It has such a profound influence on the socio-economic profile of our country that the best of the development plans cannot succeed if malaria is not kept under effective control. This is the central theme of the Five Point Programme of the Prime Minister which aim to provide health cover to all the Pakistanis regardless of their caste, colour, religion, socio-economic status and geographical location.

Malaria has been a similar problem and in fact the underlying cause of under development of all the countries of the third world. This prompted the World Health Organization to sponsor a global strategy for total eradication of malaria in 1955. Pakistan joined this campaign in 1960 under a 14 year plan which had the financial and technical backing of USAID and W.H.O. After dramatic initial success, the progress in the control of disease was retarded due to technical, financial and administrative problems. Consequently instead of achieving eradication, Pakistan found itself in the grip of severe malaria epidemic in 1972-73.

Under the new strategy of the control and to cope with the prevailing epidemic, a five year extension malaria control programme (1975-76 to 1979-80) was implemented under financial and technical support from USAID and WHO with the objective to control the disease to a level where it may not pose any public health problem. The programme was also provincialized. The plan was implemented successfully and achieved the objectives and targets as envisaged in the plan.

Thereafter, second extension plan (1981-82 to 1986-87) was implemented under USAID financial support to maintain the achieved low level of malaria in the country. The plan was

successfully implemented and almost all the targets have been achieved. There was a slight increase in malaria in some of the districts but the over all epidemiological situation remained satisfactory.

The third extension plan (1987-88 to 1992-93) for malaria control was prepared to maintain the low level of malaria so that it may not pose any public health problem in future. The External Review Team who conducted detail evaluation of malaria control project in April, 1987 is also in general agreement with the strategy proposed in this project document and therefore recommended for extension.

This project was discussed in CDWP meeting on 24-5-1987 wherein it was decided to revise the Project in the light of the following observations made by C.D.W.P:-

i) There should be greater reliance on passive case detection and medical treatment. This should be carried out at all health outlets. There should be de-escalation of reliance on insecticide spray and presumptive treatment.

ii) To undertake the above, the number of microscopes will have to be increased and provided at all DHQs.

iii) Training facilities will have to be enlarged to improve all the existing health facilities and improve the content of the training in malaria control in various training institutions for doctors and health personnel.

The project has therefore been revised in the light of the above observations. USAID is also willing to provide financial support during this plan period. Government of Japan may also support this project.

It may be pointed out that at present the execution of the programme is the entire responsibility of the respective Provincial Governments as the programmes now have completely been provincialized and integrated with General Health Services. The Federal Government is responsible for technical supervision, planning, guidance, coordination, evaluation/assessment, operational research, training and the supplies of insecticides and equipments to the provinces as they are unable to meet these essential requirements from their own resources.

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PART "A"
PROJECT DIGEST

1. Name of Project: Malaria Control Programme

2. Authorities responsible for :-

   i) Sponsoring: Federal/Provincial Governments.

   ii) Execution: Federal Health Ministry/Provincial Health Departments.

   iii) Operation and maintenance: Provincial Health Departments.

3. Time required for completion of project: 6 years (1987-88 to 1992-93)

4. a) Plan Provision:

   i) If the Project is included in the current Five Year Plan; specify actual allocation: Project is included in Sixth and Seventh Five Year Plan. In Sixth plan period, there is an allocation of Rs. 1,231.00 million for preventive programme in which the main component is malaria.

   ii) If not included in the current Plan, is it now proposed to be accommodated (Inter/Inter-Sectoral adjustments in allocation or other resources may be indicated): NOT APPLICABLE

   iii) If the project is proposed to be financed out of block provision for a programme, indicate: NOT APPLICABLE

   iv) Total Block Provision:

	Amount Already Committed.	Amount proposed for this project
	–	–

   b) If Project is not in the Plan, what warrants its inclusion in the plan: –

RELATIONSHIP OF THE PROJECT WITH THE OBJECTIVES OF THE SECTOR. Indicate the contribution of the project, quantified if possible, to the targets in the Five Year Plan, and the names of other projects (whether sanctioned or under preparation) which would form part of an integrated programme within the sector.

As long as effective control of malaria is not maintained this disease will continue to pose a potential threat to the health of the millions of Pakistanis which could quickly assume the proportions of a major epidemic as was witnessed during early seventies. This was the last major epidemic recorded in Pakistan when the incidence of malaria shot upto 133 cases/1000 population.

The Five point programme of the Prime Minister of Pakistan makes a categorical commitment to provide primary health care facilities to each and every citizen of Pakistan regardless of his socio-economic status and geographical location. Further more Government of Pakistan has signed the historic Alma Ata declaration which also provides for the provision of primary health care facilities to all the population by year 2000. Both these goals cannot be achieved untill and unless malaria is kept under effective control. Another relevant commitment of the health sector is the Child Survival Programme which is being accorded highest priority by USAID. It is not difficult to visualize that Child Survival Programme cannot succeed if malaria is rampant in the country particularly at this stage when Chloroquine resistant P. falciparum malaria is being reported from many districts particularly along the Indian border.

In short the Five Point Programme of the Prime Minister, the Alma Ata goal of Health for All by year 2000 and the Child Survival Programme will remain fond hopes if effective control of malaria is not ensured.

Since long, malaria has been recognised as the major obstacle to the overall socio-economic development of the malarious countries of the world. In fact decline of many a civilization has been attributed to malaria. Many development projects such as the laying of railway tracks, opening new areas for agriculture, construction of canals/ dams etc. etc. have been delayed and in some cases even abandoned altogether on account of the heavy toll exacted by

malaria. Malaria has also been accused, with considerable justification, for the comparative "darkness" of the African continent. The relationship between malaria and agricultural production has been proved beyond any shadow of doubt. The higher the incidence of malaria, the lower is the level of agricultural production. This inverse relationship between malaria and agricultural production has been proved during late sixties and again in late seventies in Pakistan. During these two periods of time Pakistan achieved self-sufficiency in food and they coincided with the periods of lowest malaria incidence in the country.

To sum up the foregoing paragraphs, it may be stated that the targets of the seventh Five Year Plan as for as Health, Agriculture, Industry etc. etc. are concerned cannot be achieved if malaria is not kept under effective control.

It has been estimated that there would be as many as 13.92 million cases of malaria by 1992 in the absence of a Malaria Control Programme as compared to 0.17 million cases with a Malaria Control Programme in operation. This would enable the country to avoid 13.75 million cases of malaria. The net monetary benefits by the implementation of a Malaria Control Programme would add upto Rs. 269.42 million because of savings in the loss of production and productive days as well as the savings in the costs of treatment. For detailed statistical analysis please see Annex.I.

6. Capital cost of Project: (In Million Rupees)

- Local Cost:	Rs.	135.81
- Foreign Exchange Cost:	Rs.	787.81
	Rs.	923.62

$45.1 mill

7. Annual recurring expenditure after completion: (In Million Rupees)

- Local:	Rs.	20.00
- Foreign Exchange:	Rs.	80.00
	Rs.	100.00

8. Objectives of the Project preferably in quantitative terms:

8.1. The overall objective of the Third Six Year Extension Plan of Malaria Control Programme is to keep malaria under effective control so that it does not become a major public health problem again. In this context, malaria control strategy is defined as the use of control methods which are effective, feasible and affordable under our local conditions. The specific objectives of this third extension plan are listed as follows :-

a) to keep malaria to a low level (0.5/1000) and even to further reduce this level in both rural and urban areas of Pakistan.

b) to further sharpen the delineation of areas with high, moderate to low and no malaria transmission.

c) to carry forward the full functional integration of Malaria Control Programme with General Health Services.

d) to progressively reduce reliance on the use of insecticides and simultaneously promote other alternative methods of malaria control such as environmental management and biological control.

8.2. The above mentioned objectives can be expressed in the following quantifiable targets :-

a) Annual parasite incidence should be kept at 0.5/1000 level or even reduced further.

b) P.falciparum should not exceed 40% of all malaria infections in unsprayed areas of the country as a whole. This is in accordance with parasite formula of Pakistan before the start of control/eradication measures (Pv.60, Pf.40). However, it should be much lower than this figure in areas which have been under spray for one or more than one consecutive year. If the problem of chloroquine resistance aggravates, there may be some increase in the ratio of P.falciparum in such foci.

c) The role of passive case detection in surveillance operations against malaria will be further increased. If the development of primary health care facilities proceeds as planned, then PCD should contribute more than 70% of all slides collected.

d) Indoor residual spray will be restricted to areas of high epidemiological importance and will not exceed 25-30% of total existing houses in the country in any given year.

e) Time lag between collection of blood slides to the initiation of radical treatment should not exceed a few hours in case of P.C.D. slides and 3-4 days in case of A.C.D. slides.

PREPARED BY	:	Director of Malaria Control
CHECKED BY	:	Ministry of Health
APPROVED BY	:	Secretary, Ministry of Health, Government of Pakistan.
D A T E	:	June, 1987

PART "B"

PROJECT COST & FINANCING

9. Location of Project:

a) Give name of place and administrative district in which the service centre will be provided:

b) Indicate total area which will be served:

Pakistan, Country-wide

10. Existing Facilities:

a) For Health Scheme give information about public and private sector institution in the area, their staff & equipment and the number of persons served by them.

Indicate if possible, the existing budgets of these organizations. Indicate population of the area and economic characteristics of the category of persons who are being provided service at present. Give statistical data about morbidity and incidence of epidemics during the last 5 years:

This project is a continuation of the ongoing malaria control/programme which was originally launched as an eradication programme in 1960. The Malaria Control Programme from the periphery to the Federal level has a well established organizational structure at each tier which needs to be reinforced.

Foreign Expertise is available to the programme through W.H.O. and USAID. For urban malaria each province has established an urban malaria cell and most of the municipal corporations/ committees have the requisite number of staff for anti-malaria operations.

The existing health facilities consist of teaching hospitals, District/Tehsil Headquarters Hospitals, Rural Health Centres and Basic Health Units. These institutions are curative minded and make no significant contribution to preventive programmes. The case of Passive Case Detection (PCD) serves as a good illustration of their lack of enthusiasm in preventive programmes. However, it is proposed to involve them more fully in passive case detection as detailed under Para No.8 above.

Transport/Equipment: The Malaria Control Programme was equipped with sufficient transport for its field operations. The old vehicles unfit for use have to be replaced now by procurement of new vehicles.

b) For family planning, give the statistical data about population, age groups, number of females of the fertile group. Indicate the results of knowledge attitude practice surveys and enclose copies of such reports:	NOT APPLICABLE
c) For social sector projects give details of the characteristics of beneficiaries, their total population and existing facilities to serve that group of population:	The population of the entire country will be protected against malaria.

11. DESCRIPTION OF THE PROJECT:

Malaria is an ancient disease of mankind. It may be found in the earliest account of recorded history in Pakistan. It has been postulated that malaria might have been a major factor in the decline of Indus valley civilization. In the recent past, malaria has been responsible for some of the most devastating regional epidemics of Punjab. One of the worst such epidemics occured in 1908 when 0.3 million people died within a span of 3 months.

11.1. Realising the widespread morbidity caused by malaria, the Government of Pakistan launched a 14 year (1960-74) plan for its eradication in 1960. This was part of the W.H.O. sponsored world-wide campaign for eradication of malaria which was adopted by the VIIIth World Health Assembly in May, 1955. Despite the dramatic early success of this programme, malaria incidence started showing an upward trend in the late sixties. The sole reliance on house spraying with residual insecticide, exclusion of urban areas from the programme, poor participation of general health services, the over all socio-economic profile of the country and vector resistance to DDT/BHC were some of the major causes for these reverses. By 1972 Pakistan was in the grip of a devastating epidemic with 642,958 microscopically confirmed malaria cases while the actual number of malaria cases were estimated to be at least 10 million.

11.2. First Five Year Extension Plan (1975-80):

The major objective of this plan was to deal effectively with the prevailing epidemic in the early 1970s and to progressively reduce and maintain malaria incidence to a level where the disease is no longer a major public health problem. However, the ultimate objective of total eradication was retained. For the efficient implementation of this plan, a number of administrative and technical changes were introduced. Provincialization of the malaria control programme with the Federal

Government assuming the responsibility for the supply of insecticides, equipments and transport; replacement of DDT/ BHC by Malathion for indoor spraying; and inclusion of urban areas as well as Azad Kashmir were some of the major changes introduced during this period.

The successful execution of this plan reduced malaria transmission from a slide positivity rate of 14.09% in 1973 to 0.59% in 1980. However, the Malaria Control Programme found itself in a similar situation as was the case in the late sixties. A major reason may be due to the epidemiological pattern of unstable malaria in Pakistan which fluctuates between hypoendemicity, punctuated with devastating regional epidemics. This situation calls for constant vigilance and continued control efforts on our part. The alternative is to re-experience the tragic yet inevitable consequence of rampant malaria transmission.

It may not be out of place to mention that the experts had predicted a repetition of the tragic events of early seventies during early eighties because the epidemic cycle coincided with this period. These fears were further compounded by the temporary withdrawal of USAID assistance during 1980-82. The coinciding of epidemic cycle with this temporary set-back created quite an alarming situation. However, it goes to the credit of Malaria Control Programme that they were able to keep malaria situation under effective control and a major catastrophe has been averted.

11.2.1. Second Five Year Extension Plan (1982-87):

The major objective of the ongoing plan (second Five Year Extension Plan) was to keep malaria under effective control. In quantitative terms, malaria incidence was to be kept at 0.5 cases/1000 population. For the attainment of this objective, reliance was placed on selective spraying of highly positive localities and the depletion of the infective reservoir through an improved system of surveillance. Greater stress was laid on the development of passive case detection which is rather an inexpensive yet efficient system of case detection. Despite the traditional apathy of General Health Services towards the development of a true system of P.C.D. it was felt that they would be more willing partners in our struggle for malaria control because the programme had been provincialized and integrated with General Health Services.

Despite various set backs during the implementation of the Second Five Year Plan such as delay in the approval of PC-I, inadequate funding by some of the Provincial Governments etc. etc; Malaria Control Programme has been able to achieve almost all the major objectives of this plan.

Malaria incidence has been kept very close to the stipulated level in most parts of the country with the possible exception of central districts of Punjab during 1983-85. The second plan was launched with an A.P.I. of 0.97/1000 in 1982. for the country as a whole. Due to non-availability of sufficient quantities of insecticides during preceding two years (1980-82) and the fact that this period coincided with the epidemic cycle of malaria in the Punjab, there were small

focal out breaks in central districts of Punjab. The situatinn was soon brought under control and the upward trend in A.P.I. was averted from 1984. It can be safely stated that in the absence of an effective control programme, the situation would have worsened to 1972-73 epidemic when A.P.I. had shot upto 13.18/1000. We must all offer our thanks to God Almighty for enabling us to avert such a national catastrophe. In fact our thanks are doubly due when we consider that the local strains of P.falciparum have started exhibiting signs of resistance to Chloroquine. The ratio of P.falciparum cases which is a much more sensitive indicator has also started showing a downward trend.

Similarly passive case detection (PCD) has started showing noticeable improvement. This is particularly true after the decentralization of district parasitology laboratories which has not only led to an increased contribution of PCD but also 'artificially' inflated the slide positivity rates. The increase in SPR is due to the fact that after decentralization of laboratories, slides are being made from actual fever cases who are sick enough to report for medical treatment at a PCD post. Therefore, the chances of a slide being positive have increased proportionately.

To sum up the achievements of the Second Five Year Extension Plan it may be mentioned that this plan not only averted an epidemic of 1973 magnitude (eminent malariologists had already issued a warning of the impending epidemic) but also kept malaria incidence within manageable limits which contrasts sharply with the situation in Indian Punjab where 200,000 malaria cases were reported from a much smaller population in 1985.

11.3. Influx of Afghan Refugees:

The current epidemiological situation has been further complicated by the influx of more than 3.5 million Afghan Refugees. A majority of the refugees are living in camps which are situated side by side to local villages.Worst still, there is no check on the movement of refugees and some of these groups have moved far into the interior of Punjab and Sind. Since malaria control activities disintegrated in Afghanistan due to the unsettled conditions of the past few years, there has been a marked increase in malaria incidence reflected in the high malaria rate among incoming refugees. Considering the high receptivity of most of the malarious areas of Pakistan, coupled with the frequent and unrestricted movement of refugees, we must be doubly alert if we are to avoid a major epidemic in the coming years.

The gravity of the situation can be realized by a comparison of slide positivity rates amongst Afghan refugees and the local population in some selected districts of N.W.F. Province.

11.4. Epidemiological Approach for Malaria Control:

During the original eradication programme, blanket spraying of all the malarious areas was considered a panacea for all situations. This mechanical approach has proved to be short sighted in many countries of the world, and has done irrepairable damage before being discredited. It lulled malariologists into a state of blissful somnolence. It was

assumed that the magic of blanket spray would more than make up for hard dedicated field research. But this fond hope was soon shattered by the development of vector resistance and the ever increasing costs of malaria control. Increasing concern by environmentalists over insecticide pollution also shook spray advocates out of their deep slumber. The stage has now been reached when all concerned have realised the inadequacy of our existing tools for malaria control and the very urgent need of developing cheaper, safer and more effective methods of malaria control. This highlights the urgent need of research so that we can minimise the use of insecticides and by using alternative methods be able to keep malaria under effective control.

This new epidemiological approach for control of malaria was tried during the First Five Year Extension Plan (1975-80). Under this approach, all the malarious areas of Pakistan were classified according to their malariogenic potential into areas of high, medium and low malariogenic potential. This classification, was based on cummulative epidemiological data pertaining to parasite load, vector density, climatic conditions, population movement, water logging and other factors causing man made malaria. Such classification enabled us to develop different strategies for the three types of areas thereby resulting in considerable savings to the country.

Regular indoor residual spraying was carried out for two-three, one-two, and zero to one year in areas of high, medium and low malariogenic potential respectively. Under the original scheme, three to four years of spraying was needed for all three types of areas. Therefore, the savings in insecticides and labour costs are quite obvious.

CLASSIFICATION OF MALARIOUS AREAS ACCORDING TO MALARIOGENIC POTENTIAL (RURAL) :

Province	G. R. Data	MALARIOGENIC POTENTIAL High	Medium	Low	Total
PUNJAB	Sub-sectors	1,609	344	86	2.039
	Houses	6,173,555	1,331,100	328,936	7,833,591
	Population	31,322,714	6,753,493	1,668,868	39,745,075
S I N D	Sub-sectors	479	39	45	563
	Houses	1,570,030	127,848	147,512	1,845,390
	Population	8,470,925	689,748	795,855	9,956,528
N. W. F.	Sub-sectors	72	373	181	626
	Houses	219,564	1,153,722	559,820	1,933,106
	Population	1,084,102	5,695,034	2,763,579	9,542,715
BALUCHISTAN	Sub-sectors	19	110	63	192
	Houses	41,113	268,442	151,577	461,132
	Population	257,658	1,681,885	949,422	2,888,965
T O T A L:-	Sub-sectors	2,179	866	375	3,420
	Houses	8,032,757	2,865,190	1,175,272	12,073,219
	Population	41,669,527	14,517,266	5,946,488	62,133,283

11.5. Epidemiological Approach under Proposed Project:

Under the proposed project, the insecticidal spray will be selective and will be confined to (i) the areas with high P.falciparum ratio, (ii) areas showing P.falciparum resistance to Chloroquine, (iii) flood affected areas, (iv) remote areas with difficult communication and (v) areas with poor access to health outlets. The total households with the above characteristic vary and are generally upto 25% houses/population under operation.

Additional support will be provided by modifying and intensifying epidemiological components of surveillance in order to detect and treat cases more efficiently and thereby reduce the parasite reservoir. A number of measures have already been initiated for the improvement of surveillance operations. The replacement of single active case detection agent by a mobile team comprising of CDC Supervisors, Vaccinators and Sanitary Inspectors should increase the efficiency of all activities assigned to this team. However, a word of caution is necessary here. There is a danger that the entire team may be forced to focus its attention on a single activity. This can only be done at the cost of other components. In fact such an approach will defeat the very purpose of all preventive programmes i.e. to protect our population against all preventable diseases.

The application of environment management methods as well as biological techniques for control of vector mosquito whereever feasible will also be introduced. The cases showing resistance to Chloroquine will be treated with alternative drugs i.e. Amodiaquine/Fansidar. The infection of P.falciparum will be reduced through spraying of falciparum areas alongwith quick screening of cases and their immediate radical treatment.

In remote hilly areas of Baluchistan, NWFP and Azad Kashmir, emphasis will be placed on the use of anti-malaria drugs and focal spraying where ever warranted by epidemiological considerations. In the Northern areas of Pakistan, intensified passive case detection coupled with anti-malaria treatment through Health Guards will suffice because prevalence is generally low in this region.

For urban areas heavy reliance will be placed on improved case detection to provide more reliable estimations of the problem. Control methods will emphasize mosquito adulticide methods by the use of space sprays such as fogging, duly supplemented by judicious use of larvicides and anti-malarial drugs.

THE ABOVE POINTS HAVE FURTHER BEEN ELABORATED AND MEASURES TO BE TAKEN FOR THE IMPLEMENTATION OF THE SPECIFIC RECOMMENDATIONS OF EVALUATION REPORT OF PMRC AND THE REPORT OF THE SECRETARY GENERAL ECONOMIC AFFAIRS DIVISION ARE ALSO GIVEN AS FOLLOWS :-

11.5.1. Active Case Detection (A.C.D.):

Traditionally Active Case Detection has been the major component of malaria surveillance in Pakistan. A.C.D. was assigned this role in eradication era when the health establishments in rural areas of Pakistan were few and far in between. At that time A.C.D. was the only source of

information on malaria incidence in vast portions of rural Pakistan. The situation has undergone a dramatic change starting from the Fifth Five Year Plan. According to the new strategy, at least one Rural Health Centre or Basic Health Unit will be provided in each Union Council before June, 1990. This is part of the Prime Minister's Five Point Economic and Social Development Programme. Some of the provinces are likely to achieve this target much earlier than the target date.

The role of A.C.D. will have to be changed in accordance with these developments. Malaria Supervisors will have to focus their attention on areas which lie outside the catchment area of Basic Health Units/Rural Health Centres. However, they will operate as out-reach services of the local Basic Health Units.

This new role of A.C.D. as outreach services from existing Rural Health Centres(RHC) and Basic Health Units(BHU) will be implemented in all the districts in the country. This scheme has already been implemented by the province of Punjab. It stipulates that a team of 3 workers one each from malaria, E.P.I. and sanitation will visit every village in the Union Council/Sub-sector. Each of the workers will be trained in multifunctioning role. This will ensure that no village is missed and almost all fever and fever history cases will be picked up through the combined efforts of the three workers. Presumptive treatment will be administered on the spot. Since slides will not be sent to D.H.O's Office but examined at the laboratory of nearest R.H.C., Microscopic results are expected to become available within shortest time. Medical Officer Incharge of the RHC will then issue appropriate radical treatment to malaria supervisor promptly.

11.5.2. Passive Case Detection (P.C.D.):

The recommendations regarding P.C.D. will be implemented in letter and spirit. After integration of M.C.P. with General Health Services(GHS), the prospects of improvement in P.C.D. appear to have brightened. Efforts will be made to ensure that blood slides will be made from all clinically diagnosed malaria and P.U.O. cases. Efforts are being made to improve the functioning of P.C.D. at all health-outlets by constant followup which will greatly help in the reduction of parasite reservoir in the community.

P.C.D. will receive further support from the large number of Basic Health Units which are going to be set up under the Five Point Programme of the Prime Minister. If the staff of Basic Health Units actively participate in the detection and treatment of malaria cases, the day is not far off when we will be able to reduce our dependence on indoor spraying to a fraction of its existing level.

The recently revised scheme for the enlistment, motivation and regular followup of Voluntary Collaborators will further boost the vital role of passive case detection as detailed under Para No. 11.5.6.

11.5.3. Decentralization of Laboratory Services:

Immediate availability of the results of blood examination is an ideal that has been vigorously pursued by the malaria

control programme. It is in the best interest of the patient, the community and ultimately for the MCP itself. However, the quality of processing the slides, maintenance of records, proper reporting and difficulties of effective supervision over laboratory work are the major hurdles to the decentralization of laboratory services. Another problem will be provision of extra microscopes and its maintenance before this scheme can be implemented. Nevertheless every effort will be made in this direction in every province and the results of decentralization of laboratory services upto the level of RHC will be analyzed at the end of one year. If the results are satisfactory, then decentralization of laboratory services will be continued down to the level of BHU at a subsequent stage. This phasing would be essential because of the gigantic training effort that will have to precede the decentralization of district laboratories. All the Medical Officers from each RHC and the Laboratory Technicians of the RHC will have to be trained in malariology and malaria microscopy respectively. Intensive supervision of laboratory work and the existing system of cross checking will be strictly enforced even though the laboratories at district level may have been decentralized.

The training of existing Laboratory Assistants/Technicians posted at RHU has already been started at National Malaria Training Centre (NMTC), Lahore. The training of all Laboratory Assistants working in RHC of Punjab has already been completed. Similar training courses will have to be organized for the Laboratory Assistants/Technicians of other provinces preferably at the Provincial Headquarters of the respective provinces. Since there are serious budgetory constraints both in the provinces & the NMTC, therefore, training funds from USAID will have to be utilized for this purpose.

The decentralization of laboratory will tremendously improve the time lag between slide collection, examination & treatment of cases. At present there are sufficient Primary Health Care Centres in the country to organize the decentralization of the laboratory services. There are 366 RHCs and 2251 BHUs at present in working condition in the country and 944 (RHC/BHU) are under construction.

11.5.4. Radical treatment of Clinical Malaria Cases:

It has been recommended that all cases diagnosed as clinical malaria should be given radical treatment. In view of the potential toxicity of Primaquine to be used on such a large scale, only Chloroquine treatment will be instituted to cases of clinically diagnosed malaria at all Health outlets and if confirmed positive through blood examination then the Primaquine treatment will be initiated. However, the single dose presumptive treatment of Chloroquine will continue during A.C.D. operation. Primaquine should not be administered to children less than 2 years and the pregnant women.

11.5.5. Provision of Adequate Quantities of Anti-malarial drugs:

The Directorate of Malaria Control(DOMC) has been providing generous quantities of anti-malaria drugs to the provinces, but from the last few years, limited quantity of drugs was supplied in view of reduced malaria incidence. The provinces were, therefore, making their own arrangements in accordance

with the field requirement. The Directorate of Malaria Control (DOMC) may again continue the supply of anti-malaria drugs to MCP and all other health outlets over the next five years till this responsibility is assumed by General Health Services of each province. The DOMC will also procure the alternative drugs for use in the treatment of Chloroquine resistant falciparum malaria.

11.5.6. Voluntary Collaborators (V.C.):

The use of Voluntary Collaborators for PCD was initially made during eradication era. Because of cultural factors, this experiment was only partially successful. But the need for this inexpensive method of case detection has increased considerably on account of worsening ratio between surveillance agents and population. Therefore, every effort will be made to utilize the services of V.Cs. whenever they are available. Regular follow up and motivation will be key factors in the successful functioning of V.Cs. Enlistment of V.Cs. should be restricted to qualified practitioners, Paramedics, school teachers, village leaders etc.

With USAID assistance, a pilot project is being implemented to select, train and supervise voluntary collaborators. During the initial phase of the project, no more than 100 volunteers in each of 2 districts will be selected and trained. If found successful after 6 months of operation, this economical method for malaria case detection and treatment will be replicated to wider areas with the ultimate objective of establishing such posts through out Pakistan giving priority attention to those rural areas not covered by the B.H.S. scheme.

It may be mentioned that the system of VCs has been functioning very successfully in central American countries for many years and more recently has been successfully adopted in Thailand.

11.5.7. Spray coverage to foci of high endemicity:

This is the central point of Malaria Control Project-III. Indoor residual spraying is restricted to areas of proven high endemicity. The criteria for the selection of such areas are based on surveillance data and other epidemiological factors and are revised every year in consultation with international experts. However, the details of basis for areas to be selected for insecticidal coverage have been spelled out under Para 11.5.

Single spraying round will be carried out in each year just before the transmission season but certain areas with high malariogenic potential will be given 2nd round of spray. The spray of Malathion will be carried out at the rate of 2 gm/m^2(e.i.), hence one house will be requiring 1 Kg of Malathion (50% WDP). In accordance with the present epidemiological situation, it has been estimated that nearly 2500-3000 M.Ton of insecticides will be required each year in order to cover 25-30% houses of the total

existing houses including the insecticide required for 2nd round of spray in certain areas of high malariogenic potential. In view of our present strategy for laying greater stress on the reduction of parasite reservoir, it is expected that the use of the insecticide may further be reduced during coming years. The strategy for insecticide usage is guided by the following considerations :-

i. Suitable insecticides for use in malaria control are few and currently are limited to organophosphorous(OP) compounds such as Malathion, Fenitrothion and Actellic etc. etc. The next generation of compounds, the carbamates, are several times more expensive than the O.P. compounts.

ii. The likelihood that the resistant vector population would revert back to susceptibility to DDT/BHC is very remote.

11.6. Training of Medical Officers in Malaria:

The medical profession in Pakistan is strongly inclined towards clinical disciplines. This leads to very little exposure of medical students to the concepts and practices of preventive medicine. In fact all the public health programmes and even basic medical sciences are looked down upon by the young medical graduates. This explains the acute shortage of teachers in basic medical sciences and the constant clamour of ADHO's/ DHO's for clinical posts in the Hospitals. Such a situation deserves the attention of highest echelons in the Planning and Finance Divisions and Malaria Control Programme can at best play a small role in the reorientation of young medical graduates. For this purpose Pakistan Medical and Dental Council will be requested to lay greater emphasis on preventive aspects and get the curricula of medical education revized accordingly.

The second but the most important contribution will be made through the training of all medical officers posted to Rural Health Centres/Basic Health Units. Since this is a gigantic undertaking, therefore, a team of trainers will be trained for each province who will then carry out this training of Medical Officers in a phased manner in batches of 25-30. It is hoped that this training exercise will be completed by 1992 and subsequently all fresh enterants will be trained the same year that they join General Health Services.

11.7. Health Education:

A really effective campaign of Health Education is crucial for the success of a public health programme. This had been an outstanding feature through out MCP campaign and every worker was assigned duty/responsibility of health education in his sector. This activity has been strengthened by providing health education tools like vehicles to each province which is fully equipped from generator to films and slides. In addition with the assistance of USAID, health education through Radio broadcast and printed material is also being carried out which is a major activity extended through well trained Health Educators.

Special attention will be given to other media of health education which has not been considered such as T.V. which is one of the major audio-visual source of contact between the largest population and the health educators. Efforts are also being made to involve local representatives especially local councillors in malaria control operation in urban and rural areas.

11.8. Creation of Post of District Vector Control Officer:

This relates to the creation of District Vector Control Officer as recommended by the Secretary General, Economic Affairs Division (EAD). The creation of such a post will provide relief to DHO, who have hardly any time to devote to MCP activities. While the title of this Officer may be misleading, the intention is to assign all public health work to this Officer. He will supervise the work of all CDC/MCP Officers and work under the direct supervision of DHO. He will be a medical graduate and be a replacement for District Malaria Eradication Officer/District Malaria Control Officer etc. etc. As the health care system of Pakistan evolves, this Officer will be the future District Preventive Medical Officer. The issue was again discussed at Health Division on 24th October, 1985. It was agreed unanimously to create such post at district level but with changed title of Communicable Diseases Control Officer.

11.9. Chloroquine resistant falciparum malaria:

This is one of the major technical problems which has assumed alarming proportions after the detection of R-II resistance in the districts of Bahawalnagar, Okara, Kasur, Lahore, Gujranwala and Sialkot. The situation becomes still more grim when we consider the finding that Amodiaquine is neither more effective nor safer than Chloroquine as has been the case in Okara, Kasur and Sialkot districts. Last but not the least complicating factor is the fact that Fansidar is not only being used indiscriminately all over the country but the first signs of resistance to this drug have already been observed in district of Sialkot.

To address this problem effectively, an extensive programme of monitoring will be launched in the country. To make it possible, training courses were arranged in Punjab and Sind so that provincial staff could undertake these studies on their own. To date, however, all monitoring activities have been carried out by National Malaria Training Centre, Lahore. Some limited in-vivo studies have, however, been carried out in the Punjab recently.

To boost up the monitoring of Chloroquine resistant malaria in Pakistan and other countries of EMRO a WHO Regional Workshop was organized in the National Malaria Training Centre, Lahore during August, 1986. Saudi Arabia, Kuwait, Somalia, Oman, United Arab Emirates, North and South Yemen availed of this training opportunity in addition to participants from Sind, Punjab and Federal Government. As a follow up of this Regional Workshop, two National Workshops are planned during 1986-87 so that 3-4 teams could undertake monitoring activities in every province.

This continuous and extensive monitoring will enable the MCP to demarcate foci of resistance. All control activities in such resistant foci will be carried out under the personal supervision of DHO and his staff in consultation with the DOMC. This close liaison between the Federal and Provincial MCP personnel will enable the coordination of control measures so that the spread of Chloroquine resistant falciparum malaria may be minimized.

Arrangements for the supply of some of the alternative drugs have already been made. WHO has provided 5,00,000 tablets of Amodiaquine. In addition reserve stocks of injectable quinine will be procured and maintained at Lahore and Hyderabad for the treatment of severely ill cases of falciparum malaria. Sufficient stocks of Fansidar have also been procured through the courtesy of W.H.O.

Field trials to develop alternative treatment for Chloroquine resistant falciparum malaria will also be undertaken. The first such trial was carried out in Punjab by National Malaria Training Centre, Lahore early this year.

11.10. Urban Malaria:

The problem of urban malaria came to the lime light during the Karachi epidemic of the mid sixties. Since then it is believed that there has been an increase in magnitude and in the number of affected cities. Because of the rapid increase in urban population, urban malaria may also turn to be a major problem like rural malaria within the next decade or so. Since precise data is generally not available concerning the incidence of urban malaria, strong emphasis will be placed on epidemiological evaluations to assess the magnitude of the problem. Since malaria transmission has a direct casual association with deteriorating sanitation, the sooner we tackle the problem on a permanent footing, the better for all of us. It has been mentioned elsewhere in this plan that Larviciding is at best a symptomatic treatment and we must try to attack the cause rather than symptoms.

The major emphasis in our strategy for control of urban malaria will be placed on the construction of permanent engineering works for improving the drainage of waste water in urban areas. Obviously this is outside the perview of the Malaria Control Programme but the local bodies will be persuaded to tackle this problem on a sound and permanent footing. Larviciding will be restricted only to those breeding places which cannot be dealt with by mechanical methods. It is no more than a wild goose chase to apply larvicide to every septic tank in a city.

Other areas of special emphasis in urban areas will be the development of a highly efficient system of passive case detection. The great majority of curative institutions and private practitioners are concentrated in urban areas. Not only the urban dewellers but the people from surrounding villages also seek medical aid at these institutions. Therefore, a highly developed system of passive case detection will pin-point the foci of transmission within cities and also lead us to undetected foci in rural areas.

During the first five year extension plan, urban malaria control activities were started in big cities throughout Pakistan. Transport, spraying equipment and larvicides were supplied to all of them. During the second five year extension plan, Malaria Control Activities have been extended to all cities/towns having more than 20,000 population. Apart from larvicides and spraying equipment, water pumping machines were also supplied to large cities for draining low lying areas in time of heavy rains or other emergencies. This operation will help in decreasing the mosquito breeding areas.

It might be added at this stage that the supply of new vehicles and ULV fogging machines for urban areas under this project to municipal corporations will be subject to the demonstration of functinnal systems for monitoring vector density and malaria incidence. To augment the case detection capabilities of municipalities, laboratory technicians working in Municipal Dispensaries and Hospitals are being trained in malaria microscopy. It has already been done for Lahore, Karachi, Hyderabad and Sukkur and will be extended to all the major cities in due course of time.

The DOMC has always advocated the need of very close coordination between GHS including MCP and the health staff of local bodies for control of malaria in urban areas. Urban Malaria Cells were set up in each province for this very purpose. The workshops on urban malaria were organized during 1984 and 1986, in which Mayors or their representatives from thirteen major cities participated. Efforts in this direction will be continued. In addition, training in the epidemiology and control of other vector borne diseases such as dengue & eucephatitis will also be given.

It may also be mentioned that all supplies to urban areas will be routed through Provincial Health Departments.

11.11. Safe use of Insecticides:

All types of safety measures are being adopted in the country to avoid any toxic hazards from the insecticides in use for the control of malaria in rural and urban areas. The people engaged in spraying operations are properly trained in safe use/handling of insecticides/pesticides at Federal Malaria Training Centre as well as at Provincial and District level. The necessary protective material(uniforms, hand gloves, soap etc.) are also being provided to the spraying squads to save them from toxic hazards of pesticides and at the same time the squads chiefs are provided anti-dotes (Atropine) to use in emergency. The proper vigilance is being kept through monitoring of cholinestrase level of the persons engaged in handling/use of insecticides during spraying operation. W.H.O. Tintometric Kits are being used for such studies.

By taking all the necessary precautionary measures, the insecticides are being used quite safely and no serious intoxication problem has so far been faced by the programme. However, special attention will be paid to areas where fenitrothion might have to be used on account of vector resistance to Malathion.

11.12. Training and Research in Malaria Control Programme:

11.12.1. Training:

The National Malaria Training Centre(NMTC) (originally a part of the Directorate of Malaria Control) has been meeting the training requirements of the project since 1961. The demand for training has increased significantly owing to the integration of the Malaria Control Programme with the General Health Services. The staff of MCP have to be trained in other preventive techniques before functional integration is implemented. Similarly the staff of the GHS and other vertical programme are being given training in malaria control. In addition staff of local bodies have been given training in urban malaria control techniques. The existing curricula were, therefore, revised in view of the changed strategy. All staff will require refresher courses so as to keep their knowledge up-to-date and to stimulate interest.

Recently laboratories functioning at district level have been decentralized and Microscopists have been posted at Rural Health Centres. This step has been taken to reduce the time lag between collection of blood smear and initiation of radical treatment of malaria positive cases. In addition it will boost up the role of passive case detection which has not contributed its due share so far in the surveillance operations.

For the attainment of the objectives of decentralization, it is essential that all the laboratory technicians working at Rural Health Centres and other curative health institutions and the Medical Officers are trained in malaria microscopy and malariology through condensed refresher courses of short duration. As a first step, all the laboratory technicians working at Rural Health Centres in Punjab have been trained in malaria microscopy. It will be extended to the remaining provinces during 3rd Six Year Extension Plan.

For the training of Medical Officers, it is proposed that a team of trainers be trained for each province who can then take on this massive undertaking on their own. National Malaria Training Centre has now been merged with National Institute of Malaria Research and Training. The new Institute will have to take over the role of National Malaria Training Centre and provide the required guidance and assistance in the preparation/revision of curricula and other training aids.

It may be mentioned that the training needs of each category of workers have been discussed in detail under their respective headings. At the risk of repetition, it is again being stressed that the functioning of decenralized laboratories; passive case detection activities; the role of voluntary collaborators; the pivotal role of Medical Officers of B.H.Us/R.H.Cs; monitoring of parasite and vector resistance to drugs/insecticides;control of urban malaria; safe use of insecticides and the full functional integration can be successful only if all the staff involved in these activities is properly and adequately trained.

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In addition to in country training of various tiers of malaria control project it is proposed to make use of the generous offer of USAID for long term participant training abroad in the fields of epidemiology, entomology, health education and training and research.

11.12.2. Research:

Prior to the launching of the eradication campaign, limited research in malariology was carried out by late Col.Afridi and his colleagues who were instruemental in the establishment of Malaria Institute of Pakistan in Karachi. This Institute was subsequently shifted to Dacca and was made responsible for the training needs of the then East Pakistan Malaria Eradication Programme. For West Pakistan, National Malaria Training Centre was established in Lahore. The launching of the eradication campaign was a serious set back to the research efforts both within and outside the country. However, the development of vector and parasite resistance and the world-wide resurgence of malaria once again highlighted the importance of research. It was realised that our existing methods of control do not yield the desired results and we have still a lot to learn about the epidemiology of malaria. This realization prompted the Directorate of Malaria Control to pursue the objective of establishing a Malaria Research Institute with renewed vigour. During the interim period, National Malaria Training Centre was assigned the responsibility of applied field research. National Malaria Training Centre has acquitted itself honourably in the role of a training and research institute which has been duly acknowledged by External Review Teams. Important studies relating to drug resistance, field trial of larvicides and adulticides, incrimination studies on A.stephensi and malaria survey in Northern Areas have been carried out by the National Malaria Training Centre.

Meanwhile the medical field research unit of the University of Maryland which was functioning in Lahore under the name of Pakistan Medical Research Centre was renamed as International Centre for Medical Research and Training and provided funds out of Malaria Control II Project and was made responsible for research in various disciplines of malariology. The performance of the ICMRT was evaluated by USAID and it was found that its major weakness was the lack of malariology expertise in its senior staff. Consequently ICMRT was taken over by Government of Pakistan and the National Institute of Malaria Research and Training was established on 15-5-1985 as an attached department of Ministry of Health. Various possibilities are being explored to ensure smooth coordination of the Federal and Provincial Malaria Control Programmes with National Institute of Malaria Research and Training so that it is responsive to the research needs of Malaria Control Programme.

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During the life of this project, it is proposed to concenterate research activities to the development of alternative methods of malaria control and their suitability under local conditions. In addition attention will be paid to more detailed study of vector bionomics and the regular monitoring of parasite and vector resistance to drugs/insecticides. Specifically following priority areas will be taken up for research by the staff of National Institute of Malaria Research and Training:-

i) Improvement of surveillance operations.

ii) Field testing and evaluation under local conditions of alternative methods of malaria control, such as source reduction, larviciding, space spraying and biological control.

iii) Studies on vector bionomics.

iv) Monitoring of parasite and vec-tor resistance

v) Studies on the feasibility of community participation.

vi) Studies on optimal use of insecticides.

It may not be out of place to mention that field research centres in the provinces as recommended by the External Review Team 1987 may be established during this project. Finally, efforts will be made in collaboration with USAID and WHO, to update the library facilities of NIMRT which are of crucial importance both in training and research.

11.12.3. Alternative methods of malaria control:

While the subject of alternative methods of malaria control has been discussed under relevant sections in this document yet the importance of the subject warrants separate and detailed treatment. This is so because of the problems associated with the use of insecticides (vector resistance, environmental pollution, toxic hazards etc.) and almost total nonavailability of newer chemical products. Therefore we have to pay attention to the development of environmental management and biological control methods.

Environmental Management Methods: The WHO Expert Committee on Vec-tor Control has defined environmental management for vector control as, "The planning, organization, carryingout and monitoring of activities for the modification and/or manipulation of environmental factors or their interaction with man with a view to preventing or minimizing vector propagation and reducing man-vector-pathogen contact." Landscaping, filling, drainage and

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house screening are some of the more important environmental management methods. Recently the Irrigation Department has undertaken a project for the bricklining and improvement of water courses in the provinces. Staff of NIMRT has already been requested to undertake a comparative study on the malaria incidence in two nearby villages where this intervention has been and has not been made. Similar studies will be carried out to study the impact of drainage, filling, land levelling, flushing, clearing of vegetation, dredging etc. etc. The role of community participation in environmental management methods is of crucial importance and needs to be ensured through continuous education.

Biological Methods: Biological methods are receiving increasing attention and include the use of animal predators, bacterial agents and other pathogens.

The use of larvivorous fish is a well known method that has been used for more than a century. However this method has been field tested in Pakistan and NIMRT will carry out studies on the possibility of using local species of larvivorous fish. Although limited studies have been carried out on the use of bacillus thuringiensis H-14, but they will be continued on larger scale and will be extended to other bacteria, fungi and nematodes.

Before closing this section on alternative methods of control, it is worth while to make a passing reference to Integrated Vector Control which has been defined by WHO Expert Committee as follows :-

> "The utilization of all appropriate technological and management techniques to bring about an effective degree of suppression in a cost effective manner."

The above definition implies a judicious selection of control measures acceptable to the community for a given situation. NIMRT will carry out field trials of Integrated Vector Control strategy in different provinces.

11.13. Integration:

Administrative integration of the M.C.P. has already been completed. Efforts will be made to ensure a just solution of the administrative problems persisting in the provinces to safe guard the legitimate rights of malaria control workers. Functional integration is a lengthy and slowly evolving process. To be successful, attitudes and work habits of long standing must change. Specifically, the G.H.S. staff must assume their share of the responsibility for malaria control by extending their whole hearted cooperation in P.C.D. activities. To accelerate its pace, pilot projects were run in some districts where malaria incidence was reduced to negligible levels. The results of the trial failed to meet the objectives. Gradual addition of new duties is preferred to a precipitous burdening of field workers with the entire load of public health work.

Training is crucial to the success of functional integration. The National Institute of Malaria Research and Training will have to organize a concise training programme for personnel in the GHS in malaria control. In particular, laboratory technicians assigned to G.H.S. facilities will require refresher training on malaria microscopy. Simultaneously, short courses to acquaint malaria workers with specialized control techniques of other diseases in a systematic manner must be organized. The NIMRT, Lahore is capable to perform the responsibilities of retraining the various personnel of the General Health Services and Malaria Control.

The training of DHOs is crucial to the success of functional integration. Two batches of DHOs from the Punjab have already been trained in the epidemiology and control of malaria. Efforts are needed to impart similar training to the remaining DHOs of other provinces. Recently training of DHOs and other Senior Officers of Provincial Health Departments have been completed in Punjab, NWFP and Baluchistan. This training programme will be extended to Sind in due course of time.

11.14. Cost of the New Extension Plan (1987-88 to 1992-93):

The total cost of this new extension plan for the ongoing scheme for the six year period from 1987-88 to 1992-93 has been estimated to be Rs. [illegible] million. Out of this total, a sum of Rs. [illegible] million is required in Foreign Exchange to cover the cost of imported supplies such as insecticides and equipments. Rs. 135.81 million are required to cover the expenditure of commodities locally procured such as larvicides, equipments and anti-malaria drugs etc.

11.14.1. It is important to clarify that the estimated cost of this extended plan is based primarily on projection of financial assistance to the provinces in the form of commodities such as insecticides and equipments for both rural and urban areas in line with the decision of Provincial Coordination Committee meeting. The projected cost in this plan, therefore, does not include administrative expenditure such as salaries, allowances and P.O.L. etc.etc. which is being met from non-development budget at Federal and Provincial level. The Provincial Governments are required to meet the entire administrative expenditure which includes salaries/allowances of their staff from their own resources (non-development) as the execution of the Malaria Control Project is the entire responsibility of the Provincial Governments. However, instances have come to the notice of the Federal Government causing a lot of embarrasment where funds were not provided for P.O.L, TA/DA and life saving supplies such as Atropine and soap. The aiding agencies have also taken a very serious view of this situation. The Federal Government is trying to work out a mechanism whereby such a situation does not arise in future.

11.15. Cost Benefits of the Proposed Project:

Cost benefits projections of the proposed Malaria Project have been calculated. Without a malaria programme, it is estimated that there would be more than 13 million cases of

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malaria in Pakistan by 1992 compared to 0.17 million cases with a malaria programme in operation. When the costs are added from production and work days lost, plus the cost of treatment saved because of anticipated reduction in malaria incidence, the monetary benefits from implementing this proposed malaria project is five times more than its cost (see Annexure-I).

11.16. Organizational Set-up at Federal Level:

There is a Directorate of Malaria Control at Federal level (an attached Department of Ministry of Health), responsible for Policy, Planning, Supervision, Guidance, Evaluation/ Assessment, Supplies of Technical Material (Insecticides/ equipments) to provinces, Training, Operational research and coordination with all aiding agencies. The existing organizational set-up is attached as Annexure-VI(B).

From the perusal of the existing organizational set-up, it can be visualized that the available manpower cannot discharge numerous desired functions as mentioned above for effective control of disease in both rural and urban areas of the country.

The deficiency of technical/professional personnels at Federal level has more seriously been felt when programme has reached to its advanced stages with numerous technical and operational problems in the field. External Review Team for Malaria Control Programme consisting of the senior experts from USAID, W.H.O. and Government of Pakistan have repeatedly raised this issue and pointed out lack of manpower at Federal level in their various External Review Reports presented to Government of Pakistan which read as follows:-

> "The Directorate of Malaria Control staffing pattern is not sufficient in numbers to carry out its duties to coordinate the provincial malaria control programmes, supervise and assess the field operations, procure insecticides, vehicles and equipment, conduct operational research and provide adequate and timely training. Additional staff are needed in the technical, operational and administrative branches. Immediate support in the area of transportation and logistics from the DOMC and the port area of Karachi to the provinces has been needed ever since the revision of the plan of operations in 1975."(ERT Report 1977,78 & 81)

In addition to the above remarks of External Review Team(ERT) members, it is stated that we cannot afford to overlook the fact that malaria is going to remain the major health problem for many years to come and consequently new technical and operational problems are likely to crop up in future. Therefore, an adequately staffed Directorate of Malaria Control is a must if we want to be prepared for all eventualities as well as for smooth and effective functioning of MCP in the country.

Further it is rather an anamolous situation to have the Federal Head of M.C.P. in a lower scale than some of the Provincial Heads of M.C.P. The proposed reorganization will remove this anamoly.

Under the position explained above it has been considered the right time to review the organizational set-up of DOMC with a view to cope up with the field requirements of project when new PC-I Form for another six years (1987-88 to 1992-93) is under preparation. The proposed organizational set-up with projected manpower is attached as Annexure-VI(C). It is expected that with the implementation of the proposed set-up at Federal level, DOMC will be in a position to provide full technical and administrative support/back up to all the provinces to ensure better quality of work and close and effective coordination.

However, with the implementation of the proposed new organizational set-up there will not be much financial burden on Government exchequer which will only require an additional funds of Rs. 0.40 million and can easily be met out of development budget.

12. Give date when capital expenditures estimates were prepared. If prepared more than one year age, confirm if they are still valid:

Prepared in December, 1986.

13. Give break down of capital cost year-wise, covering the whole of the investment period, as indicated below:

Please see Annexure II & III.

14. Basis of Cost Estimates: (Give full details)

Cost is based on the requirement of insecticides, equipments, anti-malarial drugs etc. at the present market rates.

15. Estimates of annual recurring expenditure after completion of each phase of project: (also include the source of financing recurring expenditure):

(Figure in Million Rupees)

	Local Cost	F. E. Cost	Total
Insecticides & Equipments	20.00	80.00	100.00

- Source of financing is Government of Pakistan.

16. Unit costs for each category of service or output e.g. for curative health schemes, the cost & income per indoor patient for preventive health schemes, the cost per vaccination, for family planning scheme, the cost per acceptor and per couple contacted:

The cost for protecting one person against malaria for one year is Rs. 1.30

17. Indicate if any charge will be levied for providing the service. If so, give average annual income:

NOT APPLICABLE

18. Annual phasing of physical work and financial requirements for the project: Attached PERT of Bar Diagrams if prepared:

(A) Financial Requirements: (Figure in Million Rupees)

Year	Local Cost	F.E. Cost	Total
1987-88	21.66	169.20	190.86
1988-89	22.67	95.00	117.67
1989-90	21.59	156.18	177.77
1990-91	22.11	162.73	184.84
1991-92	23.33	111.70	135.03
1992-93	24.45	93.00	117.45
Total :-	135.81	787.81	923.62

(B) Physical Work:

The population in the malarious areas of the country will benefit from malaria control activities such as :-

i. Selective spraying of rural areas with incidence above control levels and larviciding operations in urban areas.

ii. Increased case detection through PCD and ACD in rural/urban areas.

iii. Prompt treatment of positive cases in urban and rural areas.

iv. Operational research on malaria will be conducted.

v. Epidemiological/Entomological investigations alongwith Annual External Reviews of the Project will continue.

(C) Item-wise Details of the Project:

Please see Annexure III, IV and V.

19. Foreign Exchange Expenditure — Please see Para 18 under Foreign Exchange.

20. a) Likely sources and amount of foreign exchange cost of the project:

b) Present position regarding availability, commitment or negotiations:

Government of Pakistan/USAID/Japan/WHO. The entire Foreign Exchange requirement of the MCP will be met under grant assistance from USAID/Japan and WHO. The Foreign Exchange will be utilized to procure primarily insecticides and other commodities.

21. Indicate sources and amount rupee component of project:

Sources	Amount Capital Expenditure.	Amount for Recurring Expenditure
Federal Development budget and some part under USAID on reimbursible basis.	Rs.135.81 million	Rs. 20.00 million
a) Government sources:		
i) Grant	The total amount will be a Government grant to the Malaria Control Project derived from the Federal Development budget.	
ii) Loan		
iii) Investment		
iv) Direct Government Expenditure	-	
b) Sponsoring Agency's own fund.	-	
c) Private Investment	-	
d) Local body services if any	-	
e) Non-Government borrowing	-	
f) Other sources (e.g. recoveries)	-	

22. Results of the project:

i) Direct benefits. Number of persons served.	The people living in malarious areas, comprising 99% of the population will enjoy improved health due to the reduction in malaria transmission as a direct out put of this project.
ii) Indirect and other benefits. Contribution towards specific targets social objectives.	Increase of agricultural and industrial output through the availability of healthy manpower. Health cover to more than nine crores population.

23. a) Approximate number and categories of job opportunity likely to be created indirectly, as a result of: i) Implementation ii) Operation of Project	Organization consisting of approximately 6,000 trained employees already in existance. Nearly 10,000 spraymen (seasonal labour) to be employed every year. Further the posts of Vector Control Officers at District level and more posts of CDC workers at each Union Council basis will be created.
b) Economic life of components of project(buildings, equipment etc.)	— Equipment - 8 - 10 years.

PART "C"

PROJECT REQUIREMENTS

24. a) Manpower	Trained manpower is already available with the programme and their salaries are met out of the non-development budget at the provincial and the Federal level. The various categories of manpower at Federal/Provincial level are shown in Annexure-VI.
b) Likely shortage of manpower by occupation:	NOT APPLICABLE
c) Steps to be taken to assure availability of manpower:	NOT APPLICABLE
d) Approximate number of persons required to be trained per year (locally and abroad) and the kind of skills to be learnt:	In service training courses will be offered at the NIMRT. Under the USAID grant municipal staff will receive specialized training in urban malaria control. Short-term fellowships are also available under the project for training abroad.
e) Give total capital outlay, give the capital cost of mobilizing one worker for one shift:	NOT APPLICABLE
25. Physical and other facilities required for project:	-
26. Materials, supplies and requirement: To be completed only for major items costing more than 10% of the total cost:	Please see Annexure-IV.
27. In the case of imported material & equipment for execution, indicate:	
a) Justification for imports:	The chemicals/equipment which are not manufactured/available in the country will be procured from abroad.
b) Proposed source/sources of supply:	Mainly USAID/Japan or any other country where this material/ equipment is available.

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ANNEXURE-I

MALARIA CASE PROJECTIONS WITH AND WITHOUT THE PROGRAMME

Year	a/ Population (Million)	Without the programme: Malaria Case b/ Rate per 10,000	Without the programme: Total Cases (Mill.)	With the programme: Malaria Case c/ Rate per 10,000	With the programme: Total Cases (Mill.)	Cases Avoided (Mill.)
1987	100.00	32	0.32	15	0.15	0.17
1988	103.00	65	0.67	15	0.15	0.52
1989	106.10	135	1.43	15	0.16	1.27
1990	109.30	281	3.07	15	0.16	2.91
1991	112.60	583	6.56	15	0.17	6.39
1992	116.00	1200	13.92	15	0.17	13.75
Total:			25.97		0.96	25.01

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. The 1992 case rate of 1200 per 10,000 population without a programme is derived from the estimated case rate of the 1973 epidemic. During this epidemic, an estimated 6 million to 10 million cases of malaria occured in a population of 67 million. A mid range value of 8 million cases gives a case rate of about 1200 per 10,000 population in 1992.

c/ The malaria case rate with the programme was derived by using 15 cases per 10,000 population for the year 1980 and for each subsequent year with a malaria programme in place. This fairly conservative rate, which is three times the programme goal of maintaining or further reducing the level to five cases per 10,000 population, was chosen on the assumption that the actual number of cases is at least three times the reported number of cases.

ANNEXURE-I
(Continued)

MALARIA CONTROL PROGRAMME BENEFITS

(Figure in $ Million)

Year	Number of a/ Cases Avoided	Value of Lost b/ production due to Work days Lost	Value of Lost c/ Production due to Debilitation	Value of d/ Treatment Cost Avoided	Total benefits (b+c+d)
1987	0.17	0.51	1.06	0.71	2.28
1988	0.52	1.56	3.26	2.16	6.98
1989	1.27	3.81	7.94	5.28	17.03
1990	2.91	0.75	18.23	12.09	39.07
1991	6.39	19.21	40.04	26.55	85.80
1992	13.75	40.14	86.11	57.13	183.38
Total:	25.01	73.98	156.64	103.92	334.54

a/ The total number of cases avoided were estimated by comparing the projected number of cases with and without a malaria control programme. An incidence rate of 15 cases per 10,000 population was taken for the year 1980 and for each subsequent year with a programme in place. This rate is three times the programme goal of 5 cases 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.

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

c/ Value of lost production due to debilitation was estimated by assuming that each case of malaria results in 25 days of 50% reduced effectiveness for the 30% of the population in the labour 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.

ANNEXURE-I
(Continued)

COMPARISON OF THE COSTS AND BENEFITS OF THE MALARIA CONTROL PROGRAMME :
(Figure in $ Million)

Year	Total Costs a/	Total Benefits b/	Net Benefits
1987	12.27	2.28	- 9.99
1988	9.53	6.98	- 2.55
1989	11.38	17.03	+ 5.65
1990	9.92	39.07	+ 29.15
1991	11.50	85.80	+ 74.30
1992	10.52	183.38	+ 172.86
Total:-	65.12	334.54	+ 269.42

a/ Includes the A.I.D. dollar and Mondale rupee contribution, the contribution of the Government of Pakistan, Federal and Provincial Programmes and that of other donors (WHO and the Government of Japan)

b/ Taken from previous Table.

PER CAPITA COSTS OF THE MALARIA CONTROL PROGRAMME

Year	Population (Million)	Total Programme Costs * ($ Million)	Per Capita Programme Costs ($)
1987	100.00	12.27	0.12
1988	103.00	9.53	0.09
1989	106.10	11.38	0.11
1990	109.30	9.92	0.09
1991	112.60	11.50	0.10
1992	116.00	10.52	0.09
Total:-		65.12	0.60

* Also includes administrative expenditure at Federal and Provincial level.

ANNEXURE-II

FINANCIAL REQUIREMENTS OF MALARIA CONTROL PROJECT FOR THE PERIOD FROM 1987-88 TO 1992-93

(Figure in Million Rupees)

Item	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	Total
LOCAL CURRENCY	21.66	22.67	21.59	22.11	23.33	24.45	135.31
FOREIGN EXCHANGE	169.20	95.00	156.18	162.73	111.70	93.00	787.31
GRAND TOTAL (Local Currency + Foreign Exchange)	190.86	117.67	177.77	184.84	135.03	117.45	923.62

N.B: i) The entire expenditure of Foreign Exchange will be borne by USAID/Japan.

ii) USAID will also reimburse some part of local currency to be incurred on training, research, workshop/seminar etc. etc. during the period under project.

iii) The above calculation was based on exchange rate of $ 1 = Rs. 18.00

ANNEXURE-III

REQUIREMENT OF INSECTICIDES, EQUIPMENTS ETC. FOR MALARIA CONTROL PROJECT ON COUNTRY BASIS FOR THE PERIOD FROM 1987-88 TO 1992-93:

(Figure in Million Rupees)

	Sl. No.	Name of Item	A/U	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	Total
FOREIGN EXCHANGE:	1.	Insecticide (Malathion/ Fenitrothion)	M.Ton	105.00	91.90	96.50	81.00	85.00	89.20	548.60
	2.	Spraying Equipments:								
		- Nozzle Tips	Nos.	1.20	-	1.30	-	1.40	-	3.90
		- Sprayers	"	6.00	-	6.60	-	7.30	-	19.90
		- ULV/Fogger	"	2.00	-	2.20	-	2.30	-	6.50
	3.	ULV Synthetic Pyrethroid(10%)	Litres	3.00	3.10	3.30	3.50	3.60	3.80	20.30
	4.	Transport	Nos.	20.00	-	11.00	-	12.10	-	43.10
	5.	Microscopes	"	32.00	-	35.28	78.23	-	-	145.51
	Total: -			169.20	95.00	156.18	162.73	111.70	93.00	787.31
LOCAL CURRENCY:	1.	Larvicides 2% Granules	M.Ton	6.00	6.30	5.50	5.80	6.10	6.40	36.10
	2.	Larvicides(EC)	Litres	2.50	2.60	2.70	2.90	3.00	3.20	16.90
	3.	Protective Clothing (Shirt,Shilwar and Turban)	Sets	1.80	1.90	2.00	1.50	1.60	1.70	10.50
	4.	Hand Gloves (Thick/Thin)	Pairs	0.36	0.37	0.39	0.41	0.43	0.45	2.41
	5.	Anti-Malaria Drugs(Tablets)	Million	6.00	6.30	6.60	6.90	7.30	7.60	40.70
	6.	Transportation, Commission, duties and contingencies		5.00	5.20	4.40	4.60	4.90	5.10	29.20
	Total: -			21.66	22.67	21.59	22.11	23.33	24.45	135.81
GRAND TOTAL:(FOREIGN EXCHANGE + LOCAL CURRENCY)				190.86	117.67	177.77	184.84	135.03	117.45	923.62

Note:- The above calculation was based on exchange Rate of Dollar($) 1 = Rs. 18.00

ANNEXURE-IV

REQUIREMENT OF INSECTICIDES, EQUIPMENTS ETC. FOR MALARIA CONTROL PROJECT ON COUNTRY BASIS FOR THE PERIOD FROM 1987-88 TO 1992-93:

Sl. No.	Name of Item	A/U	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	Total
1.	Insecticide* (Malathion/ Fenitrothion)	M.Ton	3,000	2,500	2,500	2,000	2,000	2,000	14,000
2.	Spraying Equipments:								
	- Nozzle Tips	Nos.	20,000	-	20,000	-	20,000	-	60,000
	- Sprayers	"	5,000	-	5,000	-	5,000	-	15,000
	- ULV/Fogger	"	50	-	50	-	50	-	150
3.	ULV Synthetic Pyrethroid(10%)	Litres	10,000	10,000	10,000	10,000	10,000	10,000	60,000
4.	Transport	Nos.	100	-	50	-	50	-	200
5.	Microscopes	"	1,000	-	1,000	2,112	-	-	4,112
1.	Larvicides 2% Granules	M.Ton	600	600	500	500	500	500	5,200
2.	Larvicides(EC)	Litres	10,000	10,000	10,000	10,000	10,000	10,000	60,000
3.	Protective Clothing(shirt, shilwar & Turban)	Sets	20,000	20,000	20,000	15,000	15,000	15,000	105,000
4.	Hand Gloves (Thick/Thin)	Pairs	6,000	6,000	6,000	6,000	6,000	6,000	36,000
5.	Anti-Malaria Drugs(Tablets)	Millions	30	30	30	30	30	30	180

* The quantity has been worked out on the basis of the requirements of Malathion, (50% WDP). In case of Fenitrothion (40% WDP), the quantity will then be almost half. These Insecticides can be replaced by other more effective alternative Insecticides in case vector species gain resistance to them or other economic reasons.

- Estimated rates for calculation of the costs given as under :-

1.	Malathion 50% W.D.P.	Rs.	35,000/M.Ton
2.	Sprayers (10 Litres)	Rs.	1,200/Unit
3.	Nozzle Tips	Rs.	60/Unit
4.	ULV/Fogger (Mini)	Rs.	40,000/Each
5.	ULV Pyrethroid (10%)	Rs.	300/Litre
6.	Transport	Rs.	2 Lac/Vehicle
7.	Microscopes	Rs.	32,000/Unit
8.	Larvicides 2% Granules	Rs.	10,000/M.Ton
9.	Larvicides (EC)	Rs.	250/Litre
10.	Protective Clothing	Rs.	90/Set
11.	Hand Gloves (Poisonous Proof)	Rs.	60/Pair
12.	Anti-Malaria Drugs	Rs.	200/1000 Tablets

ANNEXURE-V

PROVINCE-WISE BREAK UP OF INSECTICIDES & OTHER EQUIPMENTS IN FOREIGN EXCHANGE:

Sl. No.	Articles	Province	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	Total
1.	Insecticides (Malathion/ Fenitrothion) (in M.Ton)	PUNJAB	1920	1600	1600	1300	1300	1300	9020
		SIND	550	450	450	350	350	350	2500
		N.W.F.	400	350	350	250	250	250	1850
		BALUCHISTAN	80	60	60	60	60	60	380
		AZAD KASHMIR	50	40	40	40	40	40	250
		Total : -	3000	2500	2500	2000	2000	2000	14000
2.	Synthetic Pyrithroid 10% EC for ULV. (in Litres)	PUNJAB	5000	5000	5000	5000	5000	5000	30000
		SIND	2500	2500	2500	2500	2500	2500	15000
		N.W.F.	1500	1500	1500	1500	1500	1500	9000
		BALUCHISTAN	600	600	600	600	600	600	3600
		AZAD KASHMIR	400	400	400	400	400	400	2400
		Total : -	10000	10000	10000	10000	10000	10000	60000
3.	Sprayers (in Nos.)	PUNJAB	2900	-	2900	-	2900	-	8700
		SIND	900	-	900	-	900	-	2700
		N.W.F.	700	-	700	-	700	-	2100
		BALUCHISTAN	300	-	300	-	300	-	900
		AZAD KASHMIR	200	-	200	-	200	-	600
		Total : -	5000	-	5000	-	5000	-	15000
4.	Nozzle Tips for sprayers (in Nos.)	PUNJAB	10000	-	10000	-	10000	-	30000
		SIND	5000	-	5000	-	5000	-	15000
		N.W.F.	4000	-	4000	-	4000	-	12000
		BALUCHISTAN	700	-	700	-	700	-	2100
		AZAD KASHMIR	300	-	300	-	300	-	900
		Total : -	20000	-	20000	-	20000	-	60000
5.	ULV/Foggers (in Nos.)	PUNJAB	25	-	25	-	25	-	75
		SIND	13	-	13	-	13	-	39
		N.W.F.	8	-	8	-	8	-	24
		BALUCHISTAN	3	-	3	-	3	-	9
		AZAD KASHMIR	1	-	1	-	1	-	3
		Total : -	50	-	50	-	50	-	150
6.	Transport (in Nos.)	PUNJAB	50	-	24	-	24	-	98
		SIND	23	-	12	-	12	-	47
		N.W.F.	16	-	8	-	8	-	32
		BALUCHISTAN	7	-	4	-	4	-	15
		AZAD KASHMIR	4	-	2	-	2	-	8
		Total : -	100	-	50	-	50	-	200
7.	Microscopes (in Nos.)	PUNJAB	540	-	540	1192	-	-	2272
		SIND	220	-	220	440	-	-	880
		N.W.F.	160	-	160	320	-	-	640
		BALUCHISTAN	60	-	60	120	-	-	240
		AZAD KASHMIR	20	-	20	40	-	-	80
		Total : -	1000		1000	2112			4112

ANNEXURE-V
(Continued)

PROVINCE-WISE BREAK UP OF LARVICIDES & OTHER EQUIPMENTS IN LOCAL CURRENCY

Sl. No.	Articles	Province	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	Total
1.	Larvicides 2% Granules (in M.Ton)	PUNJAB	300	300	250	250	250	250	1600
		SIND	170	170	150	150	150	150	940
		N.W.F.	100	100	80	80	80	80	520
		BALUCHISTAN	30	30	20	20	20	20	140
		AZAD KASHMIR	-	-	-	-	-	-	-
		Total :-	600	600	500	500	500	500	3200
2.	Larvicides (E.C.) (in Litres)	PUNJAB	5000	5000	5000	5000	5000	5000	30000
		SIND	2500	2500	2500	2500	2500	2500	15000
		N.W.F.	1500	1500	1500	1500	1500	1500	9000
		BALUCHISTAN	600	600	600	600	600	600	3600
		AZAD KASHMIR	400	400	400	400	400	400	2400
		Total :-	10000	10000	10000	10000	10000	10000	60000
3.	Protective Clothing (in Sets)	PUNJAB	12000	12000	12000	8000	8000	8000	60000
		SIND	4500	4500	4500	3500	3500	3500	24000
		N.W.F.	2500	2500	2500	2500	2500	2500	15000
		BALUCHISTAN	500	500	500	500	500	500	3000
		AZAD KASHMIR	500	500	500	500	500	500	3000
		Total :-	20000	20000	20000	15000	15000	15000	105000
4.	Rubber Hand Gloves (in Pairs)	PUNJAB	3000	3000	3000	3000	3000	3000	18000
		SIND	1500	1500	1500	1500	1500	1500	9000
		N.W.F.	1000	1000	1000	1000	1000	1000	6000
		BALUCHISTAN	250	250	250	250	250	250	1500
		AZAD KASHMIR	250	250	250	250	250	250	1500
		Total :-	6000	6000	6000	6000	6000	6000	36000
5.	Anti-Malaria Drugs (in Million)	PUNJAB	15	15	15	15	15	15	90
		SIND	7	7	7	7	7	7	42
		N.W.F.	5	5	5	5	5	5	30
		BALUCHISTAN	2	2	2	2	2	2	12
		AZAD KASHMIR	1	1	1	1	1	1	6
		Total :-	30	30	30	30	30	30	180

ANNEXURE-VI(A)

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

ANNEXURE-VI(A)
(Continued)

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.	Microsoope 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.

ANNEXURE-VI(B)

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)

NATIONAL MALARIA TRAINING CENTRE, LAHORE

ANNEXURE-VI(B)
(Continued)

ORGANIZATIONAL CHART OF NATIONAL MALARIA TRAINING CENTRE, LAHORE:

(FEDERAL GOVERNMENT)

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) - 1
- Senior Malaria Inspector (Grade-8) - 1
- Malaria Inspector (Grade-6) - 1
- Senior Draftsman (Grade-9) - 1

PROPOSED ORGANIZATIONAL SET UP OF DIRECTORATE OF MALARIA CONTROL (FEDERAL GOVERNMENT)

ANNEXURE-VI(C)

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

NATIONAL MALARIA TRAINING CENTRE, LAHORE